Indigenous Knowledge

Local Pathways to Global Development

Marking Five Years of the World Bank Indigenous Knowledge for Development Program

Knowledge and Learning Group
Africa Region
The World Bank

IK Notes reports periodically on indigenous knowledge (IK) initiatives in Sub-Saharan Africa and occasionally on such initiatives outside the Region. It is published by the Africa Region's Knowledge and Learning Group as part of an evolving IK partnership between the World Bank, communities, NGOs, development institutions, and multilateral organizations.

For information, please e-mail: ik-info@worldbank.org. The Indigenous Knowledge for Development Program can be found on the web at http://worldbank.org/afr/ik/default.htm

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Foreword

In 1996, we articulated a vision for the World Bank to become a "Knowledge Bank" that intermediates ideas as well as financial resources. At the First Global Knowledge Conference in Toronto in 1997, political leaders and civil society representatives from developing countries endorsed this vision. They called upon the World Bank not only to provide its own know-how, gained through more than 50 years of development experience, but to equally learn from the practices of communities so as to leverage the best in global and local knowledge systems.

The World Bank has responded to this challenge. We recognize that knowledge is not the exclusive domain of technologically advanced societies. We need to give a new meaning to empowering poor people and helping to give them voice—not as recipients of knowledge, but as contributors and protagonists of their own development.

In 1998, we launched the Indigenous Knowledge for Development Program to help learn from community-based knowledge systems and development practices, and to incorporate them into Bank-supported programs. A core activity was the publication and dissemination of a series of *IK Notes*, where development practitioners report on successful local solutions for local development problems. The present publication, marking half a decade of the IK program, is a collection of 60 such narratives. Thematic lead articles introduce the cases, synthesizing the lessons learned and discussing the impact indigenous knowledge can make on our development efforts and on helping to achieve the Millennium Development Goals (MDGs).

The cases presented here demonstrate how communities and local practitioners use indigenous knowledge systems and practices to help increase their crop yields, educate their children, reduce suffering from HIV/AIDS, decrease infant and maternal mortality, heal the impact of conflict, learn from each other, and empower themselves. The cases also suggest that the communities are quite willing, indeed eager, to combine global knowledge and modern technology with their indigenous knowledge and institutions to obtain better results. Traditional Birth Attendants in the Iganga District of Uganda, for example, use modern walkie-talkies to refer critical cases to the public health system, thus contributing to reducing maternal mortality substantially, one of the MDGs.

I am confident that this collection of successful grassroots community experiences will prove to be a valuable resource in improving our understanding of how communities empower themselves to manage their own development in the larger context of globalization. Building on such practices and helping scale up the more successful ones is critical to ensuring results. It will also enrich the development process, making it more equitable and sustainable.

James D. Wolfensohn
President
The World Bank

Preface

This publication is the five-year-milestone of the Indigenous Knowledge for Development Program in the Africa Region of the World Bank. The main goal of the program is to learn from the knowledge embedded in the practices of local communities. A core activity of the program is the publication of the *IK Notes*—a monthly periodical that appears in print and online in English, French and, occasionally, in Portuguese, Swahili, and Wolof. We present here 60 of the *IK Notes*, in which development practitioners describe how successful indigenous practices enrich the development process.

We learn, for example, how communities have applied their traditional judicial system to reduce or prevent conflict in Ghana, how rural women in India have empowered themselves by developing their own capacity, how youth in Senegal have improved their skills and competitiveness, how cooperating with traditional healers increases the effectiveness of HIV/AIDS projects, and how communities in Uganda combine traditional and modern knowledge to help reduce maternal mortality.

In addition, this publication includes several new thematic articles by leaders, scholars, and development practitioners that synthesize the lessons from the various themes of the *Notes* and discuss the conditions that make the incorporation of indigenous knowledge into development work successful. And, as His Excellency, the President of Tanzania concludes in his introduction to this publication, the most important condition is that decision-makers and development partners must be ready to learn from communities and to help them shape their own development agenda.

The World Bank has contributed to this process by helping clients enhance their capacity to develop their indigenous knowledge base and by creating more opportunities for local communities to be involved in development. In Uganda, for example, the Bank has supported the development of a national strategy that incorporates indigenous knowledge into the country's poverty reduction program. In Ethiopia, the Bank is supporting the development of medicinal plants for the domestic market. The Bank also brokered cooperation for the scientific validation of traditional medicinal practices between local research organizations, NGOs, practitioners, and the global scientific community.

The Bank has also integrated indigenous knowledge into Bank-supported programs to obtain better results. In a number of West African countries, programs to combat HIV/AIDS include regular consultations with the traditional healers. In Burkina Faso, the Bank is helping to promote a traditional water harvesting and soil conservation technology throughout the country. Bank-supported social protection projects in Malawi, Tanzania, and Northern Uganda build on community-based institutions for local management of the projects.

Over the past five years we have learned a lot about the efficacy and sustainability of indigenous practices in development. We also see a growing pattern of integration of indigenous practices in development programs for improved development results. With this new compilation of *IK Notes* and related thematic lead articles we offer the development community a collection of good practices and ideas that can help in designing programs that empower communities through the validation and use of indigenous knowledge systems.

Callisto E. Madavo
Vice President
Africa Region

This publication is the result of an international partnership by a network of promoters, practitioners, and protagonists of indigenous knowledge. The editors wish to record their gratitude to all the contributors. For over five years, the authors of the *IK Notes* have taken the time and effort to share their experiences, impressions, and lessons learned. The editors trust that they will extend our thanks to those who are the source of the knowledge discussed here: the communities, women farmers, traditional healers, birth attendants, village elders, herdsmen, and many others.

The editors wish to express their profound gratitude to His Excellency, The President of the United Republic of Tanzania, Benjamin W. Mkapa, who has been kind enough to author the introduction to this publication and whose central message we have adopted in our title: local pathways to global development.

The authors of the lead articles have patiently endured the editors' proposals for amendments in format, style, and diction. We thank them for engaging us in a fruitful discussion on context and content—up to the very last minute.

The editors further wish to thank the team members of the Indigenous Knowledge for Development Program and other World Bank staff, who provided useful commentary and contributions.

On behalf of the Africa Region's IK Program for Development, the editors wish to express their gratitude to the President of the World Bank, James D. Wolfensohn, and the Vice President of the Africa Region, Callisto E. Madavo. The Foreword and Preface to this commemorative publication are symbolic of their vision, which helped to promote the recognition of indigenous knowledge as being critical to the development process. This publication would not have been possible without their support and guidance.

Any errors of this publication remain the responsibilities of the editors.

Reinhard Woytek
Preeti Shroff-Mehta
Prasad C. Mohan

Acronyms and Abbreviations

ABC	Abstain, Be Faithful, Use Condoms
ABEL	Achieving Basic Education and Literacy
ADR	Alternative Dispute Resolution
ARV	Antiretroviral (drug)
C2C	Community-to-Community Learning and Training Exchange
CBO	Community Based Organization
CCD	Convention to Combat Desertification
CDC	Center for Disease Control
CDD	Community Driven Development
CE	Capacity Enhancement
CIDA	Canadian International Development Agency
CIRAN	The Centre for International Research and Advisory Networks (former department of NUFFIC)
CISDA	Center for Information Society Development in Africa
COSECHA	Association of Advisors for a Sustainable, Ecological and People-Centered Agriculture
CSIR	Council for Scientific Industrial Research
ECA	United Nations Economic Commission for Africa (UNECA)
ENDA	Environment and Development Action
FAO	Food and Agriculture Organization of the United Nations
FGM	Female Genital Mutilation
GM/CCD	Global Mechanism of the Convention to Combat Desertification
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Development Agency)
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HYV	High Yielding Variety
ICT	Information and Communication Technology
IDRC	International Development Research Centre (Canada)
IFAD	International Fund for Agricultural Development
IK	Indigenous Knowledge
IKS	Indigenous Knowledge Systems
ILO	International Labour Organization
IPR	Intellectual Property Rights
IPGRI	International Plant Genetic Resources Institute
ITU	International Telecommunication Union
IUCN	World Conservation Union
IUCN-ROSA	IUCN Regional Office for Southern Africa
MDG	Millennium Development Goals
MTA	Material Transfer Agreements
NARO	National Agriculture Research Organization (Uganda)
NCP	Natural Crop Protection
NGO	Non-Governmental Organization
NIH	National Institutes of Health (USA)
NORAD	Norwegian Agency for Development Cooperation
NUFFIC	Netherlands Organisation for International Cooperation in Higher Education
PELUM	Participatory Ecological Land Use Management (Network in Eastern and Southern Africa)

PICTA	Partnership for Information and Communication Technologies in Africa
PLWHA	People Living With HIV/AIDS
PROMETRA	Promotion des Médecines Traditionnelles
R&D	Research and Development
SADC	Southern African Development Community
SARNIKS	Southern African Regional Network on Indigenous Knowledge Systems
SEWA	Self-Employment Women's Association (India)
STI	Sexually Transmissible Infections
TAWG	Tanga Aids Working Group (Tanzania)
TBA	Traditional Birth Attendant
THETA	Traditional and Modern Health Practitioners Together Against AIDS and other Diseases
TRC	Truth and Reconciliation Commission
UMADEP	Uluguru Mountains Agricultural Development Project
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNCED	United Nations Conference on Environment and Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WBI	World Bank Institute
WCC	World Conservation Congress
WHO	World Health Organization
WIPO	World Intellectual Property Organization

Part One

Lead Articles

1. Indigenous Knowledge—a Local Pathway to Global Development

Benjamin Mkapa

Benjamin Mkapa is President of the United Republic of Tanzania.

In Laetoli, near Olduvai Gorge, Northern Tanzania, paleontologists have found footprints of early hominids, presumably two adults and a child, idealized as father, mother and child. We do not know where the three walkers in the "cradle of mankind" came from, where they went and what their plans were. But it is reasonable to assume that were they capable of speech they would have shared thoughts, ideas, knowledge, while walking along the plain some three and a half million years ago. Ever since humans walked on earth, they have sought more knowledge to feed their families, stay healthy, argue with their neighbors, getting a better understanding of their environment or just have some distraction from an otherwise rather challenging life.

For hundreds of millennia, local needs and constraints and day-to-day challenges drove the quest for knowledge. Scientific approaches to knowledge generation, as we know them today are, historically speaking, a very recent phenomenon. These modern approaches have brought about tremendous results: we have the capacity to feed more than six billion people satisfactorily; vaccinations protect our children from once deadly diseases, we communicate with the help of satellites around the globe and we compete on global market places with our products. Yet, despite these achievements, we still have crises of hunger, HIV/AIDS, illiteracy, isolation, and conflicts and abject poverty. While the debate on the causes of poverty is not closed, we have learned that science and technology alone cannot provide all the answers or solutions to these unsolved problems or how we can overcome living in a disparate world characterized by unequal distribution of wealth and opportunities.

As scientists struggle to respond to global challenges, they have increasingly distanced themselves from local ways of solving problems. Local solutions were even discriminated against as hindering progress, outdated, "old wives tales" or simply just unfashionable. As we "modernized" our societies, a "degree" in traditional or indigenous knowledge was not planned for. Hence, we overlooked its potential as a resource and even further neglected the knowledge that women and men, families and communities had developed themselves for centuries.

The sixty cases presented in this collection of *IK Notes* demonstrate that indigenous knowledge (IK) is a resource that can help to solve local problems, a resource to help grow more and better food, to maintain healthy lives, to share

wealth, to prevent conflict, to manage local affairs, and thus contribute to global solutions. Indigenous knowledge has contributed to building solidarity in communities affected by globalization and shielded them against some of its negative impacts. There is not one of the Millennium Development Goals to whose achievement indigenous knowledge cannot contribute. The sixty cases contained in this publication successfully underline the crucial role indigenous knowledge can play in development: IK has helped to reduce hunger and poverty in India, it has improved primary education and enrollment by using local language as a means of instruction in West Africa, it has enabled men in Senegal to understand the impact of female circumcision on women and empowered women to move towards eradicating the practice, it has helped to reduce child mortality in Eritrea and maternal mortality in Uganda, it provides primary healthcare to millions of Africans, it has helped communities in Mozambique to manage their coastal natural resources, and it has helped to build partnerships between the weak and the strong in Ghana to share wealth.

Sixty persuasive arguments and yet we find it difficult to convince so many scientists, politicians, development experts and administrators to systematically use indigenous knowledge in the development process. The plural of anecdotes is not evidence, they say; scientific proof for most of its claims has yet to be found. However, for the communities where indigenous knowledge has worked, these cases are not anecdotes but reality. Had they waited for the scientific proof for the treatments they received from local healers, four thousand HIV/AIDS patients in Tanga, Tanzania without access to modern antiviral drugs would not have been alive today.

But these sixty cases provide more lessons than just the benefits of the particular practices or approaches to development. The most pertinent ones relate to ownership of development, local capacity, self-reliance, and empowerment.

Ownership has been at the center of the development discourse over the last years. The sustainability of many externally induced development projects hinges on the ownership by the beneficiaries. When building on indigenous knowledge, ownership does not even arise as an issue. Indigenous knowledge is locally managed and owned. Studying, understanding and building on the knowledge of communities will substantially reduce the risk of failures of the development approach and the investments by governments and bi- and multilateral donors. The increased sustainability does not only arise from particular indigenous practices that would be included in the context of a development project. The very process of learning from the community recognizes the community and the bearers of indigenous knowledge as partners in development who bring as much, if not more to the process as the providers of global knowledge.

Capacity building essentially assumes a vacuum on the side of the beneficiaries of capacity building efforts, ever so often camouflaged by the term capacity strengthening. Undoubtedly, African farmers, communities, administrators, engineers and politicians have much to learn to cope with an increasingly complex and ever changing economic and political global environment. Yet, have communities and farmers not coped with an ever-changing environment in the past? Political experiments, inadequate institutions to market their crops or failing services have not prevented them from prevailing and adapting to find their own solutions to survive. The communities not only have knowledge about practices, they also have knowledge of how to adapt to adverse environments, institutions and policies.

Self-reliance, as political tradition in Tanzania since independence, is one of the key characteristics of building on indigenous knowledge. Yet, many chose to interpret self-reliance as isolation, reaffirming the assumption that knowledge sharing and learning among African communities is against tradition, and that the risk associated with that is the loss of power and control. These cases tell us differently. Communities are eager to learn and share, because their environment teaches them one lesson almost on a daily basis: only those who learn will prevail. Self-reliance is a genuinely local approach to development—no less so in an economic sense. When our late President Mwalimu Julius K. Nyerere first promoted self-reliance after Tanzania's independence, learning was a primary means for the country's development. If the orthodox sciences were as open to learning from indigenous knowledge, as local communities are ready to learn from others and the outside world, both sides would benefit substantially.

Empowerment is a central icon of the development discourse. Development planners and implementers go great lengths to help empower the poor, the women, the vulnerable. The cases in these *IK Notes* teach us that empowerment cannot come from the outside. Lasting empowerment is self-empowerment. The communities, farmers, women, innovators, teachers whose stories are presented here have all chosen to empower themselves.

They were given space and opportunity either through education, through intermediaries such as NGOs, a research station, an extension agent or a ministry, but they all had to go the last mile themselves. This reflects well what Mwalimu Julius Nyerere said at the inauguration ceremony of the South Commission on 20 October 1987:

> "From the elders of my tribe I learned a story. Here it is in the original:
>
> '*Wakasusu, nihe wagya?*
> *Nagya kwita Wanzugu.*
> *Oragya kutura?*
> *Ndagya Kusaya-sayamu, Ndinukira!*
>
> Rabbit, where are you going?
> I am going to kill the Elephant.
> Can you do it?
> Well, I'll try, and try again.'

It is in this spirit that I recommend to development experts and planners, researchers and practitioners, politicians and bureaucrats, teachers and students to humbly learn from these cases. They are not blueprints or recipes or shortcuts to development, nor do they seek to romanticize indigenous knowledge or traditions or suggest that global knowledge is irrelevant. Rather, they show that, indigenous and global knowledge working together in a democratic, self-determined way is the best combination to foster sustainable development. It remains for us, the politicians and decision makers, to provide the space for this to happen.

Only those who learn will prevail.

2. Indigenous Capacity Enhancement: Developing Community Knowledge

Frannie Leautier

Frannie Leautier is Vice President of the World Bank Institute.

When asked, communities are quick to identify solutions to address local development problems. For communities to realize their development choices, enhancement of their own capacity to deliver and manage these solutions is a critical necessity. In the introduction to this publication, His Excellency, the President of Tanzania remarks that African communities and farmers have always coped with changing environments and that "communities not only have knowledge about practices, they also have knowledge of how to adapt to adverse environments, institutions, and policies." The *IK Notes* in this publication offer a vivid illustration of three basic principles that underpin capacity enhancement (CE) in the context of indigenous knowledge (IK). First, capacity enhancement should not assume a vacuum of knowledge, a void of institutions, a lack of skills or a deficiency of willingness. Many of the cases show that with the right approach, development actors can identify and tap into local capabilities in the areas of knowledge, skills, and practices. Second, capacity enhancement efforts without the opportunity to apply that very capacity in a local context are likely to be ineffective. Adults learn best when the knowledge and skills gained are of direct relevance to the problems they are seeking to solve. Third, the enhancement of indigenous capacity is a key to the empowerment of local communities and their effective participation in the development process. People are better able to adopt new ideas when they can be seen in the context of existing practices and ways of doing.

In this context, one may distinguish three levels of capacity; one representing the more technical skills acquired in relation to a set of concrete development problems dealing with a specific situation (e.g., managing an orphanage, keeping dairy cattle, organizing an awareness campaign, etc.). The other level is concerned with skills and approaches that are critical to the management of an organization. These relate, for example, to managing local affairs and meeting the interests of local residents. The third level relates to the question of balancing interests and negotiating with central and local authorities, and is central to the empowerment of communities and the development of society. For example, the technical skills acquired when building a school in a community may be secondary to the community's experience gained in managing the project, supervising contractors, keeping the process transparent, and concluding it without much external assistance. Based on some of the insights from these *IK Notes*, this article discusses how communities can take charge of their own capacity enhancement on all three levels and what development partners can do to support this process.

Communities can take charge of their own capacity enhancement

The *IK Notes* contained in this compilation illustrate a wide range of community-based capacity enhancement initiatives. They include adapting literacy programs; introducing local knowledge approaches into school curricula; women's initiatives to manage natural resources; healing of war-affected children; farmers' access to markets, appropriate technology, and financial institutions; research design and dissemination; documenting indigenous knowledge and protecting the intellectual property rights of communities.

They tell the stories of outstanding individuals, or ordinary individuals doing extraordinary work, of dedicated CBOs or NGOs, of curious researchers or practitioners—all engaged in achieving the same goal: improving livelihoods of the communities in which they live. Finally, they document how communities have empowered themselves by engaging authorities or development partners to be more responsive to local development perspectives.

The following three boxes illustrate how different actors have built on their own knowledge systems, mobilized external expertise and helped improve livelihoods in their communities.

In Mali, local communities use literacy and numeracy programs as a platform to enhance their capacity to manage development activities that affect their daily lives. They apply newly acquired skills to design their own management systems for agricultural cooperatives.

This case may almost appear to be a provocation to conventional development planning. Had the problem been identified as "weakness in the governance of cooperative societies" the standard approach would likely have been to train more accountants at all levels (build the right skills to control), conduct awareness raising seminars (inform and therefore get buy in), and introduce computers and a management information system (transparent process of making information available and tracking key decisions). Such a project would most likely have targeted the literate and those well conversant with the existing system. Instead, a completely unrelated activity—an adult literacy program—prompted participants to develop their own accounting systems and management principles for the cooperatives, at a level of understanding that was immediately relevant in the village, and hence allowing such systems to slowly adapt to new technologies, on the appropriate organizational backbone. Eventually, the cooperatives were not only managed better, but ownership and control had shifted appropriately and to the right level.

The next case from India suggests that even in very traditional settings, the most unlikely "candidate"—a low caste woman—can become a change agent by first developing her own capacity and transferring what she knows to others. Confidence in implementing change for herself, translates into the ability to build confidence in others. Knowledge of what would be most effective for her and her community is rightly applied to make such ideas more widely acceptable in a region.

Extension workers had tried for years to introduce improved dairy management and land use technology in the same communities, yet failed—according to the case study—because of their perceived lack of understanding

Re-establishing command of the supply chain to farmers in Mali

Cotton has been cultivated and marketed in southern Mali for over thirty years, and the working of textiles from various fibres is a culture of centuries in Mali. Most recently, cotton companies and their affiliates commonly used to control the purchase of cotton from farmers and its transport to processing centers. Today, village organizations have almost entirely assumed these functions. Representatives of farmers' associations or their federations are now fully responsible for weighing the crop, paying producers, stocking the products, transporting them to processing centers, and reselling them to the processors, as well as for the necessary organizational and accounting tasks, and development of related policy. The feat was accomplished thanks in large measure to literacy and non-formal education programs, which enabled a core of adolescents and adults to acquire reading, writing, and accounting skills in their own local language. Based on these new skills, the participants developed and applied their own vernacular and bilingual management systems for the farmers' associations.[1] Farmers in Mali now manage the vertically integrated chain of production and process logistics, as they used to in past centuries, when villages made their own fabric. An indigenous skill of logistics management that was latent for many years is again in use.

Local catalyst promotes change in rural India

In rural India a socially disenfranchised woman gained acceptance in her community and beyond by challenging the local context through her technical ingenuity and her capacity to broker external knowledge into the communities. She convinced communities to adopt measures for the improvement of their lives. She did this by introducing improved land and dairy cattle management, first to her own landholding, then to her community, and finally throughout her region. Extension agents had hitherto failed to achieve a similar outcome, primarily because the community perceived the extension agents as outsiders who could "not understand and appreciate the local context and conditions." Having lived in conditions similar to or even worse than those of the other community members provided the woman change agent not only with the credibility to promote change and enhance capacity, but with the critical knowledge of where to start, and how to get broader acceptance of new ideas.[2]

of the local context. The improved management system as successfully promoted by a low-caste woman is not much different from the system proposed by extension workers. Yet, changing the change agent from an external into an internal one, made all the difference in achieving the desired outcomes.[3]

The last example from a USAID research project in West Africa has a very subtle message that omits the "skill building" theme altogether. Instead of identifying skill gaps and needs, the actors inverted the approach, surveyed existing indigenous knowledge, and reflected the results back to the respondents and their communities. This established a useful knowledge base on existing technical, operational, and managerial skills in the informal sector. But more importantly, it also helped empower the communities by making them realize that their own knowledge is valuable and useful.

The challenge for development practitioners, governments, and development partner organizations is to determine what they can do to help stimulate processes that are similar to the ones described in these cases.

Local change agents contribute to enhancing local capacity

Previous experiences of communities in interacting with governments and development projects have often led to communities adopting a wait-and-see attitude. Often, it is not the entire community or its leader, but an individual or a group within the community with a particular interest, that sets the change process in motion: women, elders, youth, coffee producers or even the poorer segments of the community or occasionally an exceptional individual. The three examples illustrated in the boxes, as well as experience from other cases, indicate that there is no single "best practice" to bring about change and empowerment through local capacity enhancement. Except when faced with severe external shocks, societies tend to prefer gradual, social, and economic change, especially when existing conditions are already fragile. Any change, especially a sudden one, brings risks that the poorer segments of the population might neither be able to anticipate nor be willing to take. Risk aversion is a cop-

Unleashing the potential of local knowledge in West Africa

The USAID-funded ABEL Project (Achieving Basic Education and Literacy) has successfully developed methods for disseminating studies carried out by African researchers around the theme "decentralization and local capacity-building." The research themes included the acquisition of skills in the informal sector, management of women's cooperatives, NGO-government cooperation in providing non-formal education services, and experiments in informal primary schooling. The research approach emphasized the involvement of the disseminators and target audience in a critical review of the studies, documenting and analyzing personal experiences, and drawing practical policy conclusions from the results. The ABEL project approach defines research as "a conversation about indigenous knowledge, its refinement, and its practical applications." Those responsible for the work struggled to make existing studies understandable in practical terms and help their "clients" recognize the fruits of their own experience as research worth comparing with work done elsewhere.[4]

ing strategy that centers around resisting most externally induced approaches to change. External change agents tend to underestimate these risks, as they usually do not have to bear these themselves.

However, the lessons of experience also tell us that being an insider is not sufficient to bring about social and economic change. The insider needs at least to have had some external exposure, stimulus, and the ability to demonstrate that it is possible to merge local and external knowledge into a working model. The advantages of local change agents are that they know the local context, "how to work the system." The narrative of how women in Malicounda, Senegal challenged and then abolished the practice of female genital mutilation is a model example of the benefits for a community of having internal change agents who have been empowered as a result of external exposure.[5]

Local context, cultural idiosyncrasies, and *usually* local management and ownership tend to determine the pace and direction of change. Once communities accept to be supported, pulled, or driven by a change agent, they tend to exploit their own and the change agents' explicit and tacit knowledge to address their social, institutional, or economic concerns.

Self-paced learning at the local level through structured literacy programs often plays a catalytic role in the process of change. The impact of self-paced learning can be most easily seen when looking at adult education in rural areas, which has played a significant role for members of a community to become active, to organize, and to start addressing a problem.[6] While the objectives of the education projects in such literacy programs are primarily directed at increasing literacy, they typical generate secondary outcomes focused on empowerment. For example, in addition to receiving literacy training, the participants in such programs would agree to address a critical problem of relevance to their community, making the learning immediately relevant and allowing local residents to learn a skill that can be used to implement other activities in the village.

Contrary to general perceptions[7] regarding the secretive nature of some form of IK, and the unwillingness of indigenous knowledge bearers to learn from others, *IK Notes* authors have recorded a remarkably high propensity among communities to learn, both from other communities and from available global knowledge. Literacy is a key mechanism that enables communities to engage in such knowledge exchange.

Innovative literacy efforts documented in the *IK Notes* show that instruction in the local language and the use of local language teaching materials (which often emphasizes local context through story-telling, local history, or literature) tend to be more successful in achieving higher literacy rates. The use of local language is not only more effective, it underscores the value of cultural norms and practices in development planning and practice. This also creates opportunities for endogenous capacity enhancement, as the two examples in the next box demonstrate.

The role of development partners

As in other areas of development cooperation, partners can support governments to create the political and economic environment that fosters indigenous capacity en-

Capacity is embedded in the practices of a community

In Nwodua, Ghana illiterate farmers, school drop-out youth, and village authorities started and managed innovative health, economic, and educational initiatives. This approach was more useful than the ideas they could adopt from recommendations by external change agents. In an environment where the only substantial remaining locally managed and controlled economic activity is subsistence production, any additional, worthwhile activity that can be owned and managed by the local community is an attractive proposition.[8] They would succeed because they were able to use latent capacity, embedded in how they managed subsistence farming, towards managing health and educational initiatives.

Another case describes the effectiveness of locally selected and retained seed for the improvement of land races. Communities were able to tap into their knowledge (as retained in the local varieties of seeds) and already existing capacity (farmers have cultivated and selected seed for centuries), not only to expand this capacity but also turn it into an opportunity not available under previous agricultural extension services.[9] This case illustrates how a traditional top-down extension service can be transformed into an enabling institution for the development of local capacity.

hancement, assist communities directly by providing opportunities to demonstrate their innovativeness, and act as brokers to help exchange experiences across communities, countries, and even regions. An enabling environment includes mechanisms that identify local innovators, while at the same time ensuring more than just incremental learning by providing platforms for knowledge exchange and learning. A rational approach to supporting indigenous capacity enhancement initiatives would also concentrate on areas that are most relevant for the country; for instance, several African countries have now started initiatives that link up traditional healers with the public health service. Apart from health, the areas most likely to yield results are agriculture, natural resources management, education and, increasingly important, conflict prevention and resolution.

Development partners can play a critical role in helping to scale up successes of transferable or replicable indigenous innovations. Once it has been reasonably well established that innovations and the capacity to manage them could be replicated elsewhere in the country or the region, with similar or equal benefits, development partners and governments could invest in the dissemination of local innovations as well as in the further development of that capacity. As a first step, governments could seek to establish processes that document the scope and degree of capacity to innovate at the community level in the country. They could then seek to support initiatives that aim at sharing and learning. Finally, they could help document and disseminate the lessons learned across communities and countries.

Some newer development approaches, such as Community Driven Development or Social Action Fund[10] type projects not only provide opportunities for capacity enhancement, but also opportunities for this capacity to be applied.

Conclusion

Capacity building or enhancement measures are often critical to programs or projects that aim to introduce new technologies, change institutions, or improve services. Many development agencies use this functional approach, built around the capacity requirements of the systems to be introduced. The *IK Notes* have demonstrated that assuming the perspective of the communities and their existing capabilities—i.e., available knowledge and institutions—helps create increased ownership, sustainability, and relevance of capacity enhancing measures. This involves applying the principles that emerge from the cases described in the *IK Notes*—that is, assuming a substantial level of existing knowledge and competence of institutions, including indigenous knowledge; providing opportunities to apply enhanced capacities; and accepting capacity enhancement not only as an end in itself but as a means for empowerment. While common sense might suggest these to be obvious, we have also seen that the described social or economic results could only be achieved after development actors have accepted these principles in a theoretical fashion *and* as categorical guidelines in the design of their community interactions and their approaches to implementation. Applying the principles we outlined in this series will contribute to a more substantive empowerment of communities, as they move from being recipients of aid to shapers of their own destiny.

1 *IK Notes 9*.
2 *IK Notes 58*.
3 *IK Notes 60* describes a series of cases with similar characteristics from India.
4 *IK Notes 14*.
5 *IK Notes 3*.
6 *IK Notes 3*.
7 *IK Notes 53*.
8 *IK Notes 7*.
9 *IK Notes 43*.
10 Over the last few years The World Bank developed Community Driven Development (CDD) and Social Action Fund projects to better address poverty by involving the beneficiaries in problem identification and finding local solutions, wherever possible.

3. Education and Indigenous Knowledge

Peter B. Easton

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The relations between education and indigenous knowledge (IK) in African countries are critical and complex. They are also potentially a two-way street as brought out by several of the *IK Notes* in this compendium. Educational activities provide one of the prime means for transmitting, accumulating, enhancing, and transforming IK; and traditions of indigenous knowledge and learning may themselves offer models or patterns for organizing the provision of education. To understand the relationship, however, it helps first of all to get a better grasp of each of the terms of the equation.

Meanings of indigenous knowledge

Members of ENDA-Tiers Monde in Dakar, an NGO active in many phases of local development, make some useful distinctions that are themselves a direct outgrowth of IK work in education and can be very helpful in further refining our sense of the multiple connections between the two.[1] They suggest that there are three meanings or operational levels of indigenous knowledge:

- IK as a heritage from the *past*, including specific bodies of knowledge in different areas like botany, medicine and social governance;
- IK as the embodiment of a different and particularly African mode of thought which *present* learners and teachers apply to the acts of learning and instruction; and
- IK as a means of articulating what people know and—for the *future*— creating new knowledge from the intersection of their capacities (in the first two senses above) and the challenges of development.

That third level of IK—creation of new knowledge from the intersection of cultural heritage, personal genius, skills and insights gathered through a lifetime, and pressing challenges of local development—broadens the notion and reveals a proactive dimension. In particular, it makes it evident that much of IK activity is fundamentally educational, for it does not involve people in discovering and preserving existing canons of knowledge—it enables them to "make" new knowledge. And in fact the majority of case studies linking IK to education in the set included in this volume are of that nature: they describe people finding ways to recognize, extend and reinvent tradition.[2]

Meanings of education

Education itself comes in many forms. The distinctions among "formal," "nonformal," and "informal" education originally made by Coombs and Ahmed (1974) are still serviceable in defining rough underlying categories that are relevant to our understanding of the uses of indigenous knowledge.

Formal education in their terminology refers to the sort of "institutionally graded and hierarchically structured" learning that leads to diplomas with official equivalence—in short, all the various branches of the official system of education, from primary schools to universities.

Nonformal education, on the other hand, denotes "any organized, systematic educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults as well as children." It thus includes a wide variety of undertakings—from traditional age-group initiation or scouting, through adult literacy and basic education programs, and on to out-of-school religious or civic education and much locally provided vocational instruction or training in business and industry.

Informal education, finally, is taken to mean "the lifelong process by which every person acquires and accumulates knowledge, skills and insights from daily experiences and exposure to the environment"—more or less systematic or serendipitous, according to circumstances, but not collectively organized, recognized, and structured.

The boundaries among these domains are obviously a bit blurry and hybrid forms abound, but the cross-hatching of the two kinds of distinctions just mentioned—i.e., between education as a vehicle for IK and IK as a model for education, on the one hand; and among formal, nonformal, and informal varieties of learning on the other—brings to light a whole series of avenues potentially linking the two. The result is depicted in the table below. Some of the dimensions of linkage illustratively highlighted are covered in the articles from *IK Notes* included in this volume that deal, directly or indirectly, with education.

As indicated in the central column of the table, perhaps the most general characteristic of the process of indigenous learning that may itself have an influence on the delivery of education is its *contextualization*. Indigenous knowledge is typically tied to and incarnated in specific social, cultural, and economic activities within the concerned community, and it is typically acquired by some form of participation in those activities, at once functional and ritualistic. Much of formal and/or organized education in African communities, however, is largely *decontexutalized* and involves learning things—and learning in ways—that show little relation with the social, cultural, and economic habits of the host community.

Cross-cutting effects of gender and religion

Indigenous knowledge is usually not gender-neutral and this fact likewise affects its educational functions. IK is in many cultures the particular province (though not the exclusive prerogative) of women, who conserve prescriptions and understandings, stories, and botanical insights from the reservoir of oral tradition and historical experience—even where these are characterized by male-dominated culture as "old wives' tales."

Examples of relationships between indigenous knowledge and education obtained by cross-hatching types of education with modes of relationship

	Education as vehicle for IK	IK as model for education	
Formal education	Introduction of local history, ethnobotanical knowledge, traditional music or crafts, etc. into the formal school or university curriculum	*Increased use of context learning and contextualized instruction*	Use of local languages as a vehicle for learning in schools; adoption of traditional apprenticeship formats as part of instructional delivery
Nonformal education	Training local extension agents or administrative personnel in intervention methods that blend IK & "Western" scientific approaches.		In addition to the above, building new educational dimensions into existing age group societies and traditional associations
Informal education	Making available through a variety of media information on different types of IK and their applications.		At a communal level, promoting increased contact and commerce with —and increased observation of— traditional artisans by the rest of the population.

Much could be said about the interaction of IK and gender. Suffice it here to note the example of teaching personnel. In countries where primary schools, and particularly those in rural areas, are staffed in good part by local women with the requisite qualifications—as is the case in India and a small but growing number of African nations—teachers may in fact find ways, both conscious and unconscious, of introducing contents and approaches drawn from local IK into the classroom experience. In much of francophone Africa, however, rural primary schools have been predominantly staffed by men—and often, through explicit administrative policy, by men from other cultural regions of the country—a characteristic that has reinforced their function as a decontextualized instructional system designed to initiate children to "modern" society and to a universal or national culture having little to do with local traditions.

The intersection of religion and indigenous knowledge likewise has many meanings for education in Africa. There are typically three cardinal points on this compass: (a) local religious traditions; (b) the doctrines and practices of world religions (for the most part, either Christianity or Islam, though not infrequently both); and (c) the culture of "lay" or State-focused schooling. Both Christianity and Islam have been adapted to African culture and even "Africanized" to varying extents during the history of their transmission across the continent—mostly accomplished through *education* of one type or another—though proponents of Islam would, if anything, deny this sort of syncretism even more vigorously than Christian missionaries (e.g., Mugambi 2002, Monteil 1964). And both have likewise influenced and been influenced by national ideologies of development to varying degrees, depending on the particular religious complexion of the State during a given period of time.

Religion complicates the picture because of the way in which it can affect the meaning of what is indigenous, what is imported. The contrast among the influences of local culture, international religions, and the colonial regime of capitalism stands out with particular clarity in works like *Ceddo*, the renowned film by Senegalese author and cinematic director Ousmane Sembène (2001 [1977]), in which the Islamic imam, the Catholic missionary, the defenders of local tradition, and the representatives of colonial power all vie for dominance. In circumstances like those of 20th century Senegal, where schooling and State power were largely monopolized by an *entente* between State and Christian missions, Islamic institutions themselves come to be seen in some sense as repositories of "indigenous" knowledge—that is, sources of an African tradition oppositional to the colonial state with roots going back through generations of local society. Sembène pointedly reminds the film-goer that Islam was itself an outside imposition at one time. The scene is strikingly similar, in some ways, to the circumstances recounted in *IK Notes* Number 4, "From Sacrilege to Sustainability," on reforestation and organic farming in Forikrom, Ghana, though the major protagonist there is evangelical Christianity.

Understanding the relationship

In a sense, most of the articles in this collection speak at least indirectly of the relation of indigenous knowledge to education, because for "traditional" ways and reservoirs of perception to have an impact on the conduct of development they must be articulated and mobilized. Once they are, to whatever end, then these bodies of knowledge and experience acquire the critical mass necessary for transmission through—and for incorporation into—existing forms of societal learning, whether as subject matter or as model for process.

But those articles that deal explicitly with concerns of education (formal, nonformal or informal)[3] even if only in part, are fewer in number, and the principal ones among them are worth briefly highlighting here. Their distribution and their nature are illustrative of a number of points made above, though, if read in detail, the texts reveal facets of a complex and dynamic reality that go well beyond a few generalizations.

It is significant that none of the articles bears preponderantly on the uses of IK in formal schooling, whether at the primary school or the university level. Though not exemplified in these papers, the blend is potentially less of a problem in higher education, where both political correctness and the normal purview of topics like history, anthropology, philosophy, and sociology can make a place for critical consideration of local knowledge and African traditions—if not for pedagogies and the type of contextualized learning typical of indigenous education. At the primary and secondary level, however, the struggle is more difficult. Even the use of African languages—themselves stratified between a large number of local speech traditions and a smaller number of vehicular ones like Swahili and Hausa—has been a practice more often recommended than sustained (cf. Bunyi 1999).

However, some articles[4] do deal with incorporation of IK contents and learning processes into *community schooling*—those unchartered versions of elementary or secondary instruction that have been established by vil-

lages and local associations, and sometimes promoted by State authorities as well, as a means of absorbing excess demand for schooling or of addressing acute problems like youth unemployment and social maladjustment. Unfortunately, as the studies relate, the nearer these locally engendered forms of schooling get to the formal system, the more they end up having to abandon IK contents and processes, like use of maternal languages.

Multiple forms of nonformal education are evident in the articles—as a means to mobilize local energies and augment local skills for the challenges of development;[5] as a facility for capturing indigenous knowledge and applying it to current challenges like democratization;[6] and as the centerpiece of alternate knowledge traditions like Koranic studies.[7] The very variety of foci in this field, which, in a manner typical of nonformal education, spans concerns from agricultural marketing through local governance, health and human rights, provides multiple interfaces for articulating and developing local knowledge. Numerous patterns of interaction manifest themselves, where adult education and vocational courses serve as a platform for reinvigorating local government in rural Ghana,[8] which recount how alternate apprenticeship systems and "rites of passage" have been developed for urban youth and war-ravaged communities in Kenya, the Sudan and Mozambique,[9] and, where a program devoted to articulating Senegalese women's "ways of knowing" ended up forging a new means of combating female genital mutilation, without condemning the culture in which it took place.[10]

Last but not least, the venues and avenues of informal education and its relations to indigenous knowledge are still more diverse, since almost any activity devoted to articulating local understandings and then applying them to current development problems—or to blending them with other sources of knowledge in conservable form—may have in and of itself a profound educational impact on participants and bystanders alike. This is quite obviously the case in situations like those analyzed in educational research in Benin,[11] on village bankers in Fandène, Senegal,[12] on women bean farmers in Kenya,[13] on local strategies for ecological preservation on the West African coast,[14] and on Fulani literature as a nonprofit business.[15] For educational institutions to be able to draw on a corpus of relevant and applicable lessons from indigenous knowledge, someone must continually pioneer its applications and adaptations. "Informal education" activities like those described in the referenced issues perform, *inter alia,* this function.

Putting it all together

In fact, there is potentially a funnel or circuit linking the interaction of indigenous knowledge with the three kinds of education highlighted here. Experiences of informal education like publishing, environmental protection, and local banking that involve applying indigenous knowledge to—or broadcasting it in—new arenas create the grist for cycles of nonformal training and thereby enrich a corpus of lessons, applications, and understandings that may progressively work its way into formal schooling as well. The recognition and dissemination that it receives then hopefully transforms the environment a bit, reinforces the informal impulse, and re-ignites the cycle.

None of the stages in this cycle is guaranteed, however. Each requires dedication, hard work and a measure of good luck or providence. Though habitual portrayals of the education system put formal education at the center and institutions of higher learning at the top, arguably the spark plug of the process described here lies in what the staff of ENDA call the capacity for new knowledge creation in indigenous culture and therefore the informal activities in which that aptitude is first realized.

1 *IK Notes 42.*
2 *IK Notes 3, 4, 6, 7, 8, 16, 17, 20, 22, 23, 25, 31 and 46.*
3 *IK Notes 5, 7, 11, 13, 18, 25, 27, 29, 31, 33, 38 and 42.*
4 *IK Notes 5, 29, 42.*
5 *IK Notes 9.*
6 *IK Notes 16.*
7 *IK Notes 11.*
8 *IK Notes 7.*
9 *IK Notes 20 and 33.*
10 *IK Notes 3 and 31.*
11 *IK Notes 14.*
12 *IK Notes 6.*
13 *IK Notes 23.*
14 *IK Notes 8.*
15 *IK Notes 38.*

4. Women's Indigenous Knowledge:
Building Bridges Between the Traditional and the Modern

Mamphela Ramphele

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Women in most societies of the world, as mothers, grandmothers, wives, sisters, or daughters, often represent the first line of health care, prepare meals for the family, convey values, and provide the first role models for behavior. In many rural societies of developing countries, women carry the burden of farm labor and on-farm transport; they arrange for household energy (mostly firewood) and water. During periods of hunger, women know which plants can provide emergency meals to help keep their families alive.

Beyond the provision of livelihoods for local communities in the areas of family health, growing of staple crops, conflict management, and bio-diversity conservation, women have also found local answers to broader issues such as trade, tourism, education, health, and employment.

Despite the essential contributions to the lives of their families and communities, women still face many constraints in exercising more influence over their living conditions. These constraints include an excessive workload, the difficulties of accessing or controlling the key factors of production, and a lack of training opportunities and appropriate information, extension and advisory services.[1]

Some *IK Notes* in this compilation present specific cases where women's indigenous knowledge and practices help them, their families, and their communities to address local development challenges successfully. This article highlights some of these cases and calls for more recognition of women's indigenous knowledge and its integration into the development process. In the past, indigenous knowledge related to family health care or subsistence food production has received little research and attention. Existing constraints are reinforced, perpetuating gender inequality partly because technical or institutional knowledge associated with women's work often remains unappreciated or is not valued.[2] While patriarchal traditions in many societies have contributed to these perceptions, we increasingly see evidence of women becoming the promoters of their own development priorities, including ways to challenge such traditions.

Addressing local challenges

We know from the findings presented in the *IK Notes* that in Senegal, the women of Malicounda initiated a campaign to put an end to the practice of female genital mutilation.[3] For years, external agents, such as development organizations, and advocacy groups had called for the abolition of this practice in Senegal. Yet the eventual change was made possible only after the women of Malicounda had decided to use indigenous structures to overcome the practice from within their communities, rather than as a response to external calls.

This is a powerful story of empowerment and social change, with important lessons. In a nutshell, the women convinced the village council to abolish the practice in the village. However, not satisfied with this result, the women created a team (including a few of their husbands) to visit neighboring villages. They spoke to women there and helped them win the support of their communities. They also managed to convince the traditional leaders, including the religious Imam of Malicounda to support the women's agenda and involve themselves actively as agents of change. This approach has increased ownership of the change process in the communities and beyond. In the event, this grassroots movement led to the "Declaration of Malicounda" by a congress of 18 village leaders from the region who committed to abandon the practice in their communities. One year later, the President of Senegal proposed the "Oath of Malicounda" as a model for national adoption. In less than three years, this grassroots movement had spread to more than 200 communities nationwide and several communities in other countries as well.[4]

Researchers have also found that women have taken a lead role in preserving natural forests and bio-diversity in high-risk and marginal regions. In Senegal's West Coast region of Popenguine, for example, local women formed an association for the protection of the environment[5] to address the issues they were most concerned about. These included loss of bio-diversity, diminishing vegetable stock, an inappropriate tourism strategy, youth unemployment, and lack of capital. The association involved traditional leaders, urban women, and youth, encouraging entire communities across the region to participate. It planted firebreaks with endogenous species around the entire perimeter of their forests, established a cooperative distribution network for wood, charcoal, and gas to regulate fuel consumption, thereby supporting local efforts to control deforestation. They collected household waste for the compost needed in the nursery producing tree seedlings and formed savings and loan groups and a regional network of women associations.[6]

Other *IK Notes*[7] point to the substantial contribution of women to maintaining agro-biodiversity. Droughts periodically affect many regions in Africa, often causing widespread famine. In their role as principal providers of food in the event of food shortages, women have developed coping strategies to maintain food security at the household level. They often rely on minor crops or semi-domesticated plants, more tolerant to droughts and pests, providing a reserve for extended periods of economic hardship.[8] Many of the plants women use also have medicinal value.[9] However, women's indigenous post-harvest technologies, such as storage, and processing practices related to underutilized plants, are in danger of disappearing.[10] Today, projects focusing on the conservation and sustainable use of medicinal plants increasingly collaborate with women on in-situ and ex-situ conservation efforts, such as the cultivation of medicinal plants in home gardens.[11]

The role of women's IK in relation to farm animals is also underestimated. Although animal ownership in most societies is associated with men, women often collect fodder for cattle, look after their health, milk them, and collect and use dry cow dung for energy purposes.[12] As a result, gender differentiated research in this area is beginning to discover that women have acquired a substantial stock of husbandry and ethno-veterinary knowledge that complements existing scientific knowledge.

Contributing to global goals

Research on indigenous knowledge has highlighted the ways in which women have developed effective strategies to help achieve the Millennium Development Goals (MDGs). In the Tanga Region of Tanzania, for instance, a local NGO run mostly by women provides prevention, testing, counseling, home-based care, and income generation opportunities to local AIDS patients. Because of the treatment provided by traditional healers, patients are able to resume their daily lives and live longer. The NGO assists women who provide home-based care to HIV/AIDS patients. It has also set up day-care centers for HIV/AIDS orphans, provides education to school children, and involves traditional birth attendants (TBAs) in awareness raising related to HIV/AIDS.[13] The work of the NGO has a direct impact on people living with HIV/AIDS (PLWHA) by enabling them to lead productive lives

again. By organizing community-based care of PLWHA, the NGO also helps facilitate a better management of women's increased total workload, allowing them to take care of their other essential tasks such as food production and family health care.

In West Africa, women have redefined adult education programs with respect to functional literacy and skill building. Following their participation in literacy programs, women returned to their communities, empowered not only by their new skills, but also by realizing that their traditional skills and knowledge, complemented with external knowledge could be put to use addressing local community problems. Their increased self-awareness enabled them to address harmful indigenous practices, such as FGM, which was described earlier.[14] By forming regional associations and promoting adult literacy programs, they encouraged other women to replicate their experiences.[15] Another innovative education project in Mali used cultural symbols and indigenous practices to initiate a dialogue about women's pregnancy and health risks within the family and the community. Project participants have also learned to use modern media, such as videos, flipcharts, and badges to promote community awareness about women's health risks.[16]

The cases relating to education reveal the complexity of indigenous knowledge and underscore the role of women in this context. While women are undoubtedly a valuable resource of indigenous knowledge, some of the constraints mentioned above are a result of actual or perceived cultural traditions. The *IK Notes* on education lead to an interesting conclusion: culturally ingrained but harmful practices such as FGM have shown great resistance to external efforts to abolish them, whereas internal and even indigenous ways to address them in a sustainable manner appear to have had a much higher chance of success. However, these indigenous approaches required the external stimulus—e.g., the adult literacy program—that gave the women the confidence to address the issue, take it up with their traditional leaders, and convince them to make it their issue as well. The result of both processes—the literacy program as well as the fight against FMG—led the women to be recognized as an empowered group in their communities and beyond.

In another case, the cooperation between the modern public health sector and traditional birth attendants in the Iganga District of Uganda demonstrates how women's indigenous and modern knowledge can be leveraged to help achieve one of the MDGs. The project managed to bridge the perceived gap between the traditional and modern knowledge systems and lead to impressive outcomes: a reported 50 percent reduction in maternal mortality in three years.[17]

Next to literacy, income generation provides additional opportunities for the empowerment of women. For example, a number of self-help groups have emerged to support women with skills development and opportunities for income generation. It is quite common for men to take over activities from women once these activities generate cash proceeds (e.g., when subsistence crops become cash crops) and seize responsibilities from women once they provide cash proceeds, especially in food production. Hence, efforts to support income-generating projects for women have to consider such gender roles to ensure that the opportunities offered can be fully utilized by the women. Combining such efforts with savings schemes increases the likelihood for women to remain in control over the proceeds.

In India, for example, women formed over 175 self-help groups in the rural district of Pratabghar in Northern India, such as the Kaveri Mahela Self Help Group. Formed in 1995, the Kaveri group initially comprised 15 members. At first, each member saved the equivalent of 10 cents per month, which they increased four to eight times over the next six months. Today, each member saves up to $6 per month. The funds are saved in the local bank under a joint fund called the Kaveri Self Help Fund. Having saved a fair amount, the women started an internal lending scheme within the group. They also took out individual loans worth $100–200 from the local bank to invest in modern technologies, such as a sugar cane processor. These self-help groups have also become effective agents of social change in the countryside and have addressed several sensitive issues, such as the dowry system. Today, a large number of women in this district can read, write, and comprehend complex aspects of their business transactions. [18]

Building on these experiences, in the small town of Embalam in South India, women run "Village Knowledge Centers" for their own and neighboring villages. This enables women to educate themselves further, not only in avenues available to them through the government and other NGOs but also on subjects of their own choice, such as local diseases and treatments for humans and farm animals.[19] As is the case in Senegal, the empowerment of women through education in India has allowed them to address cultural obstacles to their own development.

Leveraging women's indigenous knowledge: a challenge for development agents

The series of factual accounts from the *IK Notes* provides fascinating insights into various areas where women's IK can have an impact on development. Whether it is local production or political expression through advocacy, women have managed to influence community leaders, politicians, and development partners. They have raised and addressed serious issues such as female genital mutilation, HIV/AIDS, food security, and the loss of sustainable production practices while promoting innovative community institutions, such as savings and credit groups, natural resource management cooperatives, and drought management committees.

More systematic research is needed to complement studies on the socio-economic roles of women in their societies and on power relationships, concentrating on their indigenous knowledge and wisdom. This would help development practitioners to better understand, value, and eventually validate such contributions to development. The price of overlooking women's IK outside their "traditional," domestic knowledge domains could eventually result in losing a substantial body of knowledge. This poses a specific challenge for development workers: they need to help develop more space and opportunities for women to express, apply, and share their knowledge of solving development problems.

Women as bearers of indigenous knowledge, can—probably better than men—act as bridge builders between representatives of the various knowledge systems. In the area of family health, for example, where women have the distinct advantage of being considered by most people as the leading practitioners, opportunities for integration and mutual learning exist, as the Iganga experience demonstrates.[20] Local women are also better positioned to overcome the barriers that harmful traditional practices have imposed on their lives, rather than exogenous approaches, as the Malicounda example suggests.[21] These cases point to opportunities for governments, development partners, and the World Bank alike to help facilitate the integration of various knowledge systems for the betterment of the local communities.

Conclusion

One of the central messages of the *IK Notes* is that women's IK can make a significant contribution to achieving sustainable outcomes in development. Therefore, there is a need to make sustained and focused efforts towards facilitating the incorporation of women's knowledge into broader development efforts.

To enable women to maximize their IK contribution to the development process, national governments and development partners need to go beyond gender-balanced participation of women in development activities and develop approaches that provide them with:

- *Space,* in the form of fora where women can present their experiences, learn from their peers, and encounter representatives from the established knowledge systems for fair and equitable exchange and learning;
- *Opportunities,* in the form of substantially improved access for women to the knowledge systems and infrastructure in their countries in a way that is not prescriptive in its methods and outcomes. From primary school to adult literacy programs, education is a centerpiece of such an approach; its effectiveness depends on appropriate participation and inclusion not just of numbers of participants, but of contributors to a development solution; and
- *Recognition*, through a commitment by governments and development partners to direct specific research towards IK of women; to identify, document, and appropriately disseminate women's IK; to help strengthen existing women's knowledge networks; and to provide fora for the exchange of knowledge between women and the formal sciences. Recognition, of course, also includes the possibility for traditional women practitioners to gain income from their IK and not be taken advantage of in arrangements that deprive them of possibilities to practice their skills. "Recognition" depends above all on an inclusive and participatory process between the public and private actors in development. By providing them with opportunities of the type described in the *IK Notes*, women can become agents of change rooted in their traditions and yet be able to leverage learning from outside their communities.

1 Austria Development Corporation, CTA, Hellenic Development Corporation; 1999: "The economic role of women in agricultural and rural development: promoting income-generating activities." Seminar Report. (http://www.cta.int/pubs/erw/english_intro.pdf)
2 Madge, Clare; 1994: Collected food and domestic knowledge in the Gambia, West Africa: The Geographical Journal, Volume 160. Issue: 3.
3 *IK Notes 3*.
4 *IK Notes 31*.
5 *Regroupement des Femmes de Popenguine pour la Protection de la Nature* or *RFPPN*.
6 *IK Notes 8*.
7 *IK Notes 8, 23*.
8 One such plant is cat's whiskers (Cleome gynandra L./Gynandropsis gynandra (L.) Briq.), which has been the subject of some exceptional in-depth research (http://www.ipgri.cgiar.org/publications/pdf/350.pdf)
9 *IK Notes 44, 58*.
10 In Kenya, young people may reject traditional leafy vegetables because, they say, they taste bitter. Older women point out that this is probably because the food has not been prepared properly. (http://www.ipgri.cgiar.org/Institute/fact_gender.htm)
11 *IK Notes 35*.
12 *IK Notes 58*
13 *IK Notes 51*.
14 *IK Notes 31, 58*.
15 *IK Notes 3, 8*.
16 *IK Notes 12*.
17 *IK Notes 40*; the case is also summarized in the concluding lead article: "Indigenous Knowledge: The Way Forward."
18 *IK Notes 45*.
19 *IK Notes 63*, not in this compilation; can be downloaded from http://www.worldbank.org/afr/ik/iknt63.pdf
20 *IK Notes 40*.
21 *IK Notes 3, 31*.

5. Indigenous Responses to AIDS in Africa

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The *IK Notes* in this volume clearly illustrate that many solutions to the problems of the poor lie within those communities and populations. A discussion of the responses to the HIV/AIDS epidemic in Africa demonstrates that local solutions to the spread of the disease are equally or more valid, efficient, and effective than those designed on external models.

Evidence is mounting that the global model of AIDS prevention has been ineffective in Africa. The model is based on risk-reduction or "remedies" interventions (condoms, treating sexually transmissible infections [STIs] with drugs), rather than on risk avoidance (mutual monogamy, abstinence, or delay of age of first sex).[1] The remedies–based prevention model does not actively promote partner reduction, or even address multi-partner sex.

When HIV/AIDS first appeared in Africa, most governments preferred not to deal with the issue. There was indignation for blaming Africans for the origin of a deadly pandemic. There was also fear that evidence of AIDS would ruin tourism and foreign business investment. Yet at least two African governments responded very quickly to AIDS: Uganda and Senegal. These two countries are now recognized as the first two AIDS success stories in Africa.; and it is important to look carefully at these programs, which were developed largely by the countries themselves, and before Western AIDS organizations had geared up to assist Africa in the fight against AIDS.

Both Uganda and Senegal developed AIDS prevention programs that emphasized primary behavior change,[2] along with risk reduction interventions. Put another way, they dealt with AIDS as a behavioral issue requiring behavioral solutions, rather than merely as a medical problem requiring medical solutions. Both countries were successful in drastically reducing HIV prevalence (Uganda) or in preventing HIV from even entering the general (non high-risk) population (Senegal). No country in the world can match Uganda's 66 percent overall decline in infection rates.

It is accurate to say that these African governments, later assisted by their NGOs, relied on indigenous knowledge to design effective programs. This should come as no surprise. Influencing behavior, or changing deeply entrenched behavioral and social patterns, is not the same as promoting a drug or a vaccine.

Risk-reduction model

The AIDS prevention paradigm that was exported to Africa in the later 1980s was developed for high-risk groups, such as men who have sex with men in US cities like San Francisco. Part of the risk reduction model was *not* to address sexual behavior. It was argued that this would amount to making value judgments, which is unscientific and would only drive away those who needed to be reached. AIDS experts settled for risk or harm reduction approaches, which assume that behavior is difficult or impossible to change, and that efforts ought to be made to mitigate the consequences of risky behavior. Thus, condoms and clean needles (where legal) were provided to reduce the risk of sexually transmitted and blood-to-blood HIV infection respectively. There was and is no discouragement of any form of sexual behavior, or injecting drug use. AIDS experts applauded themselves for their open-mindedness and realism.

This approach might have been suitable for San Francisco, or even São Paulo or Bangkok. But when this was exported to Africa, there was little attempt to adapt the model to local cultural settings or epidemic patterns, despite claims to the contrary. In the US, Europe and most of Asia, HIV infections are concentrated in a few fairly well defined high-risk groups. In (Sub-Saharan) Africa, most infections are found in the general population. Actually, many are opposed to this distinction, arguing, "let's not single out particular risk groups. That will stigmatize them—blame the victims—and make the general public feel that they are not at risk." So our message should be, "we are *all* at risk of AIDS." This has a nice, egalitarian ring; we are all in this together. Nevertheless, differences in epidemiological patterns and cultural settings are real, calling for—among other things—different approaches to prevention in different settings.

AIDS prevention in Africa

How has the risk-reduction model fared in Africa? Most efforts have focused on condom supply and promotion. There is no evidence to date that mass promotion of condoms has paid off in the decline of HIV infection rates at the population level. The UNAIDS multi-center study, published in a special edition of *AIDS* in 2001, found that condom user levels made no significant difference in determining HIV prevalence levels (Buve et al. 2001). And a very recent UNAIDS review of condom effectiveness (Hearst and Chen 2003) concludes, "There are no definite examples yet of generalized epidemics that have been turned back by prevention programs based primarily on condom promotion."

Some argue that not enough condoms are being used in Africa to have made a difference yet, and that condoms would have an impact if only they were made easily available in the billions instead of the mere tens of millions. Possibly, but what we do know from recent USAID data is that, after more than 15 years of intense condom social marketing (a field I have worked in) in Africa, the result is an average of only 4.6 condoms available (not necessarily used) per male per year in Africa in recent years (Shelton and Johnston 2001). That figure was actually a bit higher in the mid-1990s; it has declined somewhat even since then in spite of the explosion of AIDS in southern Africa. The problem seems to be low demand rather than supply.

Uganda's home-grown approach

In addition to condoms, the other relatively expensive AIDS prevention programs currently funded by major donors are mass treatment of STIs, voluntary counseling, and testing and prevention of mother-to-child transmission through Nevirapine. Like condom marketing, these are medical remedies rather than a promotion of behavioral change. These programs, along with condom social marketing, had not yet started in Uganda when infection rates began to decline in the late 1980s. Yet Uganda has experienced the greatest decline of HIV infection of any country. Its home-grown prevention program was based largely on a message expressed in a local metaphor: "zero-graze." This means only graze your beast in your own field; do not graze elsewhere (i.e., do not have sex outside of marriage or stable relationship). Responding to foreign expert advice about AIDS, President Museveni observed in 1991, "Just as we were offered the "magic bullet" in the early 1940s, we are now being offered the condom for 'safe sex.' We are being told that only a thin piece of rubber stands between us and the death of our continent. I feel that condoms have a role to play as a means of protection, especially in couples who are HIV-positive, but they cannot become the main means of stemming the tide of AIDS."

Within a mere three to four years of the start of Uganda's prevention program, behavioral surveys (corroborated by biological data) began to show much lower levels of casual sex, a delayed age of first sex, and relatively high condom user rates among the few who still

engaged in casual sex. Uganda also pioneered approaches in reducing stigma, bringing discussion of sexual behavior out into the open, involving HIV-infected people in public education, persuading individuals and couples to be tested and counseled, and improving the status of women. The genius of Uganda's ABC program (*A*bstain, *B*e faithful, or use *C*ondoms) is that it focuses on the "proximate determinants" or immediate causes of HIV infection, as well as on what *individuals* themselves can do to change (or maintain) behavior, and thereby avoid or reduce the risk of infection. But it also tackled the difficult social and institutional problems that only committed governments can address over the near to intermediate term. These programs were led by the government (especially the Ministry of Health), but also involved many NGOs and community-based local organizations.

Senegal's indigenous solutions

Like Uganda, Senegal was one of the first countries in Africa to acknowledge HIV/AIDS and to begin implementing significant HIV/AIDS prevention and control programs. According to the U.S. Bureau of the Census (BUCEN); like Uganda, "Senegal has been a success story, as the government has managed to keep the epidemic from getting out of control" (BUCEN 2000:1). According to UNAIDS, Senegal currently has one of the lowest HIV seroprevalence rates in Sub-Saharan Africa, and it appears to be stable at under 1 percent or less of the general population (BUCEN 2000).

A UNAIDS assessment of Senegal's response to its AIDS epidemic (Sittitrai 2001:9) highlights the following elements:

- As in Uganda, politicians in Senegal were quick to move against the epidemic once the first cases appeared in the second half of the 1980s.
- Since 93 percent of Senegalese are Muslims, the government made efforts to involve religious leaders; HIV/AIDS became a regular topic in Friday sermons in mosques, and senior religious figures talked about it on television and radio.
- Many other levels of Senegalese society joined in. By 1995, 200 NGOs were active in the response, as were women's groups with about half a million members.
- HIV prevention was included when sex education was introduced in schools. Parallel efforts reached out to young people who are not in school (Sittitrai 2001:9).

Again as in Uganda, we find evidence of primary behavioral change in Senegal, that is, partner reduction and rise in age of sexual debut. According to the DHS website,[3] the median age of sexual debut has risen more than in any other African country for which DHS data exist, from 16.6 to 17.4. And the UNAIDS author notes from a review of demographic and behavioral data:

Senegalese women in their early 20s did not have sex until they were almost 19 or older. For their mothers' generation—the women who were between 40 and 49 in 1997—the median age was closer to 16 (Sittitrai 2001:11).

A 2001 study of never-married females in Dakar aged 15–23 was conducted by Family Health International, with USAID and CDC funding, through the Senegalese Ministry of Health. Only 29 females out of a random sample of 699 reported ever having had intercourse. This means that 95.9 percent were delaying sex; only 4.1 percent were having sex (Hygea/FHI 2001: 31). This represents a very low proportion of girls and young women having early sex, by almost any country's standard, especially since about 11 percent of the sample is in the age group 20–23. Most (55 percent) of the 29 young women in the FHI study who reported having *any* number of partners in the 201 study reported just one partner (Hygea/FHI 2001:35).

Like Uganda, Senegal enlisted the support of religious organizations in AIDS prevention, began AIDS education in primary schools, and deliberately used fear arousal as a prevention strategy. This does not correspond to the Western model of AIDS prevention. What occurred in Uganda and Senegal are indigenous, African responses to AIDS. And they worked.

African paradigm worked best

On the intervention side, there are similarities between Africa's two success stories, beginning with the fact that both programs were largely indigenous. If anything, Senegal seems to have been even bolder than Uganda in telling the major donor agencies that, while their support was wanted and needed, they should not tell Africans exactly how best to prevent AIDS. According to Demographic and Health surveys, Senegal and Uganda stand out among African countries in the high proportions of surveyed people who say they learned about AIDS from face-to-face, local contacts, as distinct from radio, print materials, or formal health workers. Senegal stands out as a country where women feel personally at risk of get-

ting AIDS (even though its HIV prevalence is the lowest in continental sub-Saharan Africa, about 0.50 percent), and Uganda stands out as a country where women feel they can refuse unwanted sex or insist upon condom use.

These two countries also mobilized both their religious leaders and their traditional healers at the beginning of their respective epidemics. THETA (Traditional Healers and Modern Practitioners Together Against AIDS), a Ugandan NGO, promotes collaboration between traditional and modern health practitioners in the fight against AIDS.[4] This NGO developed a model of collaborating in prevention and treatment of AIDS, drawing upon the many thousands of traditional healers in Uganda. The Africa-wide, Senegal-based NGO PROMETRA is coordinating AIDS programs that involve indigenous African healers throughout the continent.[5]

The governments of Uganda and Senegal recognized where their strength lay when it came to transmitting culturally appropriate messages to their broad populations. It came largely from community leaders. In a 1998 World Bank exercise, the author was able to estimate that between 4,500 and 6,750 Ugandan religious clergy were trained annually in HIV/AIDS prevention at district levels between 1995–1998. Fully a third of all Ugandan districts also trained traditional healers, meaning that over 1,800 healers were trained every year for four years. Of course, this estimate is based on written records. Even allowing for considerable inflation of figures, this still amounts to a greater number of indigenous healers officially involved in HIV/AIDS prevention than in most—perhaps any—other country in Africa. THETA, the Ugandan NGO, was the model for the training of indigenous healers.

In short, two African countries drew upon their respective cultures, along with what for them was common sense, and proceeded to do what was needed to prevent AIDS effectively. And they did this largely on their own. The unfortunate thing is that most African countries did very little or nothing until well-meaning experts showed up, and as a result, most African countries have AIDS programs that tend to reflect external notions of what to do. If we are to be entirely objective, it is hard to conclude that HIV/AIDS prevention programs have worked well elsewhere, since HIV infection rates appear to be going up (again) among key groups in the United States and Europe (e.g., Gross 2003; MAP 2000).

Providing more options

It has been difficult for donor agencies and consulting firms involved in AIDS prevention to accept evidence that suggests that what they have been doing may not have been very effective in Africa; meanwhile something they have not supported directly has worked better. Some have dismissed the ABC approach as simplistic, narrow or reductionist. Yet, the ABC approach adds primary behavior change (the A and B of ABC) to programs favored by donors, programs that for the most part do not go beyond "C," beyond condoms and D-for-drugs remedies. Adding primary behavior change therefore provides people with *more* options for preventing HIV infection than are currently available in most programs, and these are sustainable options that do not depend on relatively high-cost imports.

Care, support and treatment

Going beyond prevention, there are other sets of issues associated with care, support and treatment of PLWHAs (people living with HIV/AIDS) and their families. The treatment issue that currently dominates global discourse has to do with antiretroviral (ARV) drugs, and how to lower the price of these in order to make them available to the poor through complex systems of professional health care operating in biomedical health care facilities. Certainly, effective drugs (even if expensive) ought to be available to those who need them most, even if they are poor and hard to reach. But it should also be recognized that it will take at least several years to work out all the problems involved in providing ARVs in an equitable way in Africa. Meanwhile there are low-cost, home-based care and support programs already operating in Africa that could be receiving more support from foreign donors. The Tanga AIDS Working Group (TAWG) is an excellent example of a low-cost, sustainable program based on indigenous knowledge.[6]

> "TAWG's work is an outstanding example of how positive results can be achieved in the fight against AIDS by synergistically combining local expertise, indigenous knowledge, and modern health workers to provide effective low cost treatment for people living with AIDS."[7]

TAWG in Tanzania and THETA in Uganda are both community-based programs that provide herbal medicines for the treatment of the opportunistic infections of HIV/AIDS. In addition to anecdotal evidence, there are data from clinical trials (which are always hard to finance when they involve unpatentable natural products) to show that at least some of these medicines are effective. For example, clinical trails have confirmed the efficacy of one of THETA's locally available herbal medicines for Herpes Zoster and AIDS-related diarrhea (Homsy et al. 1999). Due to cost and access issues, it is likely that increasing numbers of Africans will rely primarily or exclusively on phytomedicines and indigenous therapies for the infections associated with AIDS. The pharmaceutical industry has started to recognize the value of the "ethnomedical" approach to bioprospecting for new, marketable drugs, that is, starting such research on natural product medicines already in use by traditional healers and/or entire indigenous populations.[8] And the World Bank has recognized the economic development value of conserving medicinal plants in situ, and growing them commercially ex situ.[9]

> "Given the central cultural role of traditional healers in communities, they provide one of the best hopes for treating and stemming the spread of AIDS. But healers rely on medicinal plants and there has been a significant decrease in the abundance of many important medicinal plant species as their habitats are lost through deforestation, cultivation, overgrazing, burning, droughts, desertification, etc."[10]

Some community-based programs for people infected and affected by AIDS provide information and advice on improved nutrition, psychosocial and spiritual issues, participation in support groups, stress avoidance, promotion of good general immune system health, cessation of smoking and alcohol consumption, development of positive attitudes, and the like. Considering only the role of improved nutrition, it has been established that concentrations of HIV in the genital tract are increased by vitamin A deficiency (Mostad et al. 1997), thus supplementation of this vitamin alone might play a role in prevention of HIV as well as treatment. And vitamin A can come from local fruits and vegetables. In fact, the best community programs do not rely on outside technologies, commodities, or ideas.

> "The Ethiopian government, with World Bank assistance, will soon start to implement the first conservation and sustainable use of medicinal plants project in Sub-Saharan Africa. The overall objective of the project is to initiate support for conservation, management and sustainable use of medicinal plants for human and livestock health care."[11]

Community based programs related to AIDS can give hope to those who are, or suspect they might be, HIV-positive. The message of these programs is that infected persons can live longer, more productive lives if certain steps of self-care are taken. This approach and message contradict the widespread belief in Africa that AIDS is little more than a death sentence. It contradicts fear, social stigma, and defeatist thinking. Fear and stigma leads to PLWHAs hiding their HIV status (and, for that matter, not being tested for HIV), abandoning hope, and weakening their immune system and health further with fear and anxiety, a vicious downward cycle; and, of course, not becoming involved in AIDS education as happened in Uganda.

There are some who argue that programs that rely on natural products and indigenous resources merely reflect a "double standard of health care," with "second-class medicine for the rural masses" while the best of orthodox medicine is reserved for the rich countries and the local urban elite. This has long been one of the arguments used against any sort of collaboration between biomedical and indigenous health practitioners in Africa (cf. Green 1994). Indeed, why not insist on expensive medicines for the poor as well? The answer to this is, certainly, we should insist upon the best medicines for the poor, *if* we can find a way to pay for them. But keep in mind that ARVs are very expensive, even generic versions, and we are talking about providing them in countries that spend less than $10 per year per person on all of peoples' health care, from cradle to grave. Moreover, we ought not to devalue and dismiss indigenous medicines and locally available therapies, without unbiased consideration of available evidence relating to their efficacy.

Of course it would be optimal to find ways to pay for ARVs, distribute them equitably, *and* support self-reliant, community-based programs that rely on indigenous knowledge, technologies, and structures. Most of the major donor organizations seem focused solely on the

former. The World Bank's Indigenous Knowledge for Development Program is an exception, and therefore it has several pointers to offer about the many important things that are needed in addition to ARVs. Even when ARVs become widely available, there will still be a need for sustainable, community-based programs of care, support and treatment, which are based on natural products, indigenous therapies, local organizations and flexible payment systems of health financing.

> "In many developing countries, the inadequacy of current health financing arrangements, typified by progressively declining budgetary allocations and more cost sharing schemes have led to the exploration of additional and alternative approaches to improve the financing situation. Among the alternatives suggested are risk sharing mechanisms that include community-based schemes that tap the potential of traditional social arrangements."[12]

1 This dichotomy is imperfect because reduction in the number of sexual partners would have to be classified as risk reduction, not avoidance.
2 John Richens proposed the term primary behavior change to denote fundamental changes in sexual behavior, such as partner reduction or abstinence that do not rely on devices or drugs.
3 http://www.measuredhs.com/
4 *IK Notes 26, 54.*
5 IK Notes 26.
6 *IK Notes 51.*
7 *Ibid.*
8 *IK Notes 15.*
9 *IK Notes 35.*
10 *IK Notes 30.*
11 *IK Notes 35*; the project has already started and is presently mid-term.
12 *IK Notes 48.*

6. Sustainable Agriculture and Rural Livelihoods: Local Knowledge Innovations in Development

John Aluma

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Agriculture probably comprises the largest collection of indigenous practices worldwide. Farmers and pastoralists grew crops and kept animals in the humid, boreal, arid or temperate locations, developing production systems that were well adapted to these locations and the gradual development of these systems to respond to changes in the environment. Many of these systems were sustainable only under "low-input–low-output" regimes. The introduction of mechanization, fertilizers and phytomedicines has turned some of these systems into high-input–high-output systems, most of which could only be sustained with external[1] support. However, a considerable number of these high-input systems were either not sustainable or did not produce the high outputs that were expected.

While the political environment[2] was often a factor constraining primary producers from capitalizing on these new systems, most commonly through market restrictions or land use rights, another common constraint was inappropriate technology transfer. Examples include (a) the use of few cultivars for a variety of environments; (b) the introduction of tillage developed for temperate locations often resulting in loss of organic matter and erosion in humid or tropical soils; (c) disease- and pest-plagued plants and animal breeds that had not developed immunities or resistance.

The modernization of agriculture and other land use changes have also brought about a reduction of genetic variability. Researchers and producers are counteracting this trend by re-introducing indigenous species back into the gene pool of domestic crops and livestock. While efforts in this direction are increasing, the funding available for research is minimal, given the lack of resources for public agricultural research in general.[3] However, an increasing number of national agricultural research institutions in developing countries include the study, development, and commercialization of indigenous knowledge-based production practices, especially plant products with a promising future for medicinal, nutraceutical or industrial use.[4]

Clearly, the benefits of modernized agriculture and the green revolution are undisputable—and without them, the world could hardly feed more than six billion people. However, evidence suggests that in the event of severe shortages of the major staples, many communities in Africa revert as a short- term

survival mechanism to "traditional" plants and crops that have received but a fraction—if at all—of the research attention of the major crops. This indicates an underutilized potential worth exploring, to raise the understanding of communities' responses to livelihood challenges. In this context, three major questions arise:

- In what ways have indigenous knowledge and practices and innovations enhanced livelihood in a manner that is ecologically sustainable, economically viable and socially acceptable, and more specifically, in what way has IK contributed to the three most important factors in food security: availability, access and utilization?
- Who are the drivers of IK innovation or adaptation?
- What are the circumstances that foster or constrain them, in support of or as challenges to the scaling-up of successful practices?

The *IK Notes* in this collection demonstrate local approaches that may provide some answers to these questions. An overriding principle in indigenous responses to the challenges of rural life appears to be a comprehensive approach that extends beyond the "purely technical." Instead, the community approach is embedded in a general response to issues relating to poverty, household food and nutrition security, health, sustainable agriculture, off-farm employment, participation, social and human capital formation, access to institutions and social networks, to name but a few.

Reviving a traditional practice for better livelihoods in Mali

The Jatropha Curcas Plant[5] Project in Mali promotes the production and processing of Jatropha (Physic Nut; Euphorbiaceae family). Growing the plant helps to control erosion and to improve the soil in a semi-arid environment. Processing (extracting seeds) the Jatropha results in income (especially for women) renewable energy and contributes to poverty reduction. Jatropha, of Latin American origin, was originally introduced for producing lubricant oil. It is a drought-resistant perennial and can be used as a natural fence. Jatropha hedges protect food crops and gardens from livestock and reduce soil erosion. The hedges also help to reduce conflicts between the farmers and livestock owners over animals causing crop damage.[6] The revival of the traditional practice by women who harvested the seeds for medical purposes and local soap production has led to profitable soap-making enterprises managed by women and a reduction of poverty. The press cake, which remains after oil extraction, is a high-grade organic fertilizer. Jatropha oil also works as a diesel fuel substitute for small engines that drive grain mills and water pumps.

Initially, the German Technical Assistance (GTZ) supported Jatropha cultivation activities within the framework of a renewable energy program, but after learning from communities, the project has now expanded into a comprehensive approach to agricultural development, environmental protection, income generation, and social cohesion. The team learned the following lessons.

The approach:

- Builds on valuable, local IK practice
- Demonstrates multiple uses of the product (plant, seed-oil, erosion control, property delineation)
- Addresses immediate community concerns
- Encourages women's involvement in economic initiatives and promotes home based industries
- Links ecological sustainability with economic development
- Encourages use of locally available raw material.

While it is not very common for a single crop to have such a multiplicity of applications,[7] the use of Jatropha has had a significant impact on the livelihood prospects of the community involved; it has provided income for women and has helped to empower the communities.

Driving the innovation

In Honduras in 1999, the Association of Advisors for a Sustainable, Ecological and People-Centered Agriculture (COSECHA) decided to study farmers' innovations. It eventually documented 82 technologies developed by 52 farmers.[8] Those identified as worthy of further validation and dissemination are shown in the next table.

The numbers reflect the typical, primary biophysical constraints of small farmers in developing countries: pests, diseases and weeds. Hence, control practices contribute to more than half of the innovations. The study further noted that no innovations were made in areas that researchers and scientists would have considered equally important, in this particular location: water harvesting and management of tree crops. The study concludes that farmers made no efforts to innovate in technologies that they considered outside their scope of resources (water harvesting) or that would show only long-term effects (tree management).

Farmer innovations in local technologies in Honduras (1999)	
Technology category	**Number of technologies**
Insect control	15
Fertilization	10
Control of plant disease	8
Weed control	2
Food preparation	2
Animal husbandry	2
Plant propagation	1
Green manuring	1
Soil conservation	1
Others	3
Total	45

Supporting farmer experimenters and innovators

The Government of Uttar Pradesh state in North India integrated indigenous knowledge into a World Bank-supported Sodic Land Reclamation Project. Started in 1993, the project assisted farmers in reclaiming over 68,000 hectares of sodic soils.[9] Farmers in the Uttar Pradesh region created local site implementation committees and self-help groups that worked in collaboration with project managers and non-governmental organizations in order to adapt indigenous knowledge and constantly innovate in order to develop locally appropriate strategies. The project strengthened local institutions, empowered the beneficiaries and developed a model for transferring service delivery to communities.

Modern practices, such as the use of chemical fertilizers, pesticides and new farming technologies promoted by the government were combined with farmer developed indigenous technologies, such as the application of gypsum for land reclamation, the building of contour bunds, leaching the soil, multi-cropping, green manuring, crop rotation, natural compost and plowing the land. These indigenous practices were cost-effective and environmentally friendly.

As a result, farmers have reclaimed land belonging to 247,000 families, cropping intensity has increased from 37 percent to 200 percent, crop yields and farmer incomes have risen by 60 percent over five years, and land values have quadrupled. Indirect results include the generation of income for women's self-help groups through diversified activities, such as poultry farming and horticulture and labor wage rates have doubled because of increased economic activities in the area. The most important impact on mainstreaming and scaling-up the activities derives from a farmers' school, where farmers themselves teach and develop the curriculum jointly with the instructors to maintain and further develop local knowledge innovations.

Rural development, food security and indigenous knowledge

These and other examples in the *IK Notes*[10] that reflect on agriculture, food security and rural development respond to the three questions raised in the introduction to this article: the contribution of IK to food security and rural livelihoods, drivers of the rural innovation process and enabling conditions.

The contribution that indigenous knowledge and farmers' innovation make in the context of food security cannot be underestimated. The table below presents the major issues of food security—availability, access and utilization—and their constituent factors to which IK could contribute.

The *IK Notes* discussions on agriculture and food security—or rural livelihoods as a whole—reveal that the primary drivers for local change are a deteriorating natural resource base (loss of natural habitat, deforestation, soil degradation)), declining agriculture productivity, loss of indigenous cultivation practices, and conflicts over access to and the utilization of natural resources. Ecological sustainability of the improved practices has been at the center of many innovations.

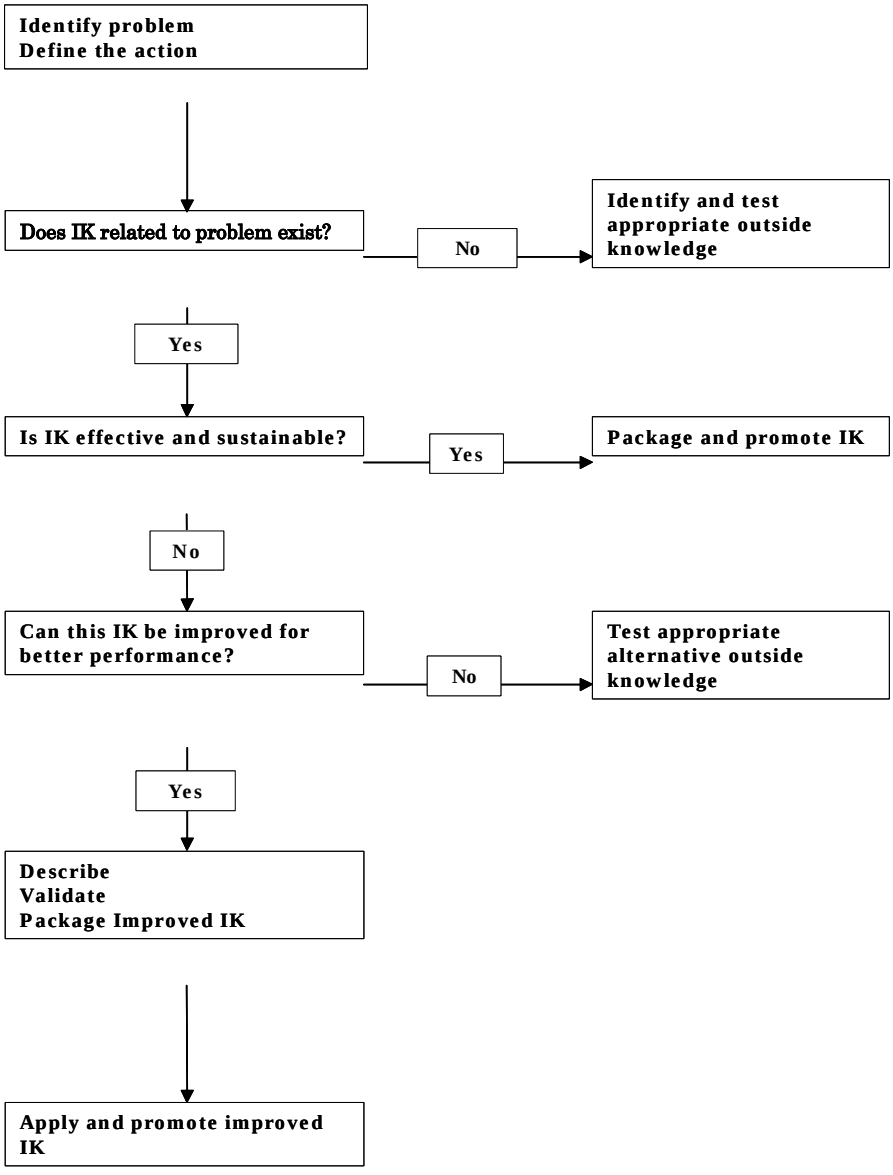
Food security issue	Possible role/contribution of IK
Availability	• increased and/ or sustainable production[11] • technology[12] • better storage facilities and reduced losses[13]
Access	• stability of production (ecologically sound production) [14] • markets, services, information, rights, social entitlements[15] • purchasing power [16]
Utilization	• consumption[17] • hygiene, water, sanitation, food safety, quality[18] • childcare, feeding practices, preparation, habits, intra-household distribution[19]
Frame conditions	• research[20] • food emergency preparedness[21] • physical health of consumers and producers[22]

While the cited examples do not allow for an assessment of the long-term impact of IK on livelihoods, immediate and mid-term effects are apparent in all cases. The drivers of innovations and change are mostly individuals, often acting in or through groups (women, youth, farmers, participants of an adult literacy training, and so forth) established through a common concern or interest, rather than formal structure. In most instances, the "innovators" have had contact with "global knowledge" to the extent that they could also better appreciate the knowledge and experience available within their own environment and realize the potential of change from within. This finding is important for the role of external agents, such as donors, agricultural research, and extension and other actors in the rural space with a mandate to assist communities to improve their livelihoods. While many of these institutions have changed their roles from being delivery systems of centrally formulated recommendations to partners of communities, understanding or valuing indigenous knowledge is often not part of their mandate.

An environment that is conducive to the valuation and promotion of indigenous knowledge practices not only enables institutions to utilize IK in a more rational and efficient manner, it also signals to the communities that their contributions to science and technology are valuable, possibly inducing more innovative creativity. For example, the National Agricultural Research Organization (NARO) in Uganda has recently developed an approach to incorporate indigenous knowledge into its activities in support of the National Program to Modernize Agriculture. By adapting a simple, yet effective decision flow matrix, indigenous practices are screened and either disseminated subjected to further studies or rejected. Based on this matrix, the organization can decide quickly where to allocate resources, where to link with outreach and where to advise against undesirable indigenous practices.

The approach of NARO (in conjunction with other actors in Uganda) has initiated a process in Uganda that fosters the study and use of indigenous knowledge and innovations and their eventual scale-up. In the context of a national strategy for the sustainable development of IK and its integration into the national poverty eradication process, Uganda provides a framework in which practitioners, as well as researchers are encouraged to promote the use and the dissemination of indigenous practices. At the same time, legislation has been drafted that looks to protect the innovators of indigenous knowledge.

IK integration matrix of NARO



Challenges

While biotechnology moves towards its next frontier, promising higher yields on poorer soils with fewer pests, communities, as well as service providers in the rural space, especially in Africa, will continue to rely in the near future on conventional technologies. Researchers and practitioners are continuously refining these technologies. To explore and utilize indigenous knowledge to improve on these technologies, researchers and other stakeholders need to go one step further towards indigenous knowledge. Researchers and policy makers need to understand better that livelihood practices are not just the manifestation of culture. Instead, there is a need to appreciate that indigenous practices are the outcome of "trial and error" research undertaken (and ongoing) by generations of practitioners in an environment that is not standardized. These indigenous practitioners largely chose not to protocol their results and have, for a variety of causes, omitted to share them across communities and borders in a systematic manner.

Agricultural research and rural development face two, essentially contradicting, requirements when confronted with the challenge of incorporating indigenous knowledge. Many of the bearers of indigenous knowledge belong to the elder generation and will take their knowledge with them once they pass away. At the same time, demands to contribute to poverty reduction and food emergency prevention often require large-scale solutions. Many of the IK practices are localized and cannot be scaled up easily before one is reasonably certain that they will work. Hence, research will be faced with the decision to document as many practices as possible or select, at the risk of missing "the best," a limited number of practices, breeds or stock for dissemination and scale up. Nevertheless, successful scale-up is possible (for example, Kenya is developing a few medicinal and aromatic plants for commercial and industrial use), especially where the private sector can play a role in providing the required investments. However, for many rarely or underutilized crops and vegetables,[23] this may not be sufficient to save them from vanishing from the menu.

Communities widen the knowledge base

Transport and telecommunication infrastructure are gradually reaching even remote communities in rural Africa. This provides opportunities for them to start sharing their problems, experiences, and solutions with other communities and jointly developing their own knowledge base. In South Africa, a group of Rooibos tea-growing farmers visited another community to learn about marketing. Following the exchange the group formed a farmers' association, improved its marketing system, and is now exporting the tea to Europe, multiplying its income. Practitioners from East Africa and South Asia met in a regional exchange to learn from each other about the conservation and production of medicinal plants.[24] Researchers, extension agents and other rural service providers can help communities to find matches for exchanges, research can broker collaboration between practitioners, accompany farmer-led experimentation and support communication beyond the physical exchange.

The following example demonstrates how communities document their own knowledge and how information technology has helped communities to share experiences. The Uluguru Mountains Agricultural Development Project (UMADEP) in Tanzania is designed to involve local farmers in the documentation of local knowledge related to Natural Crop Protection (NCP). Farmers then spread this knowledge to their peers in the area using appealing and locally relevant education materials and training workshops.[25] This approach involves the local community throughout the process of collection of the knowledge, documentation, and dissemination.

Conclusion

The *IK Notes* examples discussed above suggest that rural communities are acutely aware of their livelihood issues. They adapt indigenous knowledge in order to transform traditional institutions and generate resources required for addressing community-specific problems. Governments and development partners can play a vital role to help set up mechanisms for documentation, validation, dissemination, exchange, and integration into the national development process. Finally, such institutional and financial support provided by the government and development agencies that foster locally defined livelihood efforts of communities are likely to result in multiple positive outcomes.

1 External not in the sense of foreign development assistance but external to the local production system, e.g., mineral fertilizer rather than organic fertilizer produced on the farm.
2 Enabling policies address more than the technologies and economics of food production—whether at subsistence or commercial level. Other issues include buffer stocks, food aid and food prices, research, extension and responding to the challenges of globalization of food technology, trade and competitiveness and the market distortions created by subsidies in industrialized countries.
3 " It is notable, for example, that Monsanto, a life-sciences multinational based in St Louis, Missouri, has a research and development budget that is more than twice the R&D budget of the entire worldwide network of public-sector tropical research institutes" J. Sachs, 1999, http://www.cid.harvard.edu/cidinthenews/articles/sf9108.html
4 GFAR (Global Forum on Agricultural Research) recently launched a website related on underutilized species http://www.underutilized-species.org/
5 *IK Notes 47*.
6 *Jatropha* is a "multipurpose" plant; Ugandan farmers use it to support vanilla vines. Local communities have adapted the plant to a variety of uses, including ornamental ones.
7 Reportedly, the plant with the highest number of uses is the coconut tree which provides for nutrition, health, shelter, transport, art, fiber, to name but a few. Yet, as with so many other crops, research into coconut has concentrated on its primary product, i.e., fat; this is where the coconut faces the toughest competition of all its uses from other crops.
8 IK Notes 49.
9 *IK Notes 48*.
10 *IK Notes 2, 4, 24, 43, 44, 44, 45, 49*.
11 *IK Notes 2, 4, 44, 45, 58*.
12 *IK Notes 23, 24, 43, 47, 58*.
13 *IK Notes 47*.
14 *IK Notes 2, 8*.
15 *IK Notes 9, 15, 19, 23, 27, 28, 34, 43, 57, 58*.
16 *IK Notes 6*.
17 *IK Notes 47*.
18 *IK Notes 44, 47, 52*.
19 *IK Notes 36*.
20 *IK Notes 14, 36, 39, 49, 54*.
21 *IK Notes 39, 44*.
22 *IK Notes 15, 26, 30, 32, 35,37, 41, 51, 52, 54*.
23 As described in *IK Notes 44*, there are quite a variety of rarely used, often not domesticated plants used in emergency situations. These plants are underutilized and under-researched. While during "normal" periods, people have clear preferences for the major staple crops, these "reserve" plants may have properties that could be exploited further.
24 *IK Notes 55*.
25 *IK Notes 34*.

7. Indigenous Knowledge and Natural Resource Management

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To judge from the breadth of issues that *IK Notes* cover, the importance of indigenous knowledge for development and the environment is now increasingly acknowledged by researchers and practitioners. Research and practical experience from all over the world, and perhaps most notably from Africa, show that indigenous knowledge has not only been a key factor in the development of local cultures and in their continued adjustment to modifications in their environments, but also an increasingly important contribution to actions undertaken outside the local community realm.

The establishment of the Indigenous Knowledge Program by the World Bank in 1998 was a welcome enterprise for IUCN—The World Conservation Union, which had started working on indigenous knowledge in Southern Africa in the early 1990s. Today, IUCN continues working on indigenous ecological knowledge issues in that region, through its Regional Office for Southern Africa, as well as globally, and has firmly integrated topics relating to the knowledge of indigenous peoples and local communities in its global program.

Africa is a continent rich in natural resources, such as forests, wetlands, wildlife, minerals, fisheries, and many others. Effective systems of management can ensure that these resources not only survive, but also in fact increase while being used rationally, thus providing the foundation for sustainable development and for a stable national economy.

Natural resources have for centuries been an important part of peoples' diet, economy, and culture. For people living in or near forests, plants and animals provided food, medicine, hides, building materials, incomes, and a source of inspiration. Rivers provided transportation and fish, and water and soils provided a permanent source of sustenance.

It is well documented that traditional communities derive both their sociocultural and spiritual identity from the land. The respect for the land was built into the use of the land. Indigenous practice was based on a sense of harmony with the natural environment, which resulted in sustainable practice and sustainable use. The traditional use of natural resources was based on traditional values.

In many developing countries, the use of natural resources such as wildlife, is necessary for the well-being of their people. For centuries, their way of life

Sustainable wildlife management

In Barotseland in the Upper Zambezi Valley in central Southern Africa, it was a serious offence to kill a fertile female animal. The killing of animals was restricted to male and older animals. Certain animal species could not be hunted during certain seasons (such as the breeding season), avoiding the risk of depleting the resources. This system is similar to the culling practice for the sustainable "harvesting" of wildlife. The communities were able to ensure continued population growth of their wildlife resources, while at the same time benefiting from the protein, which was usually lacking in environments, where livestock keeping was difficult because of tsetse flies.

Both the Barotse people and the Bemba of Luapula Province of Zambia had a tradition of avoiding the catching of very small fish. Communities observed fishing seasons usually through a set of traditional ceremonies. Such a ceremony would usually open the fishing season for a given period. These practices ensured that sustainable resource exploitation.

has comprised mechanisms of conserving or ensuring sustainable utilization of such resources through a system of values and taboos. (See box.)

For instance, in Barotseland in the Upper Zambezi Valley in central Southern Africa, it was a serious offence to kill a fertile female animal. The killing of animals was restricted to male and older animals. Certain animal species could not be hunted during certain seasons (such as the breeding season), avoiding the risk of depleting the resources. This system is similar to the culling practice for the sustainable "harvesting" of wildlife. The communities were able to ensure continued population growth of their wildlife resources, while at the same time benefiting from the protein, which was usually lacking in environments, where livestock keeping was difficult because of tsetse flies.

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In these societies a fairer distribution of income was possible, both at the inter-generational and intra-generational levels, because the communities themselves respected the temporal dimensions of the exploitation of these resources. The resources belonged to the communities, and thus they exploited them keeping in mind the interests of future generations. Under traditional resource management regimes, redistribution was an accepted practice.

Communities usually passed on their indigenous knowledge of resource management to the next generation through oral transmission. The continued existence of such systems depended heavily on the passing down of this knowledge. Hence, the continuity and transmission of that knowledge and its associated culture from one generation to another, and its more effective distillation into practical applications that are socially and economically beneficial, are critical factors in the survival and dynamics of the culture.

In the absence of economic benefits and incentives associated with traditional practices, some forms of development and exploitation will lead to a loss of knowledge and sustainable practices. The 'chitemene' system of cultivation is an example of an indigenous knowledge system in danger of disappearing. This is because the local communities of Northern, Luapula, North-Western and Central Provinces of Zambia who practice 'chitemene' have no incentives to do so any longer. The Forest Act set aside large tracts of land as forest lands, reserved and closed to local communities. It further took steps to stop or discourage chitemene cultivation, which government specialists considered a simple slash-and-burn technique. However, chitemene was critical to traditional subsistence farming that has been sustainable for centuries.

Today, a combination of population pressure and shrinking land availability due to public restrictions on land use reduces the effectiveness of the chitemene system by shortening the fallow cycles. Villages used to clear only mature vegetation before planting; now succession vegetation will be cleared after only five or ten years. Formerly, the diversity of crops cultivated reduced the risk of total crop failure and the ample variety of foods enriched the diet. Intercropping and land rotation prevented land degradation and increased productivity. Now, the prevailing commercial farming, as promoted by some public policies, is causing the collapse of the traditional systems. This leads to erosion and loss of indigenous knowledge in the area.

IK and the spiritual element

Nearly half of the *IK Notes* that relate to natural resources indicate that spirituality has a strong influence on their management.[1] The traditional water conservation practice in Forikrom, Ghana, where the regulation of water access and use is based on spirituality is one such case.[2] For many local communities, the planet and its resources are considered sacred and deserve utmost respect. This often leads to management systems for crucial and fragile natural resources that are based on spiritual norms and institutions.

One of the most interesting institutions derived from traditional knowledge and practices is the establishment of sacred natural sites. Taboos and indigenous management codes commonly restrict access to these sites to particular activities and members of a community. Many sacred sites have survived for hundreds of years and act thus as important biodiversity reservoirs. Sacred natural sites also contribute to forming an ethnic identity and play a key role in local communities' culture and lifestyles.

However, state and conservation agencies, policies and laws have overlooked and undervalued the contribution of sacred sites to conservation. While community-based controls once helped protect sacred natural sites, today rural communities are increasingly vulnerable to political and economic pressures beyond their control. Without security of tenure and active participation in decisions that affect them and their land use, it is impossible for local communities to protect their lands and resources effectively.

Integrating IK into changing environments

One of the most interesting aspects brought out by IK Notes in several areas related to natural resource management is the application of IK in conditions of social, economic, and cultural change. Success stories regarding the application of indigenous knowledge to solving concrete environmental challenges point to the following factors that characterize the role of IK:

- Some elements of indigenous knowledge as preserved by elders and traditional institutions, sometimes linked to spirituality, have worked successfully for a long period of time.[3]
- External and internal factors have led progressively to the erosion of indigenous knowledge and practices; new needs have emerged putting pressure on traditional management systems; availability of lands and resources shrank due to population dynamics and competition with other users,[4] which often resulted in a reduction of the livelihood supporting role of the natural environment for the communities. In many instances, this has pushed communities into situations of conflict and resulted in the breakdown of traditional institutions.[5]
- Emerging forces—such as youth and empowered women groups, with the help of external catalysts—bring in new knowledge and practices through organizational approaches that go beyond traditional institutions.[6]
- These emerging forces strive to achieve a fundamental objective: turning indigenous knowledge and traditional rules into legal institutions that the government and the broader society accept.[7]

The *IK Notes* thus communicate a lesson that is worth reflecting about. For indigenous knowledge to survive as a vital element of the community life and livelihood strategy, it has to be put into the context of contemporary social, economic and cultural change, and has to endure the test of adapting to the new conditions. For this to happen successfully, two approaches seem to be critical:

- The combination of indigenous knowledge with formal science, interacting on an equal footing at the community level and acting on the principle of mutual support.
- The amalgamation of traditional .practices and institutions with formal regulations and structures, so as to provide renewed stronger foundations to indigenous knowledge while making the larger society aware of its values and contributions. "The challenge... is how to blend traditional systems of regulation, myth, and ritual with a necessary administrative armature to build new communally shared meanings and a new culture of natural resource management."[8]

IK in perspective

There are many ironies in the history of indigenous knowledge in the contemporary world. One of them is that centuries ago communities created protected or natural areas subject to strict regulations to keep them undisturbed based on sacredness and spirituality. In modern times, protected areas created under the secular model of the Yellowstone Park in the United States often overlap with the lands and resources of traditional communities. Yet, regulations often deny the traditional com-

munities inhabiting them the rights of use or access to lands and resources, and sometimes even expel or treat them as intruders. Fortunately, today the world recognizes the need to change protected area policies and practices to give due consideration to the needs and rights of local communities. This includes the revaluing of their indigenous knowledge and its integration into protected areas management.[9]

Another irony, with equally or perhaps more dire consequences, is the fact that indigenous knowledge—often stigmatized as ignorance and superstition—has helped to bring about many of the great fortunes of the biotechnological industry. The pharmaceutical industry, for example, has produced medicines for global markets from plants and animals of traditional medicinal value to local communities. The same can be said about the food industry. Traditional healers and local communities providing that knowledge have rarely ever received any adequate compensation from these industries. At the same time, such communities have become poorer.

The Biodiversity Convention initiated a debate and action on the issues related to the wider application of indigenous or traditional knowledge beyond local communities. Governments and civil society are called upon to address questions such as: Who should primarily benefit from it? Should commercial or non-commercial uses be stressed? What is the role of governments? It is not the intention of this article to debate such issues in detail. We believe in the usefulness and value of indigenous knowledge for natural resource management, and thus maintain that its wider application would be of great benefit to the entire world; but equity and justice are cornerstones in dealing with this issue.

A final point of this article is the great challenge of preserving indigenous knowledge. In the presence of massive and increasingly aggressive forces of cultural change, indigenous knowledge faces enormous risks. Indigenous knowledge, as stressed in the definition provided by the Indigenous Knowledge for Development Program and the experiences recorded in the *IK Notes*, is largely uncodified, tacit, and transmitted orally or by example. Nowadays, knowledge that is based exclusively on these features does not have guaranteed survival. In a few decades, perhaps most of the indigenous knowledge of the world will be lost, unless it is strengthened in a way that can endure the challenges of cultural change. This requires great innovation, creative measures that take account of communities' needs and rights, and strong commitment from all relevant institutions—educational, environmental, development cooperation, and finance.

Guided by its own policies, perspective, and mission, IUCN is firmly committed to supporting the preservation, revitalization, and application of indigenous knowledge to biodiversity conservation, and sustainable use, within a framework of equity and respect for cultural diversity, as mandated by its Congress. To this end, IUCN works together with local communities and their institutions, and builds partnerships with relevant global and national actors.

We still have the opportunity to save one of the greatest bodies of the intellectual production of humankind—one that may have embedded in it the solutions to many problems of the present and the future of the planet. We all must commit to doing it.

1 *IK Notes 4, 46, 48.*
2 *IK Notes 4.*
3 *IK Notes 4, 46, 48.*
4 *IK Notes 23, 46, 48.*
5 *IK Notes 23, 45.*
6 It could be youth associations working on environmental issues, such as the "Mobisquad" in Forikrom, (*IK Notes 4*) or women's groups such as the Association of Women of Popenguine for the Protection of the Environment in Senegal *(IK Notes 8*), or producer committees such as the Mussel Rocks Management Committee of Zimelene, Mozambique (*IK Notes 46*).
7 This often involves lengthy, complex, and sometimes painful dealings and negotiations with authorities, which unfortunately are not always ready to listen to the voice of the communities.
8 *IK Notes 46.*
9 This was a strong message given by the IUCN-organized Vth World Protected Areas Congress in 2003, held in Durban, South Africa, in September 2003. A ten-yearly event, the World Protected Areas Congress brings together organizations and experts to share their experiences and recommend approaches and actions to strengthen the role of protected areas in conserving biodiversity.

8. Indigenous Knowledge and Science and Technology: Conflict, Contradiction or Concurrence?

Sibusiso Sibisi

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Indigenous knowledge is today considered relevant in the social and human development domains. Its contribution to science and technology is often underestimated or not known. For example, the Maasai pastoralists actively immunized their herds by inoculating healthy animals with saliva froth of freshly diseased ones. Similar was the practice of English midwives, who stored molding bread with their delivery utensils and cloths. Yet, Pasteur received recognition for pioneering vaccination and Fleming for the discovery of penicillin.

For centuries, local communities have relied on their indigenous knowledge and expertise to cope with the challenges posed by harsh environments: extended droughts, flash floods, epidemic pests, or infertile soils. Farmers have developed their own systems of weather forecasting by observing cloud formations, bird migration patterns, seasonal winds and other seasonal or a-seasonal factors, or worked out complex, sustainable land use systems. In this sense, IK has evolved into a science and technology of its own, with farmers and communities performing as scientists and innovators—observing, drawing conclusions, and taking action. In Burkina Faso, meteorologists and farmers now work together to forecast weather.[1]

Modern science and technology has helped increase food security and agricultural production globally through the propagation of high yielding varieties (HYV). Occasionally, these HYV were more appropriately described as high response varieties: they perform to their full potential only when sufficient nutrients and water are available and pests, diseases, and weeds are under control. In many locations, this required the establishment of efficient and effective systems for input supply, irrigation, extension services, and downstream arrangements such as marketing and processing. The failure to establish these institutions made the Green Revolution much less successful in Africa than in Asia. Indiscriminate use of fertilizer and pesticides also caused environmental and health hazards. Agricultural research and industry responded with the development of less demanding varieties, often relying on genetic stock developed by farmers over generations into “land races.”

However, many farmers responded as well. They reverted to their indigenous knowledge and practices. To prevent soil erosion in Burkina Faso, they

used the old Zaï (demi-lunes) technology or built ridges. In Northern Tanzania and Kenya, small holders returned to agroforestry, a complex system of a highly interwoven and interdependent mix of annual and perennial plants that international research only now begins to understand fully. While these systems did not provide the same yields of a single crop under high external input regimes, they were much less risky, better adapted to local conditions, and usually more sustainable. In Malawi, old and new technologies related to sanitation, soil fertility, and education are combined for the development of an agenda for researchers and communities.[2] In Latin America, farmers have demonstrated their ability to innovate in the context of participatory technology development activities.[3] The Honey Bee Network in India supports local innovators and promotes their inventions.

Health care is another area where indigenous knowledge substitutes for modern yet inaccessible or unaffordable drugs or healthcare. In Africa, most people have only limited access to modern drugs and the ratio of traditional healers to modern doctors is over eighty to one. As a result, traditional medicine still contributes substantially to primary healthcare and many traditional healers have developed cures for many common diseases.

The world knows about the high incidence of HIV/AIDS in Africa. Little is known about how traditional healers have developed treatments for the opportunistic diseases of HIV/AIDS.[4] The Tanga AIDS Working Group in Tanzania (TAWG)—a consortium of traditional healers, modern doctors, nurses, and people living with AIDS—has treated over 4,000 patients with herbs prescribed by local healers. The treatment has enabled patients to resume their daily lives, which have been prolonged by five to ten years. TAWG has developed a wealth of information on plant collection and preparation, methods of preparation, treatments, and indicators of efficacy.

Challenges of modern science

The above examples illustrate the richness of indigenous knowledge systems and their contribution to science and technology. The basics of astronomy, pharmacology, and even mathematics, food technology or metallurgy derive from traditional knowledge and practices. But the unprecedented progress of science and technology over the last 100 years has created an implicit bias that considers any practice, not developed in a scientific laboratory or a corporate research and development (R&D) department, to be of lower value or quality, and attributes technological achievements or inventions to formally educated researchers and engineers. Learning from indigenous knowledge is still the exception rather than the rule.

Scientific validation

Indigenous knowledge and modern science can complement each other in many ways, as has been demonstrated in the case of agriculture and healthcare. However, scientific validation remains a critical challenge for indigenous knowledge practitioners. Health regulations and research protocols require that treatments in medicine or processes in other disciplines are clearly described and subjected to critical analysis and that they reproduce replicable results. They are expected to provide documented evidence of the efficacy of their claims in academic journals. However, much of indigenous knowledge is rooted in oral traditions and is not systematically documented in written form (with some notable exceptions of traditional medicine from India and China). Indigenous knowledge is largely held in the custody of the elders in a community and usually not shared across communities. As a growing number of local languages are disappearing so may a vast body of knowledge and culture. Hence, the challenge for modern scientists and traditional practitioners is to bridge the gap between their worlds of different methodologies, knowledge exchange, verification and validation and, eventually, applications.

For this to happen, the science and research communities (and their associated industries) need to develop strategic partnerships between scientists and IK practitioners. This calls for an open mind and the willingness on both sides to learn from each other. Scientists need to understand and accept the context specificity of IK, and IK practitioners need to understand and accept that knowledge sharing and critique are essential prerequisites for the maintenance and development of any knowledge.

Efforts are also needed to enhance the capacity of IK practitioners to document their work systematically to enable them to withstand the scrutiny of modern science. This requires resources and technical assistance from the scientific community and international organizations. Iin this context, the World Bank's Indigenous Knowledge Program organized a workshop, bringing together development practitioners from East Africa, scientists from the US National Institutes of Health, George Washington University Hospital, and Bank staff. The focus was on

learning from traditional health practices in Africa. The main outcome was an agreement between the participants to work together on validating herbal treatments of HIV/AIDS-related opportunistic infections.

In South Africa, research organizations such as the Medical Research Centre (MRC) and the Council for Scientific and Industrial Research (CSIR) are, with government support, making inroads into the scientific validation of traditional medicines. The CSIR's Bioprospecting Programme, formed in 1988, focuses its efforts on the transformation of African Traditional Medicines into minimally processed, scientifically validated herbal medicines; the discovery of new pharmaceutically active ingredients; and the establishment of community-based agro-processing businesses for the production of medicinal and aromatic crops.

Intellectual property rights

Science thrives on a cycle of verification, falsification, improved models and experimental verification, in an environment of global sharing and critique, allowing for substantial progress of knowledge including paradigm changes. Today, technology (and innovation) thrives on the protection of property rights, at least during the initial years of production. Traditional practitioners especially in the health sector prefer sharing their knowledge within their families, producing only incremental improvements of knowledge and practices. When traditional practitioners will be invited to the global sharing and exchange of knowledge, they will also need some protection that avoids depriving them of their livelihoods.

The World Intellectual Property Organization (WIPO) has collaborated with other UN agencies to address this challenge of intellectual property rights (IPR) for traditional knowledge holders.[5] In 1992, the Convention on Biological Diversity (CBD) aimed to address these issues by acknowledging the value of indigenous knowledge and resources. It established a framework for providing access to genetic resources and a means for fair and equitable benefit sharing.[6] Two years later, the WTO's Trade Related Intellectual Property Rights (TRIPS) Agreement came into force and created an international standard for minimum IPR protection.

WIPO has begun to provide training to IP offices, governments, NGOs, and communities at the grass roots level to increase the understanding of the role of IPRs in the protection of traditional knowledge. Creating new standards for documentation would provide a framework to help manage IPR implications in the IK documentation process. This will enable national IP offices to integrate the IK documentation into their existing procedures for conducting prior art searches to examine applications for patents related to IK-based inventions.[7]

Innovative approaches to protect IK are necessary because existing arrangements may not be applicable to the specifics of IK. The normal criteria for patenting a process do not exist with IK: traditional knowledge is preserved through oral tradition and demonstration rather than documentation. Some initiatives may help, such as encouraging local communities to register traditional practices. Other evolving forms of protection of IK include Material Transfer Agreements (MTAs), involving the provision of material (resources or information) in exchange for monetary or non-monetary benefits. Examples of fair and equitable benefit sharing between users and custodians of traditional knowledge can be found in several countries today.[8]

According to a recent report by WIPO,[9] "indigenous people possess their own locally specific systems of jurisprudence with respect to the classification of different types of knowledge, proper procedures for acquiring and sharing knowledge, and the rights and responsibilities attached to possessing knowledge, all of which are embedded uniquely in each culture and its languages." Therefore, the scientific community needs to study and understand these indigenous protocols governing their knowledge systems, and give them due recognition and respect.

However, while protection of IPR may be a necessary condition for addressing the valuation and validation of IK, it is not sufficient. Much of indigenous knowledge and practices is in the public domain (for example in agriculture). The establishment of IPR will not prevent infringements, and traditional practitioners or local communities commonly have no means for legal recourse. As with modern medicine, only the establishment of own standards of efficacy and efficiency (and in the case of medicine, safety) and agreed protocols for practicing and professional ethics will help to validate and value traditional practitioners. These standards do not need to be in opposition to—or total compliance with—those of modern science.

In developing these standards, traditional practitioners should be encouraged (and assisted) to carry out their own, more systematic research. Often, local communities do not have access to laboratories and technical expertise to conduct research. The institutions that exist in developing countries are frequently under-funded and under-

resourced. To encourage the discovery of new drugs derived from IK and reward its custodians, developed country research institutions should engage in twinning arrangements with research institutions in least developed countries. This would help to enhance research capacity of traditional practitioners as well as the research and development (R&D) capacity of national drug laboratories to undertake clinical trials on herbal treatments derived from IK. A partnership could develop between the local healers and scientists to share their knowledge of medicinal plants and the subsequent economic gains derived from marketed products. Several research faculties in industrialized countries offer exchange programs and fellowships to experts from developing countries to learn about their advanced technologies and in turn share their indigenous knowledge and expertise. This is another way to bridge the gap between traditional and modern science.

To support these efforts to scale up the science of IK, it is also critical that governments develop national strategies in support of studying and developing IK. The ministries of health and agriculture, for instance, could take the lead in assessing the role of IK in furthering their development objectives. In Uganda, for example, the National Commission for Science and Technology (UNCST) has begun to champion IK into its research priorities. At the policy level, it has integrated IK into the country's Poverty Eradication Action Program (PEAP).

A case study, which represents an impressive approach that could serve as a model for similar types of partnerships built around the scale-up and protection of IKS systems to enrich the development process, has unfolded in South Africa in recent years.

A CSIR-patented pharmaceutical formulation for obesity control generated worldwide attention in recent years. The story of P57—as this natural anti-obesity agent was dubbed—and its invention has its roots in indigenous plants, which have formed part of the diet of communities in rural South Africa for centuries.

During the early 1960s, an investigation was launched to determine the nutritional value and also any possible long-term toxic effect of "food from the veld." The National Food Research Institute of CSIR, one of the institutes now incorporated into CSIR Bio/Chemtek, led this investigation.

The genus *hoodia* was studied because certain species of this succulent plant were known to be consumed by the San as a substitute for food and water. Following six years of attempts to isolate and identify the chemical substance responsible for the anorectic effect of extracts of the *hoodia* plant, the project was moth-balled because the repertoire of chromatographic and spectroscopic techniques available to chemists and biochemists, simply was not sufficient.

During 1983, twenty years after the P57 research started at CSIR, the organization acquired state-of-the-art nuclear magnetic resonance spectrometry for the identification of chemical structures of complex natural products and the investigation was re-launched. As a result, a new chemical entity was discovered, representing a family of molecules not known before to have anorectic properties.

Other milestones followed: The CSIR patented P57 in 1996, and in 1997 licensed Phytopharm plc, a listed UK company, to undertake the further development and commercialization of the patented discovery. In its attempts to commercialize P57, Phytopharm signed a licensing agreement with Pfizer Inc. in 1998. With commercialization a real possibility, the CSIR took up discussion with the San people in 2002, publicly acknowledging the importance of the traditional knowledge of the San in this case study. A Memorandum of Agreement around the sharing of potential benefits was signed by the CSIR and the South African San Council in March 2003, with the CSIR committing to paying the San 8 percent of all milestone payments it receives from its licensee, UK-based Phytopharm, as well as 6 percent of all royalties that the CSIR receives once the drug is commercially available. This benefit-sharing model ensures that the San will receive equitable benefits if the drug is successfully commercialized.

While Pfizer has since reverted its rights to Phytopharm and endeavors to take P57 to market continue, South Africa has already benefited in terms of the transfer of world-class drug development technology to South Africa. The CSIR is equipped to collect, extract, and screen plant samples from the country's 24,000 indigenous plant species. Working relationships and formal agreements with traditional healers and communities are in place and will be key in future successes from the cooperation between science and indigenous knowledge.

The CSIR, South Africa is a leading center of excellence in science and technology in Africa. Over the past three decades it has been working together with the San people to develop a model framework to address the twin challenges of scientific validation and IPR identified earlier. This case study represents an impressive approach that could serve as a model for similar types of partnerships built around the scale up and protection of IK systems to enrich the development process.

Conclusion

The question raised in the title of this article can be answered with an emphatic plea for concurrence. Knowledge grows only when shared, applied, and challenged. The world today cannot afford to omit the abundant body of indigenous knowledge to address its problems as expressed in the Millennium Development Goals. Conflict and contradictions between the different "knowledge worlds" will vanish once the gap between traditional and modern scientists and practitioners can be closed through mutual acceptance of standards, continuous exchange, protection of rights, and recognition and reward for contributors. This will also provide the basis for an intrinsic abolishment of harmful indigenous practices that have had their share in discrediting traditional cultures and practitioners.

1 *IK Notes 39*.
2 *IK Notes 25*.
3 IK Notes 49.
4 *IK Notes 51*.
5 *IK Notes 19*.
6 *IK Notes 15*.
7 *IK Notes 61*.
8 *IK Notes 19*.
[9] WIPO, 2001: "Report on Fact Finding Missions on Intellectual Property Needs and Expectations of Traditional Knowledge Holders." Geneva.

9. Indigenous Approaches to Conflict Resolution in Africa

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The validity, appropriateness, efficiency, effectiveness, and sustainability of indigenous[1] solutions for local problems are the themes of this compilation of sixty *IK Notes*. What has been proven valid for the areas of education, agriculture and natural resource management, and health holds true for conflict resolution systems in Africa.[2] The futility of efforts to resolve conflicts in Africa at the national level has been the primary reason for the extensive involvement of regional organizations, private military companies, nongovernmental organizations, and the United Nations, though with limited success. Modern conflict resolution principles and methods are generally not continuations or adaptations of those of its indigenous populations.[3] There is a perceived gap or "disconnect" between modern and indigenous conflict resolution philosophies and practices. Chances for peaceful resolution of Africa's conflicts can be enhanced considerably if the region's indigenous principles, skills, and methods of conflict resolution are understood and harmonized with those of the modern nation-state.

The *IK Notes* in this publication touch on a crucial aspect of indigenous African conflict resolution systems, principles, procedures, reintegration of ex-combatants, and rehabilitation of war victims.

Apart from the well-known conflicts, such as the civil wars in Somalia, the Democratic Republic of the Congo, Liberia, Sierra Leone, Côte d'Ivoire, Guinea Bissau, and Senegal, most of Africa's conflicts are communal. They occur in the hinterland and are rarely reported, though they contain the seeds of escalation. They claim thousands of lives, create internally displaced persons and refugees, and limit economic activity thus preventing a nation or community from extending its production-possibility frontiers.[4]

A few key questions need to be addressed: What was the nature of conflicts in pre-colonial Africa? What systems of conflict resolution existed? How do conflicts in traditional Africa compare with those of the region's contemporary ones? In what way, if any, can an understanding of the indigenous conflict resolution approaches reduce present conflicts? Can common forms and spirit of indigenous conflict resolution be scaled up to develop a broader conflict resolution framework? Can indigenous methods be combined with modern and foreign methods?[5] Can the region develop an alternative dispute resolu-

tion (ADR)[6] system that will enable it to cope with its ever-increasing and apparently intractable conflicts?

Conflict in traditional Africa

A significant part of anthropological research in Africa places emphasis on the consensus model in which communities are seen to be coherent, self-contained systems in which economic, political, social, and religious practices complement and reinforce one another in a well-ordered and harmonious fashion. Interests that would develop from, e.g., marriage or economic cooperation between different ethnic or descent groups, would tend to evolve into certain norms of institutions that impose constraints upon community members who would otherwise choose to utilize the option of violence in situations of conflict of interest.[7] With this model of social control, conflicts were neutralized by social institutions, conventions, norms, values, beliefs, and moral principles, which primarily emphasized tendencies toward social equilibrium.[8] The primary function of institutions, therefore, was to emphasize areas of mutual benefits instead of incentives to cause harm to others.

It is empirically verifiable, too, that, as in any human society, conflicts were part and parcel of indigenous African communities. Disputes could result from a breach of contract, theft, slander, and witchcraft and sorcery accusations. They could also result from marital misunderstandings, injuries against persons, and damage to property. Fights could result from misunderstanding over inheritance and the difficulty of determining land boundaries, as well as over access to political office. Conflict could also occur between people of different communities or ethnic groups normally over the determination of rights ownership of natural resources and raid of livestock.

Thus, a meaningful search for viable alternative conflict resolution systems for Africa must start with a reconciliation of this contradiction. Most African societies emphasized social harmony as the overriding ideology of social control. This has been well-demonstrated in the conception and application of the philosophies of *ubuntu* among the indigenous communities of Southern Africa and *kanye ndu bowi* [9] among the Buem of the Ghana-Togo border area.

Indigenous African conflict resolution systems

The main indigenous conflict-handling fora identified in Africa are summarized below:

Mediation is the most popular dispute-settling forum in traditional Africa. The managers of mediation are usually lineage elders, priests, and influential individuals who are known for their wisdom, skills, and trustworthiness in their official and professional capacities and private dealings. These individuals, who are referred to elsewhere[10] as *du nkuwo,* (or the eyes of the city or community) enjoy excellent reputation within their communities and have the capability to persuade individuals who have been summoned to attend hearings. It often happens that lineage heads or influential individuals who have excelled in the art of negotiation, persuasion, conciliation, and advice are often invited to mediate conflicts outside of their own kin groups or communities. Mediation normally avoids overt display of power, winner-loser mentality, social scars, and bitterness that are normally associated with adjudication. Disputants seek mediation generally because it is considered affordable, flexible, and adaptable. As a conflict resolution method, mediation helps to achieve a settlement through negotiation, conciliation, persuasion, inducement, and compromise. It was logical and common for the people to seek mediation because disputants usually looked for a more congenial and less adversarial conflict settlement to continue to live together amicably.

Adjudication is a more elaborate process than mediation. It usually proceeds in stages and normally involves intensive cross-examination and assembling of witnesses and, where necessary, exhibits would be tended in as evidence.[11] People in general prefer mediation to adjudication, primarily because the former is not only less time-consuming and cheaper, it also avoids a winner-loser outcome, which makes post-settlement conciliation more difficult. Also, cases that were submitted for adjudication normally include those that had either failed to be resolved by mediation or arbitration or were constitutionally defined as criminal.[12]

The resort to *mystical powers* to resolve conflict was a common practice in pre-colonial Africa. Trial by ordeal was a practice whereby recourse could be made to mystical bodies, e.g., the fetish to determine guilt and/or innocence. If evidence was so conflicting that the judges or mediators were finding it difficult to come to a decision they could resort to the application of trial by ordeal.

These were normally cases in which the facts were difficult to ascertain through secular means.[13] It was also common for people to resort to the use of witchcraft and/or sorcery to settle conflict in Africa. People would resort to these mystical means when they did not want to bring their grievances into the open in order to be redressed by either adjudication or mediation. In African thought in general, witchcraft refers to the use of non-material mystical means in attacking one's adversary, whereas the use of sorcery involves both the use of non-material mystical means and material objects. The efficacy and destructive powers of witchcraft and sorcery were firmly believed and feared in most African communities.

Traditional African societies and communities dealt with the challenges of maintaining peaceful relationships with their neighboring ethnic groups through *diplomacy*. A failure of diplomacy would lead to war or the resumption and or escalation of a conflict. Central to the diplomatic efforts were clan elders, or, in the case of centralized political systems, delegates of the reigning monarch. These diplomats—often referred to as "messengers," "linguists,' or "heralds" were, like mediators, individuals who had acquired exceptional skills in the use of language and had distinguished themselves in the art of negotiation, persuasion, and conciliation.[14]

Other methods of dispute settlement in traditional Africa included fission, "slanging-match," and joking relationships. *Fission***,** also referred to as "split" or "secession" was a practice whereby one faction or party to the dispute moved and created a new settlement elsewhere.[15] Communities resorted to **"**slanging-matches**"** where the disputing parties wanted to dilute the intensity of the tension, which, if not done, could lead to violence. Parties to the conflict would challenge each other to an exchange of insulting songs and words. A *joking relationship* had a similar cathartic effect as a slanging-match. Parties to the conflict insulted each other playfully, but, challenged by the larger society or community not to react in aggressive or revengeful manner during such exchanges. In principle, one was supposed to be more tolerant of those with whom one had a joking relationship. While it could be practiced by people within the same community or society (as in the case of the Fulbe of Nigeria, Senegal, and Niger), it could also exist between peoples of different societies or communities (as in the case of the Fulbe and Tiv of Nigeria).[16]

The individual vis-à-vis the community and conflict resolution. There was a close connection between individuals and their kin groups and/or even the larger community vis-à-vis conflict resolution. As a bearer of the lineage or community name, individuals were expected to uphold a positive image of themselves in their social conduct. Lineage and community members, too, were expected to unfailingly stand by a member who was involved in any manner of dispute. Lineage heads in particular would be expected to make sure that any member of the group who was summoned for any form of wrongdoing attended the court hearing and paid the court fines that might be imposed. Recidivism in particular was, therefore, severely sanctioned by lineage leaders and the community as a whole, whose duty it was to provide the public officials with support in enforcing the community's normative order.[17]

In his contribution, Wolff extended the conflict resolution role of kinship structures and its underlying ideology, when he discussed attempts in Eritrea to offer protection to thousands of children who were victims of the county's thirty-year conflict.[18] In this program, not only were the children's extended families sought in order to be assigned the responsibility of protecting these orphans, an alternative plan was also designed whereby homes, based on the people's indigenous extended family values and structures, were being created for the protection of children whose biological extended families could not be found.

In most African societies and/or communities, social order could be sustained through the imposition of "intrinsic sanctions." These were subtle but pervasive means by which members of the community could be molded into complying with the rules of social control. These intrinsic sanctions are both positive—the psyche rewards that the people could receive when they conformed to the approved mode of behavior—and negative—the feeling of moral discomfort that they experience when they default. Thus, the sustenance of the ideology of harmony as in the case of *kanye ndu bowi* among the Buem[19] or *ubuntu* in southern Africa (explained below) involves an emphasis on community myths, beliefs, values, and motives.

Enforcement of judicial decisions. Fragility of the political order and limited capability of the enforcement mechanisms influenced the enforcement of judicial decisions in the pre-colonial setting. Unlike the modern nation-states, most pre-colonial African societies lacked organized and standing police and the institution of imprisonment.[20] How did these societies enforce their judicial decisions in order to maintain law and order? The search for an explanation to this apparent enigma directs attention to the following socio-structural elements.

Institutional and personal trustworthiness. Successful settling of conflict in pre-colonial Africa by judi-

cial officials would meet not only the expectation of the disputants that their conflict was resolved, it would also reinforce a conviction among their subjects that the politico-judicial officials could bring about the resolution of other disputes in the future. In most of the pre-colonial African societies, the political officials—chiefs, fetish priests, lineage heads, and influential individuals—were also judicial officials, such as adjudicators, mediators, and arbitrators.[21] Contrary to the modern experience where such a concentration of societal power can be a recipe for autocracy and despotism, political leaders of pre-colonial Africa utilized their roles in conflict management by demonstrating their skills, capabilities, and trustworthiness and, in doing so, enhanced their legitimacy and political standing before their subjects.

The ideational context. In pre-colonial Africa, the philosophical orientation, which under-girded conflict resolution was as important as the skills and the moral integrity of the conflict resolution officials. For example, in most African communities, disputing parties needed to concur with the decisions of the courts to consider the conflict resolved. For example, the Tiv of Nigeria believe that "a good judge does not force a decision on the parties but gets them to concur if he can."[22] In this context, the politico-judicial officials were expected to ensure that parties to a dispute unanimously concurred on the fairness of the judicial decision.[23] The implications of this indigenous principle for the contemporary peace talks in the region are enormous.[24]

The use or the threat of use of supernatural sanctions on intransigent parties in the implementation of peace agreements was crucial. If a person refused to abide by a decision of the court, the chief and his elders might, by imprecation compel him or her to do so.[25] As a verdict enforcement mechanism, curses served as powerful sanctions to ensure obedience to the court's decision. Since the dominant traditional religious entities in Africa mostly consisted of ancestral worship, the role of mystical forces in enforcing judicial decisions in the region cannot be separated from the supportive role of kin groups or community members. Religious ritual and community support were central elements in post-conflict reconstruction in some communities in Mozambique and Angola, in the economic, political, and psychological rehabilitation and reintegration of ex-combatants and victims of war.[26]

Ostracizing is a judicial procedure applied against recidivistic members of the community. These individuals — referred to as "the bad lot"[27] — are habitual criminals, apparently incorrigible, who constantly steal, rape, or murder but fail to submit themselves to the orders of the courts. The Buems of Ghana thought ostracism was equivalent to life imprisonment. This was because, once ostracized, the individual is cast out of any social event, thus assuming a status of the "finally intolerable,"[28] a pariah and an anathema to his or her kin group. He or she was "stripped of the soul."[29] Thus, the fear of ostracism in the traditional African setting was so great that it offered leaders of communities in which it was practiced an opportunity to pressurize intransigent parties to submit themselves to court hearing when summoned and to abide by judicial decisions.

Immediately on attaining political independence, Africa's founding fathers acknowledged the "disconnect" between African traditions and practices and those that were transplanted by the colonizers. They also saw the need for utilizing the region's indigenous principles, values and ideological symbols, and models as the basis for political modernization, nation-building, and the creation of democratic governance. In this spirit Leopold Senghor formulated "Negritude," Kwame Nkrumah "Consciencism," Julius Nyerere "Ujamaa," and Kenneth Kaunda "Humanism."[30] A similar attempt can be found in the adoption of the indigenous African kinship ideology by the post-colonial African leaders to enhance their legitimacy. Ranging from the conservative Houghouet-Boigny of Côte d'Ivoire to the radical Nkrumah of Ghana, most of these leaders have in one way or the other invoked the ideology of kinship as the basis for creating legitimate governance. This took the form of the "metaphor of father and family," which was a vision of governance derived from an idealized notion of authority and behavior within the African family systems.[31]

The national judicial systems in Africa recognize the existence of traditional conflict resolution systems for their relative competence in matters of local traditions and customs. Some countries have even incorporated them into the national statute.[32] Thus, cases deemed tenable under the relevant indigenous laws are often referred from the national courts to these traditional courts. For example, disputes arising from land or marriage contracts executed under a particular local custom, but brought before the national court system are often referred back to the traditional courts for redress. The traditional courts are deemed more competent in cases that demand knowledge of local customs and history since much of this has not been written and it is the chiefs and their elders who could be relied upon as sources of such knowledge.[33]

There have, however, been problems in the implementation of this judicial juxtaposition initiative. This is because some of the principles of the legal systems of the ethnic constituents are in apparent irreconcilable conflict with those of the modern nation-states that have established jurisdiction over them. Some authors believe that the implementation of a national land law alongside an existing indigenous one can give rise to "intercode ambiguity," a situation whereby two or more persons or groups can advance different, though apparently legitimate claims, to the same piece of land at the same time. This has contributed vastly to the causes of communal conflicts that have engulfed most of Africa's agrarian communities. Given the centrality of land in the economic, political, and sociocultural lives of these communities, conflict emanating from the problems of determining rights in land can be considered the key source of conflict in the region.

Conclusion

The following observations and recommendations may be of use to African governments, their development partners, and Africanist scholars with an interest in African conflict resolution:

1. It is not suggested that a wholesale application of Africa's indigenous principles and methods will resolve the region's contemporary conflicts. However, African policy-makers and their international partners must look for the means by which relevant aspects of the indigenous principles and practices can be integrated and harmonized with those of the modern nation-states of the region as well as across the diverse indigenous systems themselves.[34]

2. Indigenous philosophies with a perceived reconciliatory role such as *ubuntu* in the deliberations of post-apartheid South Africa's Truth and Reconciliation Commission (TRC) and the proposed adoption of "gacaca" in Rwanda must be acknowledged, selectively explored, and their spirit incorporated into the countries' judicial, political, and civic cultures. For example, in the case of the South African TRC's deliberations, the application of the spirit of *ubuntu*—an expression of "collective personhood" that subsists on such values as group support, compromise, caring, empathy, co-operation, and solidarity—was in harmony with the primary objective of the TRC, creating a non-adversarial relationship between offenders and their victims.[35]

3. African policy makers can also explore some of the enduring qualities of the main indigenous African conflict resolution processes and seek ways and means of applying them to the contemporary conflict resolution practices in the region. These include:

- the sanctity of the presiding mediators or the judges in terms of demonstrated moral uprightness, neutrality, and honesty in their private and public behaviors;
- full and free discussion of the complaints by the disputants, leading to a high measure of agreement between all present; and
- the losing side's recognition of the justice in the winning side's case and its acceptance of the fairness of the process.

4. The adoption of Africa's indigenous principles and values as the basis for political development, including conflict resolution, does not offer automatic success. This has been demonstrated by the extent of governance problems in most of the African countries even though most of these countries' post-colonial leaders have in one way or the other adopted the indigenous principles and values but disappointed in the behavioral obligations enshrined in the indigenous principles and their underlying norms and values.

5.To adopt, refurbish, and sustain Africa's indigenous conflict resolution principles, three key issues, must be taken into account. First, there is a need for role models, in this case the active use of the region's men and women in mediation. These individuals must be the *du nkuwo* (the eyes of community) who have been recognized, not only for effective performance in particular spheres of human endeavor such as politics, civil administration, scholarship, military, liberation struggle, and entrepreneurship, but also for the demonstration of unquestionable moral uprightness. Second, effective conflict resolution depends on good governance. Third, African governments and the various agencies of political socialization in the region need to educate the public in general and the younger generation in particular on the region's vital indigenous principles that have been handed down over the years.

African governments and Africa's regional organizations need to devise the means and political will to resolve the horrendous and growth-retarding conflicts in the region. After all, the ability of a state or a community to enact and enforce laws that govern behavior, including conflict resolution, is an unquestionable measure of its developmental capacity.[36]

1 For the purpose of this paper, the term "indigenous" is used interchangeably with the terms "traditional," "customary," and "pre-colonial."
2 The term "conflict resolution" is used in this article in a broader sense to include all manner of management, which prevents, reduces, or even resolves conflict. This also includes post-conflict activities that are meant to reinsert, reintegrate and rehabilitate ex-combatants and war-affected persons.
3 Woodman and Morse, 1987.
4 Fred-Mensah (1999).
5 Zartman, 2000, p. 9.
6 Nader, 1995, p. 64.
7 See Gluckman, 1965.
8 Bates, 1993.
9 *IK Notes 56*.
10 Kouassi, 2000, p. 74.
11 Swartz, 1966 Fred-Mensah, 2000, *IK Notes 56*.
12 Fred-Mensah, 2000.
13 Radcliffe-Brown 1940, p. xviii. 1985, p. 225.
14 Schraeder, 2000, p. 74–77. Smith (1976), Adjaye, 1996, and Kouassi (2000).
15 Merry, 1989.
16 Wilson-Fall, 2000, pp. 55–56.
17 R.D. Cooter, op. cit., p.22.
18 *IK Notes 50*.
19 *IK Notes 56*.
20 Cooter (1996) citing J. Locke's *The Second Treatise of Civil Government*.
21 J.F. Holleman (1974) pp. 16–17.
22 See Bohannan, 1957.
23 See also Fred-Mensah, 2000, 2001, IK Notes 56, 59.
24 See Stedman *et al.*, 2002.
25 See A.R. Radcliffe-Brown, 1940, p. xviii.
26 *IK Notes 10*.
27 Radcliffe-Brown, cited by Gluckman, 1965.
28 Llewellyn and Hoebel, also cited by Gluckman, 1965.
29 Fred-Mensah, 2000, p. 43.
30 See Deng and Zartman, 1991, p. 14.
31 See Schatzberg, 1986, pp. 14–15.
32 Woodman and Morse, 1987.
33 Ghana, 1960, p. 8.
34 Easton and Belloncle, 2001, p. 4.
35 See Masina, 2000, pp. 170–179.
36 See Brautigam, 1996.

10. Indigenous Knowledge: The Way Forward

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This concluding article reviews the context for and the achievements of the World Bank's Indigenous Knowledge for Development Program, discusses the main lessons learned to date, and outlines a possible way forward to promote IK in the future in the context of the Millennium Development Goals (MDGs). In doing so, the article draws on the lessons that emerge from the 60 *IK Notes*, as well as on the recommendations made by the contributing authors in the preceding thematic lead articles, and, finally, on the experiences gained during the first five years of the IK Program. Together, these point to the following: there is considerable potential for successful indigenous practices to enhance the sustainability and impact of development efforts; and the development community should increase its support to programs that help enhance the capacity of local communities to share IK and apply it to get better development results.

Context

As indicated in the foreword to this publication, the World Bank launched the Indigenous Knowledge for Development Program in 1998 in response to the challenge articulated by government and civil society leaders at the Global Knowledge Conference in Toronto, Canada in 1997. The start of the program also coincided with a newly formulated vision of a Knowledge Bank. Within this vision, and recognizing that it is not just a storehouse of universally applicable and transferable knowledge, the Bank would seek to:

- Empower its clients to tap a variety of knowledge sources, including indigenous knowledge systems embedded in local communities,
- Help connect clients to one another and to other sources of experience,
- Learn from and with clients about what works in a given setting and why.

The "business case" for using IK rests on the following premises: that understanding the local context allows for better adaptation of global knowledge; that using local knowledge sources increases ownership and eventually produces better results on the ground with enhanced sustainability;[1] that learn-

ing from and building on the knowledge systems embedded in local communities helps to empower these communities and fosters a sense of equity in their interactions with governments and external development partners; that building on IK could only be achieved in partnership with the communities themselves, with governments and civil society, and with development partners and academia, in order to leverage scarce resources and maximize the comparative advantage of the respective partners;[2] and, most importantly, that investing in the exchange of IK and its integration into development programs supported by the Bank and its development partners would help achieve the overriding development objective, the reduction of poverty.

Achievements

At the launch of the IK Program, the World Bank published a "Framework for Action".[3] The latter was embedded in a strategy aimed at improving the quality of development programs and empowering local communities through activities in three key areas: (a) raising awareness of the importance of IK; (b) enhancing local capacity to document and exchange IK; and (c) applying IK in development programs. The following is a brief summary of the intermediate outcomes, which the IK program has helped to promote to date.[4]

Raising awareness

There has been a growing recognition of the importance of IK in the development process as evidenced by the following:[5] the volume of IK publications related to development has risen substantially;[6] the concomitant number of actors, NGOs, and even research institutions engaged in IK-related matters is growing rapidly; development practitioners and decision makers increasingly recognize IK as an important and underutilized knowledge resource[7]; IK is finding a more prominent place in the global dialogue on development;[8] IK has become less controversial and its promoters today represent a mix of development practitioners, researchers, and experts from the humanities and natural sciences;[9] and the development community is beginning to address the intellectual property rights related to IK.[10]

This evolution is also clearly observable in the World Bank. "Indigenous" or "local" knowledge has increasingly entered the Bank's publications and dialogue with its clients, whereas in the past the focus was mostly on "global" knowledge.[11] Similarly, to underscore the importance of indigenous knowledge systems, at the 2001 Annual Meetings the Bank's management disseminated to its governing body a booklet entitled "Learning from Local Communities: Challenges and Opportunities" where several successful cases of IK were brought to the attention of the audience. Finally, client demand for IK-related material in the Bank has been growing steadily: the IK website is the second most visited site on the Bank's Africa Region external portal;[12] and the Swahili and Wolof versions of the IK website receive about twice as many visitors as the French version, suggesting a strong client response to IK content in local languages.

Enhancing local capacity

There has been a noticeable improvement in the capacity of local communities and IK centers to exchange indigenous practices and learn from each other as demonstrated by the following: accessing documented and published information has become much easier, including in African countries, enabled in part by the increasing reach of the Internet; networks of IK practitioners are proliferating at the country as well as regional level (e.g., associations of traditional healers in Uganda, Tanzania, and other countries; regional association of traditional hunters in West Africa, etc.); community-based documentation and dissemination centers are being established (e.g., in Uganda); cross regional IK learning exchanges have provided a platform for replicating successful indigenous practices;[13] and a growing number of community-to-community knowledge and learning exchanges (C2C) within and across countries have enhanced local capacity to learn from peer experiences in other communities.

The C2Cs represent one of the most effective approaches to sharing indigenous practices that have a strong tacit knowledge content. For example, one such C2C in South Africa produced a measurable outcome in improving the well-being of the participating community. The latter learned through the C2C how to improve its marketing strategy and succeeded in securing a sizeable export contract for a local cash crop.[14] The revenues from the exports are manifold the cost of organizing the exchange. Lessons of experience with several such C2Cs, including pointers on successful approaches to preparation, management, and evaluation of C2C, have been prepared to help practitioners in organizing such exchanges.[15]

Table 1. Examples of integration of IK into World Bank-supported projects

Project	Country	IK Component
Integrated Early Childhood Development Project	Eritrea	Collecting and disseminating traditional practices with a special reference to post conflict situations
Nutrition and Early Childhood Development (ECD) Project	Uganda	Learning exchange on IK practices in ECD projects in India and Sri Lanka and use of ICTs
Early Childhood Development (ECD) Project	Kenya	Learning exchange on IK practices in ECD projects in India and Sri Lanka and use of ICTs
Women's Development Initiative Project	Ethiopia	Indigenous practices of women collected and synthesized; SEWA's small scale enterprise experience in India transferred to Ethiopia
Agricultural Research and Training Project II	Uganda	Indigenous agricultural practices integrated into outreach and dissemination programs
National Agricultural Advisory Services Project	Uganda	Support for farmer driven extension service
National Agricultural Research Project	Kenya	IK agricultural practices for outreach, verification, and dissemination
Malawi Social Action Fund (MASAF3)	Malawi	IK as a tool for community empowerment and development communication
Northern Uganda Social Action Fund (NUSAF)	Uganda	Use IK to promote post-conflict healing of communities affected by war
National Agricultural Advisory Services Project	Uganda	Building IK-based indicators for farmer satisfaction in farmer-driven extension service
PRSP/CAS Process	Kenya	Identify potential role of local-level institutions to increase transparency and participation
MAP - Multi-Country HIV/AIDS Program	Burundi	Use IK to help local communities combat HIV/AIDS, working with local healers
MAP - Multi-Country HIV/AIDS Program	Guinea	Use traditional healers to help reduce opportunistic infections related to HIV/AIDS
Conservation and Sustainable Use of Medicinal Plants Project	Ethiopia	IK component will help collect and analyze data on benefits derived from medicinal plants
Northern Savanna Biodiversity Conservation Project	Ghana	Promote the conservation and sustainable utilization of medicinal plants

Applying IK in development

There is a growing movement toward integrating IK into poverty reduction programs to help achieve better results as evidenced by the following developments: several countries have begun the process of preparing national IK strategies through national workshops and other events (e.g., Uganda has completed a national IK strategy; and Burkina Faso, Malawi, Mali, Kenya, Sri Lanka and Tanzania have held workshops to help launch the process); a few countries have already incorporated IK into their poverty reduction programs (e.g., Uganda's Poverty Eradication Action Program (PEAP) has incorporated IK as a component of science and technology; the State of Kerala in India is incorporating IK into the State's 10th Five Year Plan, etc.); and guidelines for the integration of IK into project planning and preparation have been prepared in partnership with CIDA, ILO, and the IK Program.[16] Some regional organizations are also incorporating IK into their strategies, e.g., SADC has included IK as a component under science and technology in its Regional Indicative Strategic Development Plan).[17]

Progress in integrating IK into development efforts has also been observed in the projects supported by the World Bank. Whereas five years ago, very few projects contained specific components related to IK, today more than two dozen projects under implementation or preparation contain such elements. Table 1 highlights some of these projects in Africa.

Lessons learned and challenges

Learning about IK enables an interdisciplinary approach[18] to development that helps to empower local communities and builds their capacity to effect change. This approach involves learning about the bio-physical environment, the social fabric, the local economy, culture and history, as well as the knowledge embedded in a community. Such a holistic approach can help to: better understand the local situation in its entirety; design more effective and sustainable programs; learn from communities and help them learn to adapt global practices appropriately. This could in turn help to enrich the development process, and to promote a more balanced perspective between "exogenous" and "endogenous" concepts of development.[19]

Given the holistic nature of IK, learning from exchange of IK can also provide value that goes beyond a specific practice. For example, the community-to-community exchanges (C2C) mentioned earlier have demonstrated that participants not only learn specific skills or practices; but more importantly, they observe different approaches to solving problems and are prompted to reflect upon their own problem-solving strategies in the context of a specific practice. Hence, the C2Cs have the potential to empower the local communities and help enhance their capacity for effecting change, beyond the immediate learning of a specific technology. Since development is essentially about a process of desired change, the above approach would contribute effectively to achieving the fundamental goals of a community.

IK is highly context specific and hence may not be easily replicable, unless it is adapted or leveraged with other knowledge systems. By definition, IK is context specific.[20] Hence it sets its own limitations to transferability and scaling-up: what works successfully in one location or for one community may not for another.[21] Nevertheless, some indigenous practices can be adapted to other institutional or socio-cultural contexts or leveraged with other knowledge systems with impressive results. The box below shows how in the Iganga District of Uganda, a community driven initiative succeeded in reportedly reducing maternal mortality rates by about 50 percent in three years, using simple technology to leverage indigenous knowledge and modern knowledge systems. Such cases have the potential to be replicated and scaled up in other communities (in Uganda as well as in other countries) with similar social-cultural characteristics (e.g., the prevalence of traditional healers and birth attendants in the rural areas).

Traditional birth attendants and health workers partner to save lives in rural Uganda

In the Iganga District of Uganda, a UNFPA-supported project (RESCUER) seeking to reduce maternal mortality equipped Traditional Birth Attendants (TBA) with modern communication technology. This involved the installation of a solar-powered VHF radio communication system that included fixed base stations at the Primary Health Center, mobile "walkie-talkies" for the TBAs, and ambulance vehicles and a reliable supply of blood reserves. Improved communication and transportation links between the TBAs and the health posts resulted in increased and timelier patient referrals as well as the improved delivery of health care to a larger number of pregnant women. Connecting the Traditional Birth Attendants and the health centers helped leverage the indigenous and modern knowledge systems. A notable impact of the project was that maternal mortality reportedly declined by more than 50 percent over the period of three years i.e., about three-quarters of the applicable Millennium Development Goal for 2015![22]

Validation of IK is necessary to confirm the impact and the potential value of replication, but it requires protocols that fit the specific nature of IK and that empower its practitioners. Scientists who challenge the validity of the experiences of indigenous practitioners tend to say that "the plural of anecdote is not evidence." There are two ways to respond to this challenge. The first (more popular) approach calls for subjecting IK practices to research and methodological scrutiny. For example, some countries have invested in national pharmaceutical laboratories that analyze medicinal plants to find active ingredients; others have invested in farming systems research, aiming to understand the indigenous cropping systems.[23] However, the outcome of these investments has been limited. There are very few concrete recommendations resulting from such research that help traditional practitioners. For example, the majority of agricultural extension workers continue to concentrate on messages related to the "major" crops under relatively simple input-output regimes.

Yet, there remains a need to document and confirm the claims of impact of IK, especially in areas such as tradi-

tional medicine where lives are at stake—how does one know that the claim of healing is true and that the plants in question are safe? Appropriate protocols need to be developed that fit the specificities of IK. Some progress has recently been made in this area. For example, the IK Program has brokered an initial partnership between the Tanga AIDS Working Group, Tanzania, and the US National Institutes of Health (NIH) to cooperate on the validation of the efficacy of the herbal treatments used by traditional healers in Pangani District to treat the opportunistic diseases of thousands of HIV/AIDS patients. Another example involves development of guidelines by the WHO for appropriate approaches to determining the safety, efficacy, and quality of medicinal plants.[24]

The second option is to develop national, possibly followed by international, standards and professional ethics for IK practitioners. The latter approach could be potentially more effective in empowering indigenous practitioners. For example, the success of modern medicine builds on strong institutionalized professional bodies with appropriate regulation by the industry and government agencies. These professional bodies and communities of practice have designed own standards and ethics that, by and large successfully, help to control misuse, fraud, and mal-practice.

In the case of indigenous practitioners, however, such representation is typically the exception rather than the norm (e.g., in some countries there are associations of traditional healers). Nevertheless, progress is underway. A global network of IK resource centers is gradually emerging. Its members are academic institutions, NGOs, CBOs, and individuals engaged in the study, documentation, dissemination, and advocacy of IK. Regional networks are also slowly emerging, such as PELUM (Participatory Ecological Land Use Management), which has been formed in some countries in East and Southern Africa to share and combine experiences, skills, and knowledge in smallholder agriculture.

Active and member-driven networks can be effective disseminators and advocates of IK. However, the communities of indigenous practitioners are still fragmented, with individuals generally operating in isolation, often competing with each other, or "protecting" their knowledge through secrecy arrangements or sharing on an intra-familial basis only. As a result, IK practitioners tend to play a marginal role in the knowledge debate and have yet to develop effective mechanisms to learn from each other so as to further develop their knowledge. This tends to prevent good indigenous practitioners from being duly recognized (and rewarded) beyond the local context and lowers the "culling" rate of poor performers or harmful traditional practices, which, in turn tends to discredit the entire profession.

The two approaches mentioned above are not mutually exclusive, and research is needed as much as is advocacy. However, without the latter, the former might not achieve what good indigenous practitioners need most: general recognition as empowered, credible professionals. These empowered practitioners could then engage the research community, promote their own agendas to seek protection for their intellectual property, and act at par with policy makers and representatives of the conventional sciences. The development partners can play an important role in enabling this process.

Developing innovative approaches to protect intellectual property associated with IK is a key challenge facing the global development community. Innovative approaches are needed because existing arrangements may not be applicable to the specific nature of IK. For example, IK is typically preserved through oral tradition and demonstration rather than documentation. More often than not, it emerges gradually. Only in rare cases is an industrial process involved. And, an individual inventor is unlikely to be identified. These are all essential criteria for patenting a process or technology under the prevailing rules governing the intellectual property rights (IPR). WIPO, a partner of the IK Program, has taken the lead in promoting a global dialogue and partnerships around the challenge of how to find innovative approaches to IPR as they apply to indigenous knowledge.

There are several action areas to help address this issue. In the area of documentation, local communities could be encouraged to publicize and register traditional practices. Practical, cost-effective and indigenous examples of documentation also exist.[25] Material Transfer Agreements (MTA) is another interesting approach to protecting IK. These agreements involve the provision of material (samples or information) in exchange for monetary or non-monetary benefits. Examples of fair and equitable benefit sharing between users and custodians of IK can be found in several countries today. For example, in Cameroon, the US National Cancer Institute has reportedly signed a contract with the government, following the discovery of a forest plant species with a potential anti-AIDS chemical. Cameroon provides plant samples in return for payments, which are used for community development projects.[26]

Regional agreements could also lead to cost effective forms of protection for local communities. For example,

the 1996 Andean Pact adopted by Bolivia, Colombia, Ecuador, Peru and Venezuela, empowers the national authority and indigenous communities in each country, as the holders of traditional knowledge and resources, to grant prior informed consent in exchange for equitable returns.

The need to address the issue of IPR of IK should not prevent the development and implementation of IK initiatives that are beneficial for communities and the development process as a whole. However, some community-based organizations and NGOs remain cautious about the perceived ultimate motives of the development partners' interest in IK. They may be concerned, for example, that communities could be deprived of their knowledge (and the associated products, processes, rights or benefits). While the relevance and importance of the IPR issue is not in doubt, the development partners as well as governments should not lose sight of the fact that IK is an endangered resource—if not recorded and documented, studied and challenged, disseminated and adapted, it is very likely to disappear.[27] The challenge for the development community is therefore to develop a balanced approach that assures the preservation of IK systems while at the same time protecting its bearers.

The way forward

The material in this publication demonstrates that over the past few years there has been good progress in putting IK on the agenda of development: awareness of the value of IK in the development process is growing; although sharing of IK across borders and communities is still dominated by academic circles rather than by practitioners. This is changing gradually and the integration of IK into development projects is also beginning to take place. Nevertheless, much more needs to be done to build on the progress to date and to extend its breadth and depth. Some of the areas that need most attention emerge from the earlier section on lessons and challenges. Clearly, the main actors are the communities and the practitioners. Nevertheless, governments and their development partners can play an important role in helping to enable the communities by supporting appropriate policies, programs, research, and targeted interventions.

Is it realistic to envision that in the next five years learning from IK and incorporating successful practices into development programs becomes the standard rather than the exception that it is at present? The following suggests a six-point agenda for action by governments and partners to help realize this vision. The World Bank's IK Program is committed to supporting this agenda in partnership with all the other actors involved. The specific modalities for cooperation will have to be based on the principles of comparative advantage and appropriate burden sharing.

1. Scale up successful IK practices to help achieve the MDGs

There is ample evidence to suggest that one of the best ways to empower local communities is to enable them to apply their indigenous practices in development activities that affect them directly. While there is a growing interest by local institutions and governments in incorporating IK into programs and projects, the degree of that interest varies. In part, this is because some governments are still uncertain about the commitment of external partners in supporting such activities, who may have doubts about the efficacy of such an approach. Table 2 highlights the potential contribution of IK to helping achieve the MDGs. These cases demonstrate that with appropriate adaptation and leveraging with other knowledge resources, IK can make a significant contribution in saving lives, educating children, increasing agricultural production, enhancing governance, etc. It would, therefore, make good development sense for the partners to increase their support for community-driven activities that rely on IK.

2. Enhance the capacity of local communities to develop, share, and apply their IK

One of the most effective ways to empower local communities is to help enhance their capacity to exchange and apply indigenous practices (either directly or in combination with other practices). In particular, experience suggests that brokering knowledge and bringing together knowledge seekers and providers is especially useful in increasing the participative problem-solving capacity of local communities. Specific action in this area could include support for:

- Development of national IK strategies and their incorporation into poverty reduction programs
- Brokering of South-South knowledge and learning exchanges
- Facilitation of community-to-community exchanges
- Building of IK professional associations, standards and ethics
- Supporting communities to develop businesses related to IK.

Table 2. Potential contribution of IK towards achieving the MDGs

MDG	IK example	Source
Eradicate poverty and hunger	In the *Indian* state of Uttar Pradesh, farmers used their local knowledge and expertise to increase agricultural productivity and incomes by 60 percent in about five years.	***IK Notes 45***
Achieve universal primary education	In *West Africa*, the use of local language as a medium of instruction has helped increase literacy rates among rural populations and provided gainful employment for teachers and young girls.	***IK Notes 5***
Promote gender equality and empower women	Women are playing an active role as agents of social change throughout Africa. In *Senegal*, the women of Malicounda empowered themselves to put an end to the local practice of female genital mutilation.	***IK Notes 3***
Reduce child mortality	Throughout Africa, local communities use traditional child rearing practices to supplement the diet of infants. In *Ethiopia*, traditional medicine is used to treat common infant diseases.	***IK Notes 35***
Improve maternal health	In *Uganda*, traditional birth attendants have collaborated with district health centers, using modern ICTs, to help reduce maternal mortality reportedly by over 50 percent in three years.	***IK Notes 40***
Combat HIV/AIDS, malaria and other diseases	In *Tanzania*, traditional healers have successfully treated opportunistic infections of over 4,000 AIDS patients, prolonging their lives.	***IK Notes 51***
Ensure environmental sustainability	Rural communities in *Mozambique* manage control of forest exploitation along the country's shoreline through myths and traditional rites, maintaining these resources for the next generations.	***IK Notes 46***
Build a global partnership for development	A team of IK experts from *East Africa* visits counterparts in *South Asia* to develop a partnership for *South-South* cooperation on IK-related activities.	***IK Notes 55***

The governments could take the lead in creating the appropriate policy environment for these activities to evolve. Partners could support the process by providing resources for brokering and facilitation functions as well as the dissemination of lessons of experience (e.g., in the form of tool kits and guidelines, some prototypes of which have already been prepared). Projects, intermediaries and government agencies could be supported in providing opportunities for exposing traditional practitioners to the scientific research community and other professional associations. At the same time, the private sector could be encouraged through appropriate policies to invest in the development of products emanating from indigenous practices, or develop appropriate community - private sector partnerships.[28]

3. Develop innovative protocols for the validation and protection of IK

As indicated in the earlier section of this article, existing international protocols governing intellectual property rights (IPR) are based essentially on the concept of patents. Similarly, protocols for validation of traditional medicine are essentially based on researching the effect of single substances on a specific disease or illness. This makes their application in the case of traditional medicine problematic, given the multiple ingredients in a herbal treatment. Accordingly, more appropriate approaches need to be developed to address the issues of IPR and scientific validation in the case of IK. While there has been a start in this direction, as indicated earlier, more concerted action is called for. The governments can help by designing appropriate policies and legal covenants. The partners, led by WIPO in the case of IPR issues and by WHO in the case of traditional medicine,

could contribute by promoting the use of appropriate international protocols and disseminate them through an information campaign that reaches the local practitioners and the communities, associations researchers, etc.

4. Develop a results framework for monitoring IK and measuring its impact

With an increasing of number of projects and activities incorporating IK, a body of evidence is building up that will be useful in expanding IK applications across countries. It is, therefore, important to identify effective approaches to monitoring and evaluation of results in projects that incorporate IK, and to establish a better understanding and a larger database of quantifiable results of IK-driven activities. Sector-specific sets of indicators would need to be developed that demonstrate how the incorporation of useful IK (or addressing harmful practices) in development has made a difference. This framework would also help to distill successful approaches to replication and scale up. The framework should be referenced against the MDGs, indicating how IK can contribute to achieve them. This would also help to address the issues related to validation and IPR associated with IK. Governments could ensure that national IK strategies contain appropriate arrangements for measuring results. The partners could help by developing common methodologies based on successful country practices and disseminating these to the communities of practice.

5. Establish an innovation fund to promote successful IK practices

While IK is typically passed on from generation to generation, it is not static in that each generation can adapt and improve on earlier practices. Local communities have the potential for creativity and innovation. There is evidence to suggest that, when enabled, communities and traditional practitioners are capable of developing new problem solving approaches that build on their IK systems. There is also evidence to suggest that an innovation fund to support such activities could go a long way in stimulating further creative thinking among the communities. For example, the GTZ has evaluated a series of small scale innovation projects funded by Germany and found them to be particularly useful in promoting community-based initiatives, micro-enterprise development and local innovations. Similarly, the World Bank's Development Marketplace has spurred several very creative community-based solutions, some of which have involved IK.[29] An innovation fund dedicated to IK could be modeled on the latter and provide a platform for partners to contribute resources as "venture capital" for IK-related innovation.

6. Organize a global IK conference to promote the above agenda

Despite recent progress, awareness of the role that IK can play in development is generally limited. Yet, there is a growing body of evidence to suggest that successful indigenous practices can contribute effectively to the development agenda. In this context, it would be timely to organize a global conference that would bring together policy makers, representatives of IK communities of practice and other community-based organizations, and the development partners, etc., to help generate a stronger commitment to implement the above agenda. The year 2005 would be a realistic target for such a conference and it would provide a springboard for IK's role in helping achieve the MDGs in the remaining decade before the target date in 2015. The IK Program of the World Bank is ready to collaborate with other partners, country authorities as well as community-based organizations in preparation and organization of such a conference. An international conference would underline the commitment of development partners to promote the use of IK in the development process.

Conclusion

The present publication has attempted to bring together evidence to support the important role that IK can play in the development process. It commemorates five years of the Indigenous Knowledge Program, which is among several initiatives that the World Bank has undertaken over the last few years. These initiatives have sought to bring about some fundamental changes in the way the World Bank approaches the development challenge. The IK Program and the other initiatives are hopefully making the Bank more responsive to clients' needs, more focused on empowering local communities, and determined to learn from others to enrich its own development knowledge, which is increasingly becoming the Bank's second "currency."

As His Excellency, the President of Tanzania, concluded in his introduction to this publication: only those who learn, will prevail. We have learned that IK is a critical factor for sustainable development and empowerment

of local communities. The integration of IK into the development process will help to enrich it and make it more equitable. Like any other knowledge, IK needs to be constantly used, challenged, and further adapted to the evolving contexts. Supporting local and regional networks of IK practitioners and facilitating community-to-community knowledge and learning exchanges will help to enable the communities to participate more actively in the development process as protagonists of their own development. While innovative mechanisms for the validation and protection of IK need to be developed, many indigenous practices can at the same time be adapted and scaled up within local, national, and regional development efforts. To move ahead on these fronts requires a stronger commitment from governments, partners, community-based organizations, and other interested players to work together in a partnership to harness IK for development in a process of learning from communities and helping communities to learn.

1 Prior to the launch of the IK Program, the Bank had initiated some work in the 1980s related to indigenous knowledge in the agriculture sector in an effort to improve the design of development projects (Warren, D. M. 1991).

2 For example, WIPO would concentrate on IPR issues, IFAD on agricultural topics, NGOs would provide the link to communities, etc. The initial partners that helped launch the IK Program were ECA, CISDA, IDRC, ITU, UNESCO, UNDP, and WHO in the context of PICTA (Partnership for ICT in Africa). Subsequently, the IK Program has cooperated also with others, including CIDA, CIRAN at NUFFIC (Netherlands Organization for International Cooperation in Higher Education), FAO, GM/CCD (Global Mechanism of the Convention to Combat Desertification), GTZ, IFAD, ILO, Netherlands Development Cooperation, NORAD, Swiss Development Cooperation, UNCED, UNCTAD, WIPO, and numerous NGOs, CBOs and centers of excellence, mainly in Africa and South Asia.

3 See "Indigenous Knowledge for Development: a Framework for Action," November, 1998, http://www.worldbank.org/afr/ik/ikrept.pdf. For an early discussion of the program's rationale see also IK Notes 1 and for intermediate progress, I*K Notes 21*.

4 See tabular overview at the end of this article for activities and achievements of the IK Program.

5 The IK Program does not claim that the increase in awareness is due solely to its own activities. Other actors have played an important role.

6 Web searches for "indigenous knowledge" yielded some 10,000 hits in 1998; they exceed 120,000 by late 2003.

7 For example, participants at recent conferences organized by various UN agencies (FAO, UNCTAD, WHO, WIPO, WTO) have begun to share information and experiences related to the promotion, application and protection of IK in the development process.

8 For example, the Development Gateway has a website dedicated to IK, which is one of its most frequently visited pages. See: http://www.developmentgateway.org/node/130646/

9 This denotes a substantial qualitative change for the better, compared to the mid to late 1990s when (i) social anthropologists dominated the substantive discussion of IK, with some notable exceptions like the late agriculturalist, Michael Warren; and (ii) the supportive public opinion largely shared a romantic view of IK, whereas the opposing view considered IK akin to witchcraft ("voodoo") or "old wives tales."

10 WIPO, which has created a unit to address IK issues, provides a forum for a global dialogue on intellectual property (IP) and IK, and is developing a range of tools aimed at enhancing the IP interests of the bearers of IK.

11 For example, search results for "indigenous knowledge" in Bank documents show a significant rise from 13 in 1998 to 237 in 2003.

12 Most recent annual averages show: ~120,000 visits, ~500,000 hits to access IK objects, and the equivalent of about 25,000 books of information accessed. Moreover, the *IK Notes* sub-site has a very high user intensity rate (i.e., each visitor consulting on average about 20 *IK Notes*).

13 A group of about 20 policy makers, traditional healers and project officials from Ethiopia, Kenya and Uganda and their World Bank counterparts visited Sri Lanka and India in September 2002 to learn from successful integration of IK in traditional medicine and early childhood projects. This exchange led to further South-South exchanges between South Asia and East Africa (e.g., Ethiopian women's groups adopted guidelines from SEWA (Self Employment Women's Association in India) helping them to better market their handicrafts).

14 For more detail, see the website of the Heiveld cooperative: http://www.indigo-dc.org/history.html

15 The IFAD-housed Global Mechanism (GM/CCD)and the IK Program jointly conceived the C2C initiative, which the Governments of the Netherlands and Switzerland have supported generously. A toolkit for the preparation, implementation and evaluation of community-to-community knowledge and learning exchanges has been prepared and is available on line: http://www.worldbank.org/afr/ik/commun_toolkit/starthere.htm.

16 These guidelines are available on line: http://www.worldbank.org/afr/ik/guidelines/

17 See URL: (URL http://www.sadc.int/index.php?lang=english&path=about/risdp&page=risdp4)

18 The use of the term "interdisciplinary" in this context is deliberate: it refers to the interplay of various disciplines (e.g., economics, sociology, medicine, pedagogy etc.), in contrast to "multi-sectoral", which refers to the interplay between various sector practices (e.g., in education, health, transportation, etc.).

19 A recent doctoral thesis on development at the University of Toulouse, France, elaborates on the tension between the "external" and "endogenous" notions of development. In analyzing the IK Program, the author supports the interdisciplinary nature of the IK approach to development. See Virginie Escudie, "Du 'développement' et la 'technologie' : impasses des représentations exogènes et émergence de programmes alternatifs", January 2004.

20 For "operational" purposes, the IK Program of the World Bank uses the following definition: IK is unique to *every* culture or society, is embedded in community practices, institutions, relationships and rituals, is the basis for local-level decision making; IK provides problem solving strategies for communities, using locally available resources. The IK Program distinguishes IK from "local" and "traditional" knowledge in that IK is (i) commonly not taught in the formal education system (though it can be developed through integration with that system), (ii) still in use, and (iii), being continuously developed. "Traditional knowledge", even though it may still be in use, is commonly not developed exclusively any further. Local knowledge (and expertise) would be *all* knowledge available in a specific country or location, including indigenous,

traditional and modern. See http://www.worldbank.org/afr/ik/what.htm.

21 In the early years of development cooperation, technologies were transferred directly from industrial countries in the hope that they would help developing economies to "leap-frog." The promoters of "appropriate technologies" repeated the same approach on a reduced scale, when they assumed that what had worked well, for example, in India, would also work in Tanzania. Some of these early technology transfer efforts even developed into "movements"—especially appropriate technology—confusing ends and means, something that IK proponents should avoid.

22 *IK Notes 40*.

23 Investments in this type of research are, however, limited by budget constraints and certainly dwarfed by the public and private sector budgets available to "mainstream" research. Nevertheless, as the awareness of the importance of IK increases, so hopefully will the level of resources devoted for its research. The fact, that, in Uganda, IK has recently been integrated into the national poverty reduction program through the science and technology sector, implies that IK is recognized as a legitimate focus area for scientific research.

24 See WHO Traditional Medicine Strategy 2002-2005, WHO, 2002.

25 For example, the IIRR (International Institute for Rural Reconstruction) has produced a manual: "Recording and Using Indigenous Knowledge." It provides rural development workers with information and tools needed to integrate IK and describes more than 30 methods of recording and documenting IK. See http://www.panasia.org.sg/iirr/ikmanual/.

26 Posey, D. and Dutfield G.: (1996) Beyond intellectual property: Toward traditional resource rights for indigenous peoples and local communities. IDRC, Ottawa.

27 Another consequence of the IPR dominated public debate on IK is that national and local organizations dedicated to the promotion of IK develop a guardian's approach to the issue, creating an exclusive rather than cooperative atmosphere. Some organizations for example compete for (scarce) funding or for the recognition of being an exclusive representative of the "true" IK. Hence, investments in the development of IK strategies or action plans may face substantial transaction costs needed to bring the various players together and develop cooperation among them.

28 There are good examples: in South Africa, tea-growing farmers of Suid Bokkeveld have used indigenous practices (adopted from farmers in Wupperthal in West Cape Province) to improve their post-harvest processing and set up a cooperative which has succeeded in securing export orders to Europe. In Uganda, the authorities are supporting the marketing of a toothpaste based on indigenous plants.

29 In fact, the Bank's IK Program was launched with a grant from the Innovation Marketplace, which preceded the Development Marketplace concept, then limited to proposals from Bank teams. The Development Marketplace expanded the concept to include proposals from civil society groups in participating countries. At each marketplace, which usually takes place every other year (three such events have been organized to date), the Bank provides innovation grants ($100,000 on average) to several innovation projects selected from thousands of proposals. The last marketplace held in December 2003, awarded about $6 million to 47 proposals from 27 countries.

Indigenous Knowledge Program Overview 1998–2003

Objectives	Activities	Achievements
Raising awareness of the importance of IK	Developing a database of IK practices, lessons learned, sources, partners, etc.	Database with over 260 entries http://www.worldbank.org/afr/ik/datab.htm; established contact with over 20 IK Centers worldwide; database linked to WIPO's portal on IK databases to assist patent offices with prior art searches.
	Identifying and testing instruments for capture and dissemination of IK.	Established reporting format without disclosing practice details for entry into database; tested de-briefing technology, video recording and audio interviews; Multi Media CD ROMS (knowledge packs on using IK to help achieve the MDGs).
	Publishing selected cases in print and electronic format.	60+ IK Notes published on a monthly basis http://www.worldbank.org/afr/ik/iknotes.htm
	Raising awareness of the importance of IK among development partners.	Most of the development partners now have initiatives to incorporate or build on IK in their development programs.*
Enhancing local capacity to document and exchange IK	Helping enhance local capacity to share IK, especially among the local IK centers.	Supported the formation of regional networks; assisted five centers to establish connectivity; supported village museum for traditional Maasai culture.
	Identifying appropriate methods to collect, disseminate IK among communities.	Supported Uganda National Council for Science and Technology to develop village-based documentation and dissemination centers.
	Facilitating knowledge and learning exchanges among communities.	Supported more than a dozen local, regional and cross regional IK exchanges for communities and produced toolkits for community knowledge and learning exchanges.
Applying IK in the development process.	Helping countries to prepare national strategies to help integrate IK into poverty reduction programs.	Supported Uganda to formulate a national IK strategy; assisted Kerala to incorporate IK into the State's 10th Five Year Plan; assisted Malawi, Kenya, Uganda, Tanzania, Burkina Faso, Mali and Sri Lanka with national orientation workshops on IK, leading to follow-up activities towards proposing elements for national strategies.
	Integrating indigenous practices into programs/projects supported by the World Bank and other partners.	More than two dozen projects supported by World Bank, some in cooperation with other development partners, have IK elements or dedicated components. These include projects in early childhood development, health, HIV/AIDS, agriculture, medicinal plants, and natural resource management.

* *Direct attribution of program activities and the development partners' IK engagement is not possible. However, a survey of websites of various donors reveals that, compared with 1998, the overall efforts in this area have increased substantially.*

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Sibusiso Sibisi (Indigenous Knowledge and Science and Technology: Conflict, Contradiction or Concurrence?), a South African national, is President and CEO, CSIR South Africa. Prior to this appointment, he was Deputy Vice-Chancellor, Research and Innovation at the University of Cape Town where he added "Innovation" to the portfolio to ensure an emphasis on the social and economic returns of university research. Dr. Sibisi joined Plessey Ltd., in 1997, managing and directing research and development in telecommunication technologies. He has been the Chairperson of the National Advisory Council on Innovation (NACI). Dr. Sibisi has supplemented his science and technology background (B.Sc. Physics, London; Ph.D. Applied Mathematics and Theoretical Physics, Cambridge University; Fulbright Fellow at the California Institute of Technology) with executive management and commercial venturing. He initiated the formation of knowledge-intensive start-up enterprises both at Cambridge and Cape Town.

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Achim Steiner (Indigenous Knowledge and Natural Resource Management), a Brazilian-born German national, is Director General of IUCN, The World Conservation Union. He holds a BA from the University of Oxford, a MA from the University of London and attended the German Development Institute and the Harvard Business School. Before his appointment as Director of IUCN, Mr. Steiner was Secretary General of the World Commission on Dams. As Chief Technical Advisor with GTZ and the Mekong River Commission and Senior Policy Advisor of IUCN's Global Policy Unit, he developed new partnerships between the conservation community, the World Bank and the United Nations. He has also worked in Africa and Asia. Mr. Steiner is a member of numerous national and international bodies, including the UN Secretary General's Advisory Council for the Global Compact, the Environmental Advisory Council of the EBRD, and the China Council for International Cooperation on Environment and Development.

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James D. Wolfensohn (Foreword), an Australian-born American national is The World Bank Group's ninth President, and currently serving his second term. He built an international investment banking business with a complementary involvement in development issues and the arts. He has placed sustainable poverty reduction at the center of the Bank's mission and focused the institution's work on supporting the international community's effort at reaching the Millennium Development Goals. Mr. Wolfensohn has been a supporter of the Indigenous Knowledge for Development Program, including inaugurating the program's websites in Swahili and Wolof. He has also spearheaded other Bank initiatives in recognition of the role of culture and tradition in development.

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Reinhard Woytek (Editor), a German national, manages the Indigenous Knowledge for Development Program in the Africa Region of the World Bank. Prior to this, he led the GTZ/GATE Information and Advisory Service for Appropriate Technology, assisting local NGOs to build knowledge networks on rural development. With GTZ and EU, he worked for 10 years in Tanzania in the agriculture and environment sectors. His operational experience includes community and IK-based development of land use systems. As adviser to the Principal Secretary in the Ministry of Finance, he was involved in the coffee, food security and cooperative sector reforms.

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Part Two

IK Notes

IK Notes Summaries

No	*IK Notes* title	Author(s)	Summary	Referenced in lead articles
1	Indigenous Knowledge Systems in Sub-Saharan Africa: An Overview; October 1998	Donnelly-Roark, P.	The first, introductory *IK Note* links economic and social development with participatory approaches. Capacity enhancement and institution building efforts are significant and relevant in combining indigenous and modern interventions. The key elements of the IK approach in development are: community participation for defining development process and results; development of indigenous approaches to project management; and focusing on project outcomes that reflect community demands.	2, 10
2	Sustainable Indigenous Knowledge Systems in Agriculture in Zimbabwe's Rural Areas of Matabele Land North and South Provinces ; November 1998	Larson, J.; Sibana, H.	This case study explores socio-political, environmental, economic and religious implications of IK in farming; identifies and analyses natural resource management approaches and assesses the value and limitations of IK systems. The study argues that indigenous technologies should be recognized and integrated in development efforts. A key strategy should include community capacity enhancement for documentation, exchange and dissemination of IK.	6
3	Senegalese Women Remake their Culture ; December 1998	Easton, P.	After attending adult literacy training, the women of Malicounda community address female genital mutilation. By co-opting traditional and religious leaders, they manage to abolish the practice in their own community and numerous others countrywide.	2, 3, 4
4	From "Sacrilege" to Sustainability: Reforestation and Organic Farming in Forikrom, Ghana; January 1999	Easton, P.	Young people in Ghana bring various community groups together to address deforestation and other local problems. A newly formed young people's association succeeds in afforestation, agro-forestry, organic farming, adult education and training by working with local leaders and linking with the institute of adult education, forestry department and international development agencies.	3, 6, 7
5	Burkina Faso: "Literacy for the Little Ones" in Nomgana; February 1999	Easton, P.	The Manegbzange association in Burkina Faso initiated an alternative approach to primary schooling and adult education by teaching in the written local Moore language; they developed a curriculum around agriculture and research into local cultural dimensions, involved parents in school management and 'local resource people' in classroom learning. The outcomes suggest higher student success rates compared with schools that use French as the only language of instruction.	3
6	Village Bankers: The Experience of Fandène, Senegal; March 1999	Easton, P.	The Fandène Young People's Association (AJF) in Senegal supports community efforts to address youth migration to urban areas, cyclical recurrence of food shortages, lack of access to institutional networks and lack of local participation in development initiatives. The development of a locally designed and managed savings and loans network expands rapidly to other communities in the region and promotes economic development, women's empowerment, farming and technical skills training programs.	3, 6
7	Literacy and Local Governance in a Rural Community: The Experience of Nwodua, Ghana; April 1999	Easton, P. et al.	The Nwodu Development Committee initiative in Ghana establishes new and improved forms of local governance. The association works through sector committees, one each for adult literacy, primary health care, food processing, agro-forestry, vocational instruction, agriculture training, and road construction management.	2, 3
8	Nurturing the Environment on Senegal's West Coast; May 1999	Easton, P. et al.	Drought, over-stocking, forest fires and intensive cropping have endangered the flora and fauna surrounding the natural reserve of Ker Cupaam, situated in the "Petite Côte" region of Senegal. The local women's initiative launched during 1988 is an indigenous effort to preserve the environment and expand the tourist industry. The key activities relate to a cooperative distribution network for firewood and fodder, alternate energy sources, tree nurseries and self-sufficiency in cooking fuel.	3, 4, 6
9	The Development of an Agricultural Union in Mali: Increasing Levels of Local Empowerment; June 1999	Easton, P. et al.	A cooperative union in Mali emerges from village level associations with 'traditional' institutional structure and 'modern' functions. The Union of Cotton and Food Crops Producers operates bilingually in Bambara and French, enhances local capacity and increases participation of village organizations. It coordinates food production and marketing related financial, managerial and training activities for its members.	2, 3, 6

10	Indigenous Healing of War-Affected Children in Africa; July 1999	Green, E.C.; Honwana, A.	Indigenous healers and community leaders assist war-affected children to recover from trauma through healing rituals. Successful community-based healing approaches for children in Angola and Mozambique demonstrate the need for building on indigenous healing practices when helping to reintegrate children into society and suggest partnerships between indigenous healing approaches and donor assisted, foreign psychological interventions. Because efforts to address emotional, mental and social needs of children affected by war or ethnic conflict are still in the preliminary stage, study of indigenous healing practices can help develop culturally appropriate approaches to support victims.	9
11	Education and Koranic Literacy in West Africa; August 1999	Easton, P. et al.	Koranic schooling is a long-standing parallel system of non-formal education in Africa. Koranic schooling includes 'practical literacy', 'Islamic science', multi-tiered informal learning systems, some formal school components and links with higher education institutions in Africa as well as strong links to Islamic social and economic networks across the continent.	3
12	Cultural Resources and Maternal Health in Mali; September 1999	Clemmons, L.; Coulibaly, Y.	The Africare's Child Survival Project in the District of Dioro in the Segou Region of Southern Mali conducted action-oriented research to investigate knowledge, attitudes and practices regarding maternal health, pregnancy and childbirth, highlighting the need for open dialogues within the community about maternal health, use of culturally relevant methods to educate about pregnancy and recognition of the role of appropriate media (stories, folk songs etc.).	4
13	Sahelian Languages, Indigenous Knowledge and Self-Management ; October 1999	Easton, P.	Literacy programs in Burkina Faso increasingly recognize multi-lingual, indigenous knowledge-based primary education and the role of community managed literacy networks. The use of local language-oriented literacy programs has led to higher achievement levels among students, economic initiatives by the women, local and regional language publications and increased adult literacy.	3
14	Grassroots Dissemination of Research in Africa: Collecting and Connecting; November 1999	Easton, P.	The Achieving Basic Education and Literacy Project and the Association for the Development of Education in Africa describe their experience in designing, disseminating and decentralizing development research with the aim of building local capacity. The specific project initiatives address questions such as: how often is African researchers' work shared with the audience that can actually benefit and learn from the research? What are the channels of communication and what are the necessary means required to maximize research impact and effectiveness?	2, 3, 6
15	Health: Indigenous Knowledge, Equitable Benefits ; December 1999	Moran, K.	Shaman Pharmaceuticals, Inc. has established a benefit sharing relationship with Nigerian scientific institutions, village communities and traditional healers. The company focuses on more efficient drug discovery and development processes while ensuring benefits (IPR related and commercial) to collaborating countries, cultures and communities. The case demonstrates how benefits can be derived by linking indigenous medicinal systems with modern medical institutions.	5, 6, 8
16	Senegal: Grassroots Democracy in Action; January 2000	Easton, P.	The Senegalese NGO TOSTAN provides local democracy and human rights education, involving women, men, children and elders within the local community. Training modules developed jointly by NGO and communities focus on rural women's non-formal education, income generation and health education. Because of this initiative, women have taken leadership in conflict-resolution, local communities have developed new criteria for evaluating political candidates; women closely monitor national legislation on women's rights; communities have started garden projects and fruit cooperatives.	3

17	Regional Planning, Local Visions: Participatory Futuring in West Africa; February 2000	Easton, P.	Farmers, women and other local community members participated in developing a 'System's Perspective' for regional planning, identifying long-term trends likely to affect local communities. A series of forecasting exercises conducted across a number of West African countries identified the following issues: ecological and economic changes; urban-rural linkages; need to rely on local resources and ingenuity; strengthening of family structures; translation of government documentations and manuals into local languages; development of village cooperatives, inter-village federations for political participation.	3
18	Participatory Management and Local Culture: Proverbs and Paradigms; March 2000	Easton, P.	Local proverbs that encapsulate local attitudes and insights with regard to themes like accountability, performance and social responsibility can provide useful guidance to understand local perceptions, preferences and experience with respect to these themes and in evaluating the related performance of public programs and projects.	3
19	Indigenous Knowledge and Intellectual Property Rights; April 2000	Prakash, S.	This *IK Notes* highlights some of the ongoing debates about the benefits and limitations of IPR regimes. The recommendations include integration of indigenous customary laws with intellectual property rights through sui generis systems, documentation of indigenous knowledge within the public domain, and development of institutional benefit sharing frameworks.	6, 8
20	Reinventing Apprenticeship and Rites of Passage: An Entry into the Urban Economy in Sub-Saharan Africa ; May 2000	Easton, P.	The initiation of young people into adult life and its routines and skills is common practice in most rural communities in Africa. Similar traditional support systems are absent in the life of urban street children. Three initiatives attempt to adapt traditional institutions to the needs of the urban youth: the network of "informal schools" in urban slum communities in and around Nairobi; the efforts of the Street Kids International organization that build on the knowledge and strengths of the street children in Sudan; and innovative initiatives to support informal sector artisans in Senegal.	3
21	Indigenous Knowledge for Development : Two Years Down the Road; June 2000	Prakash, S.	This *IK Notes* reviews activities, achievements and challenges of the 'Indigenous Knowledge for Development Program' after two years. The next steps identified are: intensification of ongoing efforts to mainstream IK in development; establishment of communities of practice; and strengthening local alliances to learn from each other.	10
22	IK Goes to School. Potentials and Perils of Community Education in the Western Sahel; July 2000	Easton, P.; Capacci, C.; Kane, L.	The incorporation of IK into formal education systems and linking literacy initiatives to community needs in Africa are progressing slowly. Some national governments have begun testing non-formal community approaches to education with content in local languages. Some of these initiatives encourage community participation in areas of financial, administrative and curricular planning of primary and secondary education.	3
23	Seeds of Life: Women and Agricultural Biodiversity in Africa; August 2000	Easton, P.; Ronald, M.	Bean farming women in Kenya play a critical role in preserving genetic variety and agro-biodiversity. Mono-cropping compares to traditional Kenyan agriculture practices by reducing diversity of seed stocks and food security. Recognizing and understanding women's knowledge in this area could help to reverse such trends.	3, 4, 6, 7
24	Strengthening Traditional Technical Knowledge: The Sugar Cane Wine Example; September 2000	Ngula, L.; Khonde, B. Charles, P.; Bazabana, J.-J.	Communities in the D.R. Congo transfer knowledge of the sugar cane winemaking process through selective, informal apprenticeship and knowledge sharing. Only community elders and women were allowed to participate in the final processing. The analysis suggests to strengthen IK by linking it with modern knowledge to improve efficient and timely supply of quality raw material, product development and marketing.	6

25	Mali: Indigenous Knowledge - Blending the New and the Old; October 2000	Easton, P.; Belloncle, G.	A research team in Mali evaluating an ongoing literacy program suggests involving traditional leaders and community elders in promoting literacy. The Ministry of Education supports the use of village-based literacy-training modules emphasizing technical content, needs assessment, and awareness of IK based problem-solving approaches.	3, 8
26	Traditional Medicine and AIDS ; November 2000	Bodekar, G.; Kabatesi D.; King, R.; Homsey, J.	In proposing an 'African Solution' for combating AIDS in Africa, this article outlines the need for integrating traditional medicine into broader efforts for HIV/AIDS prevention and discusses ways to improve stakeholder networking in Southern Africa.	5, 6
27	Uganda: Information Technology and Rural Development; December 2000	Prakash, S.	The multi-purpose community telecenter in Nakaseke has introduced new information and communication technologies to stimulate rural development by facilitating access to information, learning resources, computer applications training, and communication technologies, document local farming practices and improve health services.	3, 6
28	Indigenous Knowledge and Local Power: Negotiating Change in West Africa; January 2001	Easton, P.	An evaluation study of ongoing literacy initiatives in Mali suggests that literacy projects were often not successful because of the following factors: the rural participants had few opportunities to apply knowledge of written Bambara in the rural environment; local government and agricultural services did not always use local language; schools relied on French as the medium of instruction; and there was a lack of credit or investment opportunities to match the creation of locally run enterprise a viable alternative.	6
29	West Africa Languages: Medium and Message; February 2001	Easton, P.	An analysis of the structure and lexicon of the Hausa language suggests that understanding a local language can be helpful for the development process, as they reflect specific cultural experiences.	3
30	Indigenous Knowledge and HIV/AIDS: Ghana and Zambia; March 2001	Naur. M.	A comparison of Ghana and Zambia identifies the responsibility of national governments in developing local language-based training approaches for traditional healers and community specific communication and education strategies to respond to the HIV/AIDS crisis.	3, 6
31	Malicounda-Bambara: The Sequel, The Journey of a Local Revolution; March 2001	Easton, P.	After linking with elders and other community members, Bambara women successfully abolished the harmful indigenous practice of FGM in their community. Through regional networking and education initiatives, the women succeeded in other communities and even other countries as well.	3, 4
32	African Traditional Healers: The Economics of Healing; May 2001	Leonard, K. L.	Despite the expansion of modern medicine, traditional healers are still popular in Africa and receive fees compatible or in some cases higher compared with modern medicine practitioners. The 'pay-only-if-cured' and outcome contingent contract followed by the traditional healers provides credibility and appropriate incentives to attract a range of patients.	6
33	Mozambique: Repairing the Ravages of War: Initiation Societies and Community Schooling; June 2001	Easton, P. Mahade, A.; Ahmed,. Z.	The Mozambican NGO entitled, "Children, Family and Development" demonstrates that community based efforts to blend school content with the traditional initiation model, carried out under local directions for young people uprooted by armed conflict, has led to higher school enrollment and participation of community members in curriculum reform.	3
34	Tanzania: Communicating Local Farming Knowledge; July 2001	Mgumia, A.H.	The Uluguru Mountains Agricultural Development Project works with farmers to document and disseminate their knowledge to other farmers in the region. The multi-disciplinary research relies on development of appropriate education and communication material and farmer-to-farmer knowledge sharing.	6

35	Ethiopia: Traditional Medicine and the Bridge to Better Health; August 2001	Lambert, J.	Deforestation, cultivation, over-grazing, burning, erosion etc., threaten medicinal and food plants and other natural resources that have long sustained populations in Sub-Saharan Africa. The growing scarcity of medicinal plant species requires urgent recognition of their vital contribution to human and livestock health in Africa. The key recommendations are to blend modern sciences and IK and strengthen institutional capacity to preserve medicinal plant cultivation practices.	4, 5, 6
36	Eritrea: The Process of Capturing Indigenous Knowledge; September 2001	Pidatala, K.	This *IK Notes* describes systematic efforts to document and validate indigenous knowledge across regions in Eritrea, recommending individual and group training to document and analyze IK and involving local academic institutions in Eritrea.	6
37	HIV/AIDS: Traditional Healers, Community Self-assessment, and Empowerment; October 2001	Naur. M.	Traditional healers and indigenous knowledge can empower communities to deal with social consequences of HIV/AIDS, and contribute to allocating government resources to the most effective use. As an example, South African social mobilization efforts highlight the significance of community-based human rights approaches based on Paulo Freire's education principles.	6
38	Senegal: Indigenous Language and Literature as a Non-profit Business - The ARED Story; November 2001	Easton, P.; Fagerberg-Diallo, S.	The lack of local literature is a major constraint to successful literacy training. The Pullar literacy and cultural awareness movement demonstrates an increasing demand for texts in Pullar. Local language material produced, includes literacy and numeracy manuals; novels and other literature; treatises on IK and religious practices and texts for management training.	3
39	Burkina Faso: Integrating Indigenous and Scientific Rainfall Forecasting; December 2001	Roncoli, C.; Ingram, K.; Jost, C.	This IK note compares traditional and scientific rainfall forecast methods, showing that farmers rely on both, indigenous and modern forecasting approaches.	6, 8
40	Maternal Health Care in Rural Uganda: Leveraging Traditional and Modern Knowledge Systems ; January 2002	Musoke, M. G. N.	The UNFPA-supported Rural Extended Services and Care for Ultimate Emergency Relief Project improved the referral service for pregnant women by training Traditional Birth Attendants, equipping them with walkie-talkies, transport and regular blood supply. Mortality rates have dropped by 50 percent in three years.	3, 4, 10
41	Eritrea: Eliminating a Harmful Traditional Practice; February 2002	Wolff, P. H.	The practice of female genital mutilation is common in many African communities and historically, affected women have often approved of it for various reasons. The experience of the Eritrea liberation forces suggests that imposing sanctions against the practice is ineffective as this alienates the communities and drives the practice underground. Working with Traditional Birth Attendants, educating them about inherent health risks have proven to be more appropriate and effective.	6
42	Developing Indigenous Knowledge in Francophone Africa - A Four-Nation Overview; March 2002	Easton, P.; Nikiema, E.; Essama, S.	Ethnic diversity, national policies and their implementation, and the role of NGOs determine the integration of IK into development. Local institutions, (e.g., schools) should play a bigger role to engage in IK-related activities in the context of participation and decentralization efforts of governments to foster IK integration for better development results.	4
43	Rural Seed Fairs Southern Tanzania - Why Southern Zone Rural Seed Fairs?; April 2002	Mponda, O.K.K.; Kafiriti, E.M.	Rural Seed Fairs in Tanzania help build a network of researchers, extension agents, small farmers, breeders and national seed producers. The short, medium and long-term benefits are an increase in the availability of crop varieties, enhanced regional cooperation, increased agricultural productivity and food security, higher income and indigenous knowledge exchange.	2, 6

44	Uganda: The Contribution of Indigenous Vegetables to Household Food Security; May 2002	Rubaihayo, E. B.	Traditional vegetables grown mostly by women in kitchen or home gardens or collected are part of the staple diet in rural households in many African countries. Policies on household food security, however, do not emphasize their cultivation. Urban and rural consumers would benefit from understanding their impact on health, the local economy and environment.	4, 6
45	Using Indigenous Knowledge to Raise Agricultural Productivity: An example from India; June 2002	Prakash, S.	Farmers collaborated to raise agricultural productivity in the farmer driven Sodic Lands Reclamation project in Uttar Pradesh. By building on their own experiences, they reclaimed sodic land for re-cultivation. As a result, cropping intensity increased multi-fold, economic activities expanded, wage rates doubled, out-migration declined and land value increased.	4, 6, 7
46	Managing Natural Resources along the Mozambican Shoreline: The Role of Myths and Rites; July 2002	Easton, P.; Dava, F.; Ahmed, Z.	Mozambique has rich natural resources but urbanization, falling crop prices, economic decline and severe climate changes affect sustainability of natural resources. Local institutions, informal regulations, myths and rituals and a collective management system have been critical in managing natural resources. A successful case is the management of the dense mussel colonies through a combination of family supervision and community council monitoring, pointing to significant differences between indigenous and 'modern' approaches to NRM.	3, 7
47	Using the Indigenous Knowledge of Jatropha: The use of Jatropha curcas oil as raw material and fuel; August 2002	Henning, R. K.	The 'Jatropha Curcas' plant initiative promotes economic, ecological and energy development. The initiative proposes to preserve the local knowledge and practice of the multiple uses of Jatropha in erosion control and soil improvement, poverty reduction and fostering of renewable energy by promoting women as knowledge bearers.	6
48	Ethiopia: Potential of Traditional Social Insurance for Supporting Health Care; September 2002	Haile, D.	*'Eder'* is an established community-based indigenous institution that serves as a 'social financing mechanism' in Ethiopia. In many rural areas, Eder provides medical assistance to local families. These non-profit institutions build on principles of solidarity, friendship and mutual assistance, provide incentives to participate and enforce certain community norms.	6, 7
49	Farmer Experimenters: Self-developed Technology; October 2002	Bunch, R; Canas, M.	The Association of Advisors for a Sustainable, Ecological and People-Centered agriculture documents the large and significant number of farmer innovations in technology. The *IK Notes* discusses, what kind of technologies farmers experiment with; what technologies are successful; and what kind of farmer's network and market support is required.	6, 8
50	Eritrea: Collective Responsibility for War Orphans; November 2002	Wolff, P. H.	The indigenous community networks that took responsibility for orphans and destitute children were destroyed during the conflict years in Eritrea. The *IK Notes* discusses the significance of 'grassroots safety nets' for children and the nation-wide initiative of the Social Service Agency. The initiative emphasizes reunifications of war orphans with their extended families. For those children whose families cannot be located, the plan supports the creation of group homes.	9
51	Traditional Medicine in Tanga Today - The Ancient and Modern Worlds Meet; December 2002	Scheinman, D.	Traditional healers, modern physicians, and health workers have created the Tanga AIDS working group. The NGO builds on indigenous and modern medicinal knowledge to address HIV/AIDS. The local herbalists have developed affordable and effective treatments for opportunistic diseases of HIV/AIDS. TAWG is seeking international collaboration for the scientific validation of the medicinal plants.	4, 5, 6, 8

52	Ethiopia: A Qualitative Understanding of Local Traditional Knowledge and Medicinal Plant Use; January 2003	Fassil, H.	A study conducted in Ethiopia aimed to gain insight into the local distribution of knowledge related to traditional health and the uses of various medicinal plants among men and women in rural communities. IK is not only residing with the professional traditional healers but also with women who provide the first line of health care to their families. The study calls for a community-oriented, multidisciplinary research approach to this subject	6
53	The Economics of African Indigenous Knowledge; February 2003	Nwokeabia, H.	Lack of incentives for individual healers and traditions have led to lack of knowledge sharing within local communities and resultant slow innovation processes. Opportunity cost, disclosure of secrets, monopoly rent, innovation and discovery are determinants for the decision making of traditional healers when considering to share their knowledge.	2
54	Traditional Medicine Practice in Contemporary Uganda; March 2003	Weisheit, A.; Moses, M	The authors propose a higher integration of traditional medicine into the public primary health care system and support to its development. The key strategies outlined are: conservation of rare medical plants and information exchange; development of legal and institutional frameworks for the integration of traditional practices into the mainstream health practices; product standardization, processing and packaging; and training of traditional healers as community educators.	5, 6
55	Indigenous Knowledge: the East Africa-South Asia Learning Exchange - An example of South-South Cooperation; April 2003	Prakash, S.	An Asia - Africa partnership promoted by the Africa Region of The World Bank is an effort to document and disseminate local knowledge across communities and regions. Lessons learned are integrated into the projects of the participants.	6
56	Ghana: Kanye Ndu Bowi - An Indigenous Philosophical Context for Conflict Management; May 2003	Fred-Mensah, B. K.	The 'Buem' community sustains harmony within the social system despite ongoing conflicts and implements through a conflict resolution system that imposes intrinsic rewards and sanctions. The main recommendation is to synthesize relevant aspects of modern and indigenous in conflict management interventions.	9
57	Cultural Rights for Zimbabwe's Sui Generis Legislation; June 2003	Frommer, C.	The study of plant genetic resources and traditional medicinal knowledge highlights the role of indigenous knowledge and how it is accessed, preserved, used, shared and valued in both customary and non-customary ways in Africa.	6
58	Grassroots' Women's Approach to Capacity Building; July 2003	Shroff-Mehta P.	A woman farmer and livestock keeper contributes to transforming the economic activities and livelihood strategies of her village and surrounding areas in Gujarat, India. The example of her thriving local livestock enterprise management demonstrates her understanding of community context, needs and constraints and her ability to find unique and sustainable solutions; and the building of community capacity by linking local and external knowledge.	2, 4, 6
59	Adzina: An Indigenous System of Trial by Jury on the Ghana-Togo Border; August 2003	Fred-Mensah, B. K.	*Bate Kate* and *Adzina* are institutional mechanisms developed by local communities in the Buem traditional area in Ghana. They represent an indigenous system of trial-by-jury on the Ghana-Togo border with its own procedural, institutional and community dimensions of dispute settlement and conflict resolution. The presence and interventions of community elders with 'supernatural wisdom' and opinions of community members is critical in arbitration and resolution of civil and criminal disputes.	9
60	Institutional Constraints in Promoting IK: Community Access to Social Networks and Formal Institutions; September 2003	Shroff-Mehta P.	The analysis of sixteen case studies of community innovators shows how community innovators overcome family/community, seasonal and institutional constraints and outlines their primary strategy: collaboration with social networks representing NGOs, government agencies, academic institutions and other communities in the region.	2

Indigenous Knowledge Systems in Sub-Saharan Africa: An Overview

This article was written by Paula Donnelly-Roark, who was Senior Social Scientist in the World Bank's Africa Region.

IK Notes 1
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Rural people in Africa have always maintained a certain formidable power that guards their indigenous institutions and knowledge systems, thereby maintaining some level of self-reliance. This measurable power is based upon the capacity to resist what they do not have a voice in. Recent reports from donor agencies documenting the failure of projects over the past twenty years to initiate sustainable action and make a positive difference in poverty levels in Africa tend to substantiate this thesis. These decades of failed visions did not happen because donor agency staff were uncommitted, nor because African communities were uninterested. They happened because local people's voices—their involvement and control were thought to be part of the goal of development, rather than the process of development.

The power of the rural people to resist the development projects that regard them in this manner, and include them as only "beneficiaries," but not as "actors," is admittedly a power that has not expanded their resource base; and there is now, of course, an increasing fragility of this resource base in terms of environmental and economic deterioration. Despite these almost paralyzing problems, many people and groups throughout Africa strongly believe that positive new development can happen, but only if the people themselves *stay in control* of their resources, economies, and culture.

This capacity for local control only happens, however, when people are allowed to internally work from, expand, and change their own institutions and knowledge systems. Thus, the opportunities surrounding initiatives to bring together indigenous knowledge systems and natural resource conservation are immense—however, so are the dangers. The opportunity is the possibility of working from within, consequently establishing expandable natural resource initiatives which are congruent, and therefore sustainable, with existing institutions and systems. The danger is that indigenous knowledge items or outputs—identification of plans, or methods of planting, for instance—may be identified with no regard for their other components of rules and roles—which are no less important because they often seem invisible to the outsider. When this particular incorporation happens, the ownership factors that are critical to both sustainability and self-reliance begin to fade away; and local people find themselves even more bereft of their self-reliant heritage.

It is the intent of this article then to briefly define some of the dangers so that they may be avoided, and define some of the opportunities so that they may be more thoroughly and solidly developed. To accomplish this objective, some issues are briefly outlined below which seem to contain strong elements of both danger and opportunity.

Defining how far we have come

Over the past 40 years, the international development community has primarily operated on the premise that input-output development models which offer fast, efficient transfer of goods and structural entities, were the key elements in a country's economic and social development. However, failure of these programs and institutions to achieve sustainability and effectiveness, assumed to be dependable by-products of the input-output model, has finally brought into serious question the efficacy of this approach. Expanding perception of this new reality has initiated a paradigm change away from mechanistic top-down models primarily concerned with economic development, toward dynamic participatory approaches concerned with all facets of human development. The power of this paradigm shift is that it not only provides new solutions; it also provides new insights as to what are the problems.

The key to understanding how far we have come in embracing these new perceptions is to focus on how much has changed in terms of defining what the problems are. Here the "necessity for sustainability" has accomplished what "equity" and "basic human needs" concepts, despite their efforts over several decades, have been unable to do — make the case that people-oriented, participatory development is not only preferable from a social justice perspective, but is also necessary from an effectiveness standpoint. However, this emerging consensus on what are the nature of the problems, does not necessarily indicate similar agreement on how to solve these problems, and indeed there is no such agreement.

The danger here is of two kinds. First, those who have been advocating these changes for so many decades may continue to assume that there has been no success because it has not been total; not realizing that while enduring policies of the input-output era may not have yet changed, "voice" has indeed been achieved for an alternative viewpoint. The alternative danger is to assume that because there is emerging consensus on what the problems are, there will be a similar consensus on how to solve these problems. Thus, it seems the opportunity and the way forward depends upon keeping in mind two things: on the one hand because "voice" has been achieved and therefore people are listening and willing to collaborate, increased efforts need to be placed on the how-to; on the other hand, pilot "how-to" modalities cannot assume that people who now agree on what needs to change, have similar perspectives on how things need to be changed. Therefore, these pilot initiatives featuring indigenous knowledge systems and institutions will need to spell out very clearly both the conceptual frameworks and power/control implications so that differences in perceptions and approach can be recognized and mutually attended to, rather than buried in a barrage of rhetoric.

Assumptions make a difference

The critical difference in defining how to go about change is dependent upon whether one assumes tha economic and social development can be internally initiated or whether one believes that it must be externally induced. The international development community and African governments, with their long-standing preferences for input-output models have obviously ascribed to externally induced modes and models. As the notion of sustainability began to emphasize the importance of participant ownership and the resulting responsibility, participation initiatives have become increasingly popular. Here, however, donor organizations have often assumed that participation processes were to be used to induct marginalized groups of people into the presently dominant Western-type economic and cultural systems—but with more sensitivity and within their own time-frames. This essentially leaves the assumptions surrounding the necessity for externally induced change untouched and unreflected upon.

The possibility that existing indigenous African institutions—often distinguished as "customary" or "informal"—could be a base for internally initiated development has been only rarely explored. However, the recent development focus on capacity and institution building has begun to initiate re-evaluation of the efficacy of these institutions. For instance, Mamadou Dia, in a 1991 paper on "why culture matters" proposed that recognition and utilization of Africa's own institutions are essential to the continent's future progress. A subsequent regional study entitled *African Management for the 90s* (*AM90s*)" was designed to investigate the efficacy of utilizing indigenous institutions, in particular the management and organization practices. The study's results shed definitive light on how culture and indigenous institutions matter in terms of effecting more positive governance emphasizing participatory processes, creating efficient but culturally congruent productivity, and

implementing equitable growth strategies. At the same time, the results begin to point to expanding levels of disconnect at all formal institutional levels and African civil society.

The danger that is faced here is that of unwittingly compounding the existing level of disconnect. This is a strong possibility if attempts are made to utilize indigenous natural resource systems, without explicitly eschewing external change models at both the micro and macro levels. On the other hand, while opportunities abound for necessary reconnect activities and expansion of indigenous knowledge systems, for this to be successful, conceptual frameworks must change, and the actual work will be, to a great extent, complex and uncharted.

Distinguishing among participation strategies

Approaches used to achieve grassroots participation are numerous and diverse in their objectives, operational strategies, and results. Assessing levels of control, and resulting sustainability, provides participation standards that separate action from rhetoric. This categorization, in turn, provides a measurement typology that allows facilitating agencies to be honest about participation initiatives and results. This capacity is particularly crucial when groups decide to set aside externally-induced models of development and begin working from internal initiatives and institutions.

To create basic standards, participation strategies are divided into four major categories. They are then further classified according to the amount of control which rests with the actor/participants. This classification, based upon measurement of power/control transfer, explains how different participatory strategies work and what they can be expected to accomplish from the perspective of both the "actor/participant" and the "external agent." The basic strategies and control focus are as follows.

Mobilization strategy

The project of development action is chosen and designed by outsiders, usually by specialists within the initiating donor or government institutions, before people's involvement begins. The program leadership then "mobilizes" the "targeted beneficiaries" to endorse, collaborate with, and adopt the decisions taken. This strategy leaves full control in the hands of the external agent.

Community/institutions development strategy

Social surveys are carried out or meetings held to achieve a better understanding of community/institutional perceptions about a specific problem which has been identified as a constraint to development. Local groups may then be involved, using participatory techniques, in planning and carrying out solutions to a problem. Actor/participants share specified amounts of control with the external agent, but decisions as to the actual amount often rests externally.

Organizing strategy

Marginalized groups organize themselves, or are organized, to increase their strength and influence in areas of decision-making that affect them. Cooperatives, rural unions, and some community-based NGOs are examples of this strategy. Actor/participants share specified amounts of control with external agents or with elected office holders.

Empowerment strategy

Community-based groups, often assisted by an outside facilitator, initiate a learning/empowerment process that enables them to define their own goals and objectives; assess the implications of options open to them; decide and assume responsibility for actions to achieve their agreed to objectives. The empowerment strategy places control in the hands of the actor/participants, who claim both their rights and responsibilities.

For sustainable results, the critical question is: *Where does the control rest*? The strategy of "mobilization" keeps the control solely in the hands of project managers and is therefore easy to initiate and manage. But, because local control is so minimal, this approach seldom engenders a sustainable base. "Community development" and "organizing strategies" share some levels of control with participants and are therefore capable of generating adequate levels of sustainability, but only if (a) project management processes adequately match indigenous styles; and (b) the project output meets a strong community need, such as improved water supply. "Empowerment" strategies enable the participants to create and design their own initiatives as well as implement them, thereby placing maximum control and responsibility in participant hands, with consequent high levels of local sustainability. But maximum control can also increase marginalization.

Each of these participation strategies, in addition to their control quotient, has what we may call an "action intent." In selecting a strategy it is essential to clarify this basic action intent. And critical to the success of a project is an un-

derstanding of how the action intent is preserved or distorted during implementation. Mobilization strategies use only specified portions of the participatory process to *consult*; both the community and organizing strategies use it to *negotiate*; and empowerment strategies use it to *create autonomy*. Understanding the action intent of the various participation strategies, and often subtle but critical differences between them, can help us to decide where the locus of control needs to rest for the maximum sustainability, and how we can keep it there.

The danger here is that to work effectively with indigenous knowledge systems, both negotiation and empowerment strategies must be used and sustained for long periods of time, not only at the grassroots level, but also at the policy levels. Sustaining one or the other of these two modes without slipping back to consultation levels is most difficult. On the other hand, the opportunity is that the necessity of this objective will engender extensive new "how-to" knowledge that will make future efforts in this area much easier to accomplish.

Conclusion

In summary, participatory approaches necessary for effectively working with rather than against indigenous knowledge systems do not make for easy analysis or simple solutions. However, these participatory processes do capture the complexity and inter-dependency of the issues themselves. And they effectively outline the required complex problem-solving processes for sustainable solutions. More importantly, it is a first step in returning African development initiatives to internal rather than external forces.

Zimbabwe Case Study

Sustainable Indigenous Knowledge Systems in Agriculture

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This study researched Indigenous Knowledge Systems (IKS) in agriculture in Zimbabwe's rural areas, focusing on crop farming in the Tonga of Binga District in Matebeleland's North Province, and livestock in the Kalanga tribe of the Plumtree District in Matebeleland's South Province. The study aimed to uncover some of the knowledge that indigenous people used to survive under the harsh climatic and physical conditions of the region.

Specific goals in both the Binga and Plumtree Districts were: (i) to uncover the socio-political, religious, economic and environmental implications of IKS in farming; (ii) to identify and analyze the methods of natural resources management; and (iii) to assess the value and limitations of IKS in agriculture.

Methodology

Information was collected through literature review, personal interviews with farmers, site visits, group discussions, and the use of Village-Based Researchers (VBR). The VBRs prepared the community for the field study and facilitated discussions. The field study in Binga District at Kamaziyo visited about 40 homes; in Plumtree, about 100 homes were covered.

Resource utilization

In the Binga District, the men control the family resources and they must see that these resources are distributed and used well. These resources include land, water, vegetation, livestock, and family labor. Land is distributed to new families by the chief of the area who, in consultation with other elders, distributes the land for settlement and farming. The management of the land resources in the Binga district is done by the Village Development Committees set up by the government in the 1980s.

People in the Plumtree District are mainly engaged in subsistence farming and animal husbandry. While timber is abundant, the residents feel that these resources are not being used effectively to generate employment and provide a source of income. It is used primarily for firewood and the construction of houses and fences.

IKS practices

IKS exist in both areas and are still sustaining local people in crop farming—including land preparation, grain selection, planting, harvesting, as well as grain storage and livestock management. Typical of Kalanga IKS practice

was their indigenous knowledge of grasses and soils to allocate grazing pastures. Family heads converged at the chief's place every spring to discuss grazing arrangements for that season. The beginning and ending dates of grazing in specified pastures were also established. Headmen and kraalheads then monitored villager compliance with these rules.

Both the Binga and Plumtree communities placed three values on IKS. First, knowledge is power. People who have stayed in Plumtree for a number of years knew the rainfall patterns and when to plant crops to produce better yields. The second value of IKS was that of a knowledge base that determines the supply and distribution of food, as well as the division of labor. The third importance of IKS was attributable to the continuous supply of resources for sustainable life.

Conclusions

During his field research, the author discovered the value that indigenous communities place on IKS. Both the Tongas and Kalangas value IKS as a knowledge base and for determining food production and labor division between gender and age groups, and as part of community survival. He recommends that IKS should complement, rather than compete with Western kowledge systems in the implementation of projects. The lesson for development agencies should be to investigate first what indigenous people know and have, then develop and improve upon indigenous technologies.

In the Plumtree District, the people indicated that the recurrent droughts—and lack of grass in grazing lands—have made it difficult to rotate grazing as is the traditional practice. Westernization was also threatening IKS. The Binga District pointed out that indigenous farming methods have been substituted with Western methods of farming; crops they traditionally grew have been replaced by cash crops.

One of the major limiting factors of IKS is its lack of documentation. African knowledge of indigenous plants and their African names is declining rapidly. IKS is also limited by its lack of proven scientific procedural explanations. One only hears that it is taboo to do certain things. IKS is also in a precarious position because it depends on those who have the knowledge sharing it with others. It is also viewed by many young people as obsolete and out of date compared with Western cultural knowledge and practices.

The study recommends the following:

- Build strong awareness programs to appreciate IKS and its role in resources utilization management.
- Research, document, and disseminate detailed information on IKS.
- Promote and transfer IKS to areas with similar characteristics. Exchange visits between groups working on similar projects are one way of achieving this, as are workshops on important IKS issues.
- Publish literature on IKS, particularly in the local language of the targeted communities.
- Train development agency staff, especially those that work directly with the indigenous communities.
- Capacity building and empowerment of local people to recognize the value of IKS andpromote these systems through: traditional community gatherings; training in research, documentation and the dissemination of IKS; and support from the formal sector, for the indigenous communities to develop IKS themselves.

Senegalese Women Remake Their Culture

This article is based on research conducted by Senegalese researchers with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, and with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the CILSS and the Association for the Development of Education in Africa (ADEA).

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Although for decades the capital of French West Africa, Senegal, like other countries of the Sahel, remains predominantly rural. And while 62 percent of the people reside in rural areas, more than 85 percent of the wealth is in urban centers. As in many countries, disadvantage accumulates at the level of women and girls. In 1995, female literacy countrywide was just over half the rate for men (23 percent compared to 44 percent), and the discrepancy was still greater in rural areas.

TOSTAN, literally means "breaking out of the egg" in Wolof, the language spoken by the majority of Senegal's 7.9 million people and is among a number of innovative rural development and women's education initiatives that are addressing the problem at its source. It offers an 18-month learning program that combines basic education in national languages with practical development issues, and provides rural people with the resources to improve their standard of living while fostering increased confidence in their way of life. More than literacy, this breakthrough program offers participants the tools to tackle such community issues as health, hygiene and the environment. The program uses six modules that link literacy to life skills in a highly participatory process of problem solving. TOSTAN successfully sustains the link between basic education and rural development, giving adult learners not only literacy and numeracy skills in their national languages but the means to understand and solve local problems.

Several years ago, the TOSTAN NGO responded to the solicitations of village authorities in Malicounda who had seen the impact of its training programs on women in neighboring communities and helped this Bambara community of west central Senegal to create its own center. The program placed special emphasis on the identification and resolution of common problems, and one of the last training modules in the series addressed issues of women's health and sexuality. Its popularity among rural women participants broke all records. Shortly after completing their training, the newly literate women of Malicounda decided that the problem they wished to address was the custom of female circumcision—a longstanding pattern in the Bambara/Mandigue and Pulaar communities. By informing themselves on practices elsewhere and on the effects of circumcision on girls' health and sexual life, they developed an arsenal of arguments that eventually convinced

the village council to abolish the practice officially. In the months May to July 1997—the traditional period for genital cutting on young girls—no such operations were performed in Malicounda for the first time in the community's history.

TOSTAN and UNICEF supported the women by organizing a visit from twenty Senegalese journalists to interview them about their stand. The women performed a play for the visitors to illustrate the reasons why they had made this decision and the arguments they had used with other villagers. The visit brought publicity to the issue, but also attracted some threatening comments and criticism from surrounding communities of the same ethnic group. Saddened but basically undaunted, the group from Malicounda decided to organize a delegation to two neighboring villages to convince women there of the importance of a local decision to abolish genital mutilation.

In one of these—the community of Ngerin Bambara—women who had just completed the Tostan program decided to endorse the "oath of Malicounda." The President of their Women's Association, herself the daughter of a traditional circumciser, said that her own daughter had hemorrhaged seriously during the operation and that it was time to change.

Inhabitants of the second community, Ker Simbara, decided that they could not put a stop to the practice without consulting kin in a whole network of neighboring villages. So for a period of eight weeks, two men who had taken part in the TOSTAN program—one a TOSTAN facilitator and the other a 66 year-old Imam (a senior Muslim priest)—traveled from village to village to discuss the negative effects of female circumcision with local people. The men originally had feared that they would be chased out of many of the communities. Instead they discovered that the news of Malicounda opened doors and hearts, and they heard shocking stories from women, speaking out for the first time about what they had experienced.

The men returned convinced of the importance of what they had heard and what they were doing. They assisted the women of Malicounda, Ngerin and Ker Simbara in organizing a intervillage conference in Diabougou for all those interested. In February 1998, three representatives—the village chief and two women representatives—from thirteen different villages met for two days to discuss the problem and formulated the "Diabougou Declaration," an engagement on the part of 8,000 villagers to cease henceforth genital circumcision of girls.

Word of this initiative next traveled to the Casamance region of southern Senegal, where another group of villages—these all of Pulaar lineage, an ethnic group practicing genital circumcision on 88 percent of girls—banded together for a similar conference and declaration. Their conference was attended by representatives from 18 communities, by health workers and by the highly respected Imam of Medina Cherif, who assured the women that the Muslim religion does not require girls' circumcision and guarantees women's rights to health and human dignity. Many women spoke of the harm wrought by this practice. One lamented the death of her two girls following the operation; and a traditional "cutter" admitted that a girl had died in her village the year before. Other women spoke of problems at childbirth and of painful sexual relationships. The group concluded their meeting by issuing their own declaration renouncing the practice.

The initiative has continued to spread. Early in the process, President Abdou Diouf of Senegal himself proposed the "Oath of Malicounda" as a model for national adoption. On the heels of the meetings in the Casamance, women in the St. Louis region of Senegal are now preparing for an inter-village convocation of their own, to be held in February 1999.

The sort of "active learning" promoted among women by the TOSTAN program in Senegal seems to have resulted in far-reaching cultural change. Elements that contribute to TOSTAN's successful impact in education and sustainable development are further examined below.

Issues

Cultural roots. Combined with the use of national languages, a deep valuing of African culture is the foundation of TOSTAN's educational program, showing the practical and profound relationship between culture and education.

National languages. Although French is Senegal's official language, the government has increasingly encouraged the use of national languages in literacy programs, recognizing that learning is easier and more effective in the affective domain of one's own tongue and is likely to facilitate the transition to international languages. Learning in the mother tongue inspires pride, empowering women to speak up in their homes and communities; and pride of place, encouraging men to invest in their community rather than migrate to the cities. As well, it eliminates the dissonance that children educated solely in French often feel within the village household, thereby facilitating intergenerational communication and solidarity.

Problem solving is the program's backbone and provides a strong motivator for literacy acquisition. Skills taught in this five-step process include (i) identifying and analyzing the problem; (ii) studying adapted solutions based on avail-

able financial, material and human resources, as well as the time factor; (iii) planning the solution: what needs to be accomplished? when do the steps have to be completed? who is responsible? what human, material and financial resources are necessary? what are the possible obstacles? (iv) implementing the solution; and (v) evaluating the results: Did we solve the problem?

Participation. TOSTAN was developed with villagers in a highly participative ten- year process. Curricular modules were based on the stories, proverbs, songs, and cultural traditions of each place gathered by traveling from village to village, listening and recording the oral tradition. The instructional method maintains a participatory approach and learners often involve their family and the community in the process of problem- solving.

Women. With a female illiteracy rate in 1990 of 74.9 percent, women are the least educated group in Senegal. Women particularly have been benefiting from TOSTAN's whole language approach that begins with concrete, relevant experiences from their daily lives rather than abstractions. TOSTAN has become a training ground for leadership as women gain confidence, begin to identify problems such as the retrieval of water, and start to make changes in their communities. Yet men are not excluded: nearly one-third of the participants are male, and—as the story of Ker Simbara illustrates—they may take many of the initiatives critical to alleviating the burdens that women bear.

Process of developing approaches

Besides the participatory processes mentioned, learners were also involved in the development of the contents of the program through a method of testing, dialogue and feedback. This was costly at the start but ultimately proved cost-effective due to the success rate of adaptation by other NGOs. Basic education, a UNESCO brochure on TOSTAN points out, "strikes a deeper chord in peoples lives than a straightforward literacy project. Understanding how each module will contribute to changing their lives and environment is a powerful motivating factor for learners". The problem-solving process is basic to the TOSTAN approach and easily adapted to varied environments.

Problems encountered

In 1987 there were no basic education programs in national languages in Senegal, and two government ministries shared responsibility for literacy programs which often floundered. Existing programs were little connected to practical life and functioned in a non-literate environment, where skills learned and not practiced were soon lost. The TOSTAN basic education program addressed another basic problem, boredom, by relating literacy to community and personal life and developing attractive materials from local concerns. Finding qualified facilitators was not easy at the outset, and there was resistance from participants to the idea of paying the facilitators from local resources. They preferred to use that money for materials or classroom construction. TOSTAN graduates are now themselves trained to be facilitators and provide the bulk of staffing.

Conclusions

The problem-solving skills presented in the first module are used throughout the following modules, which deal successively with hygiene activities, uses of oral rehydration therapy and vaccinations, financial and material management skills, management of human resources, and feasibility studies and income-generating projects. Using these skills, women participants have started a number of small businesses. The TOSTAN methodology has also been used to reach out-of-school children with a curriculum that covers reading, writing, math, problem solving, health and hygiene, nutrition, family management, children's rights, history, geography, education for peace, leadership skills and group dynamics. Using the participatory approach, adolescents learn to produce their own texts.

The UNESCO flyer on TOSTAN draws an apt conclusion: "The availability of a comprehensive program that offers participants problem-solving tools and deals with the crucial problems of health, hygiene, and the environment is an asset for many regions of Africa faced with high illiteracy rates, especially among women. More focus needs to be put on implementing these well-studied and tested programs rather than developing new ones. TOSTAN has shown that individuals without any formal education, from villages with minimal resources, can improve their lives and environment through a solid program leading to greater autonomy and self-sufficiency."

Ghana

From“ Sacrilege ” to Sustainability—Reforestation and Organic Farming

This article was written on the basis of research conducted by Ghanaian, Canadian, and American investigators with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, and with the collaboration of the concerned communities. Funding was supplied by the Club du Sahel/OECD, the CILSS and the Association for the Development of Education in Africa (ADEA).

IK Notes 4
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Forikrom, a community of 6,000 people in the Techiman District (Brong Ahafo region) of Ghana, is located in an area of open grassland that its inhabitants claim was once thick forest. Farming, the main occupation, concentrates on maize, yam, plantain, and cassava for own-consumption and sale at the Techiman market, and for cash crops on tobacco, palm nut and, more recently, cashew. The area once produced cocoa, but this practice ended in 1983 after fires destroyed most of the cocoa plantations. Further deforestation resulted from inappropriate farming methods—especially highly mechanized cultivation practiced during the 1960s but now abandoned—which undermined soil fertility and dried up rivers and streams.

Forikrom has now turned the corner to reforestation of its environment, but the initiative did not succeed without significant cultural conflict and could not have reached the level it has without the impetus for new solutions that the conflict produced.

A religious dispute over water

The problem began with disputes about access to “Asukantia,” the stream that had always supplied the town with water, but was beginning to dry up. It was designated a sacred area by long tradition, and local taboo forbade visiting the stream on Tuesdays. The restriction was religiously observed until 1989, a particularly dry year in that region of Ghana. During the summer, a new religious sect in the community declared the practice anachronistic and advised its members to disobey the rule. This “sacrilege” immediately led to conflict between the new sect and the community's traditional authorities, who were responsible for enforcing regulations enshrined in local tradition. The authorities charged the sect with offending the gods and provoking the drying-up of the water source; the latter in turn denounced the heathen practices of the village hierarchy.

Matters had reached a flashpoint when a group of young men came forward. They wanted to restore peace; and they were also more knowledgeable than their elders about environmental relationships, like those between deforestation, drought, and declining soil fertility.

Led by the organizing secretary (OS) of the local “Mobisquad”—a young people's association formed under the National Mobilization Program in 1983 to help communities carry out local im-

provement programs and respond to natural disasters—the group proposed to the community that it try growing trees around the stream's source as one way of restoring its health. However, this idea did not find favor with the chief and elders, who continued to feel slighted by the sect and resolved to seek redress in the courts.

Still convinced that the solution lay in planting trees at the source, the group decided to try to follow up on its own idea. Fortunately, they enjoyed the advantage of some dynamic leadership. The OS's mix of schooling and practical experience gave him a critical and innovative perspective on local problems. He had been through primary, middle and vocational training and had served in positions as varied as teacher, government paymaster around Ghana, and salesman in Nigeria. In addition, he himself had evangelical "credentials" as a literature specialist for a missionary society. It soon became apparent, however, that neither he nor the other group members had enough knowledge about the specific challenges of tree farming to succeed in their effort. Their inexperience also made it difficult to win over the traditional authorities.

Gaining the knowledge to make a new start

Conscious of this handicap, the OS persuaded his colleagues to seek out the knowledge and skills that they lacked. They turned first to a senior staff member at the Institute of Adult Education's regional office at Sunyani responsible for extension work in the Brong Ahafo region. He visited the village and subsequently helped the group to make several visits to the Forestry School and the Department of Forestry at Sunyani, about 100 km from Forikrom. Each time they returned home, they discussed what they had learned with the community, especially with the chief and elders. By the end of 1989 the group had convinced the traditional authorities that litigation was not a solution to the community's difficulties. It had also secured support from the Forestry School and the Department of Forestry to start an afforestation project.

The project was formally launched in 1990, at a community forum organized by the group in collaboration with the Sunyani office of the Institute of Adult Education. At this meeting, experts from the Forestry School at Sunyani and from Department of Forestry offices at Sunyani and Kumasi, with whom the group had been working, took turns explaining the importance of afforestation. They emphasized its utility as a means to create a shelter belt around water sources, protect against the vagaries of climate, serve as wind breaks and fire belts around the community, help protect the fertility of the soil, and provide fuelwood resources.

Convinced by this presentation, the community's adults endorsed the idea of launching an afforestation project, and thereafter took part in initial lessons on nursery practices given by two forestry officers from Sunyani who served as resource persons. During a series of regular, six-hour field training visits that the officers provided over a period of six months, groups of 30 individuals were taken through the essentials of how to prepare land and raise beds, nurse seedlings, and transplant and tend young plants. A total of about 2,000 people, the bulk of Forikrom's adult population, participated in this training.

With technical support from the resource people and a modicum of outside funding from organizations like the United Nations Development Program (UNDP) and the Adventist Development and Relief Agency, the group next created a nursery to grow new trees, initially for reforestation purposes but increasingly for commercial farming as well. Cashew, palm, and teak were offered for community members to plant on their own farms. By October 1993, the project had distributed 15,000 seedlings free of charge to many groups that came from other areas to visit the farm. In the process, the OS and ten others acquired sufficient knowledge to become valued resource persons in their own right. The project progressively became a major center of forestry extension for the immediate region.

In late 1995, having successfully created a market for teak, palm, and cashew trees, species with very good sales prospects, the project decided to make production and distribution of seedlings a commercial activity; and in early 1996 it saw its first sales of palm trees. Demand for teak seemed likely to expand as farmers in the area continued to plant stands to serve as firebreaks and, looking ahead, as general demand for telegraph and electricity poles expanded. As for cashew, its cultivation has generated very considerable interest in and around Forikrom. Within the community, farmers have in recent years planted more than 100 acres, with cashew sales beginning to pick up as the trees reach maturity.

Broadening the impact: environmental protection and organic farming

The initiative that sprang from conflict over water sources has had other positive consequences as well. The Forikrom Environmental Protection Association (EPA), an off-shoot of the afforestation project, gained a measure of celebrity when the Environmental Protection Agency of Ghana used

the Forikrom branch as a base from which to extend its message of sound environmental practices to communities lying between Techiman and Nkoranza. Starting in 1994, the Forikrom branch of the EPA was invited to a series of workshops on nursery practices and tree maintenance organized by the agency in Kumasi. They then reproduced these for local clientele, and Forikrom gradually became the site for a whole series of natural resource management and forestry training events sponsored by varied donors.

A second offshoot of the conflict over water rights has been creation of the Abrono Organic Farming Project (ABOFAP). Conceived in 1992 by the OS and his colleagues, the project was designed to deal with the concerns about declining fertility that underlay the "Asukantia" conflict. Its specific objectives were to train young farmers in organic crop production, to promote the use of composite manure to improve soil quality (and discourage use of chemicals), dry-season methods of vegetable gardening, and mushroom production.

During the latter part of 1990, the OS, accompanied by an unemployed woman from Forikrom (a middle school leaver), attended a five-day training session in Kumasi organized by the Africa 2000 Program. Combining twelve hours of classroom study with eighteen hours of practical work and observation on demonstration fields, their learning covered nursery practices, agroforestry, and composite manure making. This experience was followed by participation in a number of other workshops and site visits that added to their advance knowledge of organic farming methods.

The OS concurrently started demonstration farms on his land at Forikrom in order to stimulate interest in organic farming among young people. He began with twenty trainees—ten male and ten female—all unemployed school leavers between the ages of 17 and 25. He divided them into groups of four and set each group working plots near the Asukantia stream

By 1996 ABOFAP had trained 130 young people (75 men and 55 women), for the most part unemployed middle school leavers living with their parents, in organic and dry-season vegetable gardening. The three months of training that these individuals received opened an important door to self-employment for them. During the first three-month cycle, for example, the initial cohort of twenty trainees produced a gross income of ¢200,000, or $355, from the sale of vegetables, sharing equally a net income of ¢160,000, or $308 (the exchange rate in December 1992 was ¢519=$1.00).

Except for about 10 percent of the trainees who found farming too difficult and gave up, all participants are now on their own and are doing well. The initial trainees have branched into cashew farming and are very hopeful about the future. Nearly 200 of them have organized themselves into cooperatives of 6–10 persons each to engage in block farming of 1–2 acre plots along the stream.

Interestingly, the OS has not assumed a leading position in any of the organizations that he formed and nurtured. Rather, he has encouraged others to participate in their leadership. For example, an elderly non-literate farmer is president of the 2000-member Forikrom Afforestation Project, while the OS serves as secretary and, with three others, as a member of the Executive Committee. Likewise, a 60-year-old farmer who holds a Middle School Leaving Certificate is president of the 90-member Forikrom Environmental Protection Association. And a 23 year-old secondary school graduate serves as secretary of the 20-member ABOFAP.

Making peace with the community and the environment

Major progress has been made in Forikrom in less than a decade. New sources of wealth have been developed. But the most important consequences of the Forikrom initiative have in fact been qualitative in nature. The first of these is social comity. Community divisions sown by the dispute between the sect and traditional authorities subsided after the whole community joined hands to develop a shelter belt around the Asukantia stream. The excitement generated in the community over tree growing, new cash crops, improved implements, and the recognition of their hard work by outside institutions has helped everyone to forget about the initial divisive episode that started it all.

No less important has been the emergence of an environmentally-conscious community that serves as a model for other towns in the region. During the past six years an effective shelter belt, with four acres of teak and three acres of leucenea, has developed around the Asukantia source and stream. There is now abundant water in the stream, so much so that in recent years people have felt confident enough to use it for dry season gardening as well. In addition, local authorities report that people no longer burn the bush carelessly and, as a result, there have been no bush fires since 1990.

Burkina Faso

Literacy for the "Little Ones" in Nomgana

This article was written on the basis of research conducted by Burkinabe, Congolese and American investigators with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, and with the collaboration of the concerned communities. Funding was supplied by the Club du Sahel/OECD, the CILSS and the Association for the Development of Education in Africa.

IK Notes 5
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Nomgana is the hub community of a very active inter-village federation in the district of Loumbila, located 30 kilometers east of Ouagadougou, the capital of Burkina Faso. A local association dubbed Manegbzanga ("Development for All" in the Mooré language) was created in the region over a decade ago by the joint efforts of emigrants returning from neighboring Côte d'Ivoire and a local person who had gone to work for the Swiss NGO, Organisme Suisse d'Entraide Ouvrière (OSEO). In recent years, the association has launched an experimental program using Mooré language literacy as the basis for learning French. This has evolved over the past several years and transformed itself into an alternative strategy of primary schooling.

From adult literacy to alternative schooling

The effort began, however, with adults. The Manegbzanga Association was confronted early on with the problem of equipping its members—many of whom had had limited or no schooling— to manage their own growing affairs and deal with suppliers of agricultural inputs and clients for their products in the vicinity of Ouagadougou. A person from the community who had become a civil servant and subsequently become field director for a Swiss NGO, began working with the villagers in 1988 to create an instructional system that would enable adults trained in literacy centers to advance from written Mooré to learning spoken and written French.

The program achieved a good deal of success and was soon faced with increasing demand for enrollment from young people—children and adolescents—who had missed primary schooling or had been forced to drop out. The village literacy committee decided at last to accept the challenge of creating a program of "literacy for the little ones" (*alphabétisation des tout petits*). The instructional strategy was developed with the assistance of linguists from the University of Ouagadougou. It proceeds from the acquisition of reading, writing and arithmetic skills in Mooré to learning French and study of the entire primary school curriculum. Participating children complete the equivalent of the primary school program in four years, instead of the six prescribed (and often exceeded, due to grade repetition). In addition, they acquire mastery of the written form of their own language.

"Our working hypothesis," explains the professor of linguistics at the University of Ouagadougou, who helped develop the program, "is that knowledge of an African language and use of literacy in that language significantly facilitate acquisition of the skills that schooling is design—a shortening of the time required to complete the primary program, and an improvement in pass rates on the primary school certificate exams. But the program of the Nomgana centers was also developed with an eye to several other aspects of school quality. A systematic attempt was made to include both agricultural production activities and research into local culture in the curriculum, parents were given an especially active role in school management, and local "resource people"—artisans and griots (traditional historians and story tellers) in particular—were invited to teach classes.

Catering to the leftover children

Teaching duties were assumed by previously unemployed young people of the locality who had at least partial secondary education, though no previous teaching experience. They were trained in the method by the supervisory staff from the University of Ouagadougou. Students were drawn essentially from the children of Nomgana and the neighboring village Goué who had never enrolled in the local primary school, generally because their families had chosen another sibling to attend. They were therefore well beyond the theoretical limit age for admission to primary schooling (7), averaging over 10 years of age at their entry into the program and, sociologically speaking, had been labeled "less likely to succeed." The organizers made sure that an almost exactly equal number of girls and boys were admitted to the program. Overall, 55 children took part in the first cohort, divided into two classes, with a student-teacher ratio of 28:1. All were required as preparation to complete an accelerated (6 month) literacy course in the Mooré language.

The first two years of instruction were carried on in Mooré, though the French language was taught as a subject. By the third year, students were using the same French texts as their peers in formal primary education. In addition, they ran an animal farm which realized—in the 1997–1998 school year—net profits of 233,000 CFA francs (approximately $425) and grew both peanuts and niébé (cowpeas) as part of their curriculum. There were no dropouts from the program, whereas the average rate of attrition between the first and last years of formal primary education in Burkina Faso is over 40 percent.

Surprising results

Tests administered in December 1996 both in the Mooré language school and in the neighboring primary school demonstrated that pupils at the center were ahead of those at the area's formal primary school in French and mathematics, and had in addition, of course, a good mastery of the written form of their mother tongue. Interestingly, the level of achievement of the girls in the group (who comprised a slight majority) was well above that of the boys in the formal primary school, though below that of boys in the experimental center. These results were further confirmed the following year when the first cohort from the Mooré language school sat for the primary school certificate. The success rates among the 53 students who took the exam was 53 percent (62 percent for the boys and 44 percent for the girls) compared to a national average of 42 percent for all formal primary schools in Burkina Faso (47 percent in the Oubritenga province) and a higher level of gender inequity.

While both the organizers and the community leaders are satisfied with the results of the program to date, they point out several handicaps created by their effort to conform to the formal primary school regime and ensure full equivalence with its diplomas.

The rigidity of pre-established schedules and time allocations to different subject matters required for accreditation in the formal system worked against some of the most important things that the Nomgana center was experimenting—such as the inclusion of local materials and resource people in the curriculum, and direct involvement in farm work.

- Some of the content of French-language textbooks turned out to be quite inappropriate for use once translated into Mooré.
- To match the rhythm and requirements of the official curriculum—and to complete it in the reduced time allotted—the teaching staff had to largely abandon instruction directly in Mooré after the second year, despite the fact that some of the most encouraging learning results were appearing in classes taught in the mother tongue. In fact, in many cases, those students who did least well in the French-language portion of the curriculum and the subsequent certification tests turned out to be those who had not had sufficient "grounding" in Mooré literacy before enrolling.

Local endorsement

On the other hand, stakeholders were virtually unanimous that the effort had been successful where, for the time being, it counted most: in enabling "leftover" local children to gain formal certification while strengthening their capacities in their own language and culture; and in demonstrating the viability and instructional worth of African-language approaches to learning French and to mastering primary school contents. The relatively favored circumstances of the experimental school must of course be kept in mind when comparing results from the two types of classes—particularly the adequate supply of instructional materials and the fact that none of the children attending came, as a proportion of those in rural primary schools generally do, from other communities or were forced to make a long daily commute on foot. But the difference in the two series of data, which in fact take no account of the locally focused curricula in which the alternative school excelled, at least strongly suggest that such methods can produce results at least on a par with current formal schooling.

The linguistics professor referred to earlier puts the matter succinctly: "We hope that this experiment will contribute to overcoming obstacles to the use of African languages in our education system, both as a means of shortening the duration and broadening access to primary schooling, and as a new bridge between formal and nonformal education."

"At the same time," he adds, "the experience can help us rethink ways of handling our multilingualism, one of the unavoidable realities of an African environment. Shortening the primary cycle leaves time for mastering and using a written national language in the school curriculum.... Our languages have been quite simply the victim of prejudices ingrained by the colonial experience, (for) the opposition which some insist on drawing between African languages and French is finally pointless."

Senegal

Village Bankers: The Experience of Fandène

This article is based on research conducted by Senegalese researchers with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, and with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the CILSS and the Association for the Development of Education in Africa (ADEA).

IK Notes 6
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Fandène, a Serere and Wolof village located six kilometers from Thiès, Senegal in the country's peanut-growing region, is the seat of a locally-created credit and savings institution with a remarkable career. It now covers 34 villages throughout the region, has amassed over thirty million francs CFA of capital (around $60,000) and granted more than 1500 loans to people in those communities. Yet the structure grew essentially from local responses to the problems of drought and diminishing farm fertility experienced throughout central Senegal.

Fandène itself is the product of historical interaction between Serrere and Wolof ethnic groups. The village is largely Christian and was for years the site of a Catholic mission and community center ("Maison Familiale Rurale"), but it shares the dwindling resources of the neighboring valley and seasonal river beds with Islamic and animist communities of several different ethnic groups. Recent local development initiatives stem in part from the reaction of emigrants from Fandène to the trauma of the great Sahelian drought of the early 1970s. In an effort to help their home community find solutions to the crisis and to avoid a complete depletion of the population, young people who had left for school or work took part in creating, in 1972, the "Association des Jeunes de Fandène" (AJF)—The Fandène Young People's Association.

From culture to agriculture

For the first fifteen years of its existence, the AJF concentrated on sponsoring cultural events that would interest young people in sticking with, or returning to, their home community and would provide, at the same time, a way of reasserting cultural identity. Little was done with development projects, but AJF activities did lead to several well-educated young adults taking up residence again in the village and beginning to constitute themselves as a sort of "modern" (and critical) peasantry. This group grew gradually dissatisfied with an AJF program limited to cultural events and with leadership principally exercised by outsiders.

In 1987, therefore, the Association started on a new tack. Concerned by the cyclical recurrence of food shortages in the area, members of the Association began a series of "action-research" inquiries with other population groups in the vicinity in order to better understand the nature of the problem and of possible remedies. Three findings of this locally-conducted study stood out:

- The group noted that there were already in fact a host of small initiatives afoot, undertaken by peasant groups themselves—initiatives which had great promise for diversifying the local economy and improving the natural resource base, but that had all been hampered by inadequate access to credit and resources for developing their potential.
- Lack of credit stemmed in good part from lack of collateral and of an institutional structure that would give the local people credibility and clout.
- At the same time, the AJC members studied the nature and results of recent NGO-sponsored projects in the same region, concluding that most failed because they were designed elsewhere and were not based on the existing efforts of the local population.

Resolving the bottleneck of credit

The decision was to address these problems by establishing some sort of nonformal local savings and loan institution. The beginnings were modest, to say the least: association members each contributed 250 FCFA (about $1 at the time) to a common fund and started making small loans to villagers with worthwhile projects, charging the equivalent of 15 percent interest per annum., while seeking other ways to develop their capital endowment. One of these was to expand membership to new communities in the immediate region. Not much marketing was required. The initiative met such a sorely-felt need that inhabitants of other villages soon got wind of what was going on and began themselves inquiring about taking part.

In this manner, the savings and loan network gradually spread to all 34 communities of the Fandène region and became increasingly well structured. Each branch of the institution—19 in all—was outfitted with a women's section and a men's section, and leaders of each were trained in simple accounting, credit worthiness assessment and loan management. Inhabitants of the communities involved were encouraged to make written applications for credit through their local section officials, and leadership of the institution gradually trained itself in carrying out formal feasibility assessment of proposed loans and providing would-be borrowers with technical assistance in ensuring the credit worthiness of their ventures. Eventually an assessment team was created to help local savings and loan committees learn the ropes of evaluating loan applications and of identifying and brokering responses to the technical needs of small entrepreneurs.

Supporting local economic innovation

The enlarged savings and loan association placed particular emphasis on supporting farmers and small businesses with innovative approaches to the revitalization of agriculture and the marketing of local products. The following are examples of ventures underwritten in the first five years of operations:

- Women's producer groups were assisted in developing marketing schemes for bypassing middlemen and selling bissap fruit harvested from nearby forests and baskets made from local plants directly on the Dakar market as well as to other village associations of the region. By 1995 a thousand baskets a week were being produced in this manner.
- The Association granted loans to farmers interested in reintroducing the cultivation and sale of manioc to the area and expanding planting and use of cowpeas.
- Credit was extended to women's groups for establishing a soap-manufacturing cooperative and selling its products.
- The savings and loans institutions made numerous loans for boring of wells, development of irrigated gardening and sale of the produce.

As activities developed and capital endowment grew, the size and volume of loans also increased. Over the first five years of operation, average yearly outlays fell into the following categories:

Livestock development and marketing—5,600,000 FCFA
Small commerce and industry—2,800,000 FCFA
Improved farming—500,000 FCFA
Well drilling—500,000 FCFA.

Yearly profits from loan administration likewise rose from less than 100,000 FCFA in 1991 to over 700,000 in 1994 and by 1998 the capital endowment of the intervillage savings and loan association had risen to more than 30 million FCFA, or nearly $60,000.

Weaving a new social and economic fabric

Most impressive, though, were the institution-building results of these activities and the new horizontal linkages among Senegalese communities and varied population groups that they nurtured. The thirty-four villages of the Fandène area are Christian, Islamic and animist in religious orientation and of varied ethnic composition (Serere, Wolof,

Bambara, Fulani). Yet they have worked together very successfully in the creation of new savings and loans institutions and shared governance of their activities and resources. Women and men's branches of the association have exercised equal weight throughout.

In addition, the association has developed marketing arrangements with peasant federations in other regions of Senegal whereby many of their products are sold and many of their inputs are acquired by this sort of lateral exchange. Perhaps most interestingly, the Fandène association has created technical teams to provide support to nascent groups in poor neighborhoods of the nearby city of Thiès and the national capital, Dakar that wish to begin their own savings and loan programs—reverse technical assistance from rural to urban areas!

Nwodua, Ghana

Literacy and Local Governance in a Rural Community

This article was written on the basis of research conducted by Ghanaian, Canadian and American investigators with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University. Funding was supplied by the Club du Sahel/OECD, the CILSS and the Association for the Development of Adult Education in Africa (ADEA).

IK Notes 7
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Nwodua is a small town of 640 residents located 20 km from the city of Tamale in northern Ghana, and 3 km by what was previously a dirt path from the Tamale-Kumbungu highway. Until the early 1980s, Nwodua remained largely cut off from regional commerce and had few community facilities and no schools. The route linking Nwodua to the highway is now paved, and the town has a pipe-borne water system. The community also features a tree nursery, two grinding mills that produce weaning food for infants, a primary school, an adult vocational training center, much-increased agricultural production and an innovative mode of community governance. This last accomplishment may be a, if not the, key to all the others.

In 1979, an illiterate farmer from Nwodua decided that it was time to bring instruction in the ways of modern Ghana to his community. He started by convincing a middle school leaver from a nearby village to come develop literacy in Nwodua. Instruction was given in the mother tongue, which did not satisfy most of the young people recruited. They wanted English and dropped out. But the farmer responsible for getting the program going and a close friend persisted, remunerating the teacher by working on his fields when they could offer him no salary.

Making literacy work

The first teacher soon left to attend Teacher Training School and get a better job. His two students simply recruited another in his place and managed at the same time to bring some of the dropouts back into the fold. They used this moderate success as leverage to convince the Bishopric of the Catholic Church to establish a primary school in Nwodua in 1984. Two years later, both were able to pass the national literacy test and qualify to open their own literacy centers in the vicinity.

Their success in the effort led to further responsibility and opportunity. The two were chosen as field supervisors by the new Dagbani Functional Literacy Project just then getting under way and soon had seventy-six classes going in communities throughout the region. By virtue of its role as literacy headquarters for the region, Nwodua was able to open in 1989 a full-scale Adult Primary School where more than fifty residents of the community succeeded during the following years in getting their primary leaving certificate, some continuing on to secondary education . At the same time, the literacy effort increasingly became the fulcrum for a whole series of local development activities.

First among these was the establishment of a Primary Health Care Committee, which sent a team of residents for training with the National Health Service in Tamale and thereafter sponsored campaigns to eliminate malnutrition and childhood convulsions. These efforts attracted attention from Unicef, which assisted the Committee in establishing a grinding mill to prepare weaning mixture for infants. The Committee made sure at the same time that proceeds from rental of the mill and sale of its products paid for a second unit,thus launching the community towards a self-sustaining food processing industry.

Restoring the environment

The next initiative was in the area of agro-forestry and likewise stemmed from lessons learned and topics explored in the literacy and Adult Primary Education centers. Five participants attended a UNDP-sponsored seminar in Tamale on the problems of desertification in northern Ghana and what local communities could do in the way of reforestation. On their return to Nwodua, they convinced a critical mass of their co-residents to undertake the establishment of a nursery for tree seedlings. Though all the groundwork was accomplished in 1991 and 1992, it soon became evident that the initiative would fail from water scarcity if a way were not found to bring more water to the community.

The Nwodua Young Farmers' Club enlisted the leadership of the Dagbani Literacy Program in approaching UNDP with a proposal for extending the water pipelines supplying Tamale to Nwodua itself, a distance of about 5 km. UNDP agreed to underwrite the effort and the villagers dug 5 km of trenches to prepare the way. The hookup was successful and the Nwodua Water Committee manages to pay monthly fees from the Sewerage Commission by levying fees on each household in the village using water. At the same time, water availability removed the main bottleneck to the development of the Nwodua nursery and reforestation effort. The nursery began distributing seedlings of a variety of commercial and shade trees to Nwodua residents free of charge and selling them to outsiders. In 1995, for example, more than 2000 grafted mango and 4000 cashew seedlings were placed with groups and individuals throughout the immediate region, including institutions like the Kumbungu Sub-district Assembly. The nursery now has a growing capital fund for the initiation of new projects.

This increased commerce with the exterior made it imperative to upgrade the track leading from Nwodua to the Tamale road. A Road Committee was formed in 1991 and by the following year World Bank officials had been approached and convinced to support construction of a motorable road over the 3 km link, provided that the village would furnish manual labor and board for the specialized workers and technicians sent in to work on the job. The road was successfully completed the following year and the Road Committee made responsible for its maintenance and for planning new improvements to access routes.

Starting with adults

The ease in exporting products from Nwodua meant also ease in accessing it, and the community began, in a series of ways to play a role as hub of extension activities in its immediate region. An additional one was the constitution in 1999 of an impressive vocational-technical center funded by Danish foreign aid. With its advent, the village boasted quite a cluster of educational facilities – three for adults (the literacy center, the Adult Primary School and the Vocational-Technical Center) flanking a more modest public elementary school for children.

The Nwodua Development Committees are frequently asked why their educational program thus far seems to have given more importance to adults than to children. Their response is simple: It's the best way to go in previously poor rural communities like ours. If more adults start encountering new opportunity and learning how to benefit from it, more will be eager to send their children to primary school.

Renewed governance at the core

As remarkable as these diverse efforts are, the heart of innovation at Nwodua lies at their core—in the renewed form of community governance gradually elaborated by village authorities and the young participants in the new initiatives to provide a basis for managing and extending their activities. The initial leaders of the literacy movement sought concurrence from the traditional chief of Nwodua and his council to set up a General Development Committee (GDC) with overall responsibility for ensuring orderly implementation of the projects and preservation of community interest. This group in turn has established the working committees that take care of each of the sectors of local development and report back to it. The GDC is chaired by a sixty-five year-old illiterate farmer well respected in the community, but of the other eight members only one is over forty-five and seven are graduates of literacy or adult primary school classes.

The GDC works through eight sectoral committees, one each for adult literacy, primary health care, food processing, agro-forestry, vocational instruction, agricultural training

and road construction/maintenance. In the process of developing this networked structure of oversight, two things have happened. First, the sustainability of initiatives has been virtually ensured by this monitoring and sponsorship mechanism. Second, by incremental steps, the GDC has become the operational village government in Nwodua—though not the ceremonial one —and has succeeded in creating an environment that both facilitates local entrepreneurial initiative and is supportive of improved public service delivery.

But the success of the GDC must in turn be traced back to two other factors—on the one hand, the rich stimulus for change created by the succession of adult training and non-formal education sessions held in and around the village; and, on the other, the driving force furnished by the two previously illiterate residents who started the whole process almost twenty years ago and refused to be defeated by obstacles. Individual initiative plus the continuing availability of new training and opportunities to apply it provided the fuel for successes in local development that seemed impossible twenty years ago. But the invention of new forms of local governance furnished a framework without which none of this might have come to pass.

Nurturing the Environment on Senegal's West Coast

This article is based on research conducted by Senegalese researchers with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the CILSS and the Association for the Development of Education in Africa (ADEA).

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The Natural Reserve of Kër Cupaam is situated in the "Petite Côte" region of Senegal, 45 kilometers south of Dakar along the Atlantic coast. This fragment of a former national forest covering roughly 100 hectares was set aside by government decree in the early 1980s in order to protect the wintering site of the blue grackle and the rock grackle, two endangered species, and to shelter the migratory route of birds that follow the Atlantic coast of West Africa. The cliffs that border the seashore in this region provide prized nesting and feeding grounds for many species.

Both the flora and the fauna of this area had been severely damaged over preceding years by the effects of drought, increased grazing, and firewood harvest. The coast near Popenguine nonetheless is a favorite tourist destination for people from Dakar as well as a renowned center of religious pilgrimage for Catholics. But this activity has not greatly benefited local people, and a growing population has put heavier pressure on a deteriorating resource base.

Taking up the challenge

Though constitution of the nature reserve in the early 1980s helped to stop further degradation of the environment, the vegetation of the region had already been so severely damaged that more intensive efforts were clearly required to restore its ecology and attract the sort of tourist activity that would benefit the local population. That, in any case, was the conclusion reached by a group of women from the village of Popenguine, who decided in 1988 to create the Association of Women of Popenguine for the Protection of the Environment (*Regroupement des Femmes de Popenguine pour la Protection de la Nature* or «RFPPN»). The group was composed initially of 119 women and one man, who just happened to be present at the inaugural meeting. They selected as their matron deity *Mame Cumba Cupaam*, «the guiding spirit of coastal fisherman.»

During the following eight years, the RFPPN used first its own resources and then additional ones provided by donor organizations interested in this novel form of natural resource management to restore the vegetation of the reserve and the surrounding territory. Measures implemented by the association included constitution of green firebreaks around the entire perimeter, replanting of native species furnished by a nursery that the women established at the same time, and organization of

workshops where young volunteers from neighboring rural and urban areas were brought in to learn nature conservation and perform much of the physical labor required.

Going to the root of the matter

In addition, RFPPN members rapidly put their finger on the leading threat to restoration and preservation of the environment: deforestation due to collection of firewood by the population of villages throughout the area. The women resolved on a series of measures to provide alternate sources of energy and make their communities self-sufficient in cooking fuel.

- First, they established a cooperative distribution network for wood, charcoal and gas to regulate consumption and help their members provide for household needs.
- Second, they established a village tree nursery and a community forest to begin enhancing the supply of local combustibles.
- Finally, they organized the collection of household wastes and trash for composting both in order to stem public health threats arising from inadequate disposal facilities and to produce compost for the nursery.
- In this manner, the women not only succeeded in progressively reconstituting local bio-diversity and restoring the natural vegetation of the area, but their efforts also apparently contributed materially to the reappearance of animal species not seen in those parts for years: numerous types of birds plus porcupines, mongoose, the patas monkey, jackals, civet cats, and even antelope.

Building a network

Their efforts soon reached a level where restoration of the regional environment could not be guaranteed without broader participation from surrounding villages. The program and the example of RFPPN had, in fact, awakened an increasing amount of interest among people in neighboring communities. Rather than simply expand the RFPPN, members of the Popenguine association decided to encourage women in nearby villages to start their own organizations and establish their own nurseries, work details and fuel distribution networks. Eight communities eventually affiliated with Popenguine under the guidance of a commonly-elected coordinating committee, and the overall membership grew from the 119 members initially involved to over 1500. Tens of thousands of new tree seedlings are now produced each year by this network of associations.

At the same time, the women's groups added new dimensions of activity to their program. Three complementary directions have developed, thanks in part to substantial support from the European Economic Community (EEC).

Credit and banking: To help alleviate the pervasive poverty that led to repeated degradation of the environment, the associations began creating cereal banks, credit mutuals and small irrigated vegetable farming enterprises in each village. The last provided an additional incentive to keep up the waste collection and composting effort.

Tourist and training infrastructure: Given the growing interest in the Popenguine experiment throughout Senegal and even abroad, the women decided to build a simple infrastructure for hosting delegations and visitors, followed by the development of a «Center for Training in Ecological Management.» They have now had groups of visitors from several foreign countries intrigued by this example of successful «ecodevelopment.»

Youth employment: To help stem the out-migration of school leavers and remedy the lack of opportunity for productive employment of young people throughout the region, the associations put a premium on inducting youth into the various functions and economic activities created around the new reserve. Volunteers from surrounding villages and nearby urban areas have been recruited to help with restoration of the reserve and learn principles of good ecomanagement, in many cases leading to new lasting employment. Much of the recruitment is handled by Senegalese young people's clubs affiliated with the Nicolas Hulot Foundation, a French NGO dedicated to environmental preservation.

A model to emulate

The reserve and the surrounding protected areas now cover over 50 square miles and provide more economic opportunities for all the bordering communities. This coexistence between an African national preserve and its human neighbors is at the same time emblematic of a new and hopeful style of environmental conservation. The RFFPN has offered Senegal and interested groups in other African coun-

Mali

The Development of an Agricultural Union: Increasing Levels of Local Empowerment

This article is based on data gathered by Peter Easton, Guy Belloncle, Cheibane Coulibaly, Simon Fass, Laouali Malam Moussa and five national research teams during conduct of the PADLOS-Education Study, an inquiry into "Decentralization and Local Capacity Building in West Africa" funded by the Club du Sahel/OECD and the CILSS. For copies of the full study, contact Peter Easton, Center for Policy Studies in Education, 312 STB, College of Education, Florida State University, Tallahassee, FL 32306, USA; phone (850) 644-5042; fax (850) 644-1595; e-mail: easton@coe.fsu.edu

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In the early 1990s, the members of the village associations (*associations villageoises*, or AV) in the Koutiala region of southern Mali had an issue to sort out with the Malian Textile Company *(Compagnie Malienne des Textiles*, CMDT). A rumor was circulating that the CMDT planned to increase the pay of its field staff (i.e. their share of the profit from cotton), without raising the price paid to producers. Representatives of the different regional associations had already joined forces in 1989 to demand annulment of a policy adopted by the CMDT regarding the financial responsibility of producers' associations, a case that the producers eventually won.

Encouraged by this success, they united efforts again to address the pricing problem and created the Coordination Committee for the Village Associations and Tòns of Koutiala, composed of representatives of the various local associations. Members of the coordinating committee included farmers trained in literacy courses and experienced in the movement for local takeover of markets under way in southern Mali since the 1970s, plus a few representatives of a new stratum of the population that had appeared over the preceding decade: graduates of secondary or post-secondary education who had returned to their home communities to start their own farms.

Changing the institutional landscape of rural areas

A series of meetings and local hearings led the group to draw up an official list of claims and grievances. At the same time, the political events shaking Mali triggered upheaval in the village associations, diminishing already-narrow profit margins on the sale of the crop and impelling the committee to action. In 1991, the group decided to delegate the most highly educated of its members, a graduate of a post-secondary agricultural institute who had returned to farming, to speak to members of the village associations, calm their fears and present their claims and questions to the CMDT. The initiative directed at the AVs was very successful: the association representatives gave their full support to the coordinating committee. But CMDT management, worried by the unstable political conditions, refused any negotiation with the peasant movement. As a consequence, the committee called for a strike by cotton producers, and its members canvassed the zone to rally the AVs to its cause. For two months, the associations refused to

deliver their cotton to the CMDT, until the Minister of Rural Development came to Koutiala in person to mediate the conflict. The outcome of the negotiations was that the CMDT accepted the principle of collective bargaining by a non-governmental organization representing cotton producers and agreed as well to its participation on the National Agricultural Pricing Board.

In this manner, SYCOV (*Syndicat des Producteurs du Coton et du Vivrier* or Union of Cotton and Food Crops Producers) was born, though it was not legally established for another year, due to the administrative formalities required. Its leaders immediately took care to open the doors of the new agricultural union to all of the village associations of southern Mali, and even decided, to withdraw, with his consent, the candidacy of the principal leader of the 1991 movement for presidency of the new organization in favor of a representative from one of the regions that had not previously been involved. The Union, which operates bilingually (Bambara-French), has continued to grow, notwithstanding some resistance by the CMDT and internal difficulties caused by the uncertain evolution of the AVs themselves, some questionable decisions of the leadership and rifts between local and central levels. It is now a part of the institutional and political landscape of Mali, incarnating at a national level the legally-established right of peasants to participate in all decisions that concern them. SYCOV is also organizing training courses in oral and written French for Bambara-literate representatives of the AVs and has required bilingualism in all documents it uses and all sessions in which it takes part.

Roots of change: the transfer of economic power into local hands

In fact, with all its strengths and shortcomings, the SYCOV experiment already represents a second stage in local empowerment in rural areas of southern Mali and illustrates some of the benefits possible through the actual transfer of economic authority into the hands of farmers' associations. While cotton has been cultivated and marketed in these areas for over thirty years, the situation has evolved, in the space of the last fifteen, from one where staff of large cotton firms like the CMDT and its affiliates controlled the purchase of farm output at the local level and its transport to processing centers, to a system where these functions have been almost entirely assumed by village organizations. Representatives of these local associations or their federations are now fully responsible for weighing the crop, paying producers, stocking the products, transporting them to processing centers, and reselling them to the processors, as well as for the necessary organizational and accounting tasks and the establishment of related policy. The feat was accomplished thanks in large measure to literacy and nonformal education programs implemented with the support of the cotton companies themselves (or sometimes inherited from earlier government and NGO efforts), which enabled a core of adolescents and adults having little previous schooling to acquire reading, writing and accounting skills in their own languages and to master vernacular or bilingual management systems.

It is no exaggeration to say that such efforts have saved cotton companies billions of CFA francs (approximately 500 CFA = $1 US). A sizeable portion of the proceeds has returned to the community organizations and been apportioned by them between individual rebates to farmers and collective investment funds. The latter, in turn, have stimulated a whole series of other investments such as the establishment of credit and savings unions, purchase of more sophisticated agricultural equipment, drilling of new wells, construction of community clinics and schools, etc. This phenomenon of local takeover is not unrelated to the major increase in cotton production in Sub-Saharan Africa over the course of the last decade, a development that has moved the region into fourth position on the world market and replenished national budgets severely strained by the demands of structural adjustment programs.

Cotton can scarcely be considered the ideal driving force for sustainable development, given the devastating effects it has had on soil fertility, at least under the very deficient regime of crop rotation and soil conservation applied in West Africa. Nevertheless, the cotton experience served to demonstrate, on a large scale, the ability of local-level producers to organize commercial and management operations themselves—provided appropriate training was made available at the same time. And it has given birth to a set of reinforced rural institutions that are providing "templates" for local development in a number of other domains.

A favorable context: the interaction of economic challenge and social capital

The village associations in fact arose from the confluence of two factors, one "traditional" and the other modern; and the interweaving of the two currents accounts for much of the impressive results. Southern Malian communities are generally organized into "tòn" (the Bambara-Malinké term) or equivalent structures among neighboring ethnic groups. These age-stratified initiation groups are often very

strongly knit together and internally regulated to a high degree. The "tòn" were the associations that became directly or indirectly responsible for the assumption of marketing and reinvestment responsibilities when the CMDT undertook its experiment; and their new functions prompted them to evolve in new directions, developing in the process systems of accountability and training far in advance of those that characterized the traditional initiation groups.

In a sense, the failures, successes and pioneering efforts of SYCOV represent simply a "second tier" in the campaign for local capacity development and increased empowerment of village organizations that began with the reorganization of the cotton marketing system several years ago, and driven by the mobilization of existing social structures. And at the same time they have helped fuel other initiatives.

Carrying local development to the second tier

Another telling example: to improve their management performance, the village associations of southern Mali, with the support of the CMDT and foreign aid, created in 1993 an institution charged with auditing their accounts and providing technical assistance to local leaders in financial matters. The unit was named the "Koutiala Management Center"; several additional branches have been established since that time. The center is staffed by personnel recruited from the village associations, who are responsible for providing third-party audit of AV accounts. Local staff are trained and supported in turn by external technical assistance, which is designed to play a diminishing role. Policy oversight of the Center is carried out by an Administrative Council, which is linked in turn to the Federation of Village Associations of southern Mali. Theoretically, the center is supposed to operate entirely on a budget funded by the revenues generated from sale of its services to the village associations. It is thus half-way between being a "wholly owned subsidiary" of the Federation and a private auditing firm.

In reality, the Center was created, and is still partially dependent, on external funding. But it does seem to have survived a first phase of establishment, operation and preliminary institutionalization and is in fact providing needed services and generating revenues. The Management Center thus demonstrates the ability of local associations to move up a substantial notch in the sequence of activities required to become financially independent. It also reveals an important niche and opportunity for second-tier organizations that are able to provide critical technical support to the new enterprises of civil society. The seeds sown by the actual transfer of resources and marketing responsibility to village structures has thus begun to yield multiple fruits.

Indigenous Healing of War-Affected Children in Africa

This article was written by Edward C. Green, Ph.D, and Alcinda Honwana, Ph.D. The authors would like to thank the Christian Childrens Fund, Save the Children (USA), the Children and War Project and the Displaced Children and Orphans Fund, USAID, for use of information from their programs. We would also like to thank Mike Wessells for useful comments and suggestions. *Edward C. Green can be contacted at: egreendc@aol.com. Alcinda Honwana can be contacted at honwana@beattie.uct.ac.za*

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Children in war-torn countries of Africa and elsewhere are often direct or indirect victims of violence, and/or witnesses to various horrors associated with war. Children as young as seven or eight are forcibly conscripted and indoctrinated as child soldiers or porters in several African countries. Girls as well as boys often suffer, some being forced into sexual or other service at early ages. In conflicts where terrorizing civilians has become a routine means to political and military ends, women and children are deliberately targeted for torture and death. Globally, there are at least one million children separated from their parents because of war, and there are many thousands who have been traumatized even more directly by war. Child victims of this sort often exhibit symptoms of post–traumatic stress disorder (PTSD), to use the Western psychiatric label. Symptoms of PTSD and related stress reactions common in children include: avoidance/numbing, as in cutting off of feelings and avoidance of situations that provide reminders of traumatic events; insomnia, inability to concentrate, "intrusive re-experiencing," such as nightmares and flashbacks; lethargy, confusion, fear, aggressive behavior, social isolation, and hopelessness in relation to the future, and hyper–arousal as evidenced in hyper–vigilance and exaggerated startle responses.

In recent years, UNICEF, USAID, and various private, voluntary organizations such as Save the Children and the Christian Children's Fund have developed various types of so-called psychosocial programs to assist war-affected children. Yet therapeutic techniques for war-affected children remain at a very preliminary stage of development. It is not known to what extent western psychotherapeutic techniques for PTSD—which were originally developed to treat American veterans of the Vietnam war—would be appropriate and effective for children in Africa and other less-developed areas. One of the concerns with the PTSD is the very notion of *post*-traumatic stress disorder. In these contexts, it is problematic to talk about trauma as the past (*post*), if one understands the notion of violence to be broader than direct exposure to war situations (military attacks, landmines, etc.), and to encompass spheres like poverty, hunger, displacement and the like. Another concern with the PTSD lies in its therapeutic techniques which are centered on the individual patient. Such focus ignores local beliefs in the role that an-

cestral and malevolent spiritual forces play in the causation and healing of the affliction. It also undermines family and community involvement and active participation in the healing process.

During early psychosocial programs for war-affected children in Mozambique and Angola, community leaders, traditional healers and families showed tremendous knowledge of how to heal the 'social wounds of war in war–affected children and adults. Such disorders are in fact quite treatable by traditional healers, based on indigenous understandings of how war affects the minds and behavior of individuals, and on shared beliefs of how spiritual forces intervene in such processes. During the implementation of these programs, people expressed no need for help in addressing children's' specific mental or behavioral manifestations. What they needed, they said, was help in finding missing family members and in establishing schools, pre-schools, creating jobs opportunities for the youth, and promoting a stable social environment in which to function.

There is evidence from throughout Africa that mental or psychiatric disorders are among the conditions for which modern or western medical help is least likely to be sought. African people generally turn to indigenous forms of therapy in case of mental health. Empirical studies of the relative effectiveness of different forms of western psychotherapy in fact show that virtually all psychotherapies do the patient some good and all are potentially effective when embedded within social and cultural specificities. This may suggest that as psychotherapists, indigenous African healers may be at least as effective as modern medical specialists, especially among those who share a common African culture.

Anthropological research done in Mozambique and Angola shows that war related psychological trauma is directly linked to the power and anger of the spirits of the dead. The impossibility of performing proper burials in times of war does not allow for these spirits to be placed in their proper positions in the world of the ancestors, so they are considered to be bitter and potentially harmful to their killers and passers-by. Social pollution may arise for being in contact with death and bloodshed. Individuals who have been in a war, who killed or were around killings are believed to be potential contaminators of the social body. Thus, cleansing and purification rituals are essential for their reintegration in the communities.

In 1994, during the first project in Angola specifically to help war-traumatized children, it was found that children were already being helped by indigenous psychotherapy, provided by indigenous healers in the form of ritual purification ceremonies. This was provided for both ex-combatants and children who had either participated in or witnessed bloodshed. The earlier Children and War project in Mozambique found similar treatments for children. In both countries, these therapies appeared to be effective, at least in the short-term. Traditional healing for war-affected children in Angola and Mozambique seems to consist principally of purification or cleansing rituals, attended by family members and the broader community, during which a child is purged and purified of the "contamination" of war and death, as well as of sin, guilt, and avenging spirits of those killed by a child soldier. These ceremonies are replete with ritual and symbolism whose details are distinctive to the particular ethnolinguistic group, but whose general themes are common to all groups.

In the day of his arrival his relatives took him to the ndumba (the house of the spirits). There he was presented to the ancestral spirits of the family. The boy's grandfather addressed the spirits informing them that his grandchild had returned and thanked the spirits for their protection as his grandson was able to return alive (...) A few days later a spirit medium was invited by the family to help them perform the cleansing rituals for the boy. The practitioner took the boy to the bush, and there a small hut covered with dry grass was build. The boy, dressed with the dirty clothes he brought from the RENAMO camp, entered the hut and undressed himself. Then fire was set to the hut, and an adult relative helped out the boy. The hut, the clothes and everything else that the boy brought from the camp had to be burned. A chicken was sacrificed for the spirits of the dead and the blood spread around the ritual place After that the boy had to inhale the smoke of some herbal remedies, and bath himself with water treated with medicine (Fieldnotes, Mozambique).

This healing ritual brings together a series of symbolic meanings aimed at cutting the child's link with the past (the war). While modern psychotherapeutic practices emphasize verbal exteriorization of the affliction, here through symbolic meanings the past is locked away. This is seen in the burning of the hut and the clothes and the cleansing of the body. To talk and recall the past is not necessarily seen as a prelude to healing or diminishing pain. Indeed, it is often believed to open the space for the malevolent forces to intervene. This is also apparent in the following case from Uige (Angola).

When the child or young man returns home, he is made to wait on the outskirts of the village. The oldest woman from the village throws maize flour at the boy and anoints his entire body with a chicken. He is only able to enter the village after this ritual is complete. After the ritual, he is allowed to greet his family in the village. Once the greeting is over, he

must kill a chicken, which is subsequently cooked and served to the family. For the first eight days after the homecoming, he is not allowed to sleep in his own bed, only on a rush mat on the floor. During this time, he is taken to the river and water is poured on his head and he is given manioc to eat. As he leaves the site of the ritual, he must not look behind him.

This case emphasizes the non-interaction with family and friends before ritual cleansing. The child is kept out of the village until the ritual is performed, and cannot greet people and sleep in his bed until the ritual proceedings are over. As mentioned above, although children may be asked about war experiences as part of treatment, this is not a fundamental condition for healing. The ceremony aims at symbolically cleansing the polluted child and putting the war experience behind him, to "forget" (note the symbolism of being forbidden to look back, in the example from Uige). Food taboos and other kinds of ritual restrictions are applied. In the Uige, for example, fish and fowl must be avoided by the cleansed person for 1-2 months, after which the person must be reintroduced to the food by the traditional healer who officiated at the ceremony.

The *Okupiolissa* ritual from Huila in Angola clearly shows the active participation of the community in these rituals, and stresses the idea of cleansing from 'impurities.

The community and family members are usually excited and pleased at the homecoming. Women prepare themselves for a greeting ceremony (...) Some of the flour used to paint the women's foreheads is thrown at the child and a respected older woman of the village throws a gourd filled with ashes at the child's feet. At the same time, clean water is thrown over him as a means of purification (...) the women of the village dance around the child, gesturing with hands and arms to ward away undesirable spirits or influences. (...) they each touch him with both hands from head to foot to cleanse him of impurities. The dance is known as: Ululando-w-w-w. When the ritual is complete, the child is taken to his village and the villagers celebrate his return. A party is held in his home where only traditional beverages (...) The child must be formally presented to the chiefs by his parents (...) the child sits beside the chiefs, drinking and talking to them, and this act marks his change of status in the village.

These cleansing and purification rituals involving child soldiers have the appearance of what anthropologists call rites of transition. That is, the child undergoes a symbolic change of status from someone who has existed in a realm of sanctioned norm-violation or norm-suspension (i.e., killing, war) to someone who must now live in a realm of peaceful behavioral and social norms, and conform to these. In the case presented above from Huila, the purified child acquires a new status which allows him to sit besides the chiefs and interact with them. Until the transition is complete (through ritual performance), the child is considered to be in a dangerous state, a marginal, "betwixt and between," liminal, ambiguous state. For this reason, a child cannot return to his family or hut, or sleep in his bed, or perhaps even enter his village, until the rituals have been completed.

Manifest symptoms associated with PTSD and related stress disorders reportedly disappear shortly after these ceremonies, after which the family, indigenous healers and local chiefs direct attention toward helping to establish an enduring, trusting relationship between the traumatized child and family members, and with adults of good character. These ritual interventions are also intended to re-establish spiritual harmony, notably that between the child and its ancestor spirits. The re-establishment of normal relationships and activities with other children may not be part—or a major part—of these indigenous healing rituals. But, healers, village elders, teachers and other child caregivers readily understand this when presented with the idea during project-supported training seminars, in both Angola and Mozambique. Play therapy, drawing, drama, dance and story-telling are some of the techniques introduced in these seminars.

There is no doubt that these rituals are instrumental in building family cohesion and solidarity, and in dealing with the psychosocial and emotional side of these children s problems. The fact is, however, that they return to an impoverished countryside struggling with basic survival needs, and many with no schools, hospitals, no vocational training or job opportunities which would allow them to envisage the prospects of a better future. Thus, while these rituals are important they need to be complemented by community development programs to sustain the gains achieved in the psychosocial and emotional sphere, and which cannot be dissociated from the rest.

Therefore, the approach of donor organizations, NGO and other organizations involved in humanitarian aid for war-affected children should take into account local understandings of war trauma and indigenous strategies for dealing with it. They should work towards promoting stable, secure, culturally-familiar environments in which children can gain a sense of competence and security in a more predictable world by encouraging self-reliance through reliable community development projects. their families, or with appropriate foster families if necessary.

The project of the Christian Children's Fund in Angola tries to build upon existing indigenous healing practices and strengths, and complementing these with its psychosocial

interventions such as those just described. Evaluations of this project and the earlier "Children and War" project in Mozambique have shown that such an informal partnership between indigenous healers, with their ritualistic therapies, and donor-assisted programs, with emphasis on the family and social adjustment of the child, may provide a model of how indigenous and Western-scientific approaches can be pursued together to provide maximum benefit to children in need. Furthermore, such a model of cooperation and sharing of responsibility serves to validate indigenous healing and beliefs, which tends to energize and mobilize local people who, ultimately, need to develop sustainable, culturally acceptable solutions to help themselves.

Education and Koranic Literacy in West Africa

This article is based on research conducted by local researchers with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the CILSS and the Association for the Development of education in Africa (ADEA).

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What are the .practical. and literate skills that students acquire at different levels of West African Koranic schooling? What are the various daily uses to which suchknowledge is put and the networks through which it is developed and applied? Koranic schooling in its many forms constitutes a long-standing parallel system of education throughout much of the African continent one that has operated for centuries, yet remains relatively unknown to development planners and is therefore seldom taken into explicit account in their policies and strategies.

Islam has an extended history in West Africa and Islamic educational systems have in fact operated there for much longer than have Western ones. The Islamic faith first spread across North Africa in the 7th century. By the 10th century, communities of Muslim merchants and scholars had been established in several commercial centers of the Western Sahara and the Sahel. By the 11th or 12th century, the rulers of kingdoms such as Takrur, Ancient Ghana and Gao had converted to Islam and had appointed Muslims who were literate in Arabic as advisors.

Trans-Saharan trade flourished in pre-colonial times and carried most ofthe considerable merchandise exchanged between Africa and Europe from the 11th to the 16th centuries . until, that is, the arrival of Europeanvessels on the West African coast and the institution of the trans.Atlantic slave trade and the triangular commerce among Africa, Europe and the New World that it fueled. The backbone of trans.Saharan commerce initially consisted of networks of towns established along trade routes by itinerant merchants from North Africa, gradually sedentarized and/or replaced by local groups. The proceeds of this trade furnished much of the revenue needed for state-building.

The structure of a submerged system

The system of Islamic learning across West Africa is several-tiered though less rigidly structured than its Western counterpart. In addition, it now includes a traditional track (the Koranic sequence per se), a formal school or .modern. equivalent (Franco-Arab schools, sometimes called médersa), and intermediate orihybrid forms often referred to as improved Koranic schooling. At the base of the traditional network are the maktabor Koranic schools,

the primary level of the system, where children begin, starting somewhere between the ages of 3 and 10, to learn the Koran and the basic duties of Islamic life. Next come the madris or secondary schools where those who have essentially memorized and transcribedlarge portions (at least) of the Koran progress to a study of what is referred to as Islamic science. (ilm), including the written traditions of the religion and a variable amount of other didactic material. A few select students proceed beyond this level to advanced study either with famed imamsand marabouts of the region or at Islamic universities in North Africa and other Muslim countries.

At least in its elementary forms—represented by local Koranic schools—Islamic learning is widespread throughout West Africa. An estimate of the number of such schools in Niger alone in 1990 put them at 40,000. This form of education constitutes in reality an alternate and (to official and Western ideas) largely hidden knowledge culture rivaling, and frequently intersecting or hybridizing with the official one, even though in most African countries the basic institutions of the system—the maktab—have not been considered as schools at all. Yet Koranic students, teachers and believers in general throughout the region are highly aware of the long history of the faith in West Africa and of many of its greatest scholars and teachers, some of whom exercise major political and economic power, particularly in Sahelian regions. Those involved for years in the cash crop trade in Niger, Mali and Senegal, for example, have developed well-capitalized commercial networks with ramifications in urban real estate and industry, and increasingly abroad. All this considerably strengthens the attraction of different forms of Koranic education as gateways to an alternate and sometimes thriving economic and political system. In short, there is a strong trans-national culture at work.

Variable quality, extensive coverage

Despite these tendencies toward uniformity in underlying religious culture and basic orientation, the nature and quality of instruction in Koranic schools and the Islamic system as a whole vary noticeably from one region to another. In areas of Islamic allegiance, the vast majority of children attend Koranic school. They learn principally through memorization of the sacred text. Boys predominate in the student body, but frequently in ratios of no more than 3/2 or 2/1 in the early grades. In a few regions, like Guinean Futa Jalon, enrollment rates are virtually the same by gender.

The depth of Islamic instruction in these regions is quite variable, but in general a significant proportion of male students who remain beyond the initial Koranic lessons do continue to some level of higher study. Since understanding of either modern or classical Arabic over and beyond the Koranic texts themselves is quite rare, (except among those having pursued studies in Arabic-speaking countries), the highest levels of practical literacy—that is, ability to read and write correspondence, keep records and generally communicate in writing—are most frequently found in those areas like upland Guinea, the Sine Saloum of Senegal, and the Hausa-speaking regions of Niger, where there is a developed system for transcribing African language with Arabic characters (called ajami in the Hausa and Fulani cases). In Guinea, 93 percent of a sample of 77 male Koranic .alumni. interviewed claimed reading and writing capacity in ajami. In Senegal, between 25 and 75 percent of male adults in villages contacted, and between 10 and 25 percent of women claimed the same level of learning. In all cases, the proportions were well, if not multiples, above the literacy rate in French for the same predominantly rural communities.

On the other hand, only 26 percent of the Guinean sample of former Koranic students considered themselves numerate, as compared to 93 percent who considered themselves able to write texts in ajami. A majority of marabouts and imams seem nonetheless to have acquired numerical skills in one way or another, which helps in understanding the frequency with which they are found to be handling accounting responsibilities in community affairs.

While vocational initiation is not an explicit curricular component of Koranic schooling, most students who continue beyond the most elementary level do end up working in some apprenticed position either to the marabout or to an affiliated craftsman or merchant, if only to help pay for his or her upkeep and tuition. Koranic schooling tends to include a practical element integrated into the community, though only systematized as real vocational instruction in exceptional cases; and Koranic students are imbued with the notion that they will need to fend for themselves or find appropriate sponsorship beyond a certain age. This prompts one Senegalese researcher to remark, *"L'école coranique forme des créateurs d'activités, alors que le système formel forme des demandeurs d.emploi."* (Koranic schools train employment-creators, while the formal system trains employment-seekers.)

Applications of Koranic training

The most frequent secular application of Koranic learning at the individual level is writing and correspondence, and the most prominent career destination of accomplished Koranic students is to become themselves marabouts or

imams because there is considerable demand for teachers and dispensers of religious and incantatory services, given the rapid expansion of West African Islam in recent years. Over a quarter of the Guinean respondents, however, citedthe exercise of local public functions as a practical outcome of their training, and similar trends are evident across the region.

However, collective and communal applications are no less frequent. Islamic morality, jurisprudence and authority have been used as the backbone of traditional governance for centuries throughout the Sahel. In fact, most of the vocabulary in major Sahelian languages having to do not just with religion, but with laws, local administration, diplomacy and higher learning as well is derived or directly borrowed from Arabic.

Conclusion: Alternate avenues to knowledge

The consequence of these factors is that basic Islamic instruction—of the kind dispensed in local Koranic schools—has three essential dimensions of practical application and impact in West Africa today:

- It constitutes an introduction to the technology of writingm and to a lesser extent that of numeracy, for a sizable proportion of the population, both men and women, many of whom would otherwise have little or no schooling. Those who proceed far enough to gain fluency in reading, writing, and calculating for daily practical purposes (generally in some African language, as functional knowledge ofArabic itself is even more restricted) constitute overall a minority, though a sizable one in some areas. Moreover, literacy in Arabic script has become a point of reference in many rural and small town settings thought of as largely illiterate in Western terms.
- It is a training as well for local leadership, since solid Islamic instruction is generally accepted to be an indicator of morality, honesty and discipline and therefore a primary qualification for assuming positions of responsibility. In addition, it has always been—and, given recent disaffection with formal schooling, has increasingly become—an avenue for social and economic advancement because of the close relationship between Islamic networks and traditional commercial ones throughout the region. Koranic school graduates are more likely to find employment or apprenticeship with traditional merchants and in informal sector marketing operations.

Mali

Cultural Resources and Maternal Health

This article was written by Lydia Clemmons and Yaya Coulibaly.

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In a culture where pregnancy has traditionally been a taboo subject and was rarely discussed at the household level, the Africare's Child Survival Project in the district of Dioro in the Segou Region of Southern Mali (1989–998) successfully increased communication and health-seeking behavior during pregnancy. The overall goal of the project was to reduce morbidity and mortality rates among children and women of reproductive age The project's strategy, which used *indigenous knowledge and cultural resources*, is being widely used throughout the district of Dioro, has spread to other parts of the country, and has been recognized internationally. Of special note was the *pendelu*, a traditional undergarment for women in Mali which, when colored green, took on new symbolic meaning and was used to signal pregnancy. Specific interventions included: maternal health, nutrition and growth monitoring; diarrhea disease control, immunization services, family planning services, and education about AIDS and sexually transmitted diseases.

In 1992, Africare, a US-based Private Voluntary Organization working in community development, constructed a new maternity ward in the Dioro district in the sector of Koila, 17 kilometers from Dioro. The communities of Koila had expressed the need for the maternity ward and government health professionals saw it as a key service delivery point. Prior to its construction, only three health facilities served the entire district of Dioro, a population of nearly 90,000. Nevertheless, the maternity ward's utilization rates were only 20-30 percent of what they should have been.

Let's not discuss it

To improve their understanding of the reasons for the under-utilization of the maternity ward, the Dioro project staff designed an action-oriented qualitative research project to investigate knowledge, attitudes and practices regarding maternal health (Clemmons and Coulibaly, 1994). The research sought to illuminate the overall context of pregnancy and childbirth in the project area, and to identify both resources and obstacles related to improved maternal health and care seeking.

Focus group discussions and in-depth interviews revealed somel key findings:

- Women and men were not only aware of the dangers associated with pregnancy and childbirth, they were also worried about the outcome:

- "As soon as a woman becomes pregnant, she worries about her health throughout the pregnancy and about the conditions in which she will give birth" [Female focus group participant].
- "Every time my wife is pregnant, I've been afraid of what could happen during the delivery" [Male focus group participant].

- The local culture placed a strong value on husbands playing a supportive role during their wives' pregnancy. Both women and men said that the husband of a pregnant woman should act as her principal advisor and protector.
  - Although men lacked basic information about caring for pregnant women, they demonstrated a great deal of interest in the development of the pregnancy and said that they feel responsible for a safe outcome.
- One of the most important cultural obstacles to women's maternal health care-seeking behaviors was the absence of discussion about pregnancy at the household level, particularly between husbands and wives. Both men and women participants cited shame and embarrassment as the primary reason for the lack of verbal communication on this topic:
  - A woman is generally ashamed, from the very beginning, of people around her finding out that she is pregnant.
  - A woman is embarrassed to inform her husband that she is pregnant, particularly if it is her first pregnancy.
  - During the entire pregnancy, a woman will only discuss her pregnancy with her husband as a last resort: when she has a problem that she is unable to resolve herself, whether that be material, financial or health-related.
  - A man would rather discuss [pregnancy] and other problems related to sexual relations with a friend or someone other than his wife.

Husbands and wives were not only embarrassed to discuss pregnancy between themselves, but also women with other women, including their mothers-in-law, co-wives and friends. The lack of discussion at the household level about pregnancy can thus block information sharing between family members about high-risk pregnancies and warning signs. It can also inhibit the decision-making process necessary for the allocation of family resources and the adoption of behaviors beneficial to maternal health. Although women in the Koila sector desired maternal health services, one of the reasons they could not take advantage of them was that they could not initiate discussions and solicit the consent and financial support of their husbands, who are considered the heads of the household and the principal decision-makers about family matters in Malian culture. How then could a project hope to communicate with communities and promote the adoption of behaviors that are beneficial to maternal health if pregnancy itself was a topic that evoked feelings of silent shame and embarrassment among both women and men?

Let's start discussing pregnancy: tapping into cultural resources

Health educators typically attempt to get people to change their behaviors by appealing to reason through arguments based on logic or practical issues. As evidenced by the low impact of many health IEC (Information, Education and Communication) strategies, however, this approach has not been effective. Traditional communication channels, including stories, songs, proverbs, praise-poetry and epics, provide an important alternative for health IEC strategies. These cultural resources offer the most direct path to sensitive topics and personal issues through people's values, attitudes and motivations (Hale and Stoller, 1985; Mutasa, 1994) and can successfully promote behavior change, at both individual and social levels, by appealing to people's emotions, by informing and educating them. For these reasons, and within the socio-cultural context described above, the project staff designed a maternal health campaign that utilized three traditional communication channels: (i) a traditional article of women's clothing; (ii) a *griot* and (iii) a song.

The Green *Pendelu*

The little *pagne* (*pendelu* in Bambara) is a short cloth undergarment resembling a half-slip and worn underneath the clothing. According to social dictates, only married women can wear the *pendelu*, for in addition to serving as their intimate apparel, it is also used by a couple to wipe away body fluids following sexual intercourse. Although considered erotic clothing (much as a black negligee would be perceived in the United States), the *pendelu*, traditionally made of white cotton, has a far deeper cultural significance. It is both perceived as a symbol of marital roles, duties and privileges and interpreted as a *non-verbal signal or cue* for gender-specific attitudes and behaviors between husbands and wives. When a wife wraps the *pendelu* around her waist, the emotions associated with the act of wearing this traditional attire range from simply feeling womanly and attractive to feeling confident and *in control of a situation that she is creating*. A woman will wear the *pendelu* in front of her husband in the privacy of the bedroom, discreetly yet suggestively, because she wears it to attract his attention, to arouse

his desire, and to initiate an interaction that goes beyond the realm of sex. For when a husband notices his wife wearing a *pendelu*, he is reminded not only of his role as a sexual partner, but also as his wife's advisor, protector, and provider. The sight of his wife wearing a *pendelu* makes a man feel virile, wise, strong, concerned and responsible. Women say that it is there, in the intimacy of the bedroom, with the *pendelu* wrapped provocatively around their waists or lying close at hand, that wives are most able to express their concerns and special requests, and husbands are most inclined to listen. The *pendelu*, a subtle yet powerful symbol, is consequently an effective traditional non-verbal communication channel used by married couples. It initiates both physical and emotional intimacy and signals in women and men culture-specific and gender-specific roles and responsibilities. Chiwome(1994), has demonstrated elsewhere that often, in Africa, *the deliberate use of gestures and other non-verbal communication channels are an effective substitute for words, particularly in a setting where words would be inappropriate*.

The project staff placed a special order with local tailors to produce three hundred *pendelu* to distribute during a pilot maternal health campaign. An important modification of the *pendelu* was to color-code this intimate apparel and dye the traditional white cotton fabric a brilliant green, to symbolize pregnancy and to signal the husband's cultural role as protector, advisor and supporter. As Comaroff (1985) has noted, "blue and green, hues of rain, water, freshness and growth... are linked to activating power... (and) connote fecundity... Green specifically signifies origins or points of growth."

The *Griot*

Griots are bards whose traditional role in Malian culture is a combination of oral historian, praise-singer and social mediator. Bakary Koita is a *griot* who has lived in Dioro-ville all of his life and is well known throughout the Dioro district. He is a member of one of the major *griot* families in Mali and learned his profession from his father. Accompanying himself on a traditional guitar, he is equally at ease with praise singing, storytelling, and singing new songs that he composes himself.

The decision to enlist Bakary Koita's services for the maternal health campaign was arrived at through a good understanding of the *griot*'s role in Malian society. *Griots* have been recognized as social psychologists, mediators/conciliators, historians, artists, diplomats, possessors of supernatural, powerful forces, preservers of culture, and educators as well as entertainers. Throughout history, *griots* have consistently demonstrated their effectiveness as social catalysts, using the power of words to dramatically influence people's behavior through their emotions (Conrad and Frank; Hale and Stoller; Finnegan; Johnson; Okpewho; Peek; Sienaert and Cowper-Lewis).

Knowing the names, family history, personalities and even the mundane affairs of nearly everyone in the community, *griots* enjoy the socially-sanctioned privilege of being able to say directly to anyone what no one else in the community would dare to say, regardless of an individual's age, gender, ethnicity or social standing. *Griots* use personal charisma and the power of words to mediate social relations-between members of the same family, between neighbors, and even between communities. In Mali, only a *griot* could effectively promote discussion of the sensitive topics of pregnancy and the *pendelu* in both the public and private spheres without being considered obscene or inappropriate by rural communities.

The song

Over a period of two weeks, Mr. Koita worked with the project staff to compose a song that educated people about maternal health care and also promoted the intended use of the green *pendelu*, following a technical outline developed by the project staff, which contained key maternal health care messages. The technical outline also called for the promotion of the green *pendelu* as a symbol of pregnancy and couple communication and identified husbands, wives and wives' mothers-in-law as target audiences for the song. To counteract the shame, fear and helplessness described by both men and women in the focus group discussions, the project staff also requested Mr. Koita to associate the appearance of the green *pendelu* with feelings of happiness, pride, responsibility and confidence. The primary objectives of the song were to(i) inform married men, married women, and women's mothers-in-law about high-risk pregnancies, warning signs during pregnancy, and risk-reduction behaviors; (ii) increase communication about pregnancy and maternal health care at the household level, particularly between husbands and wives; and (iii) increase pregnant women's utilization of the maternal health care services and facilities offered by qualified providers.

The Maternal Health IEC Campaign

Africare conducted a pilot maternal health IEC campaign in seven villages in the Koila sector of the Dioro district to test

the effectiveness of the traditional media. A total of 600 adults (three hundred men and three hundred women) participated in the campaign. The campaign format consisted of men's and women's assemblies during which maternal health information was communicated by staff, and facilitated by "modern" media, such as videos, flipcharts and badges, as well as by the three identified cultural resources.

During the women's assemblies, the project staff distributed a total of three hundred green *pendelu* to all married women of reproductive age in each of the seven villages.

Impact

The project staff conducted an evaluation three months after the campaign to measure the impact of the green pendelu and other communication channels used during the -behavior change communication campaign, including the song written by the griot, the video, and a badge promoting the project community-based activities. The project's final evaluation Knowledge-Practice-Coverage Survey further measured the impact of the IEC campaign.

The impact evaluation consisted of a survey of 320 people, including 205 individuals who had participated directly in the various activities of the campaign and 115 who had not participated. The sample included 130 married women of reproductive age (referred to as wives), 127 married men (referred to as husbands) and 63 older women with married sons (referred to as mothers-in law). The average age of respondents was 36.5 years.

According to the survey results, the campaign dramatically increased the level of communication between husbands and wives concerning maternal health; overall, 65.5 percent of all survey participants said they discussed pregnancy and maternal health issues after the campaign. Prior to the campaign, approximately 3 percent of the population had discussed maternal health with their spouses.

Among all of the means of communication used during the campaign, the green *pendelu* was the element that the participants found the most interesting (83.9 percent). A total of 94.4 percent of survey respondents had heard of it.

Remarkably, 85 percent of those interviewed who had *not participated* in the campaign had heard of the green *pendelu*, indicating a rapid and effective spread of this innovative concept. Indeed, the impact evaluation indicates that although only 600 people (10 percent of the population over the age of 15 years) had participated in the IEC campaign, nearly 5000 people (89 percent of the population) had seen or heard about the green *pendelu* three months later.

Nearly all of those interviewed knew that the green *pendelu* represented pregnancy: 89.9 percent of husbands, 79 percent of wives and 76.9 percent of mothers-in-law.

The IEC campaign led to more positive attitudes and behaviors related to pregnancy at the household level, including husbands supporting their wives by reducing their workloads, improving their nutrition, and urging them to seek medical attention and maternal health services.

The evaluation survey results indicates that the innovative use of traditional communication channels was not only effective in promoting non-verbal *and verbal* communication between husbands, wives and mothers-in-law, but also facilitated social change. Pregnancy is no longer a taboo topic in the Koila sector, and indeed, discussion about pregnancy and maternal health care is now a common occurrence at both the household and community levels. In the year during and after the awareness-raising campaign, the project surpassed its objective of assuring that 60 percent of births were assisted by a trained birth attendant or health care professional, up from less than 20 percent at the beginning of the project. Approximately 77 percent of births were assisted and more than half of pregnant women sought prenatal consultations.

Conclusion

The green *pendelu* was an ideal innovation within an indigenous knowledge system because its cultural meaning and use were already well understood in the project area. All that was necessary to explain was the meaning of the color green (pregnancy) and to associate it with specific actions beneficial to maternal health. Although the meaning of the green *pendelu* was new, the setting (bedroom), circumstances (physical and emotional intimacy), users (wives) and intended audience (husbands) remained the same as those for the traditional *pendelu*. Women in the Koila sector easily adapted to wearing the green *pendelu* during pregnancy because they used a familiar "body technique."

In addition, the role of the griot was crucial: *...it is precisely because the bard... conveys a tradition which goes back many centuries that he may be able to contribute in a rather unique way to the kinds of social changes most needed for the survival of many African peoples today.* (Hale and Stoller, 1985)

Of the various media and methods used to inform, educate and communicate about pregnancy and maternal health, the DCSP impact evaluation survey showed that the three traditional media were by far the most remembered

by the communities. Nearly all respondents remembered the green *pendelu*, the *griot*, and the song. Hence, although *pendelu*, *griots* and songs are traditional channels of communication in Mali, their utilization can be effectively innovated to adapt them to modern needs. Mutasa (1994) draws similar conclusions in his discussion of the modern use of old proverbs in South Africa:

> *Changing times and situations require solutions which the traditional forms can no longer supply. However, it is often sufficient to adapt an antiquated item to a modern context or constructions. This process of innovation becomes a living proof of continuity of the traditional forms.*

Many development projects tend to ignore or undervalue cultural resources, turning instead to new technology and "modern" resources. Africare's maternal health IEC campaign in Dioro, Mali, illustrates the potential that indigenous knowledge and other cultural resources have for contributing to the health and welfare of rural communities in Africa.

Sahelian Languages, Indigenous Knowledge and Self-Management

This article is based on research conducted by local researchers with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, with the collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the Interstate Committee for Combating Drought in the Sahel/Comite Inter-etat de Lutte Contre la Secheresse (CILSS) and the Association for the Development of Education in Africa (ADEA).

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Africa is a continent of many languages —over 2,000, in fact, by recent count— though many are related and a number are inter-comprehensible to a greater or lesser degree. It is also a continent of multilinguism, where a relatively high proportion of the population speaks or understands more than one language. In addition, the distribution of languages is far from uniform. West Africa is a case in point. Coastal areas are for the most part characterized by a large number of native languages, many not widely distributed. Interior regions, and the Sahel in particular, on the other hand, are characterized by a smaller number of languages of broad diffusion.

The reasons are both topographical and political. Dense forests, numerous rivers and the ever-present tsetse fly made lateral communications and horse-born transport very difficult in coastal regions and gave rise to a multitude of ethnic groups and small language communities. However, in the inland areas of savanna and desert-edge plains, travel was easier over long distances. Empires arose to regulate and tax the flourishing trans-Sahara trade and at the same time spread vehicular African languages like Bambara, Wolof and Mooré over wide spaces. It is therefore said that one can go from Dakar to Lake Chad overland using only three African languages—Wolof, Bambara and Hausa—whereas a trip of equal distance down the coast to Nigeria would require more than 300.

In the Gulmu region of Burkina Faso, located in little-developed areas of the extreme east bordering Benin, Tin Tua, a local NGO established in 1985 by community members to resuscitate a generally unsuccessful state-supported literacy campaign, has created a network of literacy centers devoted to instruction in the Gulmancéma language, a minority language in Burkina Faso, but one spoken nonetheless by over 500,000 people. The centers cover 31 villages of the region, all of which (with the exception of the district capital) lacked primary schools at the inception of the program. It now serves about 15,000 adolescent and adult learners annually, of whom 41 percent are women. Tin Tua has also launched a monthly Gulmancéma newspaper, "Labaali," which has 3,000 subscribers and employs journalists equipped with motor bikes and tape recorders in all of the villages covered.

On the strength of the results of these literacy programs, the association began, several years ago, creating com-

munity primary schools where the initial grades of instruction are given in Gulmancéma and French is gradually introduced. Two years ago, the first cohort of students trained in these community schools reached the watershed of the primary education completion exams, which must be taken in French and govern admission to secondary schooling. The children who had started education in their mother tongue performed, on average, significantly better than the graduates of standard primary schools. The curriculum designer from Tin Tua tries to explain their success: "When you consider the environment in which all this is happening and the fact that there is only one instructor per school who speaks French, what is surprising is the speed of learning. Is it because the mother tongue serves as a springboard for performance in French, or is it the motivation of these students, the active instructional method used or the devotion of the instructor?"

African languages as an accounting tool

Now move west several hundred kilometers into southern Mali, a cotton-growing region where rates of schooling are still little over 20 percent.. In the last two decades, a string of village associations centered around Koutiala and Bougouni has progressively taken over full responsibility for the marketing of agricultural crops, the management of farm credit, and the reinvestment of proceeds from these operations. And they have done it in large part by mastering accounting and administrative systems developed directly in the Bambara language. The story is much the same further north in the inland Niger delta, where rice is the commercial crop. In the village of Niono Coloni, local leaders organize examinations to ensure that candidates to the democratically-elected positions of responsibility in the farm cooperative all have the requisite basic level in written Bambara, though the accounting forms used are in fact bilingual and include French labeling as well. Koranic students and primary school dropouts interested in applying for the positions generally enroll in the local adult literacy center to develop proficiency in the phonetic transcription of Bambara.

These are not isolated examples. Throughout much of Sahelian West Africa (countries bordering the southern edge of the Sahara Desert), the written form of African language is being used to an increasing extent as a vehicle of local, if not nation-wide, communication and a means of expressing indigenous culture.

The change is most pronounced in the Francophone countries , where relatively little recognition was given to African languages, considered "dialects" and potentially disruptive of national unity and international communication.

Slow but sure change

Several factors have contributed to this change, including the advent of more representative governments and ones more tolerant of civil society, the spread of African languages brought about by internal migration and interethnic contact, and a gradual shift towards recognizing the value of indigenous knowledge and of African culture. At the same time, experience and research have increasingly demonstrated that children starting school instruction in their mother tongue or a language already well known to them stand a better chance of success ¾ including success at mastering a second language of written communication like French or English ¾ than those who are forced to assimilate a totally foreign language from the outset. Adults, too, seem to acquire second language facility most easily through a written knowledge of their own language.

Change has been slow in coming, particularly at the central level, where more has been said than done. The introduction of African languages into primary school education, for example, has remained for years at the "experimental" level in countries like Mali, Niger, Burkina Faso and Senegal and there has been little commerce between agencies of non-formal education, which used national languages, and those of formal education, which did not.

Over the 1990s, however, momentum has been building at the local level. It has been fueled in large part by the development of new income-generating enterprises—the cooperatives, businesses, non-governmental associations and local community governments that have taken root in an era of demographic pressure and relative economic liberalization. To manage these enterprises themselves, local people need at least a core of literate staff ; to ensure some degree of democratic accountability in the effort, they need a means to ensure larger numbers of members at least a modicum of literacy and numeracy. African languages—most of which are now written in Romanized or Arabic script—provide a much more accessible means of attaining this goal than instruction in English, French, Arabic or Portuguese.

Literacy gains in Burkina Faso

Examples are numerous in Burkina Faso, a country whose name itself is an amalgam of two prominent African languages. "Burkina" is Mooré for "honest person" and "Faso" is Jula and Fulfulde for "nation"—a nation of honest

people. In Bouloulou, a small village in the northern tier of the country not far from Ouahigouya, women are flocking to a literacy center opened for them at the demand of their own economic development association. In the capital itself, Ouagadougou, a group of newly literate women of the Goughin district have banded together to create "Song Taaba," a cooperative devoted to the manufacture and sale of soap and peanut butter. After an initial failed attempt at entrusting management responsibility in the few members with the rudiments of primary schooling, they ended up developing accounting and management systems in the Mooré language and have since created a nationwide network of local women's businesses.

In fact, across the country, the numbers completing literacy courses have begun to rival those completing primary schooling, a form of education still restricted by lack of French-language trained teachers and outside funding. By 1996, there were, in round figures, 4,000 literacy centers compared to 3,000 primary schools. In that same year, 46,000 out of 72,000 literacy students tested were declared "literate" in one of the national languages of the country, whereas only 11,000 of the 86,000 entrants in sixth grade moved on to middle school. Interestingly, 52 percent of the successful literacy students were women, whereas only 40 percent of the sixth grade enrollees, and only 8.5 percent of the middle school matriculants, were girls. Nine out of ten of the newly literate women, according to the National Institute of Literacy, were active members of local women's associations and cooperatives.

Articulating indigenous knowledge

Twenty-five years ago, when the first wave of national literacy campaigns was dying out in Sahelian countries and the first hints of locally-supported literacy were appearing, a wide-ranging evaluation was conducted of literacy's consequences in western Mali. Research was carried out by case study, and the team of Malian evaluators happened to spend several days in a village named Sirakoro, south of Kita. Though government support of the program had been irregular, they found there some remarkable results.

The first group of young people made literate in the village, who then occupied positions monitoring transactions in the local peanut market, themselves trained a second cohort. Shortly thereafter, the majority of adults in the village had learned to read and write in Bambara/Malinké, and the village authorities decided that attention should be given to children's education. They resolved that no child should henceforth reach the age of twenty without knowing how to read and write in his or her own language. Because there was no formal primary school within walking distance, the village created its own independently and proceeded to build curricula for its program. Among other things, the literate young people took it upon themselves to write down the history of the village and its region and teach it to their pupils.

This pattern has been increasingly repeated over the intervening years in different parts of the Sahel. African languages are acquiring written form and being used as a means both of managing local enterprise and recording indigenous knowledge. After two or three decades of highly variable success when directed top-down in "national campaigns," literacy classes began in the 1980s to aquire momentum even as they were taken over by local associations and non-governmental associations for their own uses. And they have led in a variety of ways to the better articulation of local culture.

Functional trilingualism

One difference between the first wave of literacy action and this more recent history is local ownership. Another important one derives from the fact that African language literacy is now not generally presented as an alternative to competence in international languages like English and French, as a form of "rural education" or "Bantu schooling" for those not entitled to the "real thing"—but rather as both a cultural and political asset by itself *and* a springboard into second language learning.

In addition, a new complementarity among different languages is gradually emerging, one sometimes called "functional trilinguism." This three-tiered scheme targets everyone becoming literate in their own mother tongue, then mastering an African language of wider communication (like Mooré, Wolof or Bambara), and finally acquiring a language of international communication like English, French or Arabic. The approach seems counter-intuitive for monolingual speakers of northern countries but is not difficult to conceive, or witness, on a continent where over 50 percent of the population already speaks at least two languages.

Giving voice to minority culture

Burkina Faso again provides a case in point. Situated on the boundary between the Sahelian and coastal regions, the country counts no fewer than 71 languages, though fully 75 percent of the population speaks one or another of the three most widely-spread (Mooré, Jula and Fulani) as a second language of communication if not mother tongue. All but a

few of the "Burkinabè" languages (adjectival form of the country's name) are now transcribed and used in written form. Increasingly, therefore, a speaker of Gourmancéma is likely to learn Mooré or Fulani plus French in the course of his or her education, whether that training follows formal schooling or non-formal education in literacy classes.

For this reason, the locally-rising tide of Sahelian language use has also been a rallying point for minority cultures in West Africa that wish to affirm their own identity as part and parcel of the nation and preserve traditions while opening bridges to wider society. The Tin Tua association illustrates the point. So, too, does a remarkable experience in the Podor region of northwestern Senegal.

Since 1986 the organization "ARED" (Association for Research on Education) has dedicated itself to the publication of reading materials in the Pulaar language for learners in the departments of Senegal bordering the sea between Dakar and St. Louis. Pulaar is a regionally-specific version of the Fulani, Peulh or Fulfulde language, found throughout Sahelian countries but nowhere a majority culture outside of sections of northern Cameroon and the Futa Djalon mountains of Guinea. ARED's program is actually only one of a series of efforts, including another coordinated by APESS (Association Peulh pour l'Education et la Science) in Burkina Faso, that have been devoted in recent years to promoting the use of different regional variants of Fulfuldé.

The activities of ARED have been energetically supported by associations of Pulaar speakers who have emigrated to Saudi Arabia, Egypt, the Maghreb and Europe. This support has enabled ARED to produce a whole series of books and newspapers in Pulaar and to give a new impetus to literacy courses for adults. ARED has at the same time published manuals on a variety of local development, agricultural and action research topics in Pulaar. Achieving literacy in Pulaar has become a symbol of honor in village society in this part of Senegal, and literacy campaigns launched on this basis have greatly contributed to a cultural renewal throughout the region.

This is precisely the sort of "indigenous" effort at knowledge construction that is now cropping up more frequently across the region. What form it will take in the future is unclear. But it does seem more likely to survive than the cultural and literacy campaigns of the early decades of independence, precisely because it is "owned" by local actors and founded on local economic and social necessity.

Grassroots Dissemination of Research in Africa: Collecting and Connecting

This article is based on research conducted by local researchers with the support and technical supervision of Peter Easton, Associate professor, Graduate Studies in Adult Education, Florida State University, with the collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the Interstate Committee for Combating Drought in the Sahel/Comite Inter-etat Contre la Secheresse (CILSS) and the Association for the development of Education in Africa.

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How often does the still-limited quantity of research done by African researchers actually reach an African audience that is ready to use its results? By what channels does this communication pass and by what means can it have the most positive effect?

Methods for grassroots dissemination of the results of African research are being worked out at local levels through a USAID-funded endeavor, the ABEL Project (Achieving Basic Education and Literacy),

The project involves disseminating studies carried out by African researchers around the theme "decentralization and local capacity-building," but doing so in a manner that includes both the disseminators and the target audience in critiquing the studies, documenting and analyzing their own related experience, and drawing practical policy conclusions from the results.

Carrying out research worth disseminating

The original studies for this experiment were conducted between 1996 and 1998, through previous ABEL funding, by teams of African researchers in several countries. This approach was innovative in a number of respects, notably by the highly developed form of subcontracting. Rather than engage the researchers as "hired guns" to carry out studies directed by a northern institution, the entity with the ABEL contract (the Florida State University) contracted with research teams on a fixed-price basis to propose and carry out studies on a series of topics. The topics were drawn from a list of priority research targets established by the Working Group on Nonformal Education (WG/NFE) of the Association for the Development of Education in Africa (ADEA).

ADEA is a consortium of all African Ministers of Education and representatives of all principal donor agencies. It functions primarily through working groups of different sub-sectors of education directed by consortia of African educators and donor representatives. The Working Group on Nonformal Education and Training—established after the ADEA biennial meeting of 1995 and sponsored jointly by the Swiss Agency of International Cooperation and the Ministers of Education of Ghana, Mali and Senegal—met for its first plenary in spring 1996 in Dakar and adopted a list of priority topics for research.

The policy adopted was to invite African research teams to submit proposals on one or more of the topics selected, and to enter into agreements with those able to do research through a performance contract mechanism. This approach required the researchers to produce work of agreed-upon quality within definite time limits *and* gave them a great deal of flexibility — so necessary under the uncertain conditions for research that exist in Africa — in order to decide how best to allocate the sums to achieve those ends. Strict accountability for expenditures was required *ex post*, but teams did not have to adhere to the originally proposed budgetary breakdown.

A number of very interesting studies were conducted, several of them spanning more than one country and including portions carried out by separate research teams, who then had an opportunity to compare results. Subjects investigated included (a) the acquisition of skills in the informal sector of the urban economy, (b) the practical uses of Koranic literacy, (c) means for building competencies in women's cooperatives, (d) new formulas for NGO-government cooperation in providing nonformal education, and (e) experiments in informal primary schooling.

Getting the word out

The question now was how to disseminate this research to those at the local level who would use it. With ABEL funding, a series of studies on skill acquisition in women's cooperatives and the problems encountered in meeting their management challenges had been done in rural Ghana and Mali in 1996-1997. The results were compiled, written up, reported in conferences, and made available both in hard copy in the two countries and via the Internet. But these modes of distribution did little for women in similar situations across West Africa who might benefit from the Ghanaian and Malian experience, but who evidently neither attended professional conferences, nor perhaps had access to the Internet.

Project staff therefore decided to think "outside the box" in developing the dissemination phase of the activity. The idea was to involve researchers in other potentially interested African countries in

- culling through the studies
- identifying studies most relevant to local problems in each country
- proposing target audiences who might benefit from the research results
- developing a methodology for making these people aware of the results and helping them to compare and draw conclusions from the Ghanaian and Malian experiences.

The intermediate institutional structure to accomplish this task was the newly formed National Working Group on Nonformal Education — a consortium of public and private agencies (NGOs) involved with nonformal education and affiliated with the Association for the Development of Education in Africa (ADEA).

Results in Benin

In Benin, the embryonic Working Group on Nonformal Education went through the entire collection of studies done by African researchers under Phase I of the ABEL Project and selected three of interest to local educators: (a) skill creation in women's cooperatives, (b) the practical uses of Koranic literacy (described in IK Notes 11, August 1999), and (c) knowledge acquisition in the informal sector of the urban economy. It then invited its own constituent groups and other teams of researchers within Benin to propose methods for disseminating these studies in the field. The Benin NGO "RAMPE" proposed taking the Malian and Ghanaian studies on women's cooperatives to officers and members of similar institutions in the Toviklin region of northern Benin who, despite initial successes, were having difficulty developing their own movement.

Researchers took a summary of the nature and results of the study to leaders of the different cooperatives, and made a first discovery. Out of more than 100 entities listed as members of the network, only 21 actually were women-directed enterprises. Out of these, the research team identified ten that would be interested in the exercise and available to carry it out. They proceeded to develop a methodology for presenting the essential nature and results of the Malian and Ghanaian studies to members of each of the ten cooperatives. They then gathered their leaders to discuss how the experience of these two other countries compared with that of Toviklin and what practical conclusions might be drawn from the exercise.

The activity provoked a genuine effort of self-evaluation and situational analysis by the Beninois groups, which were so fascinated by news of progress made by their "sisters" in these two neighboring countries that they moved to identify several areas of blockage in their own situation that had prevented them from achieving autonomy. Principal among these was a deficiency in training and a consequent inability to handle the fiscal management of their new enterprises. They resolved to seek early integration—on their own terms —into a centrally sponsored literacy campaign then underway in northern Benin, and to decide on securing training for their elected officials. A number of details regarding the organization of women's cooperatives in Mali and Ghana —

and the roles played in them by men—were also discussed and compared with conditions in Benin.

Social marketing as a two-edged sword

This approach has evolved into both a means for social marketing and action research and a strategy for disseminating innovation. Its strength lies in the active involvement of target groups and their appropriation and ownership of the subject material—as well as in the potential cascading effects and learning consequences. But experience in both phases of the ABEL studies demonstrates that it has an impact at two levels: within the communities involved, and among the cadre of researchers responsible for facilitating the exercise.

This research is different than that usually taught and practiced. It is research as a conversation about indigenous knowledge, its refinement, and its practical applications. Those responsible for the work must struggle to make existing studies understandable in practical terms and help their "clients" recognize the fruit of their own experience as research worth comparing with work done elsewhere. In addition, a difficult and innovative aspect of the undertaking was the degree of management responsibility, including budgetary oversight and accountability, devolving to the researchers involved. Deploying staff to accomplish objectives as complex and integrated with local reality as the ones assigned to this dissemination scheme was an adventure in its own right, since few of the participating researchers had experience managing such an intervention. However, the responsibility was motivating, and the challenge instructive.

The style of dissemination in Benin has not been the only one developed. In Botswana, the National Working Group performed similar activities—selecting once again a set of studies by African researchers that spoke to issues of local interest—but resorting instead to a strategy of bringing leaders of NGOs together around each topic to pool national experience and compare it with the data and conclusions of the studies. Though a step more removed from the field, this approach had the virtue of creating a setting favorable to policy decisions and new forms of collaboration among the actors involved.

Where next?

Next efforts are under way in September/October 1999 in The Gambia and Chad, and focused on studies conducted in five other West African countries around the theme of decentralization and local capacity building—that is, how local communities, enterprises and associations have acquired the competence to assume new development functions in an era of government decentralization. Gambian and Chadian researchers—drawn this time both from the countries' nonformal education working groups *and* from the ranks of their Ministries of Agriculture and Rural Development—started by doing an inventory of the many sites where local groups had begun identifying those that might participate in dissemination and comparison. Results will be available by the end of the year.

Health

Indigenous Knowledge, Equitable Benefits

This article is a slightly modified version of the article entitled "Moving On: Less Description, More Prescription for Human Health" by Katy Moran, in Ecoforum*, Journal of the Environment Liaison Center International, Vol. 21, No. 4, January 1998. For more information on this subject, please contact Katy Moran, Executive Director, The Healing Forest Conservancy 3521 S Street, NW—Washington, DC 20007; e-mail: MoranHFC@aol.com*

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Since the Convention on Biological Diversity (CBD) was introduced in Rio (June 1992), we have learned much from describing the new relationships that the CBD catalyzed. Biodiversity-rich countries, indigenous cultures with their knowledge of the use of bioresources as medicines and companies that seek to discover new therapeutics through medicinal plants and traditional knowledge now share common interests. The value of plants for medicines is more widely recognized and the "intellectual property rights" (IPR) connected with their use have been debated worldwide. Indeed, IPR have become a metaphor to describe indigenous ownership of traditional knowledge also, generating options for contractual mechanisms to ensure benefits return to source cultures and countries (Mays, et al., 1997). But, as time passes, the extinction rate of species and cultures continues to accelerate and human health further deteriorates from diseases for which no cures yet exist. How can we apply CBD lessons and more quickly move on to methods to implement it? Can countries facilitate access and encourage research and investment by companies, which, in turn, provide countries and cultures with a fair bargain from products that are commercialized? Have any case studies emerged that demonstrate this, and what questions still need answers?

Plants as medicines

The IPR debate illuminates the vitality of biodiversity for human health. From ancient to modern times, plants have been the cornerstone of pharmacy. Species from tropical countries are valuable for the richness of their biological and chemical diversity, due, in part, to climatic conditions. In temperate climates, winter kills many plant predators, and temperate plants flourish in the spring before predator populations increase. But since tropical species have minimal seasonal respite from predators, many have evolved chemical protection from countless predators. The plant chemicals that have evolved to increase plant resistance against bacteria and other infectious organisms of tropical plants may also provide protection and be therapeutically useful for human health. Today, one-fourth of our drugs are based on, or derived from, plants. In lesser developed countries, eighty percent of the population depend on plants for their primary health care.

Countries

Most biodiversity-rich countries are located in the tropics of the South, but technology-rich countries, with resources to sustainably develop biodiversity, are primarily in the temperate North. Before the CBD codified the sovereignty of nations over their biodiversity, it was considered "the common heritage of mankind." Free access to biotic resources was available to all, with minimal legalized procedures to return benefits from commercialized products to source countries. The CBD now attempts to balance how all interest groups involved can gain from the sustainable use of biodiversity and its components. Northern countries can access the biodiversity of Southern countries by sharing technology and benefits that arise from its commercial use. It is the responsibility of each CBD Contracting Party, 169 nations to date, to devise a national biodiversity policy to document how this will work in their country, including a legal framework to implement it. India's state-funded Council of Scientific and Industrial Research, for example, has recently embarked on a patent program to protect its accumulated knowledge of herbal medicines.

Companies

Since the CBD was introduced, a pharmaceutical product from tropical countries using traditional knowledge has yet to be commercialized. Economic profits have yet to be realized. Drug development generally requires expensive and time consuming studies to secure government regulatory approval before any drug may be marketed. In the US, a product typically takes from 10-15 years to materialize, after an investment of over $300 million by the company and investors who take the financial risk to develop, test and market a new drug. For a new company, infrastructure such as buildings, equipment and research scientists' salaries must be paid before any product generates any revenues. To raise this huge amount of money to fund drug research and development (R & D), companies depend on venture capital, stock offerings, partnerships and the like—investments by outsiders into a company's high-risk, but high-gain ventures. Investors range from individuals to organizations and their investments are secured by patents. Patents provide intellectual property protection for the invention of the company, enabling investors to regain the funds they risked for R & D, if and when a product is commercialized. It is unlikely that any company or any investor will risk capital to discover or develop a drug unless their investment is protected from competing companies by a patent.

Cultures

Seventy-four percent of the main 121 plant derived drugs have the same, or similar, use by native cultures. Rather than randomly collecting and screening plants, it is a more efficient strategy for some companies to use indigenous knowledge as a lead to pinpoint promising plants for new medicines. But few strategies directly address how indigenous knowledge can be accessed and equitable benefits can be distributed in a culturally sensitive manner that sustains the social systems that nurtured it. The difference between a market economy, based on individual ownership, and a communal economy, which typically shares its biological and cultural resources internally, means the culture group as a whole must benefit. Even fewer indigenous groups have been included in national discussions on these issues, or on interpretation and implementation of the CBD in their countries.

A case study: Nigeria

In practice, a case study of how countries, companies and cultures can cooperate is that of Shaman Pharmaceuticals, Inc. in Nigeria. According to physician, Tom Carlson, Senior Director of Ethnobiomedical Field Research at Shaman, "In this West African country, rich in both biological and cultural diversity, indigenous medicinal systems thrive along with Western medical facilities. In 1995, the Nigerian government officially integrated traditional healers into the state-run national health service as health care providers and today, two-thirds of the health care practitioners are traditional healers of one sort or another" (Carlson et al., 1997).

Professor Maurice Iwu—a scientist and Director of the Bioresources Development and Conservation Programme (BDCP), a Nigerian NGO—explains, "the BDCP was organized in 1991 as a focal point for collaborative research relationships that build technical skills in Nigeria so bioresources are a viable vehicle for sustainable development. Improved skills generate pharmaceutical leads that target therapeutic categories for tropical diseases suffered in Nigeria such as malaria, leishmaniasis, and trypanosomiasis" (Iwu, 1996).

Shaman Pharmaceuticals, Inc.

Shaman Pharmaceuticals, Inc. entered this setting in 1990 and, through the BDCP established a research relationship with Nigerian scientific institutions, village communities, and traditional healers and their organizations. The small California-based company began operations focusing on the

discovery and development of novel pharmaceuticals from plants with a history of native use. Lisa Conte, President and founder of the company describes it, "As implied by its name, Shaman uses the science of ethnobotany, as well as isolation and natural products chemistry, medicine and pharmacology to create a more efficient drug discovery process. At the time of its incorporation as a for-profit corporation, Shaman also founded the Healing Forest Conservancy, a non-profit foundation established specifically to develop and implement a process to return benefits to Shaman's collaborating countries and cultures after a product is commercialized." Although the young company has not yet marketed a product, the use of ethnobotanical leads brought potential products to clinical trials within a record time frame (King, et al., 1996).

Immediate and medium-term benefits distributed in Nigeria

Iwu and another Nigerian scientist, Cosmos Obialor, proposed initial discussions with healers and traditional leaders to talk about a collaborative relationship with Shaman well before the CBD was introduced in Rio in 1992. "We visited communities where we had worked for several years already," said Iwu, "including the villages where Obialor and I were born. Typically, each community, or village state, is autonomous with its own chief and government. Their community decision-making process includes the village chief, his advisors, traditional healers and the elders," Iwu added. After lengthy discussions, the groups felt that Shaman shared a common purpose with them consistent with their cultural values concerning human health. Out of these and other early discussions, the prior informed consent and compensation policies of the company were formulated. Prior informed consent discussions covered topics such as the intentions and goals of the project; how and where the plants would be analyzed; their potential for commercialization and benefit-sharing.

"Since then, four ethnobotanical field expeditions have been conducted," said Steven King, Senior Vice-president for Ethnobotany and Conservation at Shaman. "By choice of Nigerian collaborators, benefits have taken the form of workshops and training programs on public health, botany, conservation and ethnobotany; support for a medicinal plant reserve; supplies for village schools; botanical collection supplies for a herbarium; laboratory equipment for scientific research on plants that treat parasitic diseases prevalent in West Africa and support for Nigerian scientists to apply modern analytical techniques. Fulfilling company policy, immediate and medium term benefits, such as those above, totaling over US$200,000 (two hundred thousand dollars) have been distributed through programs to the various stakeholders in the collaboration as the expeditions occur."

Iwu added, "The company reports laboratory results back to participating communities regularly. General literature is published on medicinal plants from Nigeria, supplying public recognition of the benefits of traditional knowledge from Nigeria to society and human health. "

Long-term benefits

After a product is commercialized, Shaman will donate a percentage of profits back to Nigeria and all other company collaborators through the Healing Forest Conservancy (the Conservancy) for as long as Shaman has a profit. The Conservancy will distribute these benefits, equally, to all the countries and cultures that are Shaman collaborators, regardless of where the plant sample or traditional knowledge that was commercialized originated. In a financially unpredictable industry such as this, spreading the benefits and risks among all Shaman collaborators increases opportunities for compensation (Moran, 1997).

Shaman and the Conservancy follow the CBD principle that when local custodians of biodiversity benefit from the sustainable use of their medicinal plants by others, conservation opportunities are increased. To resist pressure from other economic interests that may have adverse impacts on biodiversity, benefits to conserve it must be available at the local level. However, the absence of applicable models leaves this precept largely untested. To test the feasibility of using trust agreements as a vehicle for benefit sharing, the Conservancy donated $40,000 (forty thousand dollars) to a trust fund in Nigeria for a pilot project.

The Fund for Integrated Rural Development and Traditional Medicine (FIRD-TM), an independent trust fund, was established by the BDCP as the financial mechanism for sustainable development of rural areas and to distribute benefits among Nigerian stakeholders. The board is balanced to reflect these interest groups, composed of leaders of traditional healers' associations, senior government officials, representatives of village councils from various ethnic groups and technical experts from scientific institutions. Chairman of the Board of Management of the Fund, His Royal Highness Eze E. Njemanze of Owerri, is a highly respected traditional ruler. The predominance of traditional solidarity systems, such as tribal associations and professional guilds of healers supplies a social structure to ensure community participation. Diverse culture groups in Nigeria will receive funds through traditional healers' organizations and villages consistent with their governing customs. Town associations, village heads and professional guilds of healers are empowered to make decisions regarding projects in their localities. Those funded will follow the criteria of promoting

conservation of biodiversity and drug development, as well as the socioeconomic well-being of rural cultures. At the local level, technical skills gained from benefit-sharing help standardize and promote phytomedicines, disseminating and sharing information that benefits traditional healers and the health of the communities they serve.

Inauguration of the FIRD-TM was announced in Abuja, Nigeria, on September 30, 1997, during an international workshop on medicinal plants attended by five Nigerian ministers and several heads of Nigerian government agencies, including the Director General of the Federal Environmental Protection Agency. The Honorable Minister of the Federal Capital Territory of Abuja stated, "...the skills of the traditional medical practitioners who are also the custodians of our native medical culture are now being accorded the right place in society."

The trust fund concept offers the added value of attracting and managing sources of financing from other NGOs, foundations or companies interested in contributing to a stable fund. When the Conservancy donation was announced, the Association of Indigenous Pharmaceutical Manufacturers and the Orange Drug Company of Nigeria pledged additional monies to complement the donation. Next year, the project will be evaluated and used to guide the Conservancy in developing a template trust fund process for use by all Shaman collaborators, other companies and foundations.

Remaining issues

The case study of Shaman in Nigeria offers an example of how countries, culture groups and companies can cooperate for the benefit of all stakeholders to sustainably develop biodiversity for human health. It is but one of the ways to accomplish the goals of the CBD and each participant should continue to seek, identify and prescribe new techniques and paradigms that are best suited for conditions in each situation. The countries, cultures and companies involved are so diverse that actions can be effective only by addressing them in their unique cultural, economic and environmental contexts. The following issues have yet to be resolved.

- Nigeria offered a strategic alliance for Shaman, with intact institutional capacities, particularly at the village level. These autonomous systems, with their own chiefs and functioning governments, chose to use their traditional knowledge in the outside world to reach goals that they, as a group, decided were important to them. Different indigenous groups hold different beliefs about entrepreneurship and have different visions of what is a market. These differences should never be an excuse to exclude indigenous groups from the sustainable use of biodiversity, for this is their, and only their, decision to make, and not non-indigenous NGOs, as it is often the case, who claim to represent indigenous views in deciding these matters.
- Article 8 (j) is the CBD section that addresses maintenance and respect for indigenous knowledge. But it offers only weak protection for culture groups and subordinates CBD obligations to national legislation. Legally, it is the Contracting Parties of the CBD, not companies' policies, that hold sovereign authority to decide if and how the sustainable development of biodiversity will be accomplished within their borders. The political climate of States under which indigenous groups live is critical to its success. Since indigenous groups are huge stakeholders in the issues put forth under the CBD, they must be included in their national discussions on interpreting and implementing the CBD. To ensure continuation of their cultural systems, they must fully participate and advocate for themselves and their own interests. If States are to be effective at conserving the worlds' species, their strategies must be built up through participation by the custodians of biodiversity, not imposed from the capital down.
- The affiliation of indigenous peoples with traditional territories sanctions and governs their ecological practices. Legal recognition of territorial rights by governments provides authority for indigenous groups to deny or permit outsiders access to them — the first step in biodiversity conservation through traditional land and resource management. But this priority issue was given only minimal attention at a recent CBD workshop in Madrid attended by both governments and indigenous groups. A lost opportunity, many stated. Others saw the meeting as a first step where progressive prescriptions for biodiversity conservation through territorial rights, such as Act No. 8371, a recent federal statute in the Philippines, could be announced. It remains to be seen in the next forum whether biodiversity conservation through territorial rights will again be subsumed by competing agendas (Burgiel, et al., 1997).
- Accurate information is essential. It is incumbent upon all CBD stakeholders to develop a clear understanding of exactly what IPR are and what they are not. They are not a surrogate legal right for land and human rights and frustrations arise from attempting to use IPR in ways not originally intended. What will succeed is for countries, cultures and companies to share their experiences cooperatively, since no single paradigm will work for all. The conservation and sustainable development of biodiversity require a diversity of approaches.

Senegal

Grassroots Democracy in Action

This article is based on research conducted by local researchers with the support and technical supervision of Peter Easton, Associate professor, Graduate Studies in Adult Education., Florida State University, with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the Interstate Committee for Combating Drought in the Sahel/Comité Inter-état Contre la Sécheresse (CILSS) and the Association for the Development of Education in Africa.

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In villages of the Wolof-speaking groundnut basin and the Fulani-speaking Fouta Toro in Senegal, "democracy" is fast becoming a household expression. The Senegalese NGO "Tostan" (a Wolof name that means "breaking out of the egg"), a rural women's non-formal education program has been developing for over two years a brand of local training in democratic principles and behaviors. The initiative got under way on the heels of a training and empowerment program that the NGO had been promoting throughout central Senegal for the last decade. The effort was open to all, but it specifically targeted women and included lessons in problem-solving, income generation, African-language literacy and child health. In order to meet emerging felt needs, and as the program grew, new modules were developed with the beneficiaries One of the last of these was a module on women's health, including some sharing and discussion of a long-taboo subject—women's sexuality—which broke all records for participation throughout those rural areas. Tostan staff discovered that one strong and unsuspected source of interest in this module was the emphasis put on human rights, particularly the rights of women and children to be free from discrimination and the threat of violence. People wanted to know more.

Democracy from the family to the state

Before developing any new modules, however, staff decided to undertake some participatory research into just what most concerned people in this realm and what they most needed to learn. The results were surprising. Respondents very much wanted to expand on the issue of human rights and to examine the conditions, even the kind of society, in which these could be more durably ensured. The term "democracy" surfaced on a number of occasions, overheard from national political discourse, but no one was too sure exactly what it meant. Staff resolved therefore to try out a training sequence that would use "democracy" as a cover term for the kind of social arrangements under which human rights could be effectively guaranteed and people of all groups and ages could play an active role in determining their own destiny. The module that resulted from these months of effort included information, discussion, role-playing and applied activities all focusing on what human

rights society must protect, how individual and group values are balanced, by what means those who have been deprived of rights can assert them, how conflict is healed, and the sort of governance strategies such goals require. Organizers found it worthwhile to go back to the root meaning of "democracy" in Greek—*government by the people*—and to facilitate widespread discussion of just what this implied and how it related to the assertion of human rights and the resolution of conflict. Democracy was interpreted and discussed as an arrangement affecting family life, local associations and village organization every bit as much as it did politics at the regional or national level. The debate and exchange that these topics prompted in participating communities was extremely lively and soon reached well beyond the confines of the non-formal education course. A remarkable amount of dialogue between men and women, between young people and their elders, and even among ethnic groups ensued in most areas involved.

Keeping the faith

Organizers were careful to associate village authorities and religious leaders in the process. In fact, perhaps the greatest impetus to the effort was given by its interaction with religious values, mostly Islamic in the areas concerned. The widespread reaction among the faithful was that the rights and democratic principles in question were a better reflection of true Islamic values than much of contemporary society or customary practice.

Palpable results were soon evident on a number of fronts. Much of the momentum seems to have come from a dynamic much like Gandhian nonviolence—that is, from deliberate efforts to bring contradictions between values and behavior into the light of collective awareness. Violence against women and children in the family provides a case in point. Participants in the Tostan democracy education program were quick to denounce the practice of allowing the beating of wives and children within the family. Cases were brought out and discussed in community after community. As a male head of household in the village of Ngaparou put it, "We all knew it was not right to beat women. We just got away with it. But you have to change now, because the whole matter has gone public." Going public — though usually in a non-aggressive way—has to all appearances been a key arm of the movement.

Children's rights constitute another principal focus. Groups in the town of Thies who went through the study then identified the lack of birth certificates for a major proportion of children born in their community as one of the most serious abuses of human rights to be remedied. It effectively excluded these children from schooling and a series of life opportunities. Program participants went on to lobby for new procedures and to obtain certification for a large number of young people. In a number of locations across the region, the problem of early marriage without the consent of girls was posed in no uncertain terms and widely debated. The increased focus on girls' rights added new impetus to the grassroots movement to ban female circumcision highlighted in *IK Notes 3* on the Oath of Malicounda.

Habits of accountability

The democracy debate appears also to be having major effects on practice within local associations and communities. Notions of accountability, transparency, leadership qualifications, interest representation and effective governance were much discussed in the curriculum, as were means for resolving the conflicts that increased claims on social recognition and equity inevitably produce. Staff now find former participants maintaining that there has been a major change in procedures and even in personnel within community associations as a result of the training. "We now know better what a leader should be," they say; and there is a noticeable increase in women's access to leadership functions. Women also speak of no longer tolerating customary situations where the leader—of either gender—makes decisions for the membership. And, in several areas, conflict resolution clinics have been established by women who finished the democracy module.

Further political ramifications cannot be excluded. Participants suggest that a much larger proportion of women is interested in voting than ever before - and few are willing to accept the frequent pattern where the male head of the household dictates how all family members shall vote. (In fact, in a number of villages it was the chief who decided how all residents would vote.) The discussion of leader qualifications has led in several places to new criteria for evaluating political candidacies, a sort of local "checklist" of desirable characteristics and an indigenous litmus test for democratic intentions. Women in the Fouta Toro region resolved to monitor more closely national legislation on women's rights.

A growth industry

Demand for the democracy module has been increasing and prompting a sort of local campaign spirit, particularly at the intersection between this populism and the issues of women's rights. Participants from the islands of Sine Saloum canoed this summer from community to community

in order to organize women in a region-wide front against female circumcision. Over eighty villages, covering nearly the entire *arrondissement* of Dabo, have joined the movement of their own volition. And in the Toucouleur areas of the Fouta Toro, participants in the training program have organized their own "road show" to take from village to village throughout adjoining rural areas.

Results are showing up in some farther-flung areas as well. Participants from the region of Ngirin Bamba started a garden project by asking plots from the men of the village on the principle of "land to the tiller,"and then posted a sign reading "the right to land" at the gate to their vegetable and fruit cooperative.

Notions of "democracy"—adapted to local Senegalese conditions—are thus woven in and among these various assertions of human rights. The word itself has been assimilated directly into the Wolof and Fulani/Pulaar languages and crops up now in arguments, proclamations and jokes throughout the villages involved. As a women in Ker Simbara explained to training staff on a follow-up visit, "We had to change the way we ran our cooperative meetings, because it wasn't consistent with 'democracy!" At a time when the fate of national representative government still hangs very much in the balance across the sub-region, a locally-grown variety seems unexpectedly to be laying some of the groundwork for future change.

Regional Planning, Local Visions: Participatory Futuring in West Africa

This article is based on research conducted by local researchers with the support and technical supervision of Peter Easton, Associate professor, Graduate Studies in Adult Education., Florida State University, with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel / OECD, the Interstate Committee for Combating Drought in the Sahel / Comité Inter-état Contre la Sécheresse (CILSS) and the Association for the Development of Education in Africa.

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Starting in 1990, the Club du Sahel—a branch of the Organization for Economic Cooperation and Development responsible for coordinating northern donor agencies in support of food security and natural resource management in the desert-edge portions of West Africa—undertook to update existing long-term planning for the region. It cooperated in this effort with the Interstate Committee for Struggle Against Drought in the Sahel ("CILSS" by its francophone acronym), an organization affiliating Ministries of Agriculture and other government agencies of seven Sahelian countries in pursuit of similar goals, headquartered in Ouagadougou.

The work was chiefly carried out by economists and political scientists engaged by the Club du Sahel, who used existing studies and available data on regional trends to project alternate scenarios for the next thirty years of West African development. The resulting document, popularly known as the "West African Long-Term Perspectives Study" or "WALTPS," stirred a good deal of controversy. There were disagreements between Europeans who favored urban-oriented scenarios and North Americans who were more inclined toward rural-oriented ones, and between Northerners who did most of the analysis and African researchers who felt a little shortchanged. The entire project seemed for a while to be mired in disagreements that obscured the usefulness of the data gathered.

Taking it to the field

The impasse was overcome in part by turning to West African farmers for arbitration. The Club and the CILSS happened to be collaborating at the same time on a participatory study of decentralization and local capacity-building in five countries of the region: Burkina Faso, Ghana, Mali, Niger and Senegal. It involved case studies of local communities and associations which had assumed major new development and management responsibilities on their own. Organizers of the five-country research effort suggested that one way to get beyond the stalemate over the WALTPS Study would be to take its basic questions, observations and conclusions to the field and ask members of these same communities what *they* thought about the matter, since they arguably represented the most important stakeholders of such long-range planning. The specialists expressed some skepticism at such a "populist"

approach: did local people have the necessary breadth of vision and distance from daily concerns required to contribute to such futuring? Proponents countered that nearly every village had people who had either traveled extensively in the region or were currently away working in coastal cities, if not overseas, and that the combination of this experience with first-hand knowledge of local conditions made them essential counterparts.

In the end, it was decided to undertake a local consultation on long-range planning across the five countries. The African and international researchers involved developed a trial methodology for inviting debate and analysis of the future of the immediate community and the larger region in each of the areas visited. It entailed enlisting representatives from a variety of local social groups in the data collection, discussion and forecasting process.

Protocols for local debate

The work covered five sequential steps:

1. Examine the most important changes that have occurred in the immediate community, the surrounding country and the West African region as a whole over the last thirty years, concentrating on five related dimensions of daily life:
- Environment
- Demography
- Economy
- Society and culture
- Politics.

The researchers prepared a digest of the essential findings of the WALTPS Study, but also took care to solicit local viewpoints. The essential question was simply, "How have things changed in your community and its surroundings from these five points of view since the time when today's young adults were themselves babies?"

2. Consider the underlying factors that seem to account for or explain these changes, their relations to each other, and the longer-term trends that they reveal.

3. Imagine the situation that might obtain in another thirty years—in all five areas just named—if the same trends and factors continued to operate in much the same manner.

4. Discuss future scenarios and conditions that the group might prefer to this forecast—that is, the type of future that they would like to deed to their children.

5. Consider what might need to be done at local, national and international levels to move the situation toward these preferred futures.

The methodology used to launch the process and guide debate varied significantly from one country to another:
- In Ghana, for example, the research team took care to enlarge the sample of local associations and businesses visited in order to include a few secondary schools and higher training institutes where they might get the perspective of the next generation of West African leaders. (The methods used in Ghana are presented more fully in a section at the end of this appendix.)
- In Niger and in Mali, the research teams put together African language versions of the facilitator's manual and discussion guide.
- In Burkina Faso, researchers decided to ask each community to name a "panel" of participants, sampled by age and gender, and worked exclusively with this focus group.
- In Senegal, national researchers gave each local research team a set of simple facilitator's aids, including a map of Africa, a map of Senegal and a flip chart with butcher paper and felt-tip markers. The participatory dimension of the exercise was also given the greatest prominence in Senegal, where the national research team invited interested local associations to organize the debates themselves, trained the staff that they selected and established contracts with these local institutions for direction of the work.

Local visions

The exercise stirred a great deal of interest in all communities that took part—fifty-six of them in total across the five countries. Substantive results of the experiment can be summarized as follows:

1.The leaders and members of the local associations involved—both women and men—turned out to be very interested in the idea of forecasting and discussing the future of their community, country and region—and quite capable of playing an active role in the exercise. They were particularly gratified by:
- the feeling of having for the first time the opportunity to play a part in political deliberations about development strategy and the future of their environment;
- the chance to get a "systems view" of the evolution of their environment and to question local practices that seemed incompatible with sustainable development;
- this pilot-testing of a procedure that might enable local associations to do more systematic long-term planning and to visualize their relationships with their larger social environment.

2. Their analyses of the changes that have occurred at the local level, of the trends underlying them, and of likely and possible futures coincide often, but not entirely, with those of the authors of the different reference studies. The following themes stood out in the debates:

- The biggest changes and the most disturbing trends identified were those in the ecological and economic domains, concerning agriculture in particular. Widespread and very pronounced awareness of the deterioration of the environment and of the role that human activity (population increase, farming methods, natural resource use) plays in it were everywhere evident.
- Though it is recognized that population is on the increase nearly everywhere and that interaction among social and ethnic groups has intensified at the same time, neither fact is universally interpreted as a problem or a source of conflict. Opinions regarding family planning differ markedly, particularly between mature and older men, on the one hand, and young people and women on the other. The second group generally supports family planning; the first tends to reject it. One peasant woman in Senegal insists that "we are not machines for manufacturing children." Yet a *pater familias* in a neighboring community bases his arguments on the far greater population density in areas of Europe: given adequate resources, there should be no problem in handling population growth.
- Local participants give particular emphasis to the relations between urban and rural areas but speak of complementarity, two-way flow, even reverse migration more often than do the authors of the reference studies. Some speakers in towns and cities stress the need for increased investment in rural areas, where most of them continue to have close ties.
- There is general recognition, most pronounced in landlocked countries like Mali and Niger, that it will be necessary henceforth to rely to a greater extent on local resources and ingenuity and that, given growing xenophobia in host countries, out-migration is no longer a good solution.
- Exception is widely taken to the reference studies for not having paid greater attention to the deterioration of social values and to the ethnical and moral side of current trends. The breakup of traditional family structure and an increase in individualism are mentioned in both urban and rural areas.

3. There is a tendency to paint the past (represented for the purposes of this exercise by the 1960s) in somewhat idealized colors: the soil was then fertile, wildlife was abundant, people were content, etc. On the other hand, current circumstances are seen as extremely critical and everyone speaks of seeking remedies.

4. In the political realm, participants gave good marks to the beginnings of democratic processes experienced in recent years but reproached the political parties with creating dissension. Their prescriptions for the future included giving much greater prominence to local governance. Particular importance was attached by nearly all to the phenomena of locally managed associations, cooperative businesses, and intervillage federations. The problem of linking these grassroots movements with the official decentralization and democratization programs now under way was also frequently mentioned.

5. The researchers who coordinated the exercise drew attention to some major resistance to decentralization at the local level among groups that benefit from the present situation and call for clearer policies regarding the procedures to be followed. Better coupling of the top-down forms of decentralization with the bottom-up movements now developing in the field offers perhaps the simplest way of both circumventing local resistance and creating a solid base for decentralization efforts, they felt.

6. Better regional integration and cooperation among the Sahelian countries was mentioned frequently by all participants, but one important qualification to this conclusion stands out. It was recognized that, to a certain degree, the name "Sahel" itself and the membership of the CILSS designate a critical dimension of the problem, not the solution. Economic development in West Africa depends in good measure upon better coordination between landlocked and coastal areas along the north-south axes of precolonial commerce that fueled the development of the regions' great empires but were later broken by colonial patterns. Long-term solutions to economic stagnation seem therefore to require new alignments between Sahelian countries and coastal areas like Nigeria, Benin, Ghana, Ivory Coast, Guinea and Liberia—and across Francophone/Anglophone divides—that CILSS can help facilitate but cannot realize within strictly within its own framework.

Methodological lessons

At the same time, the "local long-range planning study" was a methodological experiment as much as a substantive inquiry into citizens' perceptions of the West African future.

Participants in the concluding workshop felt that the long-term payoff to the methodology tried out in the course of the exercise lies with its transformation into a strategy and a set of tools for *self-assessment and strategic planning*

of the different types of local associations and businesses that took part. This kind of instrumentation seems sorely lacking in many associations, which rarely have a method for self-evaluation, information storage and retrieval or planning.

The results show one other thing of major importance as well, and this is the pressing need for better tools and practices of "horizon scanning," strategic planning and information use *within* these organizations. Paradoxically, at a time when project planning methodologies are either falling into disuse or becoming the target of justifiable criticism in aid agencies themselves, some of the most rudimentary and much-used of these tools may turn out to be "just the ticket" in local associations, communities and enterprises.

One of the research teams was asked to propose a simple project planning methodology to a local association involved in the futuring exercise and, somewhat sheepishly, could come up with nothing other on the spot than the ancient "logframe matrix." To the surprise of the researchers, this was an instant hit, because it at least offered a "template" for organizing local reflection about possible futures and worthwhile investments. Perhaps its shortcomings were as much a consequence of being used at the wrong level (very centrally rather than more locally) as they were a function of its inherent invalidity. How much of donor organization and government agency practice now criticized might prove catalytic if transposed into the hands of local actors?

Participatory Management and Local Culture: Proverbs and Paradigms

This article is based on research conducted by local researchers with the support and technical supervision of Peter Easton, Associate professor, Graduate Studies in Adult Education., Florida State University, with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the Interstate Committee for Combating Drought in the Sahel/Comité Inter-état Contre la Sécheresse (CILSS) and the Association for the Development of Education in Africa.

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Evaluation is often considered an activity required by donors but fundamentally foreign to local culture — an experience and a way of thinking that are largely alien, if not downright threatening, to program beneficiaries and staff alike.

Much has been done in recent years to develop participatory and empowering modes of program evaluation that give local staff and stakeholders an active role and a definite say in how evaluation is carried out and in how its results are interpreted. Creative ways have been found to reconcile this popular participation with reasonable rigor in results and even to increase the reliability, validity and the representative nature of findings through more substantial stakeholder input. In addition, there has been increased recognition that high caliber evaluations of program impact are necessarily built on careful day-by-day monitoring and description of actual processes by those involved, and that the meaning of quantitative results is equivocal at best until they are interpreted—sometimes contradictorily—by the different stakeholder groups concerned.

Evaluation: Outside mandate or local reflex?

All these trends give enhanced importance to local participation in and "ownership" of evaluation efforts. Yet they may leave the heart of the matter largely untouched. Are notions of accountability, performance assessment and data-based decision making outside impositions or do they bear analogies to "indigenous" concerns? And, if so, what are the relationships and how are they best tapped to make evaluation a local tool, an appropriate technology? The question is of no small significance in an era of increasing "decentralization" in administration and education, where successful approaches to genuine self-management are at a premium.

In fact, one of the unanticipated results of participatory evaluation practice in West Africa has been to bring to light local attitudes and approaches to evaluation, thus creating a basis for the development of appropriate evaluation methodology. And one of the means for that discovery has been the use of proverbs that encapsulate local attitudes and insight with regard to evaluation-related issues like accountability, performance and social responsibility.

Proverbs: Tradition in motion

Throughout the region, proverbs provide a highly condensed, often poetic window on human experience and on local understandings of the world. The word for "proverb" itself is illustrative of the point in many cultural traditions. In the Hausa language, for example, the term is "karin magana," which literally means "folded speech." African proverbs are in fact a finely-wrought form of expression where meanings are tightly interleaved, creating associations between apparently disparate realms of experience that throw new light on events and order perception. No wonder these expressions so often require, for the uninitiated, what modern criticism would call careful "unpacking." They can be spare and evocative as a poem, and as central to establishing shared understandings of collective phenomena as any political assembly.

African proverbs are both new and old. They scarcely constitute a fixed canon of wisdom. New ones are being invented all the time and old ones are falling into disuse, a constant process of what linguists would call "lexical creativity." At the same time, they are not oracles: for every proverb, it is said, there is another asserting the opposite point of view. Proverbs are more like a language of thought. But they afford a capital means for linking current concerns with the historical experience of the group and helping to ensure continuity and coherence in the value systems and motivations that underlie new initiatives. As an Ewe saying from eastern Ghana makes clear, *Ka xoxoa nu wogbia yeyea ðo*—"A new rope is plaited at the end of the old."

Evaluation and performance

To imagine that there was no accountability for resources at the local level prior to the intervention of official development programs is like presuming that no one learned anything before formal schools were established or that agriculture was non-existent prior to the arrival of the extension agent. As a Nigérien proverb reminds us: *Kunkuru ya san makamar matarshi*: "The tortoise knows how to embrace his wife."

In short, certain things may seem incomprehensible to the outside observer, but insofar as they concern people's essential health and welfare, you can be sure that those involved worked out solutions to their at least interim satisfaction long ago.

Flash back to an evaluation of functional literacy in the Republic of Mali over two decades ago. In frustration over the difficulties of tracking a program where advertised results sometimes seemed leagues away from field-level reality, one of the members of the team dredged up a proverb from neighboring Niger that seemed to sum up the situation with trenchant good humor:

Da an ce da kare tuwo ya yi yawa a gidan biki, ya ce 'Ma gani a kas!: "When the dog was told that there was food for everyone at the wedding feast, he replied, 'We'll check that out at the ground level!'"

In truth, there can be all kinds of nourishment on the table at a feast, but unless and until it gets down to the ground the dog has no part in it. So it is with many a development program: the inflated rhetoric does not much match the benefits for local participants, and it is just this reality and disparity that evaluation should help examine.

The interesting point here is not just the pertinence of the proverb when applied to evaluation concerns, but equally the fact that its relevance and poignancy were so immediately understood and appreciated by people of a neighboring ethnic group. The expression became a sort of motto for the evaluation.

Accountability and efficiency

Accountability may appear to be another imported notion. But a Hausa expression of long vintage sums up perspectives familiar in most West African cultures:

In ba k'ira, me ya ci gawai?: "If nothing has been forged, then what happened to the charcoal?"

Blacksmithing is still carried on in many areas of West Africa over charcoal fires. But if that valuable resource is consumed and nothing is produced, there is real cause for concern.

Effectiveness is likewise a frequent focus. The Beti of Cameroun put the matter quite simply: *Fà è tèbé nèbài è dùgàn à àbam :* "If the machete doesn't want to cut brush, it had best sneak back to the sheath."

"Efficiency" itself is scarcely a foreign notion. Numerous local expressions highlight the problem of social processes that give poor or no results, the downside of operations where the ratio of inputs to outputs is «suboptimal,» to use the dialect of planners. One of the most colorful comes from the Wolof language of Senegal. "Ten digging, ten filling—lots of dust, no hole." A commentary is scarcely needed!

Collective decision-making

Arguably, evaluation is at its best a form of collective decision-making about the use of resources and appropriate goals for community life. Participatory evaluation makes

this goal a leitmotif. And West African culture is extremely rich in wisdom and insight regarding both the necessity of cooperation in decision-making and the ways to obtain it. The Hausa language puts the case in few words:

Shawara d'awkar d'aki. "Making a decision is [like] putting the roof on a hut." In short, everyone must bend down and lift together!

An Ewe expression puts another critical spin on the issue, and one particularly relevant to evaluation*:* «*Nunya avemexevie ame ðeka me len o.* "Knowledge is like the bird of the forest: one person alone can never catch it."

At the same time, proverbs frequently make it clear that differing points of view are an essential component of decision-making and that nothing is subject to one single interpretation. *Sira kelen sira tè,* the Malinké people say: "One way is no way at all."

And the Hausa language has two marvelous ways to illustrate the diplomacy and gentleness with which consensus-building must be approached: *Girma da arziki kan sa jan sa da abawa:* "It's respect and kindness that allow one to lead a bull with a tiny piece of thread."

Makiyayen kwad'i ya yi hankali da sandarshi! "The shepherd of a herd of toads must be very patient with his rod!" Toads do not move very quickly or all in the same direction, but they also are soft-skinned and vulnerable creatures—and if the one responsible for herding them gets angry and starts laying about with his staff, he is sure to crush a few.

Empiricism and causal analysis

Evidence is scarcely less important in the local cultures of West Africa than it is in the Western scientific tradition, though it may not always be marshaled in the same ways. In fact, as Levi Strauss maintained in his classic *La Science du concret*, "traditional" culture is, if anything, more tied to the "hard data" of experience than is the academic one. Local practices are typically the results of generations of observation, trial and experiment.

These reflexes are obviously important in evaluation and are expressed in a variety of proverbs and sayings throughout the region. To test, among other things, policy options and the often extravagant claims made by politicians, the Hausa people comment quite simply, *Ba a gardamar noma ga damana:*. "There's no point debating agricultural skills in the rainy [growing] season!" In short, let each one use his or her own methods to cultivate their field, and we will see soon enough what the real results are.

A popular Ewe saying stresses the importance of comparing information across contexts: "The farmer who has never ventured beyond his field says his own methods are the best." And another Hausa insight emphasizes the contextual circumstances that must be understood to explain even the most unanticipated behavior. *Abin da ya ka'da kusu wuta, ya hi wuta zahi:* "Whatever caused the mouse to jump into the fire must be hotter than fire itself."

At the same time, the relativity of all explanations of events, and the importance of triangulating among interpretations—including those of the least well represented—are eloquently evoked in another proverb from the African continent, this one from Zimbabwe: «The stories of the hunt will be tales of glory until the day when the animals have their own historians!»

Self-governance and self-assessment

Self-assessment is arguably a key component skill in genuine self-governance, and African proverbs offer numerous related insights. A Moré saying from Burkina Faso uses a striking image to remind us that we are never independent without our own tools and resources: "The one who sleeps on a borrowed mat should realize he is sleeping on the cold, cold ground."

The Wolof put the same idea a little differently, but with no less effect: *Ku la abal i tànk, nga dem fa ko neex:* "Borrow a man's legs and you go where he wants you to go."

But to take charge of one's destiny requires competence: *Barawon kakaki ba ya da iko ya busa shi*, they say in Hausa: "The one who steals the chief's trumpet doesn't have the strength to blow it." And it requires an ability and willingness to measure and correct one's faults.

Sa kògòlen be dogo, in the Bambara language: "The hidden serpent grows large." That is, the failings and weaknesses we don't correct only get worse.

And the Hausa language adds *Ranar wanka ba a b'oyon cibiya*. "On the day of the bath, there is no point in hiding the belly button!"

A language for mobilizing local insight

The use of local proverbs in evaluation has typically served two purposes. First, it can shed new light on the social dynamics that influence program operations, insofar as these distillates of local culture—many of which are quite similar and recognizable across ethnic groups—illustrate factors that impinge on individual and collective behavior.

Still more important, however, the proverbs and sayings offer a way of demonstrating that evaluation and accountability and a host of similar notions of increasing importance in movements for decentralization and local development are not unfamiliar activities but simply ramifications of concerns as old as the culture itself. And this attitude creates the basis for helping beneficiaries develop a culturally-appropriate technology of democratic self-governance and—more important still—authoring it themselves.

Gyorgy Szèll has pointed out that a common denominator credo in the participatory management movements of modern industry has been the notion that "the expert in regard to a worker's work is finally the worker him or herself." A Hausa proverb puts it a bit differently, but with much the same import: *Kome ya ke cikin aikin d'an tsako, shaho ya dade da saninsh*:. "Whatever concerns the habits of little chicks, [you can be quite sure that] the hawk started learning it long ago."

Indigenous Knowledge and Intellectual Property Rights

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International trade in genetic resources, often referred to as bio-trade involves high economic stakes today. The sale of drugs based on traditional medicines alone amounts to over US$ 32 billion (1 billion equals 1,000 million) a year. It has been estimated that by consulting indigenous peoples, bioprospectors can increase the success ratio in trials from one in 10,000 samples to one in two. In the experience of another expert, traditional knowledge increases the efficiency of screening plants for medicinal properties by more than 400 percent. Without the input of indigenous knowledge, many valuable medical products used extensively today, would not exist.

Prior to 1992, traditional knowledge and resources were seen as the common heritage of mankind. There were no international (and in most countries national) laws regulating access to genetic resources As a result, there was an increase in the commercial use of the knowledge and biological resources of indigenous peoples. The rapid depletion of environmental resources and the need to reward both users and providers, gave rise to the Convention on Biological Diversity (CBD), which for the first time acknowledged the value of indigenous knowledge and resources. It established a framework for providing access to genetic resources and a means for fair and equitable benefit sharing.

Intellectual property is a means of acquiring ownership over a particular resource that is intangible in nature. It usually involves the protection of some form of invention created by the human mind. This includes a wide variety of creations, ranging from new music, novels, drugs, to computer software and products obtained from the use of indigenous knowledge.

The CBD introduced the notion of intellectual property rights as a strategy for conserving biodiversity by granting countries sovereign rights over their resources. This was complemented by the Agreement on Trade-Related Intellectual Property Rights (TRIPS). The inclusion of TRIPS into the mainstream of the WTO system established new disciplines for many countries in patents, copyrights, geographical indications, trademarks and industrial designs. The main objective of the agreement is to create an international standard for minimum intellectual property rights (IPR) protection.

Intellectual property rights: conflict or synergy?

Does the protection of indigenous knowledge and resources through the establishment of IPRs promote or hinder the channeling of equitable economic benefits to the custodians? Critics argue that IPRs are a threat to biodiversity by limiting access to resources and the products derived from them. They encourage companies to patent inventions derived from indigenous knowledge and resources, without equitably sharing the commercial rewards with these communities. The advocates of TRIPS claim that it encourages technology transfer, which could be one strategy for equitable benefit sharing. There are several other issues that arise in this debate which will be dealt with and reconciled by examining strategies for working within existing IPR regimes and widening their scope where necessary, to conserve indigenous knowledge and biodiversity.

Problems of applicability

The individualistic nature of IPRs creates several complications, when applied to local communities. They fail to take into account the fact that these communities have a holistic approach to their environment. Such communities find it difficult to separate the resources from which their livelihood stems into distinct economic and social assets.

As far as IPR is concerned, this leads to another critical problem. How does one define an innovation and a beneficiary in local communities, given the need to prove novelty and non-obviousness. In most traditional communities, knowledge is acquired over time and passed on from one generation to the next. Through this process it keeps evolving and changing in character. Therefore, it is difficult to establish when such knowledge was actually discovered and when it entered the public domain.

The second aspect of the dilemma involves the community aspect of indigenous knowledge. It is developed by being shared amongst the members of the community such as the elders who have the wisdom of years of experience which adds further value to knowledge. In this sense it has always been in the public domain of the community and therefore fails to meet the non-obviousness criteria of a patent. And when an entire community is involved in the evolution of traditional knowledge, how does one identify the inventor? The problem is further complicated in cases where the same indigenous knowledge is used by different communities across the world. For instance, if a particular herb is used by the Maasai in Kenya, as well as by the Amazonian Indians, how does one identify the rightful inventor?

Towards a synergy

These issues may be reconciled by working within the framework of TRIPS through the use of different forms of intellectual property rights. These include geographical indications which are more applicable to community based inventions. Another possibility is to widen the scope of IPRs to include the notion of community based rights. This may include *sui generis* (of its own kind; constituting a class alone) forms of protection which are more innovative than the use of patents.

Some suggest that patent laws be modified to ensure that all patent applications disclose the country of origin of biological materials and traditional knowledge used to develop the invention. A related issue involving the patenting of indigenous practices is the need to document them. The problem with most indigenous practices is that they are passed on from one generation to the next through oral traditions and not written records. In order to prevent traditional knowledge that is already in the public domain from being patented as a new invention in another country, it is vital to provide written documentation of such practices. This way, indigenous communities can challenge patents being granted to others for practices that are traditionally their own. The World Bank's Indigenous Knowledge database and a similar initiative by WIPO to register traditional practices are initiatives in this direction.

In addition, the creation of national, regional and international registries of traditional knowledge could support benefit sharing among industry and local communities. They could support IPR- related measures such as strengthening traditional knowledge's status as prior art, enabling 'defensive publications'.

Aside from patents, there are other possible mechanisms for establishing intellectual property rights over indigenous knowledge and resources. These include the use of geographical indications (place names or words associated with a place to identify the origin, type and quality of a product—for example "Darjeeling tea"). These are unique in their ability to reward collective traditions while allowing for evolution. They emphasize the relationships between human cultures and their local environment and can be maintained as long as the collective tradition survives. It is immaterial whether the inventor is an individual, family or large corporation. Indigenous communities claim their knowledge is not to be freely bought or sold. Similarly, a geographical indication lacks the typical private property characteristic of being freely transferable.

Other forms of protection include copyrights and trade secrets. Copyrights are often used to protect traditional folklore from unauthorized duplication. WIPO has protected

folklore from different parts of the world as copyrights. Trade secrets are a means to protect confidential information that can give others such as a business firm a competitive advantage. They could be an effective way of protecting indigenous knowledge. Local communities could restrict access to their territories and information to outsiders through agreements that secure confidentiality and economic benefits. Such practices have been initiated in countries such as Ecuador with the support of the Inter-American Development Bank.

Sui generis: access and equitable benefit sharing

Some of the biggest controversies surrounding IPRs concern the protection of local plant species. The TRIPS agreement states that members may exclude from patentability…

> *"Plants and animals other than micro-organisms and essentially biological processes for the production of plants and animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof."*—(Article 27.3b)

Sui generis refers to methods of protection other than the use of a patent. The most common form of *sui generis* protection for new varieties of plants involves some kind of "plant breeders rights". At the international level, a number of countries have joined together in the International Union for the Protection of New Varieties of Plants (UPOV), and negotiated an International Convention for the Protection of New Varieties of Plants. The Convention lays down minimum standards of protection that national systems should accord. It enables breeders to enjoy the so-called "breeder's privilege" which gives them the freedom to use protected plant varieties in their breeding programs to generate other (derived) varieties.

Such forms of protection have generated some concerns amongst developing countries, most of which seem to be unfounded. The fear, for example, that farmers will no longer be allowed to carry on with their traditional farming practices as a result of a patent or *sui generis* form of protection being issued for a product that has been used by them over a long period of time, is misplaced. A product or process that has been used publicly is not new and therefore cannot be patented. Only new plant varieties will be eligible for protection and even then, the onus is on the breeder to seek protection. It is not compulsory. Thus, farmers will be able to retain seed from their harvest for sowing on their land (this has come to be known as the "farmers' privilege").

Sui generis offers the possibility to move beyond traditional forms of IPR and examine other mechanisms for regulating access to resources and equitable benefit sharing. These could include contracts between the users and custodians of these resources, such as Material Transfer Agreements. In Cameroon, for instance, the US National Cancer Institute signed a contract with the government following the discovery of a forest plant species with a potential anti-AIDS chemical. Cameroon provides plant samples in return for payments which are used for indigenous community development projects to conserve the forests.

Others argue that *sui generis* systems that allow for considerable innovation in the form of protection offered need to be expanded even further to include community-based rights and traditional resources rights. NGOs such as the Third World Network advocate an alternative rights regime that reflects the culture and value system of local communities. They argue that, to take into account the dynamic nature of traditional knowledge, the concept of 'innovation' needs to be redefined beyond what typifies industrial innovations. This could be embodied in community-based rights.

Academics have advanced a more holistic approach that integrates property rights with customary laws and practices. They claim that indigenous knowledge cannot be separated from other indigenous rights such as human rights, rights to land and self government. One possible solution could be an integrated rights approach through the establishment of traditional resource rights which could provide a framework of principles upholding the rights of traditional communities. These can serve as guidelines for other rights such as *sui generis* property rights.

Conclusion

Intellectual property rights can provide an effective means of protecting indigenous knowledge systems and plant varieties. This note emphasizes the critical importance of documenting indigenous knowledge in writing, which can then be used to challenge a patent claim on knowledge that is already in the public domain. Second, it highlights the usefulness of other forms of intellectual property rights than patents such as geographical indications. These may be of more use to indigenous communities seeking to regulate access over their resources, as they can be applied to knowledge that evolves over time and with the input of the local community at large. This offers the possibility of widening the TRIPS agreement to ensure that patents disclose the origin of genetic resources and use of indigenous knowledge and consider *sui generis* forms of intellectual property such as community based rights to secure equitable benefit sharing.

An Entry into the Urban Economy in Sub-Saharan Africa

Reinventing Apprenticeship and Rites of Passage

This article is based on research conducted by local researchers with the support and technical supervision of Peter Easton, Associate Professor, Graduate Studies in Adult Education, Florida State University, with the active collaboration of the concerned African communities. The research was carried out under the joint aegis of the Club du Sahel/OECD, the Interstate Committee for Combating Drought in the Sahel/Comite Inter-etat Contre la Secheresse (CILSS) and the Association for the Development of Education in Africa.

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Most traditional societies in sub-Saharan Africa have developed well-built systems for initiation of young people into the routines, skills and understandings of adult life. These include age-group organizations, initiatory rites of passage, and trade apprenticeship patterns.

Traditional arrangements for apprenticeship and initiation remain strongest in rural communities and are much less in evidence on the urban periphery among those whom hunger, unemployment, or simply the lure of a better life have motivated to move townward. Many ties between the two areas remain, and associations for out-migrants from specific villages and regions are well known in the cities.

A generation left to its own devices

On the whole, however, rural out-migration has contributed materially to breaking down the relevance and strength of initiatory and apprenticeship customs over the years since "flag independence." The most extreme example of the dissolution of social guarantees for rites of passage probably lies in the situation of street children, those young people without schooling, occupation and often fixed residence who haunt the highways and byways of urban Africa.

United Nations agencies and many NGOs concerned with the issue consider street children as one sub-category of working children—that is, young people below the age of legal or social maturity in their host cultures who are working in conditions detrimental to their growth and development. Most children in developing societies, it is true, *do and will work*. The challenge is much less one of prohibiting all forms of labor by those under age than it is ensuring that children are not forced into inappropriate and harmful work by the pressures of survival, and that they have opportunities for a positive transition to adult life.

But the plight of street children does throw into relief an important aspect of the situation in the urban periphery that is more than just economic, even if it is solidly rooted in resource deprivation: the lack of socially-sponsored avenues for displaced young people to develop an adult identity. Carbon copies of traditional associations are unlikely to work. As a Hausa proverb puts the matter, "*In rawa ta sake, ki'di ita ma sai ta sake.*" When the beat of the drum changes, the dance step must change as

well. What are the new beats that make sense in terms of existing social capital and cultural rhythms, as well as the changed conditions that challenge them? Three examples from Africa and one from the Caribbean offer some ideas.

Stemming the tide of street children: the Undugu Society in Kenya

The Undugu Society was established through the efforts of a Dutch priest who moved to Nairobi in 1972 after 17 years of experience in rural Tanzania and who there began a ministry for urban youth. Few young people turned up for his church-based programs, but he observed that the streets of Nairobi were overflowing with unemployed youth, most visibly the city's "parking boys" who sought gratuities from motorists for guarding or washing their cars in Nairobi's crowded central district.

In 1973, the priest began spending most of his time on the streets developing rapport with the boys, talking to them about their daily lives and about their aspirations. He found many of them to be primary school dropouts whose abandonment of school and home had often been because their families could not pay school fees or buy the necessary uniforms and materials. Most, as an Undugu "housefather" points out, responded to queries about their needs with "*Nataka kusoma*"—Kiswahili for "I want education."[1]

For these reasons, the priest initially decided that efforts in support of the street children should concentrate on getting them back into school, and he set out to find the funds to pay fees and material costs for as many of them as possible. He soon discovered, however, that school directors for the most part could not take the children or did not want them back. They feared by and large that the same factors that had forced these young people out of school the first time would do so again or that the street had worked character changes which would make it impossible for them to conform to standard classroom routine.

A learning process

This first reversal was followed by a series of new departures, failed initiatives and learning experiences that led the Undugu Society to gradually develop an innovative and progressively more successful approach to the situation of deprived youth in Nairobi. That model had four clear steps. The first was a network of "informal schools" located in slum communities in and around Nairobi. They targeted boys and girls aged 10–16 who had not entered or been able to stay in primary school and were thus at risk of becoming street and working children, if they had not already done so. The program was designed to last three years, give basic literacy and survival skills plus a heightened sense of their own self-worth, and allow those who wished, to return to formal education or move into vocational training.

This initiation to formal education or appropriate vocational skills constituted phase two of the process and occupied an additional year. Those who remained in the program—or returned to it after a period in formal schooling—had an opportunity to experiment with trades that were prominent in Nairobi's informal economy and for which Undugu possessed adequate workshop facilitites: principally carpentry, tailoring, auto mechanics and metalworking.

Finding a place in society

The third phase involved transition to employment and adult economic roles. Young people who had developed a trade preference were assisted in identifying an informal-sector artisan with whom they might apprentice for a year in order to gain further training and experience. Undugu was partner to this negotiation and developed certain criteria for the selection of "host" artisans as well as a procedure for periodic inspection of their facilities to help ensure that the apprentices were being trained and that working conditions were not exploitative. During this year of apprenticeship, the young people involved come in weekly to the workshops at Undugu headquarters for "skill upgrading." This consisted of targeted training with equipment and on technical skills that most local artisans could not offer, training designed at the same time to prepare them to take the first government trade test in their vocational area at the end of the year.

Placement of Undugu trade graduates in jobs or, more frequently, in situations of profitable self-employment in the informal sector was the final and fourth phase. Undugu's Business Advisory Unit provides business training and loans to the program's graduates in order to help them set themselves up in their trade. The Society has also established an Industrial Design department to work on improving the design and marketing of goods and services produced by the informal sector, and specifically in the trades that Undugu supports and by the artisans with whom apprentices have been placed. Staff of the industrial design unit hold workshops for the informal sector artisans who are collaborating with Undugu on the design and marketing of their products, in effect using Undugu apprentices as a vector or vehicle for progressive technical upgrading of informal sector production.

A variety of other approaches

The SKI Courier Service in Khartoum. A different but related approach has been taken by the non-governmental organization (NGO) Street Kids International in its work in Khartoum, Sudan. The problem of how to secure for these young people an insertion into urban society and the urban economy led the organization's staff and the young people themselves to reflect on the "comparative advantage" that street children might have on the urban market. One of their skills is that they do in fact know the streets—i.e., the highways and byways of a conurbation like Khartoum—and are able to handle themselves effectively in what others might find to be an intimidating environment. Staff and street children put this fact up against what economists call current "rigidities" in the urban economy, and in particular the difficulty of getting important packages and materials from one side to another of Khartoum's sprawling traffic jams. And they came up with the idea of a Street Children Courier Service.

As developed, this initiative involved

- Procuring bicycles for the cadre of couriers, which each child could then reimburse from their work proceeds
- Training the children in the delivery scheme and appropriate safety measures
- Helping to establish the central organization and accounting measures that would make the activity feasible.

It was, in fact, a considerable success; and the model was replicated with good effect by SKI in Banglore, India a few years later.

Artisans' Associations in Senegal (ENDA/GRAF). Initiatives supported by ENDA (Environment and Development) Third World in the urban area of Dakar, Senegal, started in a sense at the other end of the stick. ENDA staff were involved in helping informal sector artisans—in carpentry, leather working and beverage manufacturing—to form their own associations in the interests of upgrading their technology and resolving common problems of supply and marketing. Each activity began, however, with a thorough "reconnaissance" of the local environment. It is ENDA's practice, and particularly the habit of its action research unit (*Groupe recherche-action-formation* or "GRAF"), to base all local development work in urban slums upon action research carried out with the beneficiaries. One of the prime issues identified in this exercise by the artisans themselves was the situation of the numerous out-of-school youth on foot in their neighborhoods.

As a consequence, the associations resolved to create their own apprenticeship system to provide avenues for socialization into the workplace and adult life for these young people. The Carpenters' Cooperative was the most active in this regard and has developed a system for rotating the out-of-school youth whom it adopts as apprentices among a series of master craftsmen to learn different aspects of their trade and then—with ENDA/GRAF's help—initiating them as well into accounting and management for small business.

SERVOL in Trinidad. A final example of note is taken from a location well off the African continent, but linked to it in numerous historical and cultural ways: the island of Trinidad in the West Indies. Problems of youth-adult transition in urban environments are every bit as pronounced there as in the three cases just examined—and in a sense, the origins of one of the best known programs that has sought to deal with them, SERVOL ("Service Volunteered for All"), were similar as well. Like the Undugu Society, SERVOL was founded by a Catholic priest concerned with deteriorating conditions for youth in the city. Like Undugu, it has grown into an organization that offers not just employment but alternate paths of socialization into adult life for its charges. Prime among these are the SERVOL "Life Centres."

As the name implies, the Life Centres are much more than vocational training facilities. To begin with, they are built by their adolescent members to house workshops, classrooms and community facilities. Each serves as a preschool center as well, and all participants must take some responsibility for the infants. Then, too, a major emphasis is on peer counseling and opportunities for young people to talk through the varied social and emotional challenges they face, in a context imbued with values from the island's three religious traditions: Christian, Muslim and Hindu. The young people participate in development of their own "SPICES" curriculum: Spiritual, Physical, Intellectual, Cultural and Emotional savvy. From there, participants may move into vocational training and employment or qualify for modest loan funds to start as entrepreneurs on their own. The program drop-out rate is only 5 percent, the post-training employment or successful self-employment rate over 75 percent.

Essential ingredients: employment, meaning and self-direction

All these examples represent efforts to fill the void in apprenticeship of adult roles for impoverished young people thrown out of a traditional framework and into the vortex of African cities. And they seem to succeed best where they manage to "recreate tradition", infusing the customary cat-

egories of apprentice and age-group association with new economic direction and increased self-direction and definition by the participants.

A few other lessons emerge from this rapid overview of efforts to assist Africa's impoverished youth in building new identities:

- An "adult education" approach works best, insofar as it involves building on the experience and skills that young people already have and giving them a determining role in guiding the program.
- Gainful and meaningful employment is a cornerstone of new identities, but not the cement. That is provided by a vision of the future—whether religious, cultural or political—and the opportunity to apply it to one's own life. Peer counseling is a frequent element of successful programs.
- Traditional forms of apprenticeship and youth association should be used as repertoire and resource, but also be critiqued. Such programs are typically a crucible for many neighboring cultures.
- Discovery of one's environment—and advocacy for change—are critical complements to any effort.

Indigenous Knowledge for Development Program

Two Years Down the Road

This IK Note was written by Siddhartha Prakash of the Africa Region, World Bank.

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Knowledge as a vehicle for development is under-used. In the past, most African nations adopted economic policies with a view to modernizing society and transforming the productive sectors. Indigenous knowledge that could have supported this process, or in some cases, offered an alternative perspective, was often relegated to the backwaters. However, the 1992 Rio Earth Summit, through the notion of sustainable development, catapulted these practices to the forefront of the development discourse. Policymakers worldwide, through conferences and workshops, have begun to highlight the critical role of indigenous knowledge in the development process. The first of these was the Global Knowledge Conference held in Toronto in June 1997.

Under the auspices of the Partnership for Information and Communication Technology for Africa (PICTA), the World Bank was encouraged to lead the Indigenous Knowledge (IK) for Development Initiative in collaboration with other organizations such as UNESCO, ITU and WIPO. The Initiative aims to facilitate a multilateral dialogue between indigenous communities, NGOs, governments, civil society and the private sector. The objective is to mainstream indigenous knowledge into development activities and optimize the benefits of development assistance, especially to the poor. The Bank adopted a framework for action, which is being implemented in conjunction with its partner organizations.

Two years down the road, its time to review the Bank's progress in achieving these goals. Has the IK Development Initiative been effective in disseminating information; facilitating information exchange among developing communities; applying Indigenous Knowledge in the development process; establishing partnerships?

Disseminating information

Since its inception, the initiative has developed a database of indigenous knowledge and practices with over 100 case studies on the web. Each one draws upon the lessons learned from the experiences of a particular community in dealing with an aspect of development. The case studies are not meant to be a repository of knowledge, but a referral database on IK. They cover a wide range of activities—including indigenous financial practices among farming communities in Nigeria, AIDs prevention through involving traditional healers in awareness campaigns, reintroducing local architecture

in Egypt, common water resource management in Burkina Faso, and indigenous healing of war-affected children elsewhere in Africa.

The range and complexity of subjects that can be effectively dealt with through the application of indigenous knowledge and practices are being documented in a series of IK Notes. These are published electronically and in print in three languages, reaching over 20,000 readers. Each of the 19 IK Notes to date explores in some detail sensitive issues, such as female circumcision, and describes locally driven solutions. These range from the efforts of indigenous women's NGOs that have successfully campaigned against such practices to lobbying the government to introduce new laws. Each case reinforces the success of a bottom-up approach to development. In cases, where international agencies such as Unicef have assisted, they have merely provided backup support via financial assistance and international recognition. In each case, the initiative is always "home grown" and locally owned. This has in turn strengthened local institutions and led to some cutting edge work in areas such as education and Koranic literacy in West Africa.

The IK Notes have shown that "individuals without any formal education, from villages with minimal resources, can improve their lives and environment through a solid program leading to greater autonomy and self sufficiency". These success stories endorse the universality of indigenous knowledge, which can play a key role in the process of empowering local communities, at the regional, national and global level.

IK Practice No: 12
Country: NIGERIA
Domain: Rural Finance
Technology: Savings and Loans
Application: Indigenous financial practices among farming communities
Summary: Farming communities in Nigeria have developed various systems of saving and lending. Normally farmers would form savings associations with an emphasis on savings and access to the resources on a rotational basis. Some of the associations would formulate regulations and by-laws while the majority has strong but undocumented formal rules and regulations. Once a member, saving is compulsory and expected on a regular basis, usually related to market days. The loans are used for non-consumables, but also for payment of school fees or farm labor. Repayment is ensured through social control. Usually members do not receive interest on deposits, loans are granted on favorable terms. No mention is made of dealing with defaulters; it is assumed that social control is sufficient to ensure a sustainable S/L association. However, the savings base is too small for accumulation or for credits to finance major investments. So far there has been little recognition by the formal credit institutions of the existing indigenous financial practices.
Lesson: Existing indigenous rural savings and loan associations are yet to be recognized by the formal credit sector. Collaboration on an equitable basis would increase the impact of formal institutions and increase the investment potential in rural areas.
Source: Nweze, N.J. IK Monitor 2(2) August 1994
External Link: IK Monitor

Facilitating exchange

The World Bank has supported eight IK Resource Centers in Africa, by improving their capacity to share information. This has taken many forms. In Cameroon, Tanzania, Ethiopia and Zimbabwe, the project facilitated the capturing of IK through stimulating research into IK practices by local centers. In Burkina Faso and Uganda, the project improved the connectivity and networking capacity of local telecommunications. As a result, rural community Telecenters are now being used to obtain information from local communities and disseminate the knowledge generated to other regions.

Applying Indigenous Knowledge

One of the greatest achievements of the IK Initiative has been its initial success in mainstreaming the use of IK in development programs and projects. It supported Uganda in formulating a national policy on IK, Ghana in the use of IK to improve agricultural practices, Burkina Faso in highlighting the role of traditional hunters in natural resource management.

In July 1999, the Bank initiated a study in collaboration with UNCST to explore the diversity of IK in Uganda in relation to agriculture, health sciences and technology. This formed the basis of a national strategy that would include all the stakeholders, from indigenous healers to civil society, as well as policy makers.

Six months later, a national workshop involving these key players was held to draft a national strategy and framework for action. This was the genesis of the Kampala Declaration on IK for sustainable development. The Declaration urges the government to support the development of IK and planners to include IK in the national planning process. This is being implemented in several ways, such as including IK into Uganda's Comprehensive Development Framework (CDF), led by the Ministry of Planning. This is a joint partnership between donors and governments aimed at accelerat-

ing the pace of growth in Africa. In Uganda, one of the goals is raising agricultural productivity. The IK Initiative has played a facilitating role by establishing a Steering Committee to monitor the implementation process and a Secretariat to coordinate activities specifically related to IK.

The IK Initiative is moving beyond policy making into project management. It has begun advising the Ugandan National Agricultural Research Organization (NARO) on the use of IK in Bank supported Agriculture, Research and Training Projects (ARTP). The second phase of the ongoing ARTP (II) project is aimed at supporting long term technology development and dissemination. The IK Initiative's role is to provide the methodological input to transfer relevant technologies and IK and improved cultural practices to farmers' fields and promote their adoption. Examples of such practices include the improved cultural management of *Matoke* to reduce the harmful effects of the *Sigatoka* disease and small farm implements designed for the smaller cattle of Uganda such as the improved Ugandan plow. Although, the project is still in its infancy, it is hoped that its success can be used to mainstream and replicate the use of IK in the development of new projects.

Establishing partnerships

The project has expanded its support base by establishing close partnerships with several development organizations, NGOs and IK Centers. More than 75 percent of the best practices disseminated on the web were provided by these partners. The initiative is growing beyond PICTA members. It has for instance, begun to work with WIPO to address the intellectual property rights aspect of IK. At the grass roots, the Initiative has begun to engage local communities and learn from their experiences. By supporting NGOs and institutions such as UNCST, the Bank has played an enabling role in bringing together traditional healers, academics, ministers, civil society and the church. As a result, indigenous organizations such as Traditional Herbalists Associations are able to pursue a two-way dialogue, with government institutions on a level playing field. By creating channels for local communities to voice their concerns at the regional and international level, the project has made significant progress towards mainstreaming IK into the development process in Africa.

Next steps

The challenges ahead include:

- Intensified efforts to mainstream IK into the development process
- Greater donor involvement and active participation
- Facilitating interactive exchanges through establishing communities of practice (through various fora—e.g., Development Marketplace)
- Forming local alliances around topics such as IPRs to facilitate enablement and empowerment.

Indigenous Knowledge Goes to School

Potential and Perils of Community Education in the Western Sahel

This article was co-authored by by Peter Easton (Florida State University), Chris Capacci (Community Schools / Kolondiéba, Mali) and Lamine Kane (ANAFA / Senegal). The research was carried out under the joint aegis of the Club du Sahel / OECD, the Interstate Committee for Combating Drought in the Sahel / Comité Inter-état Contre la Sécheresse (CILSS) and the Association for the Development of Education in Africa.

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For indigenous knowledge to have significant bearing on the future of West African societies, it must gain some currency in schools, the social institution officially chartered to organize learning, certify knowledge and train the next generation of citizens. And yet across the region education has been the sector least likely to embrace local knowledge or to regard indigenous science as a legitimate source of inspiration. Exceptions to the rule have mostly occurred in nonformal education and literacy programs, which are more frequently conducted in African languages and focused on local community needs.

New ways of schooling

Changes that have taken place throughout West Africa in the situation of formal primary education over the last twenty years, however, have begun to breach the wall that separated schooling and local society. They are at the same time creating a space for new curricula. Prime examples:

- Universal primary education remains an elusive goal. By reducing resources available for education and restricting public sector employment, the structural adjustment policies applied to West African countries beginning in the 1980s put a dent both in popular motivation for schooling and the capacity of the State to provide it. Gross enrollment ratios at the primary level, which averaged under 30 percent for Sahelian countries in 1980, progressed very little over the ensuing decade—negative growth in Mali, (-3 percent), barely 4 percent in Niger, and between 1 and 2 percent a year in Burkina Faso, Mauritania and Senegal. Coverage shrank in most rural areas.
- Governments have begun turning to alternate formulas and supply mechanisms to reverse enrollment trends, achieve coverage and/or increase relevance. These include community schools, increased support for nonformal education, and a variety of experimental programs.
- Traditional formal schooling has been subject to increased cultural competition and critique from other models: some centered on "appropriate development," others on religious instruction, adult education approaches or African-language curricula. Reform of primary and secondary schooling is nearly everywhere on the agenda.

- Civil society is playing an enhanced role in educational supply. Non-governmental organizations (NGOs), private foundations and local associations are increasingly authorized and encouraged to create their own schools. Government is less and less concerned with exercising monopoly rights in the area of education, though it conserves key regulatory functions.
- The formal educational system itself is being decentralized to an unaccustomed degree, with greater discretionary powers being placed in the hands of regional inspectors and local educational councils.

It is this diversification in provision and search for cultural identity that has opened the door, however hesitantly, to new curricula and new sources of inspiration and has created new opportunities for the recognition of indigenous knowledge.

A history of experimentation

In one sense, of course, the search for alternate forms of schooling is not new to West Africa. In fact, the very notion of "indigenous curricula" is heavily tainted with remembrances from colonial times, when terms like these were code words for distinguishing the kind of education judged appropriate for rural or "native" populations from the kind reserved for an urban elite. Excess demand for formal schooling, however, or its perceived shortcomings led to a variety of alternative educational delivery models in post-independence Africa. The Harambee movement in Kenya is a prime example of the former: schools created by communities in the absence of State provision, though subsequently taken over by the government in many cases. The Serowe Brigades in Botswana and "*Enseignement moyen pratique*" in Senegal exemplify the latter: attempts to make school curricula relevant to local development by infusions of appropriate technology training, practical business experience and local cultural reference.

There are, though, some important quantitative and qualitative differences between the varied experiments in alternative schooling or community sponsorship launched over the early decades of West African independence and the situation obtaining today. In quantitative terms, alternative and community-based schooling has become, for the first time, a significant slice of the overall national system in a number of countries like Mali, Senegal and Burkina Faso. Such efforts were traditionally "pilot projects," destined—it seemed—never to expand beyond their select locations. They have broken out of this enclosure to an increasing degree, accounting presently for nearly a quarter of all elementary schools in rural Mali and are projected to total 20 percent of those in Senegal in the next few years. Qualitatively, alternative education is no longer necessarily second class, though issues of equivalency with traditional diplomas and promotion schemes (discussed below) remain acute. The increasing legitimacy of instruction in African languages, gradual shifts in power toward local actors under slowly decentralizing regimes and changes in the employment prospects of school leavers have all eroded the hegemony of the single standard Western curriculum and opened space for different and complementary approaches.

The search for alternatives has taken a variety of forms—State-sponsored community schools; NGO-sponsored community schools; State-sponsored pilot or reform schools (generally traditional elementary schools selected to adopt one or more of the innovative methods of community schooling and to apply it within a formal educational framework); increased interest in Koranic schooling or hybrid Islamic-Western forms; and private or "wildcat" schools started by individuals or entrepreneurs, particularly in urban areas.

The community involvement model

In the Sahel as elsewhere around the African continent, community schools are premised on the notion of greater parental and community involvement in the governance and delivery of education. Local "ownership" of schooling is developed and expressed in several ways:

- *Financial participation:* Contributions to the construction and equipment of classes, to school operating expenses and to teacher stipends.
- *Administrative participation:* Involvement in decision-making concerning school administration and regulations.
- *Curricular participation:* An increased role for parents and community members in choosing and specifying curricula, in teaching classes and assessing student learning.

Curricular participation is evidently the variety of community input of greatest relevance to the inclusion of indigenous knowledge in schooling, though financial and administrative participation may be necessary to make it effective. Among the measures proposed for achieving it in the case of outside-sponsored community schools are use of the local languages for instruction; adoption of local artisans as resources for instruction, either through their actual teaching of courses or visits by children to their places of work; record-

ing and teaching of local history along with other subject matters; and inclusion of locally-inspired religious or moral education.

In addition, some of the NGOs and civil society institutions involved in sponsoring community schools are animated by an explicit desire to create new curricula more appropriate to the challenges of local development in 21st century Africa. The *Institut d'Education Populaire* in Kati, Mali, for example, has labored long and hard on the elaboration of an elementary school "Ciwara" program (the Bambara word for the antelope-head totem symbolic of Malian identity) focusing on the acquisition of "leadership" skills—in short, young people's ability to play a decisive role in the development of their own communities.

In both Senegal and Mali, moreover, the civil society partners involved in support for community schools tend to be associations with parallel involvements in other sectors of local development, like natural resource management, health and agriculture. CEWIGAP in northern Mali ("Community Education, Water and Income Generating Activities") and organizations like Tostan and ANAFA in the Djourbel region of Senegal, for example, combine their school sponsorship with a variety of other projects. This cross-breeding creates increased opportunities for introducing local development topics into the curriculum of elementary and secondary schooling, along with local sources of related knowledge.

Difficulties of implementation

Unfortunately, a great deal is still more said than done in this realm. The indigenous knowledge elements in the community school model tend to be those least frequently implemented, for they require the most imagination and energy, not to say willingness to break with existing norms. In fact, there is a general tendency for schools of this sort to become simply low-cost if not low-quality replicas of existing primary schooling, due principally to the resource constraints that they face.

Human resource constraints. Teachers generally have minimal training and may have limited education. In some models, literate villagers or parents are selected by the community itself to undergo a few days of training; in another, volunteers paid by donated funds are recruited from among unemployed school leavers and assigned to villages.

Financial constraints. Community education models are designed to be inexpensive, a solution to the prohibitive costs of generalizing the existing school infrastructure. They count, to the extent possible, on local materials and funds, and these are often scarce. Areas where communities are expected to pay teachers often experience particular problems.

Technical constraints. Building an alternative curriculum takes experience and insight that are often in short supply. The biggest challenge is reconciling local content with a program of studies that enables some, at least, to continue to further formal education should they desire to do so. This synthesis, called "pédagogie convergente" in Mali, depends to a great extent on finding a way to teach the international language used in secondary and higher education from a basis of literacy in the local or national language, and doing so with the assistance of teaching personnel who themselves often do not have a mastery of the former. The effort typically takes such energy that little is left for developing the indigenous knowledge inputs into the curriculum.

Political constraints. The success of community schools is partly contingent on the possibility of building institutional bridges to subsequent formal schooling, what are called "passerelles" in the Franchophone countries. This terrain tends to be heavily guarded by the proponents (and products) of traditional primary and secondary education. Ironically, as provision of alternate education is expanded and delegated to local associations and NGOs, there is often increased stasis on this political front, because local associations feel less "empowered" to challenge the existing educational constabulary on this terrain than might ministerial representatives or large international organizations.

Concerns for quality

"Quality" and "equity" are keywords in the debate about the future of community schools in Sahelian West Africa. The former invokes the criticism most often leveled at the movement: education is made available to new communities and students, but *what* education? Can poorly supervised teachers who are unable to handle the lingua franca of the formal system and schools without textbooks or amenities offer children anything worth having? And doesn't this sort of provision pose as much of an equity problem as it resolves—by creating a two-tiered system, where the rural and urban poor get only the caricature of a "real education"?

These days proponents of community schools are very aware of the issue, and internal evaluations within organizations sponsoring schools tend to focus increasingly on quality concerns. At the same time, proponents typically have two rejoinders that at least serve to broaden the debate. First, what exactly is meant by "quality"? Do commu-

nity involvement, literacy in the local language, incorporation of cultural contents and direct relationship to development concerns in other sectors figure in the definition, or are standardized test scores and passage rates to secondary school the only criteria? Second, in respect to equity, what are the tradeoffs between local gender equity and increased parity between city and countryside? Community schools do at least have on average a distinctly better record of female participation than their formal sector counterparts.

Education by all?

Both the community school movement and the attempt to give indigenous knowledge a place in local schooling therefore face formidable obstacles. Community schools nonetheless constitute one of the most massive opportunities for greater recognition of indigenous knowledge to have arisen so far in Sahelian West Africa and already have several major accomplishments to their credit. As evaluation surveys in both Senegal and Mali reveal, they are generally well appreciated by consumers—that is, parents and local authorities—principally because of their use of African languages and their potential congruence with local culture.

The recent move toward NGO and local association sponsorship has also meant a closer link with other realms of local development where indigenous knowledge is both needed and used. And the movement constitutes a sizeable wedge for reform of schooling in general—as witness the number of times that its example has been invoked in the "Estates General" (or national assemblies on education) convoked by Sahelian countries in recent years to address issues of educational reform. Community education in fact embodies one potential form of "Education *BY* All," a strategy" critically needed to complement increasing emphasis on "Education FOR All"—and it represents a venue within which indigenous knowledge might come into its own.

At the same time, the perils and potentials of the community school movement illustrate the kinds of policy changes that will be required to achieve the systematic promotion of indigenous knowledge in contemporary West Africa.

Seeds of Life: Women and Agricultural Biodiversity in Africa

This article was written by co-authored by Peter Easton and Margaret Ronald, Florida State University. The research was caried out under the joint aegis of the Club du Sahel/OECD, the Interstate Committee for Combating Drought in the Sahel/Comité Inter-état Contre la Sécheresse (CILSS) and the Association for the Development of Education in Africa.

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Agricultural development worldwide has caused, as one of its downsides, the replacement of native plant species by marketable crops and a parallel reduction in the diversity of the seed stock. The disappearance of plants with potential medicinal uses, particularly in areas of high biodiversity like tropical rain forests, has been headlined in recent years; but crowding out of the natural diversity of edible species by standard, and sometimes genetically altered, cash crops—and the replacement of "landraces" (indigenous plant types) by commercial farming—constitute an equally serious problem.

Efforts are now being made to constitute reserves and pools of threatened varieties of food crops. Indigenous knowledge of edible plants is one key "pool" of biodiversity in Africa—and one in which women play a vital role.

Bean farming in Kenya

Bean farming among the Kikuyu in Kenya provides a case in point. Available evidence indicates that in precolonial times a large variety of different bean species was cultivated in the Kenyan uplands. Beans moreover constituted a critical element of the diet of rural people, furnishing a rich source of protein to complement maize consumption and other available foodstuffs. In particular, the varieties of indigenous black beans termed "njahe" in Kikuyu (largely *Lablab niger* and *Dolichos lablab* by their scientific names, and "lablab beans" in English), which were cultivated by women, constituted a good proportion of the harvest. Njahe had, moreover, special meaning for women, as the bean was considered to increase fertility and to have curative virtues for post-partum mothers. It was at the same time a quasi-sacred food. It grew on the Ol Donyo Sabuk mountain, the second most important dwelling place of the Creator in Kikuyu religion, and it was widely used in divination ceremonies.

Beans in Kenya are predominantly a small landholder crop, largely farmed by women to feed their families. Traditionally, women tended to grow multiple varieties on the same field—and to conserve multiple seed stocks—as a hedge against disease and unpredictable climate. Local dishes, like "githeri" and "irio," also were based on multiple types of beans.

These patterns began to change in colonial times. The British administration was principally interested in in-

creasing maize production, which provided the least expensive supply of food to feed railroad construction workers, and in introducing other cash crops like cotton and sisal to ensure tax payments. The strategy developed for advancing this agenda included providing financial incentives and favorable pricing for maize cultivation, on the one hand; and, on the other, introducing new varieties of white and red beans with export potential (to Europe in particular) in order to replace the njahe and other "native" species. Though a considerable variety of bean species was experimented with over the years by the colonial agricultural extension service, few proved adapted to Kenyan conditions or acceptable in local diets. Those that did—Canadian kidney, rose coco and *Phaseolus vulgaris*, in particular—gradually took over the market and began pushing njahe out of production. The colonial agricultural extension service also carried out purification campaigns to eliminate multicropping of mixed beans and to ensure a practice of "one variety per location"—generally an exportable variety. Pure or sorted beans were priced at two or three times above mixed crops.

The costs of monocropping

The phenomenon had real consequences for nutrition, for agricultural biodiversity in the Kenyan highlands, for soil fertility, and for women farmers themselves. Replacement of beans by maize in local diets began a downward spiral in the food intake of the rural population which, while scarcely attributable only to this factor, has continued unabated. At the same time, elimination of many of the multiple varieties of beans cultivated in precolonial times had, for parallel effect, impoverishment of the agricultural genetic stock, developed over thousands of years of human agriculture in East Africa. Intensive "maize mining" and neglect of the nitrogen-fixing properties of legumes like njahe resulted in the progressive impoverishment of soils. Bean monocropping led in turn to higher susceptibility of these crop stands to disease. Finally, since bean cultivation constituted an important element in the economic activity of women and their capacity to nourish their families, the pressure to produce income and abandon beans inevitably contributed to the increasing out-migration of women to urban areas.

Colonial policies were in effect extended into the period of Kenyan independence, by default if not by design. Continued preoccupation with cash crop and export production, monopoly of these activities by men, and economic pressures from taxes and the need to pay school fees all kept attention away from women's roles in bean production and the conservation of seed diversity. Not until the 1970s did the prejudice against traditional bean species begin to relax, as Kenyan agricultural policy underwent gradual re-Africanization.

Examples across Africa

The situation described in Kenya is scarcely an isolated phenomenon. Across Africa, similar stories could be evoked—stories of the gradual impoverishment of seed stocks under the pressure of cash cropping and of the parallel negligence of women's roles in agriculture and their key function as guardians of biodiversity. In fact, Africa is one of the world's regions with the lowest quotient of original to imported seed stock—a characteristic typical elsewhere of zones of settler implantation, like North America and Australia. Seed stocks and germ plasm constitute a kind of botanical repository of indigenous knowledge. Because of their responsibility for family subsistence, women have for millenia been central to the breeding of food crop species, the preservation of seeds and the domestication and use of wild edible plants. Concerns with susceptibility to disease and insurance against crop failure under climatic stress and unpredictability have led them to diversify these stocks and cultivation patterns.

- In Burkina Faso and throughout the West African Sahel, for example, rural women carefully collect the fruit, leaves and roots of native plants like the baobab tree (*Adansonia digitata*), red sorrel leaves (*Hibiscus saddarifa*), kapok leaves (*Ceiba pentandra*) and tigernut tubers (*Cyperus esculentus L*) for use in the diet of their families, supplementing the agricultural grains (millet, sorghum) that provide only one part of the nutritional spectrum and may fail in any given year. More than 800 species of edible wild plants have been catalogued across the Sahel.
- In southern Sudan, women are directly responsible for the selection of all sorghum seeds saved for planting each year. They cull seeds and preserve a spread of varieties that will ensure resistance to the variety of conditions that may arise in any given growing season.

The role of women farmers worldwide

Equivalent stories can be recounted about gender and agricultural biodiversity in other regions of the world as well. In agricultural societies around the globe, women have tended to be the custodians of biodiversity.

• Researchers from the Wageningen Agricultural University of the Netherlands have found that women in the Kalasin region of northern Thailand play a critical role in managing the interface between wild and domesticated species of edible plants. They have both brought new species of wild plants under cultivation in recent years and spurred their communities to carefully regulate collection rights in the face of increasing commercialization.

• Women in the Dalwangan and Mammbong communities, Bukidnon province, Mindanao (the Philippines) have played an active role in constituing a "memory bank" of indigenous germplasm with agricultural researchers, because they share the concern for diversity. "I cultivate different kinds [of sweet potatoes], as many as I can get cuttings of," one farmer commented, " because each has its use and none is proof to all disasters."

• In northern India, an elderly woman farmer puts the matter succinctly as she selects seeds for storage: "It takes a sharp eye, a sensitive hand and a lot of patience to tell the difference between these seeds. But these are not the things that are honored any more."

• In the United States, genetic modification of tomatoes by agro industry has led to species that have a long "shelf life"—i.e., ability to ripen in transit or in grocery stores after being harvested green—and even a square form that facilitates packing in crates. These characteristics make tomato-farming a more profitable activity and one easier to carry out on a large scale, but have had for parallel consequence poorer taste and loss of genetic diversity. A minor market has sprung up in "heirloom tomatoes"—species preserved in many cases by women gardeners and now conserved and reproduced for the organic customer.

Turning the tide

Is there still time in countries such as Kenya ? Yes, but not to waste. The diminishing diversity of seed stocks puts food security at risk, because of the greater vulnerability of a narrow band of species to climate change and other environmental events. And it seems unlikely that the situation can be turned around without paying much closer attention to the means by which traditional farmers have nurtured seed stocks and indigenous species, and the key role that women have played in this enterprise.

The njahe bean itself has nonetheless recouped a part of the terrain lost over the last century. With the abandonment of export ambitions for white beans, African tastes for red and black varieties have begun to reassert themselves. But dried beans—and the female labor that traditionally ensured their volume and diversity—remain subsidiary in the Kenyan economy.

Increased sensitivity to issues of biodiversity—triggered by the rain forest and the example of disappearing species with medical significance—has sown new seeds of hope in this realm, however, both for Africa and for other developing regions. The International Center for Tropical Agriculture (CIAT) in Cali, Colombia is coordinating a multiyear participatory research program on gender roles in agriculture and participatory plant breeding (Participatory Research and Gender Analysis: "PRGA" , on the web at http://www.prgaprogram.org). One branch office has been established in Uganda for the African Highlands Initiative, an explotation of participatory gender research in East Africa. At the same time, the West African Rice Development Association (WARDA), headquartered in Bouaké, Ivory Coast, has given increasing attention to the preservation of biodiversity among rice farmers of the Sahel and has sponsored research into related practices in southwestern Mali. (See http://www.cgiar.org/warda/)

Strengthening Traditional Technical Knowledge: The Sugar Cane Wine Example

This article has been excerpted from the original in French by LUZIETOSO Nguala Ph.D (GREDA), BOM KHONDE Paul Charles Ph.D (GREDA), and BAZABANA Jean Jacques Magloire Ph.D (GREDA). GREDA stands for Groupe de Recherche et d'Expertise sur la valorisation des savoir-faire locaux pour le Développement en Afrique.

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African countries are endowed with considerable potential for processing a large variety of plants (fruits, leaves, roots, tubers, stems, flowers), to make food and drinks (fruit juices, wines, etc.). In the context of globalization, local products already in high demand in their region of origin could also be successfully marketed nationally and internationally. Although a few of these traditional products are found in some local markets, most of them remain little known. Sugar cane wine is one of them.

In Angola, Congo, and the Democratic Republic of Congo (DRC), sugar cane has three main uses. First, it is consumed as a "*canne de bouche* " (literally, cane for the mouth), to quench one's thirst, and/or to assuage one's hunger. Consumers peel the cane with a knife, chew on the tender part, suck on it, swallow the juice and get rid of the bagasse (the fibrous portion of the sugar cane remaining after the juice has been extracted). Second, it is used as a raw material to produce sugar. Third, it is used in the preparation of sugar cane wine, called "*lungwila*."

This article examines the knowledge process used to make sugar cane wine, a traditional product in the three countries mentioned. There are several reasons for this choice: (i) the wine-making traditional process is an ancestral practice, transmitted from one generation to the next; (ii) sugar cane wine consumption is growing substantially in rural as well as urban areas. Indeed, the product is known and well-appreciated in the capital cities of the three countries mentioned, with approximately 9 millions inhabitants (2 million in Luanda, 600,000 in Brazzaville, and 6 million in Kinshasa), as well as in other less populated cities and towns; and (iii) the market for sugar cane wine is therefore potentially important, and sugar cane (traditional) processing contributes to job creation and constitutes a source of income for small food processing enterprises, established mainly in the rural areas and suburban zones. The knowledge used is specific to the local populations of Northern Angola, Southern Congo and the Western Democratic Republic of Congo, allowing entrepreneurs from these regions to enjoy a comparative advantage. In addition, the growing demand for sugar cane wine has a stimulus effect on sugar cane production, and is increasing the need for the equipment and packaging.

Building on traditional knowledge

Sugar cane technology

The expansion of the sugar cane wine market has helped to improve production plant and work organization. In Kimbongo, an area of intense activity, wine processors have formed associations in order to reduce the difficulty of the work. They use bagasse as a fermentation substrate. To replace the one-lever press, they invented a manual two-lever press, and then a mechanical press. In 1997, Mexican technology was imported and introduced in the various regions where the wine is produced. It was adopted because it shortens the transformation process, reduces the difficulties in the work process, and improves the rate of juice extraction. However, its use remains limited because of its high cost, and local artisans are developing a local version.

Knowledge transmission

The sugar cane winemaking process comes from the ancient kingdom of Congo. Descendants of various communities who use to live there are now found in some regions of Angola, Congo, and the Democratic Republic of Congo.

This knowledge is held by men only—usually elders— and raw material is usually self-supplied. Women are active in the final stage, i.e., in the marketing of the finished product. Historically, the knowledge is transmitted within clans and families, from one generation to the next. With urbanization and the introduction of sugar cane wine in some markets, other forms of transmission have emerged, particularly within producer groups and associations as well as in peri-urban environments.

Small business owners transmit it to their employees, who, usually, are their relatives. Within wine-making associations, the learning system that prevails is relatively different, with two coexisting modes of apprenticeship: elder to younger transmission, and knowledge sharing.

The first method of apprenticeship (elder to younger) is the one found in family-owned businesses, where the main beneficiaries are the younger, or those untrained persons who wish to start their own business.

The second method is based on knowledge sharing. It is a system where members of associations exchange their know-how. A member who masters a specific operation (fermentation for example) will share it with his peers, and will receive in exchange some other knowledge. These exchanges contribute to improving the skills of the producers group as a whole.

Unlike other formal learning systems, beneficiaries from traditional training do not have to pay to acquire it. This is a solidarity system inherited from ancient traditions. For entrepreneurs, this system has numerous advantages:

It reduces starting costs. Indeed, the entrepreneur who wishes to produce sugar cane wine can easily acquire the related knowledge. In Kimbongo for example, hundreds of processors start their businesses without having to go through the usual administrative steps, and without information and training costs.

In addition, every entrepreneur who becomes part of a producers association in urban as well as rural areas, can improve his knowledge through the custom of experience-sharing between members. This can be considered as a form of continuing vocational training developed by local communities as well as collective innovation management without the support of the usual formal appropriate institutions.

Prospects

Indigenous technical knowledge is often under-estimated by development researchers, decision-makers, and practitioners. This situation has had a negative impact on the design and implementation of policies.

The example of sugar wine making in the DRC highlights some important lessons regarding indigenous technical knowledge and its importance for African economic development. Some issues need to be highlighted. The production process is characterized by low productivity, disrupted activity, shortages in raw materials and supplies (due to the seasonal harvesting of sugar cane), storage problems for large quantities of wine, etc. This situation creates regular wine shortages on the supply side.

In addition, traditional technical knowledge does not permit the exploitation of by-products (bagasse, peelings). Moreover, not to recycle these waste products aggravates pollution in the workshop surroundings. Finally, the traditional production process lacks the packaging and bottling techniques adapted needed for remote markets.

Regarding these constraints, it is crucial that development agents (entrepreneurs, researchers, NGOs, public authorities, etc.) try to both understand traditional technical knowledge and strengthen it. In this instance, the focus needs to be on developing appropriate packaging, recycling waste, and improving production plant facilities, etc.

Strengthening indigenous technical knowledge

Development practitioners seem to be paying more attention to the objectives and functions of scientific indigenous knowledge. This does not mean that external assistance is not useful or needed - it means that these practitioners should built on their indigenous knowledge and skills. The combination of traditional and exogenous techniques (non-traditional but also traditional, emanating from other com-

munities), may contribute to improving the production process. This approach is quite different from the one that proclaims that development agents know "everything" and constitute the best transfer mechanism for science and technology from research and development institutes to local communities. The producers and users of local knowledge are often the real "experts". Scientists and technologists, when involved in development, should listen to them and make the most of their knowledge and experience, and find ways to complement each other's knowledge.

In spite of the technical difficulties that they encounter and their relative exclusion from the national production system, users of traditional knowledge are technically capable of responding to changes in production conditions and finding innovative solutions to their problems. It has often been noticed that the more critical their situation, the more inventive they become. Indeed, local communities often resort to a wide range of traditional knowledge to adapt their production techniques in order to ensure a good quality for their final product.

Research and development organizations have a critical role to play in the acknowledgment of indigenous technical knowledge, and the promotion of development programs aiming at their valorization. Indigenous technical knowledge may be revitalized by decentralized forms of government emphasizing a policy of local development. In addition, the current trend in favor of so-called "ethnic products" opens a new way to the development (through export) of products born from traditional activities.

Promoting indigenous technical knowledge

The current globalization of exchanges requires a reorganization of African economies. This requirement is becoming more and more necessary and raises problems that the centralized approaches (of the Keynesian type) are unable to help solve. Decentralization at the regional and local levels allows the application of economic solutions to problems that are better apprehended by a decentralized entity, closer to those who are supposed to devise these solutions, apply them and benefit from them. The creation of businesses relying on indigenous technical knowledge also means jobs creation at a local level. This approach would trigger a new dynamism of economic activity based on local human, physical, and financial resources. Such local initiatives may result in the emergence of a local industrial structure comprising of small businesses. This would of course need an enabling environment and appropriate assistance.

Development agents can promote these activities through focusing on innovation processes in collaboration with producers organizations. These organizations can also form partnerships within the framework of decentralized cooperation structures. Government awareness of the social and economic impact of these activities is essential, in order to design and implement an incentive-based policy to promote the commercial development of local products.

Mali

Indigenous Knowledge: Blending the New and the Old

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How is indigenous knowledge brought out of the traditional closet, into synergy with new technologies and into application on new development tasks? What are the "pedagogies" by which it is elicited, relearned and reworked? An experience more than two decades old from the Republic of Mali suggests some valuable lessons.

Hidden structure, hidden knowledge

In Mali, as in many Sub-Saharan African countries, there has been a strong bifurcation between the customs and knowledge of traditional rural cultures on the one hand and the systems and technologies of official urban society on the other.

In the late 1970s, a team of Malian researchers assisted by the author conducted a thoroughgoing evaluation of functional adult literacy in the Western and peanut-growing regions of the country. The region was then under the agricultural guidance of a parastatal corporation, the *Opération Arachides et Cultures Vivrières* (Peanut and Food Crops Operation or "OACV"), which was charged with developing production and upgrading farm technology. In fact, the literacy program itself was administered under OACV tutelage and concentrated—at least in theory—on the skills that rural residents needed to improve production and take increased responsibility for credit and market operations. In fact, however, OACV had, up to that point, done little to transfer authority and resources for local operations to communities that demonstrated literate competence.

The results of the first year of evaluation demonstrated that, if the literacy program had attained its full quantitative objectives in only a few localities, the vast majority of participating communities had nonetheless managed to produce a "nucleus" of literate people—generally from 5 to 8 young adults. These villagers were then charged by the others with principally shadowing the marketing teams sent out to buy commercial crops by OACV, in order to protect against fraud, and monitoring tax bills and remissions. As the evaluation team remarked after closer inspection, the result seemed the consequence of a very accurate assessment by local people of the nature and magnitude of literacy's uses in the rural environment. Market and tax monitoring were important, but not frequent enough from an individual point

of view to justify each person or family mastering the new skills. Once "collectivized" and assigned to a small team of village residents, however, they made for critical and profitable work.

On the strength of its assessment, the evaluation team succeeded in convincing OACV officials to approve the transfer of marketing functions—and of a portion of the profit margin on commercial crop sales—to villages having a sufficient number of new literates to handle the tasks. And the team was then responsible, during its own trip around rural areas at the outset of the following year's literacy campaign, for explaining the policy change and the modalities of its application to village leaders.

An interesting thing then transpired. During colonial times, villages throughout the Malian countryside had adopted the habit of naming a fictitious chief and set of counselors to meet with the French administration whenever it came visiting. Contacts with the colonial administration were considered, for the most part, beneath the dignity of the true traditional authorities and seldom relevant to the village's lasting interests. The same pattern persisted in many areas after "flag" independence in 1960, because representatives of the modern Malian state were felt to be no less foreign to traditional culture and scarcely more supportive of its conservation and well-being. In more than one village, therefore, the evaluation team began presenting the new policy and its implications to a first set of local notables. As soon as the village counterparts realized that a serious transfer of power and resources was under discussion, however, they asked to be excused and then, as if on a revolving stage, a second set of negotiators took their place: the real traditional authorities.

Priming a social process

How are traditional culture and its store of knowledge genuinely "engaged" in development projects? A perception of true interest, like the one that intervened in those discussions of the transfer of marketing functions, is obviously a key ingredient. But indigenous science may be trickier to flush out of cover and express than the simple perception of self-interest. As an Ewe proverb puts the matter, "The bird of knowledge – one person alone can never catch it." Knowledge that is social in nature and culturally transmitted typically comes forth in social situations, where groups of people form to resolve what they perceive to be important problems or to communicate wisdom across generations.

Methods for priming this process were developed in Mali by the same group of researchers in connection with an effort undertaken to create other uses for literacy. With World Bank support, the Ministry of Education sponsored in the months to follow a study of new directions for nonformal basic education, premised on the notion that newly acquired literacy should be considered a starting point for new training relevant to rural development as much as a goal achieved. The research team devised three training sequences for newly literate young adults – one on agricultural fertility, one on accounting systems for village enterprise, and one on the diagnosis and prevention of prevalent infectious diseases.

Methods for eliciting local knowledge

This was training with a difference, however. The researchers wished to blend outside technical knowledge in each domain with the insights of local culture and tradition — and to do so by involving those most aware of the latter: the elders in each community. They therefore worked out a procedure with several distinct steps:

First, the researchers met with village authorities to ask their permission to discuss with the elders current local problems and possible solutions in the area under consideration (declining soil fertility, rampant river blindness, or difficulties in starting local enterprise). Since communities were chosen in localities where one or another of these problems was already particularly acute, agreement was rapidly reached in most cases.

During the session subsequently held with the village elders, the research team took care to dwell on (a) the nature and importance of the problem, as perceived by the community itself; (b) the availability of new technical methods that —if adapted and appropriately applied—might offer hope of effective solutions; and (c) the presence of young people newly literate in Bambara who potentially had the tools and inquisitiveness to learn new approaches and share them with others.

The researchers then proposed the idea of holding in the village a training workshop to analyze the problem and test new solutions. They promised, in this case, to bring study materials, information on the new technologies and some material for trying them out. And they requested that the elders sponsor the initiative and delegate the young people to attend and report back to them on the applicability of the new methods. Three villages ended up accepting the challenge and sponsoring the training, one on each of the topics.

Ingredients in the recipe

The key challenge was then organizing the experience so that it was not just an opportunity for the dissemination of technical material and advanced training of the young people involved, but an occasion and stimulus for the expression of related local knowledge. To ensure this outcome, the training sessions, which lasted two weeks each, had five closely-related elements:

• *Technical content.* Researchers served as trainers but made sure that at least one highly skilled technical resource person was associated with each of the sessions. The team developed the initial curriculum, based on the Bambara translation of available dissemination materials.

• *Hands-on developmental work.* Each training included "laboratory" work with some tools and new technologies of relevance to the problem. Researchers responsible for the infectious disease program, for example, came armed with simple microscopes with which trainees could examine samples .

• *Field inquiry or local needs assessment.* Each training also entailed survey of the extent and nature of the problem in the locality by the trainees themselves.

• *Comparison with indigenous knowledge.* Researchers explicitly and systematically created occasions for expressing local knowledge about the problems under study and comparing these insights with the dissemination material.

• *Experimental trial and analysis.* Each training was designed to identify issues regarding the actual trial of new methods and based on the observation of their results.

The critical interaction with indigenous knowledge was handled in two ways. First, during the phase of field inquiry into current practices and needs, the trainees were careful to survey not just the problems people were encountering but also their understandings of root causes and their methods for addressing the issue. Still more importantly, *the evening of each day was devoted to a feedback and discussion session with village elders.* At this time, the young trainees reported on events that had transpired and lessons learned during the day and sought reactions and suggestions from their elders about what these results meant and where to go next. This collective reflection proved to be the ideal venue for bringing out elements of traditional knowledge, comparing it to the "scientific" notions introduced in the training and bringing both to bear on the resolution of problems.

Local knowledge of water-borne diseases

Though all three training episodes followed this general model, actual details of the sessions differed from one location to another as a function both of differences in the problem situations and differences in the social context. Each experience, though, shed new light on the methodology itself.

Training on infectious diseases was conducted in the village of Fasa, close to the Baloue River basin, a fertile farming area largely abandoned over the preceding years due to the high incidence of river blindness (onchocerciasis) and schistosomiasis. People in various stages of river blindness were quite evident in the village itself; and the community chose to focus on these two water-borne infections. A full census of those affected throughout the community was carried out by the trainees, who discovered that almost 25 percent of the population carried the onchocerciasis tumor and more than a third of those were already in at least the incipient stages of sight loss.

The local knowledge of the hosts regarding the parasites and the stages in their life cycle turned out to be considerable. The technical assistant to this training—a doctor from the University of Marseille—was astounded to find that the village elders knew things about the life cycle of the schistosome parasite that he believed only to have been discovered in French laboratories two years previously.

Understanding soil fertility

The training session focusing on soil fertility was held in the village of Suransan Tumoto, north of the town of Kita in the peanut-growing regions of western Mali. The soils here had been depleted by successive commercial crops and the yields had begun to plummet. After an initial study of soil chemistry, the trainees set about their work by interviewing elders regarding the types of soil found in the village environment and the plants that had traditionally grown on each. They then carefully surveyed the topography and condition of this flora around the village with the help of an agricultural technician from the national research institute and brought back results for discussion with the entire community.

A comparison of agricultural extension themes on soil fertility with local knowledge of soil conditions and associated plant led to the decision to create an experimental farm station to test different methods for improving agricultural yields. Unfortunately, this initiative was thereafter stopped by a conservative reaction from OACV, which judged it inadmissible to try out with local farmers types of experimentation its own extension agents had not mastered.

Indigenous accounting systems

The training workshop on accounting and village enterprises was held in the cotton-growing region of the country, where crop marketing by newly literate personnel from local communities had opened the way to a certain amount of economic diversification. The movement, though, had encountered a serious obstacle: lack of Bambara language accounting systems that would allow local staff to assume full control of crop markets and to create other enterprises with the proceeds of this activity.

Here, after studying accounting methods, trainees interviewed elders concerning traditional means for ensuring accountability and carried out a workshop to inventory and create an appropriate Bambara-language terminology for the various steps in the process. The workshop concluded with the production and testing of an entire series of Bambara-language accounting forms and with a presentation to the assembled community of a locally-conducted audit of its financial operations.

A pedagogy for expressing indigenous knowledge

The common denominator in all the sessions was the systematic attempt to take account of local knowledge and to bring it to bear on the design of new solutions to the development problems in question. This was accomplished by a judicious and creative application of long-standing adult education principles:

- Focus on felt needs
- Start with what people already know
- Associate them as teachers in the learning enterprise
- Create a context for collective reflection and recall of relevant experiential data
- Vary modes of instruction
- Follow through to application or resolution of problems.

But the key factors in mobilizing indigenous knowledge in these experiments—or turning the "revolving stage" pictured in the opening anecdote—were the middle ones in the list above. They involved ways of affiliating the "repositories" of that knowledge in commissioning training, then in taking part themselves in the search for solutions, all within a social scenario that lent itself to group reflection. The approach borrowed something from two sources—from the traditional African social structure, which assigns deliberative roles to the elders, management tasks to the householders and technical ones to the young people in a manner meant to be synergistic and complementary; and from participatory action research, which entails organizing learning around the tasks required to solve a problem.

Under these circumstances, the comparison and interaction with "modern science" became a stimulus rather than an inhibition to the expression of indigenous knowledge. Much of traditional knowledge—as of any scientific system—is fundamentally *taxonomic*: accumulated observation and organization of the different types of naturally occurring phenomena and their inter-correlations. The reservoir is rich, but the lack of means to record and compare individual variations or test and analyze planned interventions have left the agenda (sympathetic mastery of natural forces) incomplete. The kind of training organized in Mali and described here creates an opportunity not only to express indigenous knowledge and bring it to bear on development problems, but also to fulfill its own potential for improving the human condition through comparison and collaboration with a tradition that is more systematically based on the analysis of natural and planned variation.

Traditional Medicine and AIDS

This article is reproduced in its entirety, with permission, from Lancet, *8th April 2000, Volume 355, page 1284. The original title of the article was " A Regional Task Force on Traditional Medicine and AIDS". The authors are Gerard Bodeker, Donna Kabatesi, Rachel, King, Jacques Homsy, Green College, University of Oxford, Oxford OX2 6HG, UK; THETA, Uganda; and Medecins Sans Frontieres, Uganda.*

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A regional task force on traditional medicine and AIDS in east and southern Africa will be *(sic*) inaugurated in Kampala, Uganda, on April 10, 2000. The task force will coordinate activity related to the widespread use of traditional medicine by people with HIV/AIDS in Africa and the role of traditional healers in AIDS prevention. The nine-member task force of east and southern African non-governmental organizations (NGOs), international organizations, and west African observer delegations, will share information, generate an inventory of activities about traditional medicine, document and distribute best practices, promote research in traditional medicine, and mobilize resources. The task force will recognize the fact that in Africa, the high cost and scarcity of many essential drugs, including antiretroviral drugs, means that most people with HIV/AIDS use traditional herbal treatments for HIV-related conditions including opportunistic infections. In Uganda, there is one traditional health practitioners for every 200–400 people, whereas the availability of trained medical personnel is typically one per 20,000 people.

The plan to establish the task force arose from a UNAIDS-sponsored conference in Kampala, in February, 2000. 100 delegates from 17 African countries met to review the effect of traditional healers on HIV prevention and care. The meeting was hosted by Traditional and Modern Health Practitioners Together Against AIDS (THETA), a Ugandan NGO that promotes collaboration between traditional and modern health practitioners in the fight against AIDS. Support was provided by UNAIDS and the Association for the Promotion of Traditional Medicine (PROMETRA), an international NGO based in Senegal. THETA has taken the lead in east Africa in developing partnerships between biomedical and traditional health sectors.

Many of the conference delegates argued at the Kampala meeting that, in view of its widespread use, traditional medicine is in a real sense carrying the burden of clinical care for the AIDS epidemic in Africa, a trend largely overlooked by health ministries, international agencies, and donors. Delegates focused on collaboration between the traditional and modern health sectors. They identified projects that meet criteria for "best practice" responses to the AIDS epidemic in Africa. Most countries in the region reported some initiatives involving traditional medi-

cine and practitioners. Dr Sandra Anderson of UNAIDS, South Africa, noted that "traditional health practitioners occupy a critical role in African societies and are making a valuable contribution to AIDS prevention and care". THETA director, Dr Donna Kabatesi, cited clinical data on Ugandan herbal treatments effective against herpes zoster and HIV-associated chronic diarrhea and weight loss. Professor Charles Wambebe, head of Nigeria's National Institute for Pharmaceutical Research and Development, reported preliminary clinical data on a Nigerian herbal medicine that seems to increase CD4-cell counts and lead to improvements in HIV-related illness; controlled clinical trials are now underway. Dr Mberesero Firmina of the Tanga AIDS Working Group presented findings on Tanzanian herbal treatments for HIV-related fungal infections.

Although traditional health systems are locally accessible and culturally relevant, they must first be rendered safe. Most importantly, poor documentation, a lack of standardization, and the absence of regulatory mechanisms for traditional health-care practice in many countries were seen as challenges to be overcome if traditional medicine is to be more systematically included as a key player in AIDS prevention and care. Mutual misunderstanding between modern and traditional practitioners, weak organization of healers, and sensationalist media reporting all contribute to the marginal status of traditional medicine in African countries. Despite many governments and international agencies calling for "recognition" of traditional medicine, the lack of serious commitment and action on this issue was seen as a key impediment to identifying effective indigenous approaches to AIDS prevention and care and to building strong partnerships for an integrated strategy against HIV/AIDS. As a result, scores of medicinal plants that are used daily in Africa and may have potential effectiveness against opportunistic infections or HIV remain unknown or uninvestigated, while most Africans with HIV/AIDS cannot afford modern drugs with proven effectiveness.

Noting the need for a regional network of organizations currently working in isolation with traditional medicine and HIV/AIDS, the meeting proposed the establishment of the task force, for which THETA will serve as the Secretariat. Task-force members include the Traditional Health Practitioners Association of Zambia, and the Zimbabwean National Traditional Healers Association. There will be observer groups from the west African nations of Ghana, Nigeria, and Cameroon. International partners are UNAIDS, WHO/AFRO, and the Global Initiative For Traditional Systems (GIFTS) of Health and its partner organization the Commonwealth Working Group on Traditional and Complementary Health Systems. GIFTS has accepted responsibility to lay the groundwork for a network of researchers and institutions to build a research program that will identify, assess, and develop safe and effective local treatments for HIV-related illnesses. The program will use simplified but controlled clinical protocols to conduct rapid investigations of promising treatments. It will build databases for information sharing on the successes and failures of local treatments. The program will be based on an intellectual property rights framework to protect the rights of local knowledge holders, learning lessons from a few existing programs in Africa. Recognizing the global, unsustainable pressure on wild stocks of medicinal plants, sustainable horticulture will be promoted for priority species. A solid government research infrastructure, backed by international agencies, will need to be developed to ensure a rapid research response to positive preliminary findings. This strategy will be designed to guide promising herbal treatments through to the stages of development of safe, effective, and affordable medicines. It will emphasize, where applicable, the local production and dissemination of useful herbs at the national, community, and family level, towards an African solution for combating AIDS in Africa.

Uganda

Information Technology and Rural Development: The Nakaseke Multi-Purpose Telecenter

This report was written by Siddhartha Prakash of the World Bank, and is based on a field visit to the Nakaseke Multi-Purpose Tele-Center in May 2000.

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It is often said that modern technology tends to bypass local communities found in remote regions. However, some recent technological advancements in communications have begun to blur geographical distances and infra-structural bottlenecks. Located 50 kilometers north of Kampala, Uganda in a remote village, the Nakaseke Multi-Purpose Community Tele-center has introduced new information and communication technologies to this rural area. In three years, the telecenter has catalyzed a number of development activities in the region.

Nakaseke sub-county has a population of over 38,953 of which 18,617 are women. Nakaseke town itself has a population of 3,000 people, most of whom are the Baganda—the biggest tribe in central Uganda. The community is largely oral and does not have a established reading culture. Till the telecenter started in 1997, newspapers were only available in the next town 16 kilometers away and connected by a rough road.

The Nakaseke Telecenter is part of a chain of five donor (UNESCO/IDRC/ ITU) supported telecenter projects initiated in Benin, Mali, Mozambique and Tanzania. The overall objective of the project is to stimulate rural development by facilitating access to information, learning resources and communication technologies by the Nakaseke and Kasangombe communities and support improved medical services through telemedicine.

Current activities include computer applications training, and Internet, e-mail, telephone, fax, library, and photocopying services, an Open Learning Center (for outreach), topical video shows and audio recordings and community listening and newspapers, as well as leisure and sports activities for young people.

While the telecenter aims at serving the entire communities of Nakaseke and Kasangombe, it focuses on the following core user groups: women, youth, children, medical, workers, teaching staff, farmers and local leaders. The content and programming for the telecenter is therefore tailored towards meeting primarily the needs and aspirations of these groups.

Implementation strategy

The participation and involvement of the community is central to the implementation of the telecenter's activities. Since it was started, the community has been at the center of the planning and execution of the all activities. A local steering committee was elected from

and by the community representing each of the core target groups to:

- Supervise the telecenter's daily activities
- Liaise with the management committee
- Mobilize the community to participate in all activities and programs
- Steer community ownership programs and involve the community in any activities that promote the sustainability of the telecenter, including organizing fundraising activities.

Impact

The community has access to a modern library/resource center, telephone connectivity and an information communications technology (ICT) core unit for all ICT-related activities/services.

The multi-purpose telecenter has transformed the lives of the local community. It has provided internet, telephone and fax services that are being utilized to conduct local business activities. Computer training has provided jobs for the youth, who now have access to a fully-fledged library with major international journals and books. Farmers have begun to engage in on-line trading and use the telecenter to capture and disseminate information about local farming techniques and crop prices. The telecenter has begun to implement an Indigenous Knowledge Program in collaboration with local farmers, which could be utilized as an affective focal point to conduct community to community exchanges. Farmers are now requesting for market rates and general trends regarding the crops they grow.

The school community (7,000 school children) as well as community workers and medical officers have benefited from the resource center. The community (42 villages and 3,000 households) is gradually appreciating the importance of information as evidenced by the growing number of people inquiring about information on a variety of issues. The daily newspapers available at the telecenter have also helped to keep the community up to date with what is going on in the rest of the country.

Agricultural project utilizes indigenous knowledge

While Uganda's population is expected to double over the next 30 years however, a necessary and corresponding increase in agricultural growth is a cause for concern. The present low agricultural growth has been attributed, among other things, to poor research-extension–farmer linkages and ineffective technology delivery systems, including poor or inefficient information and communication packaging and delivery systems.

The agricultural project aims to:

- Increase overall agricultural productivity and household incomes in Nakaseke and Kasangombe Sub- counties.
- Support agricultural extension workers in providing information and guidance to the farming community.
- Directly link research work and farmers' units, thereby enhancing the flow of information from both sides. International, national and local institutions will be linked to the telecenter as the hub for agri-consulting.
- Provide a forum for experimentation on the use of ICT to deliver timely agricultural information and dissemination of research results.

From the beginning, the project incorporated local community knowledge into its organizational structure and framework. It established a special section in the library to gather and disseminate IK-related information, which was used to increase the responsiveness of local farmers to changes in government policy with a view to raising agricultural productivity at the regional level. A photographic display shed light on traditional approaches to natural resource management, savings and informal transfers and local medicinal approaches and applications.

Over the last three years, through a process of trial and error, all actors involved have been trained to demonstrate a high degree of adaptability. Several community-based workshops and study tours were organized to train local farmers to understand and anticipate fast-moving trends so as to adopt the correct response strategies.

Field research was conducted to understand and appreciate indigenous approaches to farming, which focused on the complexity, diversity and risk prone approaches of many farming systems. The study tours effectively showcased the knowledge, professionalism and rationality of small and poor farmers. A series of formal and informal discussions brought out their experimental mindset behavior and ability to conduct their own analysis.

The accessibility, diversity and timely relevance of information were key elements for enabling all parties to adapt and make a change for the better. Different modes of communication such as internet, telephone and fax determined the extent to which the process of dialogue, negotiation and communication, between the different parties involved, was strengthened. The telecenter played a key role as a facilitator, by connecting Nakaseke to other parts of the country/world and vice-versa. For the first time, the local community could engage in an ongoing dialogue with other communities and share their experiences.

Impact

- Extension agents, NGOs and farmers are well-trained in the use of ICT.
- Relevant agricultural information are accessed and developed in collaboration with at least three research institutions. Technologies and crops include post harvest, banana, coffee, horticulture, root crops and cereals.
- Training manuals, information brochures, guides leaflets and posters are developed.
- At least 65 percent of farmers in Nakaseke and Kasangombe are exposed to this approach and 98 percent of agricultural extension agents and community development workers are involved.

In addition to agriculture, the Nakaseke Telecenter has developed a series of projects that utilize the knowledge and expertise of local communities particularly in the fields of education, gender and healthcare. This includes an innovative Tele-Medicine Program being developed in collaboration with the Nakaseke Hospital. Once in operation, the idea is to be able to link local patients with medical practitioners in Kampala and other cities and vice-versa. This could prove to be an effective forum to mainstream the use of traditional medicine being practiced widely across Africa. In this way, Tele-centers could serve as a platform for capturing and documenting indigenous knowledge and disseminating it from one local community to another.

Lessons learned

Involving the community at an early stage in the planning and implementation of the project helped to mainstream telecenter issues into the general activities of the community. Localizing the ICT applications to a level that is understandable to all community members helped to sell the telecenter concept. This was achieved through translating information packages into Luganda — the dominant local language of the community. Illustration of new concepts and programs is the key to deep appreciation and understanding, especially if it concerns an illiterate community. It is vital to recruit local "sons and daughters of the soil" to manage the daily operations. They know the community better than any other expert and communicate in the 'language' that the people understand.

Nakaseke is a successful example of transferring the maintenance costs from donors to the local communities, thereby moving towards sustainable local ownership. The community has successfully, out of their own tax collections elected a permanent building for the telecenter and found other sources of funding to support the construction work. It also lobbied the government for a new telecom tower to facilitate the connection of over 50 new telephone lines in the region. This confirms the extent to which rural communities appreciate the value of information in the development process.

The challenges ahead

In a new nitiative like the telecenter, there is a critical need for documentation. It offers numerous tools that could be effectively used to document the rich diversity of indigenous knowledge in the region. The process has begun by training researchers in ethnographic research methods and developing a methodology for data gathering and recording in a databank. This is being achieved through the use of audio-visuals and by recording views in written documentary.

The next step is to develop a framework for information dissemination, sharing and networking. The process has begun through forging practical linkages within ICT initiatives in and out of the country. The telecenter has a plan to share documentation systems and record keeping with other telecenters involved in the pilot within the country.

Additional programs are being developed to mainstream the knowledge captured by the Tele-center, including one on community trade and business practices. The program will empower local traders with the ability and insight to appreciate and critically analyze their commercial environment, with a view to cultivate a savings culture and control expenditure. The focus will be on documenting and mainstreaming indigenous entrepreneurial practices and applications.

Indigenous Knowledge and Local Power: Negotiating Change in West Africa

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Alhough the development, articulation and systematization of indigenous knowledge in Africa are most often seen as issues of culture and local epistemology (the study of the nature and grounds of knowledge), they have at the same time critical power dimensions. The relation between local knowledge bases—and practitioners—on the one hand and central or Westernized ones on the other is manifestly a high-power/low-power situation, a matter most often quite acutely and accurately perceived by local people themselves. Until and unless the "terms of trade" between these two spheres are significantly altered, or at least cast in a framework that promises some renegotiation, it is entirely understandable that the repositories of indigenous science would choose to keep it "off the market."

Telltale patterns of literacy acquisition

A story from an evaluation of functional literacy in Mali two decades ago illustrates the point and provides a basis for further examining the problem. In the late 1970s an effort was undertaken—with joint Ministry of Education, Ministry of Rural Development and World Bank funding—to inventory and assess results from several years of functional literacy classes in the villages of the western portion of the country. The literacy program had been established through the parastatal agricultural operation responsible for the development of cash and food crop farming in the region, as a means of gaining local farmer confidence and providing people with ways of scrutinizing commercial transactions. The results were mixed. Two aspects of the "balance sheet" of outcomes drawn up by the team responsible for the participatory evaluation effort clearly illustrated the concerns of villagers with power relations.

The first lay in the figures on that balance sheet themselves. In the initial design of the Bambara-language literacy program, it was assumed that each community would create a training center, enroll and make literate some twenty adults, then create another class and train a second group of similar or larger size. By the end of four years, somewhere between thirty and fifty newly literate participants should have been on the rolls in each community concerned.

The actual results both fell well short of this objective and turned out, upon closer examination, to be highly significant. Almost nowhere across the entire region did one find a community where more than ten "new literates" had been trained. On the other hand, it was equally rare—excepting a few cases of major implementation failure—to find villages where no one had learned anything. In case after case, the program seemed to have resulted—after several years of effort, an appropriate amount of rhetoric and a generally weak record of material support by government agencies—in the emergence of a nucleus of new literates, generally between four and seven young men. Why this number and so seldom less or more?

Interpreting the record

The answer seemed to lie in the real uses to which literacy in Bambara could be put under circumstances then applying in western Mali. Though the program was publicized with all the appropriate rhetoric about the importance of learning and the functional value of the new learning, in point of fact there were few opportunities to apply knowledge of written Bambara in the rural environment. What formal schools existed were all conducted in French, few if any publications in written African language could be found, and the medium of writing in Bambara was not used to any practical ends by either the local government or the agricultural operation itself. Moreover, there was an acute lack of credit or investment opportunities that might have made the creation of locally run enterprises a viable.

But to say that there were few outlets for the use of literate and numerate competence did not mean that there were none. Control of tax transactions with the government and oversight of farm marketing functions were two issues of major interest to local actors, because they saw themselves as being so regularly exploited in these areas. Viewed from an individual perspective, the monitoring of tax remittances and agricultural marketing was not a frequent enough activity to justify each adult becoming literate and, perhaps more importantly, "numerate." However, when these functions were "collectivized" and confided in a handful of (generally young male) villagers, they made for valuable, regular and sometimes remunerated work undertaken in defense of the community as a whole. As a consequence, in village after village, the evaluators found that the training programs had resulted in the creation of a nucleus of four to seven new literates who organized and assumed these functions. The local people seemed to have accurately assessed the magnitude of opportunities for use of the new knowledge as well as the imperative of better collective self-defense and to have thus modulated their response to the programs.

Results from the first year's participatory assessment were communicated to officials of the agricultural operation to demonstrate the existence of core groups of literate farmers across the region. This was done in the hope of motivating them to offer communities with this sort of nucleus—and the demonstrated capacity to train the number of people that new economic and political opportunity justified—the chance to take over larger portions of agricultural marketing responsibility and to receive, in return, a significant slice of the profit margin on the sale of the crop for rebate to individual farmers or collective reinvestment in locally-directed development projects. After some negotiation, agreement was finally reached on this major change of policy and the evaluation team set out, on the eve of the following agricultural marketing season, to communicate this news to local authorities along with a summary of the results of the initial round of the participatory literacy evaluation. The effort produced the second major lesson about local knowledge and collective self-defense.

Distinguishing "for show" and "for go"

First, though, a word of background. During the period of French colonial rule, throughout rural areas of the western Sahel, local communities became accustomed to dealing quite circumspectly with representatives of the central regime. Each village named, in effect, its own puppet government—that is, a set of fictional local authorities who would meet with the French whenever that was required, gather information to be relayed back, if necessary, to the real village chief and his counselors and generally relieve them of the necessity of dealing directly with colonial agents. This pattern was maintained well into the period of African independence, because the representatives of the new national regimes were often perceived as no less alien or inimical to local interests than their colonial predecessors.

This attitude was clearly if subtly manifested during the first year of evaluation work on more than one occasion. One of the Malian evaluators involved in discussions with local authorities noted that the word they themselves used in Bambara for the cooperatives set up by the national government to handle farm production and marketing was something more than what it seemed to be—a deformation of the French term "coopérative." He asked people to repeat what they were saying, listened respectfully and made a few discreet inquiries after the discussion was over. What people were actually saying was "ko-fara-tinti," a Bambara pun on

the French term that meant, literally, "skin the back and plunge in a dagger." It was, in effect, an eloquent and lapidary commentary on how local people then saw the underlying objective of State agricultural policy.

Given this level of suspicion, it was no surprise that the evaluation team ended up meeting—both in the first year and during the dissemination efforts at the beginning of the second—with puppet authorities in most communities visited, even if these people were indistinguishable, to an unpracticed eye, from the true local officials. But something of great interest transpired early in the second year when the evaluators came back to relay the news of the government's decision about the transfer of marketing responsibility and related resources into local hands. No sooner had these topics been broached than their interlocutors asked for a pause in discussions. They quietly disappeared from the scene and, after a short interval, were replaced, as if on a revolving stage, by a new set of counterparts—the true village authorities. If there was a chance that real transfer of power and resource was in the offing, then it was time to bring indigenous culture and authority into the balance.

Four decades of experience

The lesson is reinforced by experience in other countries of the region—Burkina Faso, Cameroon, Niger and the Central African Republic—with literacy and agricultural management programs. By far the most success in the rapid acquisition of new skills and mobilization of local knowledge in related efforts of institutional development have been recorded in circumstances of durable transfer of authority and resources into local hands. In fact, programs based on participatory design of the knowledge systems and local language tools required to effectively manage new economic activity and political jurisdiction seem to provide an ideal medium for "inventorying" and articulating related indigenous knowledge—because they create an environment in which it is clear (or at least clearer) that the cultural treasures exhumed and deployed will serve local interests and remain under local control. And, under these circumstances, literacy training itself turns out to be an excellent medium for mobilizing local knowledge, because it provides an opportunity and tool for "renaming" development and for reconfiguring the details of its implementation.

This proved true, for example, in a series of experiments with the local management of rural enterprise in which the authors took part: in central Niger in the late 1960s, again in Burkina Faso in the 1970s, in northern Cameroon in the 1980s and among the livestock herders of the Central African Republic in the early 1990s. The Cameroonian case involved the creation of an entire accounting system in the Massa language, whereas the Central African Republic experience was based on training Fulani herders already literate in religious Arabic script in the Romanized transcription of their own language. The literate training itself took as little as three or four weeks of intensive instruction developed with—and monitored by—the local population; but the follow-up period of assumption of new powers and management responsibilities was critical and more prolonged.

Who controls the knowledge?

Similar conclusions could be drawn from the experience with participatory agricultural experimentation and extension work undertaken in Mali on the heels of the literacy evaluation described above. There the incentive for local participants was the chance to take charge of agricultural experimentation themselves, while both learning the new skills required and assessing the store of local knowledge relevant to the endeavor. No small part of the motivation sprang from the opportunity to "turn the tables" on traditional agricultural extension work—where resources, methods and paradigms remained under the strict control of government agents and were devoted to producing products and procedures in official experimental stations for top-down dissemination to farmers. Local authorities were very responsive when invited—and enabled—to draw up the experimental designs themselves and name people who would undergo related training. However, the undertaking was eventually undermined by the firm opposition of the official agricultural extension services to this kind of contestation and decentralization of their rights and privileges.

Articulating and expressing local knowledge, as these examples illustrate, is therefore much more than an "epistemological" and cultural undertaking. It is hedged about by questions of power and the "terms of trade" between local and central societies that are simply reconfirmed—in another particular sphere—by recent concerns for the copyright and patent protection of indigenous pharmaceutical or botanical lore. Devising strategies that mediate these conflicts and weave creative transfer of authority and resource into reconstruction of local knowledge is the true challenge.

West African Languages: Medium and Message

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Indigenous knowledge in Africa, and the world over, is expressed in language, and usually in an "indigenous" language—in short, the mother tongue of inhabitants of the locality, or a *lingua franca* in regular usage by them. Are these languages simply a neutral medium? Are they just instrumental "vehicles" for the expression of local knowledge and daily life? Or do the languages themselves play some role, by their very structure and usage, in what is thought and known?

Language is very important in Africa. There are upwards of 2,000 languages on the continent, the number varying as a function of the way in which distinctions are drawn among neighboring or related speech traditions. African cultures have been largely oral ones for centuries though varieties of writing (Western, Arabic and a few codes of African origin) have become increasingly well known. In many areas, the status and role of "praise-singer" or "griot" is institutionalized to the point where an entire caste of people devotes its life to learning and orally declaiming the history and traditions of the locality and of its leading inhabitants. African cultures also typically place great emphasis on social relations and communication, all of which adds to the critical role played by language in the organization of community and of knowledge.

The examples in the paragraphs to follow are principally drawn from Hausa, the second most widespread tongue in Africa (after Swahili) and a member of the "Chadic" group of languages. It is principally spoken in northern Nigeria and central Niger, but is used as well in several other countries of the region. The patterns are nonetheless roughly representative of a host of western and central African language traditions.

Language as "capital"

Hausa speakers give every bit as much importance to spoken expression and language as suggested above. *Magana jari ce* a traditional saying maintains: "Language is capital." In the Hausa lexicon, the word *hausa* itself signifies not just the speech of that particular population group, but "language" in general and underlying "meaning." *Me ne ne Hausarka?* people will ask: "What language do you speak?", or, literally "What is your 'Hausa?'" *Ban gane ba Hausarshi* is a common way of saying that "I don't understand what he *means*."[1]

[1] *Northern* Hausa is used throughout all these examples and quoted expressions.

At least three levels of Hausa language may have a bearing on how thought is formulated and knowledge expressed: the grammar of the language, its lexicon and the social patterns governing its usage.

The deep structure of grammar?

One of the first things to strike a non-Hausa speaker—and a non-African in particular—in going beyond the fundamentals of the language is that the verb system is not really organized into tenses. In other words, the primary information that the grammatical form of the verb phrase conveys is less *when* something happened or will happen than it is *how* that action is viewed by the people involved and what the nature of their intentions is with respect to it. Though the divisions of the verb parallel to some degree the tenses of many non-African languages, they are better described as "aspects." Action is thus linguistically divided into the categories listed below.*

Once again, the primary information conveyed by this aspectual organization of the verb concerns the state of human intention and commitment with respect to the action, not the time, even if there are analogies with a tense system. Someone who is leaving a party or house will therefore say to their host *Naa*—which, translated as a temporal statement, would signify (nonsensically) "I have left." What is meant, however, is that the person has decided to leave, and therefore the act is as good as done in the intentional realm.

A focus on intention

In a similar vein, the principal concern of the Hausa speaker is often with the nature of one's resolution or commitment to perform an act and with the process of decision itself, rather than with the exact date and duration of the act's performance. Hausa speakers sometimes express frustration with Westerners' frequent use of the word "perhaps" (*watakila* in Hausa) in their conversation and planning. The habit is seen as a way of avoiding commitment. A popular saying puts the point succinctly: *Watakila abin da ya hana ma nasara* k*arya!* "Perhaps is the word that saves [literally "prevents"] the Westerner from lying."

Such patterns of expression by no means exclude attention to schedules and timing, and temporal planning concerns have certainly become a more prominent fact of Sahelian life in the last half-century. At the same time, this perspective or "paradigm" may not be so poorly adapted to circumstances where logistics have long been highly unpredictable and lasting commitment has been essential to getting things done—and it may have relevance to the future needs of African society as well.

Verb aspect	Example Hausa phrase	Meaning in Hausa	English equivalent Meaning	"Tense"
Completive	*Yaa tahi*	His leaving can be regarded as completed. (Commitment is accomplished.)	"He left"	Past tense
Continative	*Ya naa tahiya*	He is in the process of leaving or going. (The intention is being accomplished.)	"He is leaving" or "going"	Present tense
Projected	*Zay tahiya*	He plans to leave or go	"He will go"	Future tense
Potential	*Yaà tahi*	"He MAY go." (His commitment is real but conditional.)	"He will very likely go if circumstances permit"	Weak future (no equivalent tense)
Intentional	*Yà tahi*	He should or must go. (Others' —or his own—intentions are clear but not executed.)	«Let him go» or «that he go»	Subjunctive
Habitual	*Ya kan tahi*	He is in the habit of going	More or less «he usually goes»	No equivalent tense

* The transcription used for Hausa words and phrases throughout this article is, in general, the one currently prescribed by UNESCO. The table and paragraph to follow are one exception. Long sounds are represented by doubled vowels, as was formerly the case, because there is no other handy way to bring out differences among the verb aspects. A "grave" accent indicates a low tone, and such an accent on the second vowel in a cluster indicates a falling tone.

Using words where it counts

The notion that language does not just express thought, but also shapes or influences it to some extent, has a long history in western linguistic and cultural thought and remains hotly debated. Benjamin Lee Whorf and Edward Sapir were among the first to articulate it, and the "Whorfian" or "Wharf-Sapir hypothesis" still stirs controversy. Without steering toward those particular shoals, one can at least entertain the idea that the form of a language is part and parcel of indigenous knowledge and a factor to be studied—and savored—in the attempt to preserve it.

Whorf himself paid attention not just to the structure of languages but to their lexical properties as well—i.e., the vocabulary, and, more specifically, the differences between the areas of experience that different languages seem to emphasize by the richness of their lexicon. He was fond of remarking that Eskimo languages have multiple words for different varieties of snow, but only one for all types of motorized conveyance; whereas in English it is nearer the reverse. Critics have aptly pointed out that ski enthusiasts likewise have multiple terms in *English* for varying snow conditions. But the idea that the relative development of different areas of experience in the lexicon of a language says something about the distinctions that are important to its speakers still merits consideration.

An examination of a Hausa dictionary brings some similar ideas to mind. Once again, there are relatively few traditional words for motorized tool—though a number of introduced ones—but the terminology for varieties of relationships among people (both consanguineous and covenantal) and for shades of behavior is extremely developed. Three examples: (a) *nurkurkusa*—which can best be rendered as "continually putting off paying someone"; *kwakyara* for "blurting out what ought not to have been said"; and *santi* (or *fanya*)—which designates "saying something ordinary during a group meal that, due to general pleasure with the quality of the food, sends everyone into peals of laughter"!

Lexical creativity

Any African language can be used, of course, to say whatever one wants, and assimilation of new ideas and terms is no less prevalent in these languages than it is in English, French or Chinese—an example of what social scientists call "lexical creativity." Hausa is no exception to the rule. New terms have been created over the years for a host of initially foreign concepts, with sometimes poetic results. The United Nations was dubbed *majalisar dinkin duniya* or "the assembly to unite [literally, 'sew together'] the world."

The small French-made Solex motorbike—a simple contraption where the motor rode on top of the front wheel, driving it by friction — was baptized in Hausa *kare ya dauko tukunya:* "the dog carrying a cooking pot." And its slightly larger cousin, the "mobylette," was christened more onomatopoetically *dan bututu*. (The letter *"d "* being what linguists call an "implosive" sound.) There is, in fact, a Hausa Language Board in northern Nigeria that rules—much like the Académie Française—on neologisms and appropriate ways of expressing new ideas. But what a language community has traditonally—if implicitly—*chosen* to represent by a single specialized term as opposed to a longer explanation says something about the ideas and perspectives that re-occur most often in thought patterns and expression.

Speech behaviors

If language has some influence on thought and expression, it is shaped in turn by patterns of *usage*—the roles people play in employing it and the ends to which they put it. This is, of course, the domain *par excellence* of socio-linguists. Deborah Tannen has written some works well known in the United States about variations in the speech behavior of American men and women, including striking differences by gender in the meaning of interruptions and overlapping: breaking into what someone else is saying or completing it for them. Stated most simply, for men it tends to be an aggressive and competitive act, for women it can be a kind of support.

An interesting aspect of speech patterns among the Hausa is the frequency—and the role—of similar kinds of "overlapping." The author was once responsible for transcribing word for word the proceedings of a village conference on livestock conducted in Hausa. When the discussions had been recorded and transferred to paper, an interesting thing appeared, something we all knew but had never paid much attention to. A number of very pertinent suggestions about how to stable cattle in the village and provide for their fodder (something not traditionally done in that region) came out during the sessions. On close examination of the transcript and audition of the tapes, however, it was clear that nearly no one had expressed a complete or well-formed idea on the topic. Rather, one person would utter the beginnings of a sentence or thought, someone else would add to it, a third would round it out or reformulate it; and the discourse bounced around the straw enclosure with few, if any, disquisitions or even individually-completed sentences. Yet,

through this medium, some useful ideas and resolutions took form.

From talking the talk to walking the walk

There are many parallels to this practice of group or interpersonal complementarity in the social life of the region as well. Another story will illustrate the point. At a similar stage in (personal) prehistory, this author was responsible for setting up the first film projector ever seen in the town of Madaoua, Niger. It required, of course, an electrical generator to boot, as there was no electricity in the town. Unfortunately, once delivered over 500 kilometers of washboard laterite road, neither piece of machinery showed any sign of life and both resisted the best ministrations. The only recourse was the garage of the local *arrondissement*, or county seat, where a crew of barefoot mechanics worked under an adobe mud shelter behind the administrative offices with few tools to repair a small fleet of battered Land Rovers.

The mechanics were glad to oblige, but as they started work our qualms grew. The group of them—five or six—proceeded to squat around the equipment and to poke and pull at it from various angles, while keeping up a rapid and sometimes raucous dialogue about what they were doing. One thought at this point that the projector was history. But within fifteen minutes they had both pieces of equipment running perfectly. Somehow they had managed to use the complementary experience and intuition of all group members—mediated through language—to solve a problem they had never encountered before. In an era when international business headlines the critical—and generally deficient—skills of teamwork and "organizational learning" within the workforce, these very habits, partly built into language form and usage, may turn out once again to be quite applicable.

Food for thought

None of these anecdotal examples should be taken too far or given too much weight. The underlying argument and experience, though, seem worthy of the attention of those interested in indigenous knowledge: part of that knowledge lies in, or is at least supported by, the medium of language itself.

Ghana and Zambia

Indigenous Knowledge and HIV/AIDS

This article has been written by Maja Naur, Ph.D. in sociology, consultant to the World Bank. The projects referred to are: Zambia: Environmental Support Program, report no. 16239-ZA, and Ghana: Northern Savanna Biodiversity Conservation Project, project document on a proposed grant from the Global Environmental Facility Trust Fund. The author wants to thank the concerned Task Managers, Yves Prevost and Hassan M. Hassan and not least John Lambert for his work on medicinal plants. The social studies for the projects have been undertaken by the author and funded by the Danish Trust Fund. For more information, e-mail: MAJANAUR@msn.com

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It has always been difficult to reach poor people with development aid, particularly in health where most resources benefit the middle classes in urban hospitals. For the rural poor, and increasingly also for the urban poor, often the only affordable and accessible form of health care is provided by traditional healers. Zambia with an estimated 20-25 percent of the population HIV-positive has only 900 western-educated doctors (600 of whom are foreign) but has 40,000 registered traditional healers for a population of 10 million. Ghana, with 5 percent of the population being HIV-positive, has 1,200 western educated doctors but an estimated 50,000 traditional healers for a population of 20 million. Thus, the ratio of doctor to traditional healer is 1:44 in Zambia and 1:42 in Ghana. Given the central cultural role of traditional healers in communities, they provide one of the best hopes for treating and stemming the spread of AIDS. But healers rely on medicinal plants and there has been a significant decrease in the abundance of many important medicinal plant species as their habitat are lost through deforestation, cultivation, overgrazing, burning, droughts, desertification, etc. This problem has been exacerbated by the unmanaged local and international demand for medicinal plants. Furthermore, traditional healers have identified as an important issue, the loss of indigenous knowledge regarding traditional medicine, which forms part of the cultural heritage of local communities and is usually transmitted orally. This knowledge is often undervalued by the younger generations, at least in part because traditional medicine seldom brings high economic returns to the practitioner.

In recognition of the importance to preserve and protect this ethnomedical knowledge, and the plant species on which it is based, the governments of Zambia and Ghana, with support from the World Bank, are in the process of establishing a bridge between environment and health in fighting HIV/AIDS. In Zambia the executing agency is the Traditional Health Practitioners Association of Zambia (THPAZ) through the Environmental Support Program (ESP) under the Ministry of Environment and Natural Resources. In Ghana, the effort will be part of the Northern Savanna Biodiversity Conservation Project (NSBCP) under the Ministry of Land, Forestry and Mines. Basically, the two projects have the same approach although they differ in

design: in Zambia the initiative has been retrofitted into an already existing program while in Ghana the activities will be part of on-going project design. What follows is first a short description of the AIDS component involving traditional healers under the Zambian ESP; second, a comparison of the sociocultural findings particularly concerning gender differences related to traditional medicine in the two countries; and third, some of the difficulties experienced during the process of establishing this cross-sector initiative involving agriculture, environment, health, and rural development.

Under the Zambian initiative, "Protection and Sustainable Use of Biodiversity for Medicinal Value: An Initiative to Combat HIV/AIDS" there are three main activities. The first activity, "Conservation of Biodiversity for HIV/AIDS Prevention and Treatment" includes the establishment of botanic gardens, forest reserves for medicinal plants, and a herbarium with medicinal plants. Some of the seeds, cuttings and tubers for planting will come from Spiritual Forests, which have considerable biodiversity and contain rare species of plants and trees, which have been preserved because of the traditional rules, norms, and taboos associated with them. The second activity "Training and Capacity Building" is directed towards the traditional healers and includes a long list of topics from behavior modification in relation to HIV/AIDS, understanding ecosystems, nutrition, toxicology, basic virology, epidemics, and immunology. In addition to the environmental and medical aspects there will also be legal training so that healers do not infringe the law, such as the Witchcraft Act, and get a better understanding of human rights. The third activity "Dissemination of Information/Knowledge on Biodiversity and HIV/AIDS" will set up a communication strategy to be implemented through newsletters, radio programs, TV, drama/plays and leaflets. This activity will also include an electronic database on medicinal plants and publication of a handbook for traditional healers to be used in their practice. All training materials, programs, and publications will be in the major local languages and a basic literacy program will be added to make the (often) -illiterate healers capable of registering their patients, and documenting their indigenous knowledge.

Whereas gender analysis has been essential for project design in both Zambia and Ghana the role of women are very different in the two countries. Generally the gender division of labor has been stronger in Ghana than in Zambia. This has had an effect on the position of female traditional healers as well as their ability to participate in project activities. Some of the sociocultural differences are analyzed here. In Zambia, traditional healers have received donor help to be organized on a national basis, and 60 percent of the registered traditional healers are women. The number of women healers is even said to be growing in response to the increasing number of AIDS patients. People call HIV/AIDS "Kalaye noko," meaning "go and say goodbye to your mother," because most people die in their villages in their mothers' homes. Although women in Ghana are also the ones to care for the ill, the contrast is striking when it comes to practicing healing. In Ghana, there is no functional national traditional healers' association, and the three northern regions have less than one-fifth of the estimated healers' registered. Of these (few) registered members, less than 10 percent are women except for one minor sub-region where an active healer has managed to raise the figure to 49 percent. However, the low figure in Ghana is more a reflection of local beliefs than of the actual number of women healers. Also, the Bank-assisted initiative might have unintentionally cemented already existing gender bias by, for example, only training the registered healers, who are overwhelmingly male. According to one female healer in Ghana, women, if they openly practice traditional medicine "are termed witches and every misfortune is blamed on them; in most cases these women are disowned and sent out of their societies. For this reason it is only the queen of witches who is known to heal, because she is so powerful that it is impossible for any member of the society to challenge her."

In both countries it was extremely rare to find traditional healers who cultivated medicinal plants, and when it did happen, it was almost exclusively funded by donors. In Zambia, women healers often referred to a spirit guiding them to the medicinal plants, which they collected and prepared for medicine themselves. In Ghana, there was substantial gender bias related to the collection of plants, preparation of medicine, and even to sexuality, which had a positive influence on males but a negative influence on women. Fewer female healers in Ghana were married than were male healers, which one female healer explained by saying that she would not be able to heal if her husband was living with her. Neither would healers, who used traditional African religious rituals in the healing process, send their daughters into the bush to get the plants, because "people would think they were witches." And husbands would not let their wives help to make the medicine "because the medicine would not work" if prepared by a woman. An obvious rationale for this taboo was patrilineal location and succession which meant that a woman at marriage would move to her husband's house, and the family's secret knowledge on plants and its medical use, would thereby be in danger of being uncovered by another family. Healers in Ghana were also reluctant to teach their daughters traditional medicine, but little girls also have eyes and ears, and many women practice medi-

cine, although not openly. That obviously had a negative influence on women's options for income generation through their practice. Only traditional birth attendants (TBA) were almost exclusively women, and most TBAs received some remuneration for their services. But most traditional healers earn their main income from farming and remuneration for healing was in farm products. In Zambia, the declining economy had forced many healers to give up payment in kind, and healers had increasingly turned to (their individual) standard payments for each disease. The highest price was always a cure for infertility, which had to be paid at the arrival of an infant son. The strong division of labor in Ghana gives a unique opportunity through the project to support women and families in HIV/AIDS prevention and poverty reduction, thereby enhancing the prospects of success for the project as a whole. The long-term goal of biodiversity conservation could seem abstract to communities suffering from food shortages and hunger; however, short-term income generation through the cultivation and selling of medicinal plants and vegetables leading to improvements in, particularly, children's health could have a catalytic effect on the success of the project.

Traditional healers, both male and female, expressed an eagerness to be trained to improve their practice. In Ghana, the mass communication program on HIV/AIDS had succeeded in disseminating information on transmission of the disease from one person to another via blood, sexual intercourse, infected needles, and so forth. But communities' knowledge on how it is transmitted was not always complete or accurate. Some communities referred to the danger of eating or bathing together with an AIDS-infected person; even shaking hands or using the same clothes was mentioned as a possible way to be infected. None of the communities admitted that there were any affected individuals in their village, and in both Zambia and Ghana, severe stigma was attached to a person with AIDS. Thus, people were less likely to admit infection and treat HIV/AIDS as a common, but serious, disease. Poverty and cultural norms also make Africa the continent with the highest proportion of women to men infected with AIDS. In the fight against AIDS, traditional healers need training as they provide health care for about 70 percent of the population. And TBAs, according to the World Health Organization, deliver 95 percent of babies in the rural areas, which makes them particularly critical care-givers but also renders them more vulnerable to HIV/AIDS. In the long run, the health infrastructure provided by the traditional healers and their organizations could provide the distribution network for AIDS medicines when they become available at a reasonable price. Traditional healers have a unique position as educators and potential distributors of AIDS medicine—for example in handling patients' doses. No African government has the resources or health personnel in the numbers needed to fight the AIDS epidemic.

Governments in Ghana or Zambia do not support traditional healers financially as they do their (modern) medical associations, and in neither country is traditional medicine part of the curriculum at medical faculties. In this respect, African countries are far behind countries such as China and India where alternative medicine is an integrated part of modern medicine practiced at hospitals. However, Ghana and Zambia both have staff in their Ministries of Health to coordinate policies to traditional healers, and both governments want healers to be registered. Ghana has shown a positive attitude towards the conservation of medicinal plants and has acknowledged traditional healers by passing a Traditional Medicine Practice Act in 2000. In Zambia, on the other hand, it was when more than one-fifth of the population became infected with AIDS that traditional healers were invited to become part of the Technical Committee on Natural Remedies for HIV and Other Related Diseases, placed directly under the Head of State. The Ministry of Environment and Natural Resources, under which the ESP is located, was initially very reluctant to involve civil society in natural resource management, and particularly THPAZ, which is the country's largest NGO. Traditional healers were considered to be irrelevant to modernity and therefore to be excluded from development. A similar reluctance was initially found in the World Bank where traditional healers' practices were often perceived as lacking scientific validation, and hence legitimacy. This view was also widespread among western doctors, although traditional health practice predates modern medical practice just as the use of herbs and medicinal plants predates the present pharmacological practice. Gradually, however, this attitude has changed and today it is acknowledged that initiatives like the ones in Zambia and Ghana are benefiting the poor directly and have considerable potential in treating AIDS-related diseases.

Malicounda-Bambara: The Sequel

The Journey of a Local Revolution

This article was co-authored by Peter Easton, Associate Professor, Graduate Studies in Adult and Continuing Education, EFPS, and Dr. Karen Monkman, Assistant Professor of International Education, both of Florida State University.

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In the space of less than four years, a locally-impelled movement to abandon the practice of female genital cutting (FGC) has spread from a single village in central Senegal to over 200 communities nationwide, and to several other African countries as well. The path and mode of its dissemination carry a host of lessons and questions, about how indigenous culture renews itself.

The experience of the village of Malicounda-Bambara in the Thies region of central Senegal and its immediate aftermath were recounted in an earlier issue of *IK Notes* ("Senegalese Women Remake Their Culture," October 1998, no. 3). But the "rest of the story" has been immensely instructive.

A brief reminder of the dimensions of the original initiative, and of the critical events that shaped its aftermath, will help to situate the story.

In at the creation

Between 1995 and 1997, women and a few men in the village of Malicounda-Bambara took part in a nonformal education program sponsored by the Senegal-based NGO "Tostan." The program focused on methods of problem-solving, themes of women's health and human rights, and the beginnings of literacy.

The participants in Malicounda-Bambara decided that they had a priority objective apart from the development of income-generating activities, establishment of well-baby programs, launching village hygiene initiatives and so forth : get their village to abandon FGC once and for all. Bambara people are among the sizeable minority of Senegalese ethnic groups that observe the practice. In the course of the training, women had shared with each other painful personal experiences on this taboo topic and had confronted them with their renewed sense of women's rights. As a consequence, they approached local authorities and other villagers to win their support for a common declaration of intent to abandon the practice. And they were successful. On July 31, 1997 the villagers of Malicounda-Bambara made a statement renouncing the practice in perpetuity in front of twenty Senegalese journalists invited for the occasion.

The event made a minor splash, perhaps greater through word-of-mouth dissemination in local culture than in print and audio media. There was some immediate vocal opposition to what the women of Malicounda had done, as much in reaction to the "shame" of talking this publicly about a taboo topic as to the substance of the declaration.

Despite the controversy, a second nearby village also undergoing the Tostan training program—Nguerigne-Bambara—decided to imitate Malicounda-Bambara's example, led by a woman who was herself a traditional "cutter"; and yet another, Kër Simbara, began actively discussing the idea. Then a critical event occurred.

The turning point

The Imam of Kër Simbara—a 66-year old religious leader much respected in the region—became very concerned at the events, and he came to talk with Tostan representatives and the women of Malicounda-Bambara. He was not opposed to the abandonment of FGC. In fact, the controversy had prompted him to talk to his female relatives about their own experience and feelings regarding FGC for the first time, and he ended up a strong supporter. But he felt that there were two major problems with the way in which things were being done.

First, a single village cannot do this alone, the Imam said. "We are part of an inter-marrying community, and unless *all* the villages involved take part, you are asking parents to forfeit the chance of their daughters getting married." Second, there was a real problem of language and approach. These are taboo topics, he pointed out, and they should not be discussed lightly or inconsiderately. The people who crusaded against FGC in the past used terms that villagers consider unmentionable and showed images and pictures that shocked them. They treated the practice as a disease to eradicate and its practitioners as social pariahs. That is no way to change a culture, or to help it change itself, the Imam said.

His interlocutors agreed: It was time to think things through a good deal more carefully. Together, they outlined a strategy:

- Go to all the villages in the inter-marrying community. Start by reaffirming personal relationships.
- Don't tell the villagers what to do. Tell them what Malicounda-Bambara and Nguerigne-Bambara have done, and why. Then let them tell their own stories and make their own decisions.
- Avoid using graphic terms or demonstrations for taboo activities. Refer to FGC simply as "the custom." Everyone will know what is meant. In Senegalese Bambara, "customs" in the plural refers to a whole set of cultural traditions; "the custom" in the singular refers to FGC alone.
- Avoid condemning practitioners either implicitly or explicitly. They have been performing in good faith.

On the basis of these agreements, the Imam set out on foot, accompanied by the woman cutter from Kër Simbara and his own nephew, to visit ten other villages in that marriage community. It was a ground-shaking experience. Women opened up—they told stories of daughters who had died from hemorrhage, others who had contracted infections or long-term psychic distress from the FGC trauma. Those who performed the practice talked, too—about why, and about changing customs. Men joined in with their reflections.

Before it was over, all ten villages had decided to join the ranks of those declaring against FGC. With representatives of Malicounda-Bambara, Nguerigne-Bambara and Kër Simbara itself, they met at the village of Diabougou, fifty strong representing 8,000 rural people, and declared "never again" on February 15, 1998. The news continued to spread.

The movement next jumped to the southern region of Senegal below the Gambia, where the Fulani ethnic group has traditionally practiced FGC. A first group of fourteen villages studied the Tostan curriculum, listened to news of Malicounda-Bambara, resolved to take action in their own environment, and enlisted four additional communities within their socio-marital network to make a joint declaration, promulgated in the village of Medina Cherif on June 12, 1998.

An indigenous strategy for dissemination

It is worth stopping a moment at this point to reflect on exactly what had happened because it explains much of the rest of the dissemination story—successes, opposition encountered, and lessons yet to be learned.

Essentially, the strategy that developed from local response and input had three distinct elements.

The first was that it was *collective* in nature, rather than—or in addition to being—individual. The approach explicitly recognized that families cannot abandon a long-rooted cultural practice if there is not a collective will to change the incentive structures and at least some of the objective conditions that hold it in place. When thirteen related villages became affiliated, those involved in effect changed the marriage market and created conditions in which people *could* comply, and do so out of solidarity with their own community.

Second, the approach was grounded in the local context and evoked some of strongest values and practices of ambient culture—parental love, Koranic piety—to challenge others. It therefore came across more as a movement for internal consistency and liberation than as an outside condem-

nation. No one talks of the "eradication" of FGC, as if it were a plague to be stamped out, but rather of its "abandonment"—a conscious act by those most concerned. The presence of an Imam who could remind people that Islam never dictated such a practice was highly instrumental. And men were in no way excluded. In fact, their support was critical to the development of the movement.

Finally, the method was empowering—that is, while rooted in personal testimony and the transmission of new information, it left resolution and action up to the initiative of each community and its members. It cast the problem of FGC in the larger frame of women's health and human rights, topics with which men too are vitally concerned. The result was not only that people chose to follow of their own free will, but that they were ready to spread the word.

Beating two tracks

From that point on, the evolution of the movement has essentially followed two axes: one out front in the media and international fora, and the other on the ground. For once, though, the out-front publicity has not outstripped the local reality, and the activity has remained largely wedded to its village manifestations.

Media attention was quick in coming, both in Senegal and abroad. Notice appeared in short order in the Senegalese press. In October 1997, a feature article on the "Oath of Malicounda-Bambara" came out in *Le Monde* in Paris. Tostan representatives have since been invited to numerous conferences, assemblies, and events to relate the story of the movement against FGC. In almost every instance, promoters have made sure that local women and men spoke for themselves—through interpreters, where necessary. The local champions of the movement—the elderly Imam and the women cutters and organizers—have made presentations to the British Parliament, to the German Ministry of Development and Cooperation, to the European Union in Brussels, to a Women's Rights Conference in Washington, and to committees of the United Nations in New York. More significantly still, they have traveled to neighboring countries, Burkina Faso and Mali, to talk with other women facing similar problems.

But outside attention had its downside as well. Endorsement of the Oath of Malicounda by the Senegalese President Abdou Diouf—significant, even if he was himself from the majority Wolof, who do not practice FGC—was eventually followed by a move in the country's *Assemblée Nationale* (Parliament) to pass a law abolishing the practice and dictating severe penalties for violators. The allies of Tostan were immediately concerned and went to Dakar to testify against the law, not, obviously, because they wanted to maintain FGC, but because they firmly believed official abolition and sanction were not the way to go. The law, they felt, should *follow* and model a change in practice developed in the field, not attempt to dictate it. As the Imam from Kër Simbara put it in reference to his own ethnic group, "Try to tell Bambara people what they must do about their own customs and you have a fight on your hands."

The premonitions proved right. The law was passed, despite these words of caution from the field, and a general outcry ensued. In protest, one traditional cutter in the region of Tambacounda made a point of performing no fewer than *120 "circumcisions"* in the days following.

Keeping the local movement alive

Developments on the ground pursued quite a different path. The Imam and former cutter from Kër Simbara and Nguerigne-Bambara launched out into another group of twelve villages in central Senegal. The local women who had been ringleaders in the Kolda region expanded their efforts to neighboring communities, parlaying support from the Imam of Medina Cherif into a religiously endorsed movement. At the same time, they undertook to transpose the effort to the Futa Toro region of northwestern Senegal, an area of Toucouleur culture over 250 kilometers away that speaks the same Fulani language.

In addition, one of the villages that had participated in the Diabougou declaration—Samba Dia—took initiatives of its own. Samba Dia was in fact of "SerereNiominka" lineage, an offshoot of the Serere ethnic group that had historically commingled with Mandinka and Bambara speakers. The women of Samba Dia decided that the word had to be spread among their own people, fisherfolk inhabiting the islands of Sine Saloum on the Senegalese coast southeast of Dakar. Women and men got some support for transport costs from Tostan and started canoeing around from island to island, visiting twenty-six insular communities throughout the archipelago.

In the Futa Toro, there was fierce opposition from some traditional religious and cultural authorities. The women and their allies felt that they could not make a proclamation about FGC under these circumstances, but they found a dynamic alternative. No less than eighty-seven villages sent representatives to a meeting at Aere Lao in the Podor region (east of St. Louis) where, on November 4, 2000, they signed a solemn declaration foreswearing all practices harmful to women's health and development. By "retreating" to the ground of human rights, they outflanked the opposition.

Farther south in the Sine Saloum islands, representatives of the twenty-six villages contacted by boat—none of whom had yet undergone the Tostan training program—assembled of their own volition on the island of Niodior on April 7, 2000 to draw up their own declaration of abandonment of the practice and to make arrangements for starting their own classes. And in the region of Kolda, the number of communities making declarations and undertaking training has continued to grow, progressing from the original eighteen to thirty that took part in the Tostan program and, by the end of last year, to an additional seventy-five neighboring communities. Tostan representatives report that in February 2001 word came in from yet another group of local women who had completed the training and succeeded in aligning all communities of their entire rural "county" (the *communauté rurale* of Mampatim) behind the effort: nearly 100 additional villages, which have scheduled their proclamation for March 2001.

Following the local lead

No one can say exactly what subsequent stages in this local groundswell will bring. As the Director of Tostan puts it, "Much of this caught us by surprise. We are following them." But a number of results beyond the simple statistics of villages mobilized and groups renouncing FGC are already evident:

- Connections are being made everywhere between the locally motivated abandonment of FGC and concerns of democracy and human rights. In fact, the key issues have been cast in these larger terms and have led to a variety of associated efforts: public examination of domestic violence, local assertion of girls' rights to schooling, requests for increased accountability in local governance.
- Men have become a vital part of the effort, both in classes and out "on the campaign trail." Even in programs focusing in good part on women's health and rights, male participation remains at nearly 30 percent.
- The public declaration model has been adopted in a number of other areas of locally driven rural development, from resolutions about domestic violence to others renouncing the practice of brush fires as a land-clearing technique.
- And the effort has begun to go continent-wide. Initiatives modeled on the Senegalese example, but modified for each cultural context, are now underway in Burkina Faso, Mali and Sudan, and there have been inquiries from as far away as East Africa. The women and men working on the ground in Senegal have been the principal ambassadors, while Tostan is itself planning a training center in Thies for those from other countries who would like to visit, share with and learn from the women's rights cohorts in Senegalese villages.

As a West African proverb succinctly says, "Once the sun has risen, the palm of your hand can no longer cover it."

African Traditional Healers: The Economics of Healing

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Traditional healers are a source of health care for which Africans have always paid. Even with the expansion of modern medicine, healers are still popular and command fees exceeding the average treatment cost at most modern practitioners. Are traditional healers miracle workers or are they charlatans? Clearly either view is too extreme. Traditional healers are not perfect: although we have all heard stories of miraculous cures, the health status of the average African peasant cannot be reconciled with omnipotent healers. Nor, however, can they be charlatans: people cannot be continuously ignorant about the capacity of someone who lives among them. This article advances a view of traditional healers that relies on neither supernatural power nor manifest ignorance. It suggests that healers remain popular despite abundant modern medicine because they have wisely used an important economic contract to the mutual benefit of their practice and the population they serve.

While the contrasts between traditional medicine and modern medicine are many, the article focuses on the differences in the way traditional and modern healers are paid. An important element of their practice has been previously ignored: traditional healers receive the bulk of their payment only if the patient is cured.

Economic theory

When consumers purchase a service where quality matters but cannot be directly observed or evaluated, economic theory raises the possibility of a market failure. Health care is a classic example of this type of failure, commonly referred to as agency. Patients choose to visit physicians precisely because physicians know more than patients do. The patient cannot evaluate what the doctor is doing for her sake, nor can she infer physician effort from the outcome. Patients are often cured despite poor quality care, or fail to be cured despite expert care. If patients cannot tell what doctors are doing, then doctors have fewer reasons to exert extraordinary effort on the patient's behalf. Thus, although patients are willing to pay for high-quality care and physicians are able to provide it, the market may fail and high-quality health care would not be delivered.

The standard economic solution is to force the agent (the person performing the unobservable services) to face the

loss or gain of his/her actions. Thus, salespersons are paid on commission, and CEOs receive stock options. The health counterpart is the pay-only-if-cured or outcome-contingent (since payments are contingent on outcomes) contract. If patients paid their doctors only if they were cured, or more if they were cured than if they were not, the economic cost of agency would be reduced.

Despite the fact that health care suffers from a problem widely identified in theory, health economics as a whole has dismissed the economic solution to the problem as inapplicable to health care. Non-contractibility is one of the most widely cited reasons for dismissing this solution. Contractibility means that agreements about payments are enforceable. The outcome-contingent contract is considered non-contractible because patients can simply lie about the outcome of treatment and the doctor would be unable to prove his case to a third party. The definitions of cured and not cured are inherently subjective and subject to deliberate misrepresentation.

Economic practices of traditional healers in Africa

This "ideal" but previously unobserved economic contract is exactly the method by which traditional healers in Africa do business. Patients pay traditional healers more if they are cured than if they are not cured. The results of interviews with healers in Cameroon, Tanzania, and Ethiopia reported in a publication by this author are summarized here. The healers spoken with received an initial payment and, in addition, negotiated with the patient over a payment to be made in the future. In all cases, if the treatment did not result in improvement of the condition, the patient paid nothing beyond the initial payment.

When asked about the practice of "cursing" patients for non-payment, many healers were adamant that they never engaged in the practice, though almost all admitted that their ancestors or, specifically, parents had done so. The practice traditionally operated as follows: when a patient refused to pay, the healer would either invoke a curse on the patient or revoke the cure. This practice invokes near-universal fear in rural populations, and most non-healers believed that if they failed to pay they would be cursed. All healers told stories of patients leaving without paying and then returning, sometimes years later, begging to be allowed to pay. Patients believe cursing is still practiced, allowing healers to wait until after the treatment to collect payment without fear that the patient will refuse to pay.

The outcome-contingent contract means that healers have strong incentives to provide quality care even if the patient cannot evaluate or observe this quality. But what of the non-contractibility concern? How can traditional healers agree to accept payment when the patient could lie about the outcome and refuse to make any payments? Two reasons are advanced: first, healers live in the same village as many of their patients and can therefore observe what patients are doing; second, patients believe that healers know whether they are cured.

In contrast, outcome-contingent contracts are not used in the practices of modern medicine anywhere in the world. Instead, patients pay a fixed fee for all services delivered whether they are cured or not. No one expects this type of payment scheme to deliver quality. Instead, the assumption is that quality care is assured by restrictions on the activity of practitioners that come from other sources (including, but not limited to medical associations, referral networks, hospital networks and direct regulation of the practitioner.) In Africa, physicians at modern facilities such as government or not-for-profit health systems (primarily church-operated) are regulated through hierarchical supervision, where physicians evaluate the quality of other physicians and employment status or bonuses depend on the result of the evaluation. Since the payment (or well-being) of the practitioner depends, not on the outcome, but the effort s/he exerts, this is referred to as an effort-contingent contract. Note that in order to regulate another doctor you need to be at least as well trained as s/he is: only doctors can regulate other doctors.

Comparing outcome-contingent to effort-contingent contracts

The outcome-contingent contract of traditional healers gives them good reason to exert effort in the treatment of patients even if the patient cannot evaluate what the healer is doing. However, if a modern physician practices in an organization that cares about quality, s/he will also have a good reason to produce high-quality care; her/his employers will insure that s/he does. Thus, while it would appear that the contract of the traditional healer does not offer any additional benefit over a well-implemented contract at any modern provider, this is not quite true.

The fact that healers contract on outcomes rather than effort has important repercussions on their practices. Take, for example, a patient with asthma who smokes. A modern doctor treating this patient can be evaluated based on what s/he does for this patient by another physician who knows what s/he is supposed to do. S/he can be evaluated on tests ordered, treatments prescribed, or advice given but will not be evaluated on whether the patient is cured (or in this case, whether his/her symptoms are alleviated). If the patient re-

fuses to quit smoking s/he will not be cured, but this does not matter to the modern physician.

The traditional healer, on the other hand, has no chance of being paid if the patient does not quit smoking. If he is unable to convince the patient to quit, he could refuse to take the case, or at the very least, refuse to accept the outcome-contingent contract. The difference between the two types of contracts emerges not from the amount of medical effort finally delivered, but from the difference in the relationship between the efforts of practitioners and the efforts of patients. Because outcomes (and not inputs) matter, a traditional healer cares more than the modern doctor about the actions that patients take.

Patient perception of the practice of healers

Economic theory suggests that the contract used by healers will lead them to provide high-quality effort in health care. Modern practitioners may also provide high-quality effort, but they will not work as well with patients in situations where patient effort is important to outcomes.

How do patients use traditional healers? If the theory is correct, traditional healers should have an advantage (holding other factors constant) when patients suffer from illnesses that require both medical and patient effort. They will not have an advantage in situations in which special equipment or skills are required. Contrast the example of asthma with malaria and appendicitis. Malaria is comparatively easy to diagnose and does not require extensive effort on the part of either physicians or patients—instead, it requires widely available medication. Patients should visit the least expensive provider who has the appropriate medicine without concern for quality. Appendicitis, on the other hand, requires surgery—a service for which hospitals are much better equipped than traditional healers; patients should seek skilled treatment.

Indeed, across Africa there are consistent patterns in the choice of health care practitioner according to illness condition: certain conditions tend to lead to visits to certain practitioners. This author tested these patterns to see if they fit the patterns that would be predicted by theory. In order to do this, each individual illness condition is examined by physicians who evaluated the degree to which the outcome depends on the efforts of the practitioner and the efforts of the patient.

In the southwest province of Cameroon, patients are more likely to visit a mission facility over a government facility when they suffer from conditions that require substantial amounts of medical effort. Since mission facilities are well regulated compared to government facilities, this makes sense; patients seek and are willing to pay for this particular measure of quality only when they deem that it really matters. In addition, as would be predicted by economic theory, patients are more likely to visit a traditional healer (even over the high-quality mission facility) when they suffer from a condition that requires large amounts of *both* medical and patient effort. Patient behavior follows the patterns predicted by an economic understanding of the payment scheme used at traditional healers.

Conclusion

While traditional healers perform many roles in their societies, this article focuses on one important feature of their practices: they use an economically rational tool in their practices and their behavior and the behavior of patients reflects the use and benefits of this tool. The pay-only-if-cured or outcome-contingent contract provides traditional healers with the right incentives to provide high-quality care, and patients behave as if they are aware of the implications of this contract. Importantly, the magical or mysterious elements of their practices are essential to the proper functioning of this contract. Without the belief that healers know the outcome of treatments, the outcome-contingent contract would be non-contractible. Thus, although this contract appears to be very successful for healers, it cannot be widely adopted.

Traditional healers, far from duping a gullible population, behave as if they are rational and serving a rational population. As long as modern medicine is delivered in a context in which quality is uncertain, traditional healers will continue to attract patients.

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Repairing the Ravages of War in Mozambique

Initiation Societies and Community Schooling

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Indigenous healing has shown itself to be an effective treatment for the trauma suffered by children in war-torn countries of Africa (*see IK Note No. 10).* Recent experience in Mozambique demonstrates that other dimensions of local culture may be just as important in socially "grounding" a generation of young people uprooted by armed conflict and repairing the ravages of war.

The years of civil strife in that country left rural children and their communities wounded in a number of ways. Children lost their parents. Others were separated from their families in the rush to escape the fighting and ended up living with adoptive parents or in military camps for long periods of time. Young people were also wounded or abused. And some were conscripted into the rebel army and forced to commit acts of violence.

At the same time, rural communities were largely devastated and stripped of the little infrastructure they possessed. Schools have typically been few and far between in the remoter areas of Mozambique. Under colonial rule, little was done outside urban areas. During the few short years of relative stability after the country's hard-won independence in 1975, numbers of schools and students multiplied rapidly. Supply could not keep up with demand and, as in many areas of Africa, community schools created locally began appearing in the countryside in the late 1970s. They were for the most part staffed by young people with a few years of education at best who reproduced what they could of the standard curriculum.

This nascent infrastructure was devastated, however, in the long civil war launched by the rebel movement in 1977. Health and education facilities in the countryside were largely wiped out because disruption of social life and particularly government services to the population was one of the movement's prime objectives. Enrollment statistics dipped dramatically throughout the following decade and only began to recover when peace initiatives began in 1990.

Putting the pieces back together

By the late 1980s, the hostilities had begun to abate and a variety of efforts was undertaken to reunite children separated from their families and to promote healing. The Mozambican National Directorate of Social Action (DNAS) sponsored an initial round of

programs jointly with the "Children and War" Project (C&W) of the international non-governmental organization Save the Children. The program remained, however, too bureaucratic to have much success in penetrating rural areas. C&W therefore set out on its own to collaborate directly with interested communities. By 1992 it had created a network of over 14,000 volunteers and succeeded in reuniting some 12,000 children with their families.

Much of this result was due to the initiatives of the local communities themselves. By the time they were able to begin picking up the pieces, reuniting families and resuming a semblance of normal life, little in the way of social services was left, and a government burdened by debt was unable to offer much consistent help. So the local people went to work. In order to address the needs of unaccompanied and newly reunited children, some started to rebuild community schools, developed community-based child socialization programs, and design and implement youth skills training initiatives. To ensure longer lasting support to the effort, C&W was transformed into a Mozambican NGO entitled "Children, Family and Development" (CFD).

A village takes charge

The effort bore unexpected fruit in the administrative division of Itoculo, a remote cluster of communities in the northern Nampulo province of Mozambique. The people of Itoculo belong to one of the country's principal ethnic groups, the Macua. Access to Itoculo is difficult and its contact with the outside world is infrequent. The most regular visitors to the area are illegal loggers bent on profiting from its rich forest resources, and the cotton buyers, who show up once a year during the crop-marketing season. There was only one elementary school in the central village of Itoculo, serving a fraction of the 30,000 people living close by and none of the additional 20,000 residing in the more far-flung villages of the zone, the farthest being 22 kilometers away by cart track.

By the early 1990s, many of the children of Itoculo who were orphaned or deprived of a normal childhood during the long years of conflict had themselves become parents and heads of households. They did not want their own children to be deprived in the same way, and they wanted to rebuild their communities. At that time, the government Department of Social Action approached leaders of the Itoculo communities to discuss ways of addressing the developmental and educational needs of preschool-aged children. An agreement was reached to create three *escolinhas comunitárias,* or community preschools. However, these only lasted two short years: the standardized curriculum, the rigid model of implementation, and the experience of enforced dependency on state agencies unable to fulfill their promises discouraged local participation.

The problems of unattended children remained acute and a major preoccupation of the renascent communities. The first break-through came when Itoculo area residents who had worked with C&W during the war thought of borrowing the model of traditional initiation societies and grafting it onto the *escolinhas* idea in order to devise a solution. In Macua culture, as in most others across the African continent, youth go through traditional initiation rites on their way to adulthood. For these rites, children are informally grouped into small cohorts of friends and relatives as they grow toward adolescence. When a certain number—averaging ten to fifteen young boys or girls—is achieved, the children are taken away from the community to an isolated area by an elder. There they are taught the "lore" of adulthood: male and female roles, the meaning of puberty, community traditions and relevant skills. Boys receive instruction in hunting and fishing, house construction, and related matters. Girls learn about their bodies and the responsibilities of being a mother and housewife; and they are instructed to protect themselves and break contact with boys.

Adapting the traditional model

The initial idea was simply to revive the failed *escolinhas comunitárias* in another form, under local control. Some of the few schooled young people in the village would take charge of cohorts of older children in a thatched hut "classroom" away from town and share with them the rudiments of literacy. Three *escolinhas* of this type were created. Although the initiative worked, community members did not think it went far enough. The younger children needed care as well, and things other than the three Rs belonged in the "curriculum." So the community requested help from CFD to expand and develop the idea. CFD staff agreed to train *animadores* for the community school and provide some assistance with management and organization if Itoculo residents lent material support and took charge. A committee was formed, and the collaboration was launched.

CFD backing triggered an extended process of blending or "cross-breeding" between the community school and the traditional initiation model, carried out under local direction. Though they remained supportive of the idea of children becoming literate in Portuguese to facilitate communications with the outside world, Itoculo committee members questioned whether this learning would be enough for the

children to become full members of the community itself. And so they began, step by step, to elaborate the curriculum and revamp the organization of the *escolinhas*, selecting among the methods of initiation societies ideas and models that made sense and inventing new ones as they advanced.

Deliberations about the curriculum and *escolinha* organization typically involved a cross-section of committee members, parents, *animadores* and children. Among the innovations adopted over time by Itoculo were the following:

- Elders were invited in to tell stories of the traditions of the community and their own life experience.
- The committee encouraged all community members to contribute games, toys, songs and poetry that could be shared with the children. Traditional chants used to teach numeracy were "unearthed," adapted and added to the curriculum. And the schools began sponsoring or joining events to exchange these cultural resources with other *escolinhas* of the region.
- Local artisans were contacted to provide instruction in their crafts. Women who made clay pots for cooking and gardening shared their skills with the children, as did weavers and dancers.
- The schedule of classes was reviewed and modified to fit better with the seasons of farming and social activity in Itoculo.
- After first using the standard government preschool curriculum as the point of reference for the "academic" portions of the *escolinha* program, the committee decided to adopt—and adapt—major portions of the national adult literacy curriculum as more appropriate to their goals.

Spreading the word

The first few years of experience of the *escolinhas comunitárias*—from 1995 through 2000—have been successful ones. The number of these schools in Itoculo has grown to eight, and the initiative has begun to attract much attention throughout the region. Starting in 1998, other communities in Nampulo began to ask the Itoculo committee for assistance in starting similar projects, and committee members have grown increasingly proficient as "consultants" and "trainers" in their own right. Six other such schools now function in neighboring areas.

In addition, the experience in managing a locally directed initiative like the *escolinhas* has given committee and community members some valuable and very "transferable" skills in collective entrepreneurship—and ones that they have begun to apply to a series of other local development challenges, including water supply and health services. In fact, the group has now created two formal public schools to begin filling out local educational infrastructure and provide a means of further training for at least some of the children who have gone through the community learning experience. In each case, the formula used for the *escolinhas*—outside support with substantial matching resources from the community, clear accountability and direct local control—has proved functional. In the year 2000, the village formally created the *Associação dos Amigos da Criança de Itoculo* (AMICI) or the Association of Friends of the Children of Itoculo, to coordinate all such initiatives, the first such legally chartered entity in the community's history.

AMICI offers a unique opportunity to couple past and future in the Nampula region and to harness the best of traditional practice in youth initiation to opportunities for viable rural futures in Mozambique. An infusion and selection of indigenous models has proved to be a vital element in the solution to the problems of a war-torn society.

Tanzania

Communicating Local Farming Knowledge

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The link between the documentation of local knowledge and the dissemination of useful local technologies to farmers is generally weak in the indigenous technology development process. A considerable amount of local knowledge has been documented, but in most cases, such information is not made available to farmers in a form they can make use of to improve their agricultural production. In the cases where information is given back, it is often too general and/or does not relate to the targeted groups' own surroundings and culture.

To fill this gap, the Uluguru Mountains Agricultural Development Project (UMADEP) has been working with local farmers to document their local knowledge related to Natural Crop Protection (NCP) and to spread this knowledge to other farmers in the Uluguru Mountains using interesting and locally relevant educational materials and farmer-led training workshops. The approach used by UMADEP involves the local community throughout the process of collection of the knowledge, documentation and dissemination.

Mgeta is a division in Morogoro Rural District, Morogoro Region in the eastern part of Tanzania. Situated on the slopes of the Uluguru Mountains. The climate is subtropical and allows the production of a wide range of horticultural crops, i.e., cabbage, cauliflower, peas, lettuce, parsley, leeks and deciduous fruits (peaches and plums).

UMADEP has been in operation in the Mgeta and Mkuyuni Divisions since 1993 with the overall aim of improving the agricultural productivity and the general socio-economic conditions of the small-scale farmers in the project area. The project works as an integrated agricultural development project using multidisciplinary approaches and is implemented with a collaborative effort between government and donor agencies. The Agricultural Officers in charge of crop development activities have already undertaken several micro-research projects on NCP involving the use of botanical pesticides; trap crops and organic fertilisers on the UMADEP demonstration plots and subsequently replicated in farmer's managed plots.

Before the introduction of industrial inputs, the farmers in Mgeta depended solely on NCP, utilising parts of certain indigenous plants prepared in various forms for crop protection and against animal diseases. After the introduction of agro-chemicals, farmers rapidly

abandoned the traditional ways of controlling insect pests and diseases and opted for industrial agro-chemicals. Their reasons were many: the government gave subsidies for farm inputs including agro-chemicals; chemical pesticides require less time for preparation and application; the chemicals proved more effective than botanical pesticides, and the companies producing and trading agro-chemicals advertised and marketed them aggressively.

However, the government has now stopped subsides on agricultural inputs and the cost of agro-chemicals is very high. Furthermore, due to ongoing campaigns on environmental conservation, farmers in Mgeta, like other parts of Tanzania, are becoming more aware of the hazardous effects of industrial agro-chemicals.

In collaboration with government extension staff in the area, UMADEP initiated efforts to encourage farmers to go back to NCP. Since indigenous knowledge on NCP has started to disappear from farming communities, the indigenous plants that provide the raw materials for NCP have lost their value and are also disappearing. The first intervention by UMADEP was to campaign for the safe use of chemical pesticides while encouraging farmers to research for more effective botanical pesticides through farmer-managed trials.

Most farmers involved in these kinds of research were members of farmers' groups known as *Ujuzi asili* from Tchenzema Ward, who devoted a portion of their land to produce organic vegetables. This is because they own enough land and either have knowledge on NCP themselves or have access to local knowledge on the uses of botanical pesticides through the elders.

UMADEP, using demonstration plots located in the village, also conducted experiments simultaneously with farmers. UMADEP staff also helped farmers to organize and monitor the results. Farmers were trained on how to compare traditional and new methods of pest management and data collection.

In Mgeta, as in many other parts of Tanzania, extension personnel are trained to encourage farmers to reduce the use of industrial agro-chemicals due to their adverse effects on human health and the environment. However, it is hard for them to do so since knowledge of NCP is limited to only a few members of the community and also because the communities have no alternatives. Moreover, most farmers believe that the botanical pesticides are there to be used by old people and farmers who cannot afford chemicals, not by the young and better-off farmers. This reluctance to use botanical pesticides is a key factor in reducing the spread of natural crop protection practices.

Steps and approaches

In order to effectively communicate the message about NCP to communities, UMADEP developed visual materials (posters, booklets and leaflets) with very simple instructions about the use of botanicals and with illustrations done in a comic book style. The materials were drawn and created by a local artist whose objective was to make them relevant and attractive to local tastes. The following are the steps and approaches which were used for the production of posters relating to the use of botanical pesticides in Mgeta division.

(i) *Accessing the know-how of the innovation*
Because the use of local visual educational materials is not very common in Mgeta, UMADEP organised a workshop where farmers who are experts on botanical pesticides met with the artist, project staff and extension officers. The aim of the workshop was to increase the understanding of the two distinctively different inputs that are needed for the visual material, i.e., the indigenous knowledge about the botanical pesticide and the artistic creativity that makes the information interesting.

A two-day residential workshop was organised whereby farmer experts were invited from six villages within Mgeta Division. During the workshop, the farmer experts presented their experiences and research findings regarding the use of botanicals in crop protection. Based on this information, UMADEP staff decided to focus on disseminating information about the two most familiar plants regarding which the majority of farmers had confidence in their effectiveness in controlling insect pests.

(ii) *Defining communication needs*
The main issues which were proposed to be documented for community consumption included: plant description and habitats, propagation techniques, preparation and application, insect pest control and management, and how the plants can be used for soil and water conservation as well as improvement of soil fertility. The propagation techniques were emphasised because, for example, *kibembeni* (local plant species corresponding to the Buddleia species) can only be found in the forest reserve which is about 5 kilometres from the residential areas. Therefore, to increase availability, these plants need to be planted within the field.

(iii) *Targeting the audience*
For the purpose of sharing information and popularizing the use of botanical pesticides, workshop participants recommended that the educational materials developed should

be mainly targeted to young farmers. This is because young farmers are the most reluctant to use NCP and because there is a communication barrier in the use of NCP between the older and young farmers. Furthermore, the participants suggested that the project arrange a field visit for the artist to see and be able to visualise the working places, field tools and equipment and the habitat of the selected plants in typical local settings.

(iv) *Visualisation and production of artwork*
The artist visited a few of the farmers who had participated in the workshop. During the visits, the artist got a good idea about the habitat of the plants, the local names of plants and insect pests, and their damage to crops. He also studied how the farmers prepared and applied the botanical pesticides and the tools they worked with in order to render this information in the drawings. After the field work, the artist developed a draft of six posters describing and explaining the use of two selected plants.

(v) *Field testing*
Before the final production of the posters, the artist, together with extension and UMADEP staff conducted field-testing for the posters with the representative farmers from the community. This was intended to ascertain:

- Whether the farmers had understood the posters and the contents.
- The farmers ability to identify with the drawings, the situation, the problem and solutions, and the character (age and gender relationship). This helped to determine whether or not the visual representation of the information and the problems was realistic.

(vi) *Farmer-to-farmer dissemination*
Since the posters carried only abstract information about the use of botanical pesticides, project staff thought that the best teachers and disseminators of information in the educational campaign would be the farmer experts themselves. Using them in dissemination workshops would give them the opportunity to explain in detail their experiences with botanical pesticides to their fellow farmers. Allowing farmers to share their practical experiences with other farmers would also help to increase trust and confidence in the use of botanical pesticides by the younger and better-off farmers. To achieve this, UMADEP staff organised a planning workshop to define the roles and responsibilities of the farmers and the extension staff in the education campaign.

For the purpose of reaching as many farmers as possible, it was agreed that seminars should be organised at the sub-village level and in primary schools. The posters should be placed in public areas such as markets, in the village government offices and in the beer shops. The farmer experts volunteered to conduct seminars for other farmers with some help from the project, especially for organising the audiences and meeting other logistical needs. Farmer participants (volunteers) from each village were allocated a few sub villages near where they lived, where they would train their fellow farmers using posters already developed as a guide.

Lessons learned

- Testing of the posters or training materials permits crucial and valuable feedback from audiences for improving the materials before final production.
- Involvement of the target audience from the initial planning of educational materials builds a sense of ownership of the materials. The end-user then values the educational material more and is therefore more likely to use the information and share it.
- Farmers are much more interested in issues that they immediately recognise as being part of their local situation. Therefore, the use of local artists is crucial as well as using drawings that fully reflect local people, images, tools, activities, responses and environment.
- Dissemination of the local knowledge about indigenous plants using modern methods such as printed posters added value to the knowledge and indigenous plants involved. Consequently, it promotes the conservation and multiplication of indigenous plants. It also stimulates farmers to research and develop other local knowledge related to agricultural production.
- The partnership of farmers with UMADEP helped the farmers to obtain quantitative proof of the economic viability of their Natural Crop Protection practices. It also improved their skills in carrying out experiments designed to develop a farming system adapted to their conditions, needs and objectives. Further, farmers participating in farmer-to-farmer dissemination workshops are able to develop their communication skills and abilities.

Ethiopia

Traditional Medicine and the Bridge to Better Health

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In Sub-Saharan Africa, thousands of kilograms of medicinal plants and/or their parts are collected and used every day by mothers in the home, traditional healers,[1] livestock owners and pastoralists. For more than 500 million people and hundreds of millions of livestock they are the only readily available and affordable source of human and livestock healthcare. However, the loss of 5.5 million hectares of resource lands every year due to deforestation, cultivation, over-grazing, burning, erosion, etc. severely decreases this supply. Medicines, foods and other natural resource products that have sustained rural people for centuries are now seriously threatened and many potential medicinal plant species may be lost forever. This increasing scarcity of medicinal plant species represents a trend that should be immediately addressed.

The majority of Ethiopians depend on medicinal plants as their only source of health care, especially in rural areas where access to villages is lacking due to the absence of vehicular roads. Modern health care through the construction of new hospitals and upgrading of existing hospitals, health centers and health posts, imported drug supplies and training of doctors and nurses is of little value at the present time to the majority of the rural population (in excess of 40 million people). Medicinal plants and knowledge of their use provide a vital contribution to human and livestock health care needs throughout the country. The plants are generally readily available, have minimal side-effects and are free and/or affordable. They are an important component of the agricultural and environmental sectors and have the potential to make major contributions to both macro and economic growth and rural poverty reduction in the country. Environmental degradation, deforestation, agricultural expansion, over-harvesting and population growth are principal threats to medicinal plants in the country. The loss from plant extinctions could result in significant socio-economic loss to Ethiopia and could be of global significance.

At present in Sub-Saharan Africa, there are no country-wide quantitative data available on the supply of, or consumer demand for, medicinal plants and on economic benefits derived by the use of medicinal plants and their contribution to health care. Similarly, most collectors/producers and end users are unaware of the extent to which the expanding demand in medicinal plants is threatening the survival of an

increasing number of medicinal plant species. The prices paid to collectors tend to be very low, and resources are frequently open-access or common property. As a result, commercial plant gatherers often "mine" the resources rather than managing them.

The health and drug policies of the Ethiopian Ministry of Health recognize the important role medicinal plants and traditional health systems play in health care. Unfortunately, little has been done in recent decades to enhance and develop the beneficial aspects of traditional medicine including related research and its gradual integration into modern medicine. Despite Ethiopia's commitment to the health sector, its ability to provide increased resources for the study and sustainable use of medicinal plants has been limited.

In most African countries, and Ethiopia is no exception, there is a cadre of highly-trained professionals whose talents and expertise in the field of plant chemistry, pharmacognosy, pharmacology, natural resource management, and the industrial utilization of medicinal plant-based products are underutilized. These professionals acknowledge their indebtedness to traditional healers and birth attendants and the need to work together to establish processes to manage and validate traditional medicines. At present, both levels of knowledge capital (traditional and scientifically-based) are underutilized.

The increasing demand by the industrial countries for herbal remedies has put increasing pressure on the supply of raw materials available in developing countries. Ethiopia is particularly conscious of the loss of its genetic resources, especially in this case where such resources are the primary, if not only, source of healthcare for the rural and urban poor populations. By developing national Pharmacopoeia, governments will initiate a process to formalize processes for the extraction, standardization, safety and efficacy, and dosage and formulation of phytomedicines. The formal integration of traditional and western medicine systems will build upon an ancient and acceptable cultural heritage, give strength to biodiversity conservation and management programs and provide a level of health care to all citizens that will be reflected in future social and economic prosperity.

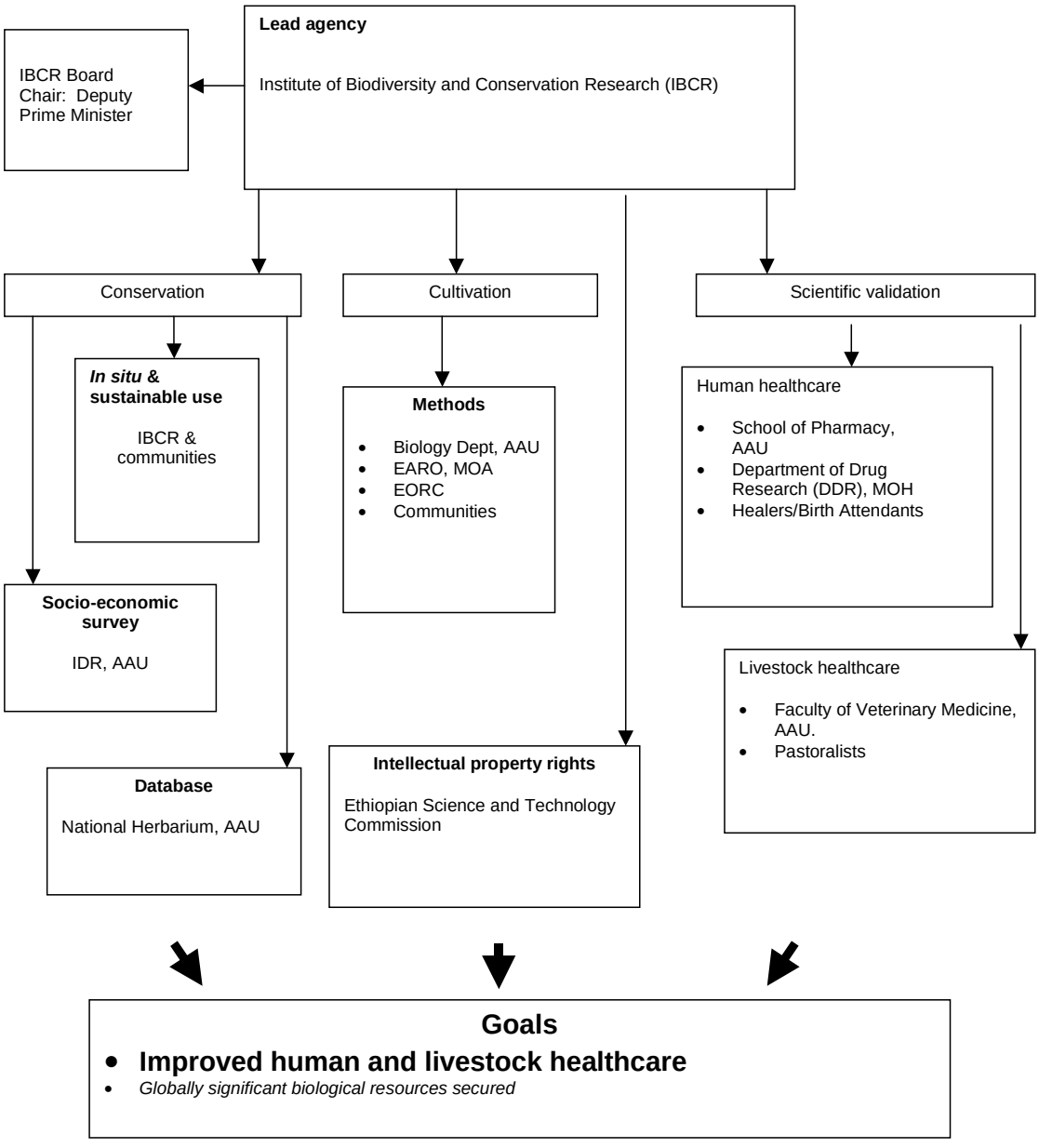
After a somewhat circuitous development passage, the Ethiopian government, with World Bank assistance, will soon start to implement the first conservation and sustainable use of medicinal plants project in Sub-Saharan Africa. The overall objective of the project is to initiate support for conservation, management and sustainable use of medicinal plants for human and livestock health care. The project's specific objectives are to: (i) strengthen institutional capacity; (ii) confirm and document selected commonly-used medicinal plants for the treatment of three major human diseases (tapeworm infections, bronchopneumonia, hypertension) and three livestock diseases (tapeworm infections, mastitis, dermatophilosis); (iii) initiate studies for the safe utilization of effective medicinal plant remedies for these three major human diseases and three livestock diseases; (iv) assess the economic benefits derived from medicinal plants in human and livestock healthcare on a national level; (v) develop a national medicinal plant database; and (vi) support *in situ* conservation and management and initiate *ex situ* cultivation of medicinal plants in the Bale Mountains National Park area.

Project funding will be both credit and grant. The credit will support: development of a national database of medicinal plants; assessment of current levels of usage and economic benefits derived in the country from the use of medicinal plants; training and institutional strengthening; development of Intellectual Property rights guidelines for sharing traditional medicinal knowledge; determining safety and efficacy of plant remedies used to treat three major human diseases and three major livestock diseases; initiating studies of propagation and cultivation methods for selected medicinal plants; and project implementation, monitoring and evaluation. Grant funds will support biodiversity conservation and sustainable management of *in situ* medicinal plant resources in and around the Bale Mountains National Park as a means of reducing harvesting pressure on wild plants. The grant will also cover the costs of education and mass awareness campaigns, local training, and pilot farmer-based cultivation trials of selected threatened medicinal plants in home and community gardens and boundary and buffer zones of the national park. The lead agency and collaborating agencies, institutes and communities are identified in Figure 1.

Recommendations for using traditional plant-based remedies in primary health care programs will carry weight only through studies that establish their credibility and illustrate their safety. The use of such remedies over a long period of time may provide important information on pharmacological effects in humans and livestock of particular groups of chemical compounds — information not usually available when testing a new synthetic drug. Testing requirements formulated by regulatory authorities to ensure safety of "new" drugs are not necessarily applicable to traditional remedies. A more limited range of pre-clinical toxicological tests may be adequate.

Medicinal plants and knowledge of their use are a thread that links education and knowledge institutions, health and population issues, sustainable development, environmental and cultural issues, gender, and rural, urban and private

Ethiopia conservation and sustainable use of medicinal plants
lead agency and contributing institutes, agencies and communities



sector strategies. Consequently, this project should be monitored carefully by the concerned departments both in the World Bank and other development organizations to see how it can be effectively integrated for the benefit of the poor. While not the panacea, they are basic to poverty alleviation and development effectiveness and should be viewed within the long-term holistic and strategic framework.

1 Traditional healers in this context only include herbalists, bone setters, psychic healers and traditional birth attendants. Faith healers, diviners and spiritualists also use medicinal plants, but not as the primary source of healing.

Eritrea

The Process of Capturing Indigenous Knowledge

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Located in the horn of Africa, Eritrea comprises six regions and over nine distinct ethnic peoples (Tigrigna, Tigre, Rashayda, Saho, Bilen, Hidareb, Kunama, Nara, Afar)—each with its own indigenous culture and traditional practices.

While indigenous knowledge (IK) is embedded in community practices, institutions, relationships and rituals, it is often difficult to discern due to its tacit nature. With the rapid increase in globalization, many countries and development organizations have recently recognized the threat of losing IK and are putting together initiatives aimed at the preservation and revitalization of this valuable resource.

In 1982, a group of Eritreans organized themselves and launched a scheme to identify and document their local knowledge. The objective of the twenty-year effort was to identify and understand the IK of the Eritrean peoples in a socio-economic context. It attempted to examine the socio-cultural and economic activities of each of the nine different ethnic nationalities in Eritrea beginning with the origins of Eritrean society through colonial times to the current period. In this process, the purpose was to study the cultures and traditional practices of the ethnic nationalities and capture, categorize and document these for subsequent preservation and publication. What is notable is that funding for this IK initiative was provided by the Public Administration Department till 1990 and by the Ministry of Local Government from 1995 onwards.

This initiative was conceived as being carried out in two phases, of which only the first has seen significant progress :

- Phase I–Collection of IK information
- Phase II–Detailed validation and analysis

Collection framework

The collection of indigenous knowledge revolved around the following steps :

1. Group IK into categories such as—land use, farming, astrology, cultural rituals, traditional medicine, family, etc.
2. Select a target culture—by region and/or ethnic group; identify IK bearers within
3. Collect IK—use questionnaires, panel discussions etc.
4. Validate—cross-check across panels, field visits
5. Record and store by category on the computer
6. Publish—delineate into public and private information; publish public IK in print (encyclopedia)

The Eritrean IK collection methodology focused on the study of one ethnic nationality at a time. The entire process of IK collection from one ethnic nationality took between eighteen months to two years. The entire IK collection process was conducted in four stages.

Stage 1
The first step was to determine the region that this ethnic nationality inhabited. A pilot study of some of the areas in that region was conducted to gather general knowledge about that area, its peoples and traditions. The next step was to conduct several interviews with the district and local administrators, surrounding communities and village elders to pinpoint where the IK collection process would be focused. On the basis of the preceding discussions, the semi-structured questionnaire was modified or refined. This questionnaire was used as a survey instrument to help identify the important items of IK and the important bearers of this knowledge within each ethnic nationality.

Stage 2
The second stage is significant because it helped determine the number of people who were most knowledgeable within the ethnic nationality about its culture and traditional practices. The survey results (from the questionnaire) as well as the preceding interviews in Stage 1 identified this core group, which normally numbered between twenty to thirty people. Most of this core group are Elders, who have traditionally been the holders of this indigenous knowledge. The next step was to agree upon a time and place to convene all these persons for an extended period of time (fifty to sixty days) to enable the IK collection process to move forward .

Stage 3
Panel discussions comprised the cornerstone of the third stage of the IK collection process. The selected bearers of knowledge were divided into three or four different groups and panel discussions were conducted within each group for periods that normally lasted around sixty days. These were focused, intense discussions and the participants were provided boarding and lodging (in addition to a nominal per-diem to compensate for loss of income) during this entire period. The objective of this stage was to assess the credibility of data, look for contradictions and finally to cross-check the information gathered from one group with information from other groups.

Stage 4
The final stage in the IK collection process was to carry out field visits to substantiate information gathered during the preceding stages. In this process, the IK collection team met with actual practitioners and the wider population within the ethnic groups in their actual real world settings. The purpose of these meetings was to expose each IK collection team member to the indigenous experience to enable data validation and further re-checking. If some questions had not been fully answered during the panel discussions stage, efforts were made to replace or add new members to the selected groups at this stage with a view to get adequate responses.

Constraints

In the twenty years of its existence, the IK collection team went through several crises ¯both social and political. The war of independence, conflict with Ethiopia, famine, the HIV/AIDS crisis and budgetary pressures have all had some bearing on the pace of collection and analysis of the IK process. The semi-structured questionnaire (which is the initial information gathering tool) is a living document and has changed constantly, the last revision being made in 1998. Eritrean society has slowly been changing while the experience of the IK collection team grew during the same period. An astonishing aspect in this entire twenty-year endeavor has been the strong desire by the Elders (bearers of knowledge within the different ethnic nationalities) to preserve and revitalize their culture and traditions for transmission to the younger generation. Contrary to normal assumptions, it was the Elders who never gave up. Their keenness and perseverance was instrumental in keeping the lengthy IK Collection process going.

Impact

IK collected over the last twenty years is mainly in the form of volumes of a raw data format. However, some sections of Eritrean society have managed to access parts of this collection in an isolated and sporadic manner, resulting in an indirect impact. Examples of usage and indirect benefits include:

- Asmara University faculty and students have referred to this IK collection in pursuit of their theses
- The Ministry of Education has referred to it for traditional education and preparation of cultural messages aimed at ethnic groups
- The Ministry of Health has referred to it for traditional post-natal care and exercises, child birth practices, treatment for 1–5 year old children

- The Ministry of Justice has referred to it for rich customary law, use of Elders and the exercise of traditional methods to resolve conflicts within communities
- The Ministry of Local Government has used some of this IK to help delineate the regions and organize the concerned peoples.

Challenges ahead

The first phase of the project has been completed. Several challenges remain—both in the consolidated analysis of the vast amounts of data that has been collected and also in the usage of the output that is expected to be derived from the above. These challenges include the following:

- The transfer of IK to the younger generation is slow for a variety of reasons such as the movement of the younger generation to urban areas in search of employment, increasing the influence on them of western society and values and globalization
- IK gatherers are mainly liberation activists with a lot of experience but little formal training in the theory of analysis and presentation of the results
- The expected studies have not gone forward as fast as expected due to a variety of reasons such as the lack of fiscal resources, outdated equipment, intervening conflict etc.
- The IK data collected have not been adequately coded, indexed and are often in a crude form
- Some of the data (specially from Tigrigna nationality) are in the vernacular text and have yet to be translated into English.

Next steps

Of the nine people who started this IK collection initiative nearly two decades ago, only four are still associated with this effort. Having spent a large part of their working lives on it, they are keen that the output from this extensive IK exercise be professionally analyzed and presented for the benefit of the Eritrean people. Eritrea has spent around 1.5 million Nakfa (approximately US$190,000 without accounting for inflation and using an average of 8 Nafka to a US dollar) to date (since independence in 1991) on this initiative and over 30,000 pages of data are available that needs to be examined. The immediate needed next steps are:

- Funding for and assistance from a multi-disciplinary group (comprising of anthropologists and other specialists) to validate and analyze the raw data collected to date
- Appropriate training for the IK collection team in an accredited university abroad (preferably for a year or so) to enable them to speak/understand the multi-disciplinary team's language (in terms of concepts and jargon), thus facilitating meaningful and effective interaction
- The involvement of Eritrean academia in this IK effort so that specialized knowledge about the IK collection is passed on from the remaining four staff to them. This entails the provision of appropriate exposure while building capacity and interest in IK within the country

The ultimate beneficiaries of this IK initiative will be the rural populations of the nine ethnic nationalities whose way of life, subsistence activities, and cultural institutions will be more transparent to the organizations that assist them with services and participate in their development. Indigenous knowledge and practices gleaned from this initiative will not only provide a context for developmental activities but also help in their preservation and revitalization.

HIV/AIDS: Traditional Healers, Community Self-assessment, and Empowerment

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Most African countries have ratified the *African Charter on Human and People's Rights*, which states the rights to health, education, and "promoting, safeguarding, and reinforcing mutual respect and tolerance." In Sub-Saharan Africa alone, some 17.2 million have died of HIV/AIDS which includes some 3.7 million children under the age of 15. Fighting the disease has so far concentrated on prevention, and only limited attention has been directed towards treatment and the social and human rights aspects related to the pandemic. This seems to put the Charter to the test. Although several western pharmaceutical companies have lowered expenses for HIV/AIDS retroviral treatment, these medicines are still beyond the reach of most Africans. And even if medicine was provided free of charge, countries in Sub-Saharan Africa lack the medical infrastructure to distribute the medicine, and it is doubtful if health systems can be expanded at the speed and quality required. Finally there is a high risk that the resources allocated to fight the disease will not be fully accessed by the beneficiaries for whom it was intended. The focus here is, therefore, on how traditional healers and indigenous knowledge can empower communities to deal with the social consequences of the pandemic, and, at the same time, be able to ensure that government resources are actually being used to their benefit.

U.N. Secretary General Kofi Annan asked recently for an addition of $7 billion to $10 billion per year as a minimum transfer from rich countries to Africa to fight HIV/AIDS. But some experts in the region says that even such sums will have little impact until African nations build up their health systems to administer the drugs and monitor the health of those receiving them. The formal health care system only reaches 10 to 20 percent of the people, and those mainly in urban centers at hospitals and clinics. Traditional healers provide primary health care for 80 percent of the population and live in the communities where help is needed; they are the ones who today treat many patients for HIV/AIDS-related diseases. Some healers have already been successful in extending the lives of patients with HIV/AIDS using medicines they from locally grown medicinal plants. A good example is the work being done near Tanga in Tanzania.

Should Western medicine finally become available at affordable rates to poor communities, traditional healers could be the ones to distribute the

medicine and ensure that patients take the right doses. While traditional healers will need to be educated to do this, it will be less expensive to upgrade their knowledge than to expand the formal health system. Building on existing systems seems to have a higher chance of sustainability.

HIV/AIDS does not respect boundaries of class, culture or race, but lack of knowledge and misconception on how the disease is transmitted from one person to another often result in human rights violations by exclusion or isolation of individuals and families with HIV/AIDS. And the social effects affect the poor the most. Many communities have become aware that HIV/AIDS is transmitted via blood and sexual intercourse, but there is also a widespread misconception that transmission occurs by shaking hands, eating or bathing together, wearing the same clothes, using the same tools, or for children sleeping in the same bed. Education and information on how HIV/AIDS is being transmitted has so far been the core initiative in fighting the disease. Little attention has been directed towards lifting the social stigma related to the pandemic in spite of the fact that "what we cannot speak about we can do nothing about." Individual and social empowerment is essential for communities to handle the challenge, which is mainly left to them in the HIV/AIDS crisis. Moreover, when resources for the World Bank-assisted Multisector Aids Program (MAP) initiatives begin to flow, communities should be empowered to access and monitor resources intended for them. A very useful tool of empowerment was applied in the transitional period from apartheid up to the election in South Africa where NGOs and civil rights organizations managed to mobilize communities all over the country. The campaign was the largest ever undertaken anywhere at the time. The method was rooted in the facilitation of communities to create their own human rights charter based on democracy and respect for individuals of all races (Dorsey 1997). The idea was based on Paulo Freire's democratic proposals of problem-solving education where "men and women develop their power to perceive critically the way they exist in the world with which and in which they find themselves; they come to see the world not as a static reality but as a reality in the process of transformation" (Freire 2000).

To apply the successful experience of social mobilization in the fight against HIV/AIDS, a mini epidemiological study has to be undertaken *by community members* and *for the community*. Traditional healers (especially women healers) could be key facilitators in this process. What is important in community-managed research is the process its members go through, which differs fundamentally from a social assessment in which data collection is the most important. The process of community-managed research could be facilitated, apart from the traditional healers, by a local NGO/CBO to balance any attempt by local elites to dominate the process. Among the issues to be dealt with are the following:

- Where does the community think HIV/AIDS comes from?
- How does a person get the disease?
- Are there particular places where the risk for getting the disease is high?
- Are there many community members who often go to these places?
- Are there particular groups at high risk?
- Who in the community are seriously ill?
- What occupation did the ill persons have at the time they became ill?
- Has there been change in the person(s)' occupation since they became ill?
- How have the symptoms developed over time?
- Who did they contact when they first fell ill?
- Did they get some medical help and where did they get it?
- Has their social conditions changed after they became ill and how has it changed?
- What happens to a family (socially and economically) that has a member with HIV/AIDS?
- What initiatives have been taken by the community, by the government, or by the municipality/district in relation to the HIV/AIDS pandemic?
- Is anybody aware of resources for which the community can apply in order to fight HIV/AIDS?

The aim of such community research is: (i) to begin a process within the community to focus on HIV/AIDS, so as to enable people to talk about the disease; (ii) to increase awareness that the disease is not an abstract phenomenon talked about on the radio but something concerning members of their own community; (iii) to get personal stories which may help others in the same situation; (iv) to raise awareness among risk groups; (v) to make the disease become a concern for the community—e.g., on how the disease can be prevented and how the patients and their families including orphans can be helped; and, finally and very important, (vi) *facilitate the community to formulate their own Bill of Rights*. Each Community Bill of Rights will have unique features depending on the particular local conditions. But what the communities have agreed upon they will also be eager to enforce and to install social sanctions against those who violate what is in the best interest of the community as a whole.

"Charter Making and Participatory Research" by Ellen Dorsey in *Human Rights Education for the Twenty-First Century* edited by George J. Andreopolos and Richard Pierre Claude, University of Pennsylvania Press, Philadelphia 1997.

Pedagogy of the Oppressed by Paulo Freire, 30th Anniversary Edition, Continuum, New York 2000.

Senegal

Indigenous Language and Literature as a Non-profit Business

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Issue 13 of this series ("Sahelian Languages, Indigenous Knowledge And Self-Management," October 1999) reasoned that literacy in African languages, now on the rise in a number of countries across the continent, provides an important vehicle for the expression and development of indigenous knowledge. Literacy and nonformal education programs throughout the region are giving a measure of public "voice"—at least at the local level—to community groups and associations that had none before. But they often run into one considerable obstacle: the lack of literature for new literates in the languages of instruction.

The problem is beginning to be resolved among Senegalese speakers of the Fulani or *Pulaar* language in some instructive ways. This article presents briefly the experience of ARED (Associates in Research and Education for Development) and CERFLA (*Centre d'Etudes pour la Recherche et la Formation en Langues Africaines*), two closely linked non-profit organizations operating in Pulaar-speaking regions of the country, which have been working over the last twelve years to sustain popular literacy in the language.

ARED now manages a publishing venture that sells between 30,000 and 50,000 volumes of literature ever year, predominantly in Senegalese languages. The books are principally distributed in Senegal, and their continuing publication is 75 percent funded by the proceeds of book sales themselves. ARED is also increasingly active in training (CERFLA was founded to develop the organization's training vocation) and in local knowledge cultivation. How has it succeeded and what are the lessons of this experience in "adding sinew to local knowledge?"

The cultural context

The Pulaar culture constitutes the largest minority community in Senegal. Nearly a third of the country's 9 million inhabitants speak Pulaar, second only to those conversant in the majority African language of the country, Wolof. Across West Africa, from Senegal to northern Cameroon, speakers of Pulaar and related Fulani languages number over 25 million, nowhere in the national majority but predominant in a number of subnational regions. The Fulani are an ancient herding and, therefore, largely nomadic people, per-

haps of Egyptian origins in prehistoric times, who spread across the savanna regions of central and western Africa and became sedentarized in certain areas through religious conversion and political conquest. They have also emigrated to a number of other countries of Africa and many cities of Europe, the Middle East and South Asia.

Starting in the late 1950s, this experience of strong cultural tradition and minority status gave birth to a cultural revitalization. In 1958 a Senegaleese Pulaar speaker who had been living in Cairo for twenty years published a novel in the Pulaar language—*Ndikkiri Joom Moolo*, or "Ndikkiri, the First Born, a Guitarist"—written as an exercise in remembering his homeland. It was the story—at turns nostalgic, irreverent and hilarious—of a Pulaar antihero who abandoned hearth and home to take up a succession of careers as performing artist, religious cleric and finally charismatic leader, recurrently pursued by political authorities but triumphing and restored to his culture and family in the end. The author chose to write in a Latinized transcription of the language rather than the existing "ajami" or Arabic-based transcription, already in restricted use for many years among the religious elite.

Though rife with typographical errors that the Egyptian proofreaders obviously could not catch, the book gradually acquired a cult readership throughout the Pulaar diaspora. One early reader, who later became an editor of Pulaar-language materials, recounts the effect the book had on him. He found himself devouring the novel outside his residence at three in the morning so that his roommates could sleep.

> *I would sit on the sidewalk reading from Ndikkiri. With each page, I could barely keep from laughing out loud as I sat alone in the street. ... The next day, I would entertain my friends with stories from Ndikkiri while we drank tea together. In the end, all of my friends who were literate in Pulaar could hardly wait [to read] the book...*

The birth of a movement

This sort of enthusiasm helped give birth to a movement of Pulaar literacy and cultural renewal among those living in the Near East. From there, the initiative spread to France and in 1982 came home to Senegal in the form of the *Association pour la Renaissance du Poular* (ARP), an organization uniting overseas Pulaar-speakers with others living in urban areas of Senegal who wished their children to be more familiar with their own culture.

In the years following, ARP—spurred in part by the spread of African language literacy programs and in part by the threat of the adoption of Wolof as official lingua franca for the country—turned its energies to promoting local literacy classes in Pulaar in Senegal itself. Hundreds such classes were created over the next five years—classes sponsored by government agencies or official development projects as well as a mass of others initiated by local communities themselves. Standards were typically low, however; writing systems used were extremely various; and follow-up literature was very scarce. But the enthusiasm was real and the initiative was passionately homegrown.

In an effort to remedy the perceived weaknesses of the campaign, a group of Pulaar authors created in 1989 a *Groupe d'Initiative pour la Promotion des Livres en Langue Nationale* ("Group for Initiatives to Promote Books in National Languages" or GIPLLN) to draw together existing texts and facilitate their distribution to literacy classes. The instinct was good, but the initiative proved more ambitious than a team of authors could manage by themselves. Operations were consequently transferred the following year to a new nonprofit association registered in the United States, ARED. GIPLLN members constituted much of the Board, but technically-skilled Senegalese and an American researcher married to a Pulaar speaker were brought in as the association's executive personnel. ARED set about reproducing the stock of Pulaar-language texts available and developing others, essentially as a service to the new literacy centers.

Unexpected success

The undertaking succeeded to a much greater extent than its promoters had anticipated. The combination of literacy courses, an increasingly self-aware diaspora community, and the growth of NGOs concerned with developing better avenues of dissemination and contact with Pulaar-speaking populations offered a growing, if initially modest, "market" for such publications. The numbers of volumes sold annually expanded from 6,000 in 1988 to 41,000 in 2000, and titles published from a handful to over 150. Fully 95 percent of sales were to clients in Senegal. Prices were set to cover production costs and afford resellers a potential 25 percent margin of profit.

"Resellers" in fact included none of the major bookstores in the country, which did not—and still do not—deal in African language literature. ARED counts instead on small merchants and entrepreneurs who see the interest of their texts for local readers and buy a few dozen to resell. Their favorite story in this regard concerns a young man who walked from Kayes (in neighboring Mali) to Dakar, the capital of Senegal, behind a large herd of cattle. He sold his livestock on the urban market and showed up at ARED offices with a good part of his take: over 1,000,000 West African

francs (about $1,500). The money was already earmarked to buy Pulaar-language publications for resale in the Kayes region, volumes ordered ahead of time by local merchants there. The young man carried away a minor library to the train station, confident of a good profit on his return home.

A rich palette of publications

Through the end of calendar year 2000, ARED and its predecessor, GILLPIN, had disseminated 350,000 copies of their publications, representing 168 different titles, 85 of them written in Pulaar or translated into it, and the rest in other Senegalese languages, including French. This mass of literature can be broken down in at least two informative ways¯by topic area and by source. Materials cover the following basic topic areas:

- *Literacy and numeracy manuals* (seven titles published in calendar year 2000, two of them new)
- *Novels, stories and other creative literature* (one new title last year)
- *Information on development and civil society* (six titles published in 2000, two of them new)
- *Treatises on indigenous knowledge and traditional or religious practices* (three titles, two new)
- *Instructional texts for management capacity building* (one new publication).

Four different sources have been used for the written material. The first is texts—mostly creative or religious—authored by the founding members of GILLPIN and ARED themselves. Second come materials developed and written by ARED staff, principally its series of basic literacy training manuals, The third category comprises new books developed by staff, or existing publications translated into a Senegalese language by them, at the request of some outside donor. Publications of this nature include everything from agricultural extension manuals to a Pulaar version of *L'Aventure Ambiguë*, the renowned work of Senegalese novelist Cheikh Amadou Kane, translated under his personal direction. Interestingly, in both cases cited, ARED staff and resellers have testimonies from readers among the civil servant and University student population who admit they never fully understood the material before seeing the Pulaar version.

Last but not least, except numerically, come unsolicited manuscripts submitted by free-lance authors. Such submissions have until recently been quite rare, in part because ARED had not worked out clear contracting and remuneration norms for free-lance authors. These problems have now been resolved, however: published authors receive 10 percent of proceeds from sales of their books in two installments. Moreover, the organization has decided in its most recent general assembly to systematically encourage free-lance submissions in order to foster broader local authorship of publications; and the total number of such works having appeared in print has now risen to six.

Fiscal policies

ARED does not distribute its books free of charge, but rather tries to set prices at a level that covers cost of production plus a commission for the potential resellers while remaining relatively affordable in Senegalese terms. Most titles currently cost the equivalent of $1.50. Some are subsidized by outside donors, like NGOs interested in using literacy manuals or commissioning documents on development themes, or bilateral agencies wishing to produce extension material for projects they fund. Others are underwritten by ARED's own "investment funds," or the savings they have realized from their diverse training and publication endeavors over the years. *In toto*, ARED now covers 75 percent of the cost of its publishing through book sales and another 25 percent through subsidized support and its own investment funds, making it the nearest things to a self-funding source of African language publications in francophone West Africa.

During the latter years of the last decade, the organization's revenues were greatly strengthened by two clients. The first was foreign-aid supported government literacy programs that, under Senegal's *faire faire* or decentralized service provision strategy, funded a variety of NGOs to carry out their own local literacy efforts and authorized them to purchase manuals and texts from publishing ventures like ARED that had developed certifiably effective materials. On the strength of these orders, for example, the number of basic literacy books in Pulaar sold surged from just under 9,000 in 1995 to over 40,000. The second source was major support from Lutheran World Relief (LWR) throughout the early and middle years of the decade, both for training local associations and for the development and publication of a variety of written materials. Forty-seven of the latter were funded entirely or in part by LWR. Its support was sharply curtailed starting in 1998, however, due to problems that the organization was experiencing in its own fund raising. ARED was forced to downsize its staff, consolidate its operations, and concentrate efforts on areas of demand likely to produce new business. The effort has apparently been a success. In calendar year 2000, ARED produced

12 new titles and CERFLA carried out 26 new training sessions, while the total numbers of books sold rebounded from a low of 23,000 in the year following reduction in its major underwriting to 41,000.

Lessons learned

What are the lessons of the ARED experience? For one, the story of ARED makes it clear that—at least under the conditions in Senegal that the association has faced over the last two decades—it is possible to develop a nonprofit business and publishing firm devoted to African language literacy and to the dissemination of indigenous knowledge. There are workable formulas that rely essentially on local sales and service receipts (though partly provided through the NGO and aid funding network), without major underwriting from donor agencies. ARED has survived this transition and managed to continue growing. Several non-financial factors have played a critical role, however, in the association's success:

• ARED and CERFLA are as much "movement" as nonprofit business. The contributions of a certain number of political ringleaders from within the Pulaarophone community, both in the diaspora and locally in Senegal, have been critical to their maturation and growth.

• An ability to read the signs of the times and discern developmental "niches" for African-language publications and literacy development has also been essential. Much in the current spirit of decentralization, local empowerment and cultural renewal lends itself to making the formula work, but a bit of entrepreneurial spirit and acumen is required to capitalize on it.

• Good institutional backup for accounting and management have also been critical. ARED benefits from a system and a track record for resource management and from its status as a US-, as well as Senegal-, registered association.

• Ironically, perhaps, aspects of the information revolution have simplified and supported the task of publishing in African languages. Computers can handle the specialized fonts for language-specific sounds that posed big obstacles in the typewriter age, desk-top publishing makes local document design and production a relative snap, and e-mail tightens networks among far-flung allies.

Recognizing a disappearing resource

To these factors should be added both the minority status and the particular resilience of the Pulaar community, which has lent to the endeavor a certain aura of "sacred cause." Nothing frames the value of indigenous knowledge and the will to perpetuate so well, it would seem, as widespread awareness that it is in danger of disappearing.

Burkina Faso

Integrating Indigenous and Scientific Rainfall Forecasting

This article was written by Carla Roncoli, Keith Ingram, Paul Kirshen, and Christine Jost of the Climate Forecasting for Agricultural Resources (CFAR) project, an interdisciplinary research initiative jointly implemented by the University of Georgia and Tufts University and funded by the Office of Global Program of the National Oceanic and Atmospheric Administration. A longer version is forthcoming in Society and Natural Resources, *v.15. For more information contact Carla Roncoli at: (404) 524-8833 or croncoli@gaes.griffin.peachnet.edu.*

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This case study describes how farmers of Burkina Faso predict seasonal rainfall and examines how their forecasts relate to scientific ones. In recent years, meteorological science has made enormous progress in predicting climate. The realization that sea surface temperatures (SSTs) influence global atmospheric circulation enables scientists to formulate forecasts of seasonal rainfall. These are presented as the probability of total seasonal rainfall quantity being in the above normal, below normal, or normal compared with an average resulting from analysis of thirty- years series. In West Africa, seasonal rainfall relates to the three months of July, August, and September, during which 90 percent of total annual rainfall occurs.

Rather than conceiving local and scientific knowledge as absolutely incompatible, our research shows that farmers are used to operating in multiple cognitive frameworks and that they are interested in receiving scientific forecasts because they perceive local forecasts as becoming less reliable due to increasing climate variability. But to effectively convey scientific forecasts we need to understand how people think about rainfall, including how they perceive and predict variability. Understanding local cultural models is essential for communicating research products and development technology.

Locality and livelihoods

Bonam is a village located in the Namentenga Province, one of the poorest of forty-five provinces in Burkina Faso. Most of Bonam inhabitants are Mossi, the dominant ethnic group in the country, and draw a livelihood from rain-fed farming of grain and leguminous crops, combined with some livestock production, petty trade, and labor migration to Côte d'Ivoire. Some Fulani pastoralists have also settled in the area.

Rain falls during a single season lasting from May to October, characterized by extreme inter-annual and non-uniform distribution within seasons. The long-term mean annual rainfall is 674 mm. At the onset of the rainy season, farmers decide what, when, and where to plant. They do so according to their expectations for seasonal rainfall, striving to minimize risk by combining the water retention capacity of different soil types and field positions with the water requirements of various crops and crop varieties.

Farmers' forecasting knowledge encompasses shared and selective repertoires. Experienced (mostly elderly male) farmers formulate hypotheses about seasonal rainfall by observing natural phenomena, while cultural and ritual specialists draw predictions from divination, visions, or dreams.

Shared forecasting knowledge

Environmental indicators that farmers use to predict seasonal rainfall become available for observation at different times of year. Among the earliest and most widely relied upon indicators are the timing, intensity, and duration of cold temperatures during the early part of the dry season (November–January). Farmers believe that intense cold (below 15 degrees C) during this time corresponds to abundant rainfall during the rainy season and that if this cold period begins early or ends late, the rains will do likewise. Following the cold-dry period is a hot-dry period (February–April): intense heat at this time is also believed to predict good rainfall.

The second most common forecasting indicator is the production of fruit by certain local trees, which occurs between April and June. According to farmers, good yields from trees such as *taanga* (*Butyrospermum parkii*) and *sibga* (*Anogeissus leiocarpus*) predict a favorable season. On the other hand, farmers link abundant fruit production by *nobga* (*Sclerocarya birrea)* and *sabtuluga* (*Lannea acida*) trees to drought.

Trees are also used as signs for the approaching of the rains or the presence of water. When *sibga* begin fruiting and *sabtuluga* lose their leaves farmers know that they should get ready for planting. *Kankanga* is a fig-like tree that grows where the water table is near the soil surface. Therefore, it signals herders where to dig wells to water their cattle and farmers where they can plant water-demanding crops, such as cotton.

Another indicator that becomes available at the onset of the rains is the water level in streams and ponds. If it remains consistently high after the first rains, farmers believe that the season will be favorable since heavy rains at the onset are believed to be a propitious sign. Herders who pasture animals in the bush watch the nesting of small quail-like bird (known as *koobre* in Moré) and believe that when nests hang high on trees then the rains will be heavy; when nests hang low, the rains will be scarce.

Women also observe insect behavior at water sources and in rubbish heaps outside compound walls. For instance, *bugvaré* are black insects of the *Orthoptera* sp. that dig con-cave nests in rubbish heaps outside compounds. After the first rains, larvae emerge, filling the nests with dirt. Women said that they expect a good farming season if *bugvaré* fill their nests to the brim with dirt, which symbolizes a full granary.

But, while signs are observed throughout the dry season, it is at the onset of the rains that farmers consolidate their expectations for rainy season. An early onset, especially with a regular succession of rains that enable good crop establishment, is the most widely considered indicator of a good season. The number of times farmers must plant is also key in evaluating the nature of a season and predicting crop performance. For example, when a drought affected the region in 1997, farmers had known a food crisis loomed ahead by the end of planting time (early August), half a year before official famine early-warning systems registered distress signals.

Some elders are also able to interpret constellation movements and lunar phases. For instance, they consider the visible phases of the moon, especially the full moon, to be more likely to be dry than dark phases because moonlight exerts a force that prevents rain from falling. Stars also signify suitable planting periods for different fields and crops. The appearance of *Souci* (Pleiades) in early May indicates that it is time to prepare valley bottom fields for planting. Shifts in the position of the *Budb Kutoega* (Ursa Major) identify the start and end of the period for planting sorghum. The appearance of *Tatba* (Orion) in July coincides with heavy rains (*sa nyanga*) that favor maize planting.

Specialized forecasting knowledge

In contrast to the observation of environmental signs which is available to most farmers, divination and other spiritual practices are the prerogative of select groups or individuals. The most authoritative among them is the *Tengsoba,* the eldest descendent of the clan that first settled the land. He performs sacrifices to mediate between the living and the ancestral and earth spirits that inhabit fetish sites, some of which influence the rains. Predictions are drawn from the behavior of sacrificed animals, how long it takes to fall, in which direction it falls, and where the blood spills. The *Tengsoba* and other traditional specialists might also receive forecasts from ancestors or deities in the form of dreams or visions.

Marabouts are spiritualists who situate themselves within the Islamic tradition, although Islamic orthodoxy frowns on their practices. These spiritualists range from Islamic clerics (*Limam*) who are versed in the Koran to divin-

ers who mix Islam with indigenous beliefs and practices. The *Zambende* ceremony, which marks the beginning of the Muslim year, is the key venue for *marabouts* to issue their forecasts. *Marabouts* base their predictions on the day of the week that marks the first day of *Zambende*. Each day is associated with a different prophet and the year that follows is characterized by symbolic events in the life or time of that prophet. Prophecies are written in Arabic texts along with instructions for ritual offerings and other measures to stave off inauspicious events.

Unlike the *Tengsoba* and the *marabouts* who can only issue predictions and offer intercessory prayers, there are other specialists, known as *sa tatta*, who claim direct command over the rains. But their powers are feared as rainmaking is considered to endanger both practitioners and the community. Invoked rains are believed to be mostly violent downpours (*saraogo*) accompanied by heavy wind, sharp thunder, and lightning that cause damage to crops, houses, and animals. For this reason, a government cloud-seeding project at the beginning of the 1998 rainy season caused anxiety rather than relief among farmers in Bonam.

Some spiritualists foresaw the 1997 drought and their responses have implications for their potential role in diffusing scientific forecasts as well. The *Tengsoba* admitted having had dire premonitions during the dry season, but he did not reveal them. Other spiritualists confirm that they tend not to publicize dire predictions because to do so "would be like launching a curse" against those under their authority. Verbalizing negative forecasts would reify them into an inevitable outcome by voiding any possibility for supplication and negotiation with the spirits. The failure to alter dire predictions may also undermine the credibility of spiritualists responsible for interceding between the living and the spirits. Furthermore, a bleak forecast may also discourage people from farming and induce them to migrate, undermining the social order on which the elders' authority rests.

Integrating local and scientific forecasts

Bonam farmers recognize that both society and climate have undergone significant changes in the last few decades. Traditional leaders lament that formal education, monotheistic religions, and modernization ideologies have diminished their authority, especially among the youth. Climate variability has also weakened farmers' confidence in local knowledge. Elders recalled that in the past they were able to predict the rain onset so accurately that they could mobilize family labor plant on dry soil, knowing that the rains would soon follow, but now their sons refuse to go to the field until it actually rains.

But this does not mean that farmers perceive scientific information as a threat to local culture. On the contrary, because they perceive local forecasts to have become less reliable, farmers are keenly interested in alternative sources of information. Rather than being static and uniform, their cognitive landscape already incorporates a plurality of knowledge frameworks. Local forecasting combines empirical observations and spiritual insights that draw from a variety of religious traditions. Farmers mix local and introduced practices and technologies and families pragmatically combine modern medicine and local treatments when one of their members is sick. It is the imposition of any one knowledge system as representing the totality of truth that is resented and resisted.

Hence, scientific information must be presented in ways that conform to cultural notions concerning the nature of knowledge, its production and validation, and its relationship to society. Local systems of thought emphasize the partial nature of human understanding, which means that no one source of information is considered as having the entire picture. Local forecasts systems rely on a range of indicators that become available to different people and at different times. Farmers do not resolve contradictions among indicators into a cogent scenario. Discrepancies among forecasts or between forecasts and outcomes are explained in terms of the diversity of ecological niches and cropping systems. The probabilistic nature of the forecast may also be explained by reference to the uncertain nature of destiny as the outcome of negotiations between the living and the spirits and, ultimately, of the arbitrary will of the latter.

There are several aspects of method and content where local and scientific knowledge of forecasting converges. For example in formulating predictions, spiritualists use approaches reminiscent of scientific practice. *Zambende* prophecies derive from the exegesis of textual material and from consultations among spiritualists, who then officially communicate them to the lay public. In the domain of environmental knowledge, farmer forecasts resemble scientific methods in their reliance on the systematic observation of natural phenomena. The generation of knowledge from observation is consistent with cultural learning styles whereby children learn from watching adults rather than through verbal instruction or asking questions.

Meteorologists could build on local understanding of the relationship between temperatures and rainfall to explain the technical aspects of scientific forecasts based on sea surface temperatures. Farmers' interpretations of wind patterns also recognize the ocean as the origin for rain. During the dry season, farmers expect winds to blow westward, that is, to go to the ocean to pick up water, and then return

blowing eastward at the onset of the rainy season. Farmers predicted and explained drought from the absence of such winds.

But farmers' forecasts diverge from scientific ones in important ways, particularly the scale and parameters they address. Unlike scientific forecasts, which are formulated in reference to "zones," the production and the application of local forecasts are deeply localized. They derive from an intimate interaction with a microenvironment whose rhythms are intertwined with the cycles of family and community life. It is not the generic *sibga* or *taanga* that farmers usually consider in predicting rainfall, but specific trees near their home or their fields that they might have observed over a lifetime.

While scientific forecasts hinge on estimates of total seasonal quantity, farmers evaluate seasons in terms of types and time of rainfall. For instance, they recognize that the same amount of rainfall can lead to different production outcomes if it occurs as *sa nyanga* (prolonged but consistent rain that leaves the soil moist for several days) or as *saraogo* (localized thunderstorm accompanied by violent wind). Water-deficit periods that occur during establishment or heading will cause more damage to crops than those that occur during other crop growth stages.

The time of onset and of termination, marking the duration of the rains, is such a salient parameter that a forecast of an "above average" seasonal rainfall is invariably understood by Bonam farmers as predicting a longer season. Currently, science is unable to reliably predict either the duration or distribution of seasonal rainfall, but the integration of scientific forecasts with local knowledge might allow some inferences in this regard. For example, the abnormally heavy rains that fell in July and August 1999 could have been predicted by combining farmers' predictions of delayed onset with the scientific forecast for above-normal seasonal rainfall.

Conclusions

Our findings show that neither the experiences of bridging knowledge systems nor the concepts of rainfall forecasting are alien to the farmers of Burkina Faso. Local forecasts converge with scientific ones in some aspects of content and method, but also diverge in terms of practical significance and moral meanings. These contrasts challenge science on two fronts.

On the one hand, the specificity of local forecast parameters urges science to be more responsive to farmers' information needs and more relevant to the livelihood decisions they face. On the other hand, local systems of expertise and leadership tightly link knowledge and social responsibility, calling for scientists to be more aware of and accountable for the impacts of the knowledge they produce and provide to users.

This responsibility propels us beyond the task of integrating local and scientific knowledge in form and content forecasts, to face the challenge of addressing consequences and context of their use. In particular, the provision of information needs to be integrated with appropriate interventions that bolster farmers' ability to negotiate a mitigated outcome of predicted scenarios. Scientists, policymakers, donors, and development practitioners must work together to devise consistent and sustainable approaches to improving the flexibility of local production systems and the resiliency of livelihood security for the resource-limited farmers of the Sudano-Sahel region.

Leveraging Traditional and Modern Knowledge Systems

Maternal Health Care in Rural Uganda

This article was written by Dr. Maria G.N. Musoke (PhD), Makerere University, Kampala, Uganda.

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Uganda is one of the least urbanized countries in Africa, where over 80 percent of the population of about 20 million people live in rural areas. Uganda's economy depends mainly on agriculture and women contribute 60–80 percent of the labour. Women's health, therefore, has vital social and economic implications for national development. However, among Ugandan women of reproductive age, maternal health issues are a major problem as demonstrated by the following indicators: a high maternal mortality rate estimated at 506/100,000; an equally high fertility rate of about 6.9; only about 38 percent births are attended to by trained health workers, the rest (62 percent) are attended by traditional birth attendants[1] (TBAs) and relatives.[2] To address these problems, the Ugandan Ministry of Health (MoH) identified several strategies and activities. Some of these activities included expanding the referral system and improving the TBA network as well as training TBAs. The Rural Extended Services and Care for Ultimate Emergency Relief (RESCUER) project was started as one of these initiatives.

Project description

The RESCUER project was launched in March 1996, on a pilot basis, in Iganga[3] District, Eastern Uganda. It is basically a referral project, designed to address the high maternal mortality problem. The project was initiated by the MoH, UNFPA, and the Uganda Population Secretariat. A multi-sectoral Iganga district task force implements the project, while UNFPA and the MoH do the monitoring.

RESCUER has three components: communication, transport and quality health services delivery.

Communication

The type of information communications technology (ICT) selected was dictated by a number of factors, some of which include: unavailability of electric power supply in most rural areas, lack of wired telephones, the need for the ICT to be accessed twenty four hours a day, flexibility, the need to re-use the system in other parts of the country and the economic sustainability of the system when donor support ended. For these reasons, the VHF radio was the type of ICT selected to be used in the project. This included fixed base stations at the health units, mobile

walkie-talkies with the TBAs, and vehicle radios in the referral hospital ambulance and the District Medical Officer's vehicle. The VHF radio communication is solar-powered, avoiding electric power shortage or surge problems.

The RESCUER project was designed to link the traditional rural community health providers with the formal health delivery system in a cost-effective way, such that when an obstetric emergency occurs in a village, a TBA uses a walkie-talkie to call for assistance from the nearest health unit. A message on what to do is immediately relayed over the radio system. If the TBA cannot manage the case, transport is dispatched from the health unit with a midwife to collect the patient. If a case cannot be managed at the health centre level, the hospital is called and an ambulance is sent to transport the patient to the referral hospital.

Transport

Tricycles were provided to each of the participating primary-level referral health units which were generally subcounty health centres. An old ambulance at the main referral hospital was repaired and equipped with radio communication. TBAs were given bicycles to assist them with transport to the health units to charge the walkie-talkie battery and to collect monthly statistics.

Quality health services delivery

This included capacity building (e.g., training of TBAs, midwives, technicians), recruitment of at least two midwives and a clinical officer in all the participating health units, renovation of the maternity wards (including provision of delivery beds, oxygen, and I.V. fluid stands) and regular provision of maternal emergency kits and other supplies.

Implementation

A district task force comprising of the Director of District Health Services (DDHS—formerly known as the District Medical Officer), and officials from other sectors in the district was set up to oversee the planning, development, and implementation of the project. It is answerable to the highest tier of district leadership, namely, the LC5 chairperson. The task force is chaired by the DDHS, and comprises representatives from sectors relevant to health in the district.

Results and impact

In July 1999, the author carried out a study to investigate the effect of the communication system on maternal health care, and its contribution to the referral project. She identified factors affecting the project, as well as the costs and sustainability of the project. Data were collected from both secondary and primary sources. Secondary sources included progress reports and other project documents. Primary data were collected qualitatively, through interviews and based on incidents narrated by health workers and TBAs. The study sample focused on Iganga district where the project had been running since March 1996.

The increased number of deliveries under trained personnel and increased referrals to health units led to a reduction of about 50 percent in the maternal mortality rate (MMR) in three years as indicated below:

"A survey carried out recently in three districts of Arua, Iganga and Tororo, which all had got their TBAs trained, showed that Iganga's MMR had reduced from 500/100,000 in 1996 to 271/100,000; whereas rates for Tororo and Arua had reduced, but both were above 350/100,000. This indicated that communication and transport facilities in Iganga contributed to a reduction in MMR. Before the project, there were problems of lack of communication facilities and transport, which made referrals slow and sometimes led to the death of the mother or baby or both" (Administrator).

Six health units and one referral hospital participated in the project. Of these, four health units and the referral hospital were studied and their midwives interviewed. In addition, ten TBAs, three project administrators and four women beneficiaries were interviewed.

To the TBAs, the walkie-talkie technology was a great source of empowerment as it improved their image and credibility, thus increasing compliance with referral advice, and also augmented their income by increasing the number of women they attended to. Those who are not able to write further pointed out that :

"Since I can't write, it was difficult for me to refer women; I had to go with them to the health unit and explain… but now, the walkie-talkie saved me all that trouble, because I just call the midwife and explain the condition of the person I am referring… I don't have to go escorting every person I refer" (TBA7).

The communication technology brought the rural midwives closer to each other, thereby reducing isolation and facilitating consultation. Panic situations and the uncertain management of complications were reduced considerably.

In the referral hospital, communication was reported to have made the work of midwives easier as they were able to know in advance what to expect and prepare for emergencies. Women beneficiaries reported that this communication link gave them hope in critical situations.

Lessons learned

The study highlighted a number of lessons.

Complementarity

• A critical mass of complementary activities is needed to achieve maximum impact. For example, the study found that although the communication component made a very significant contribution to the success of the RESCUER project, it could not stand on its own. For the project to achieve its objectives of improved referrals leading to increased deliveries by trained personnel, the other two components (transportation and quality of services delivery) had to play their complementary role. When transport broke down, however, it was reported that the presence of a midwife and the communication system played a big role in saving lives: the TBAs called to consult health units, these also called to consult colleagues and seniors. However, where the emergency necessitated a referral, the need for transport became very crucial.

Technology

• The impact of ICTs is enhanced if the technology is appropriate to the local conditions. As indicated, the ICT choice was made after careful considerations of the local problems in rural Uganda.

• The use of solar power by the radio communication system could also benefit rural health units, which have no electricity. In particular, the study recommended that the solar power should be extended to provide light in the maternity wards / labour suites in the first-level referral units.

• The simple design of the radio communication system facilitated its use according to all the people interviewed.

• The public audibility of the radio communication system renders it difficult to abuse or misuse. Interviewees reported that calls made are usually brief and to the point, and that the nature of this ICT protects it from theft.

• A multi-tiered ICT approach can help bring the benefits of advanced technology to the rural population in Sub-Saharan Africa. Such an approach will cater to the different capabilities in African situations. For example, telemedicine and other advanced technology facilities (e.g., the Internet) can be adopted at the district hospital, while simple technologies like radio can serve lower levels (rural health units, TBAs, etc.). The consultations made by lower units to the district hospital would ensure that the rural population benefits indirectly from the technology.

Institutional capacity

• The project built on existing infrastructure and local capacity, including traditional knowledge systems. The TBAs' knowledge of local culture, values and their ability to connect traditional and modern practices was critical to the project. Indeed the project started at the grassroots with the traditional knowledge held by the TBAs, and improved it by conducting refresher courses and equipping TBAs, as well as professional health workers, with simple ICT, transport and regular supplies.

• Leveraging traditional and modern knowledge systems can increase impact. For example, the RESCUER project brought together traditional and modern health practitioners and inculcated mutual understanding and trust that has enhanced maternal health care.

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1 A traditional birth attendant (TBA) is a person from the community with no formal training, but who has knowledge of indigenous practices which has been acquired through apprenticeship and being part of a local community's culture and value system. She/he attends to women in childbirth, advises on and treats matters of family health usually using herbs and / or other traditional medicines and practices. (Adapted from: National Traditional Birth Attendants' curriculum for Uganda. MoH / Maternal and Child Health and Family Planning division. Kampala.)

2 *Source*: UNDP (1998). Uganda Human Development report.

3 Iganga distict had a population of 706,476 of whom 52 percent were females. This was before Mayuge was split from Iganga in 2000. *Source*: Iganga District Planning department.

Eritrea

Eliminating a Harmful Traditional Practice

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Female genital mutilation is widespread throughout many regions of Africa and elsewhere. It is usually perpetrated during early childhood and has serious consequences for the medical, gynecological, and obstetrical well-being of girls. These effects persist throughout the childbearing years and beyond. Less often recognized are the psychological suffering, humiliation social dignity and self-concepts of the girls and women subjected to this traditional practice.

Infibulation that is usually performed during early childhood is the most radical and destructive form of female genital mutilation. It also has the most destructive gynecological and obstetrical consequences. The practice of infibulation was traditionally widespread throughout the Lowlands of Eritrea, and particularly among the nomads. During the thirty-year war for Eritrean independence, the medical department of the liberation forces that treated not only the combatants but also the civilian populations in the liberated zones frequently had to treat girls and women with major gynecological and obstetrical disorders. The majority of these were directly related to genital mutilation. The question was therefore discussed in detail among the combatants as to what measures could be taken to ease this dreadful burden on women to prevent serious medical complications. At the same time it was recognized that this practice was totally incompatible with the efforts to improve the social status of women in the society.

Expatriate visitors to the field who were informed about the practice of genital mutilation among Eritrean nomads, and others abroad who heard about these practices were outraged and immediately insisted that the surgical infibulation be forbidden, with severe penalties for those who continued to this harmful traditional practice. These expatriates failed to understand either the delicate balance between liberation forces and the civilian population, or that the overall policy of the independence forces to unify the country depended on cooperation and close working relationships among all sectors of the population. Most outsiders further assumed that, at the present time, it was primarily the men who perpetrated these mutilations on women. Historically, the nefarious practices were no doubt instituted by males on females, but over centuries women had assimilated the cultural importance of the practice, on the premise that women who were not infibulated or circumcised were in danger of becoming

sexually promiscuous or of becoming prostitutes. To preserve their respect in the community, women therefore insisted on the mutilation, and in many countries still do.

The medical department of the Eritrean independence forces therefore made the decision not to forbid the practice in the lowlands or to impose any penalties on those who continued the practice. They recognized that trying to stop it by force would only alienate the population and drive the practice underground. Instead, voluntary meetings were called at which Traditional Birth Attendants (TBAs) who were the civilians who performed the infibulations were invited to participate in repeated month-long workshops conducted by nurses and doctors on a voluntary basis. At these workshops TBAs were given detailed information about the severe harmful immediate effects of hemorrhage and infection; as well as about the serious long-term gynecological consequences, increased infant and maternal mortality, and the like. They also underwent courses in modern sterile technique, obstetrical practices, etc. As is the practice at Eritrean workshops, the transmission of information was followed by active discussion. Thereafter, the TBAs returned to their villages.

Although there were no systematic follow-up studies, anecdotal reports suggested that there was a gradual reduction in the adverse consequences of genital mutilation as the TBAs applied their new knowledge. However, it could not be expected that the practices were abandoned altogether during, or even after the war. Since independence, the National Association of Eritrean Women makes frequent visits to the nomads to continue these discussion based on mutual respect and cooperation. The general impression is that the practice is slowly disappearing.

Impact

The quickest solution for stopping the practices of female genital mutilation (and the one proposed by foreigner informal advisors) might at first glance appear to be to forbid the practice and to impose penalties on those who continued the practice. However, in view of the delicate relationship between the independence forces and the civilian population it would in any case have been politically inappropriate to impose such legal measures. Moreover, the practices would have merely continued underground. Instead, the independence forces relied on the inherent intelligence and willingness of the TBAs to modify their gynecological practices gradually, once they were given the necessary modern medical information as to how they might modify them, and to educate the civilian population by practice rather than by fiat. This approach also laid the groundwork for the continuing education of women by women after independence—an additional step towards assuring the equality of women.

A Four-Nation Overview

Developing Indigenous Knowledge in Francophone Africa

The mission in mid-2001 comprised the authors of this article, Peter Easton (consultant), Emmanuel Nikiema (World Bank staff, Burkina Faso Field Office), and Suzanne Essama (World Bank staff, Washington D.C.). For more information, please e-mail sessama@worldbank.org

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How well is indigenous knowledge (IK) taking hold and being integrated into the development policy and practice in the Francophone countries of West and Central Africa? Results of a World Bank mission in early summer 2001 to four of these nations—Senegal, Mali, Burkina Faso and Cameroon—offer a brief panorama of the current situation. This note is based on contacts with public and private sector counterparts involved in different facets of indigenous knowledge promotion and interviews that grew, in many instances, from these initial contacts. The situation in each country was different—a function of its own history and the challenges and opportunities it faces; yet there were important commonalities as well. Both are briefly explored below.

An abundance of initiatives

Much is going on in relation to indigenous knowledge in all four countries, both in the public sector and among non-governmental and community-based organizations. Activities are cropping up across multiple domains of development: health, agriculture, education, natural resource management, cultural affairs. A few examples:

- An NGO in Mali devoted to "adding muscle to local knowledge" (*muscler le savoir local*) recruits students from across West Africa to attend seminars on the dynamics of indigenous knowledge and to carry out first hand research—particularly in the agricultural zone of the Office du Niger—on how local farmers have adapted traditional understandings of crop fertility and production to the exigencies of commercial operations.
- A center in rural Senegal gathers together over 400 traditional healers to exchange methods and test the efficacy of their ministrations with modern medical diagnosis.
- The Ministry of Culture and Art in Burkina Faso sponsors, through its "Direction of Cultural Heritage," a series of local museums devoted to preserving indigenous crafts and a program of fora on local know-how.
- A researcher at the Natural Products Research Foundation in Cameroon has carried out, under OAU sponsorship, an ethno-botanic survey of traditional uses of the vast store of plants in that country.

Indigenous knowledge now appears to be a hot topic. There are sources of funding, both private and foreign aid-

based, for studies and initiatives in this area, and it is increasingly politically correct to endorse related efforts. Cross-country undertakings are not uncommon. The Ministry of Culture in Mali recently held an international colloquium of traditional hunters and "bush chieftains" (*chefs de la brousse*) from several West African countries to discuss indigenous methods of natural resource preservation; and the NGO PROMETRA (*Promotion des medicines traditionnelles* or "Promotion of traditional medicine") in Senegal has joined forces with similar organizations or created branches of its own structure in twelve other African countries. It is evident that any further effort now envisaged in these countries must take careful account of what has already been initiated and of the lessons learned from practice to date.

Uneven development

The very popularity of indigenous knowledge as a banner for action, and funding, attracts such a variety of aspirants and contributors that testing claims against field-level results is a critical means for identifying best practice and separating the wheat from the chaff. Yet such assessment is far from the rule.

There is nonetheless an increasing amount of substance in the domain of indigenous knowledge throughout the four countries visited, but it remains unevenly developed in a number of respects.

- Despite the creation of Ministries of Culture (as in Mali and Burkina Faso), the preponderance of activities remains in the NGO and voluntary sector. Cultivation of indigenous knowledge is seldom part of the policy or practices of pubic agencies. In Senegal, for example, almost all of the experiments with traditional medicine have been carried out under private auspices, and their proponents have had little success in interesting the mainline medical system in such initiatives.
- There is also a marked divergence between what might be called the "hard" and "soft" sectors of development. Most IK initiatives have been undertaken in social service domains like health, culture and education. There are some, though fewer, in agriculture The further one moves from the realm of social development toward engineering, finance and the more technical sectors of development, the fewer people one finds who understand the role of IK or are ready to take it into account. Natural resource management constitutes perhaps the most notable exception.
- Use of African languages is in many cases closely related to efforts to record, develop, and incorporate local knowledge; but practices in this regard are conditioned by a host of other policy concerns. It is typically more difficult to adopt coherent policies promoting them in coastal countries with hundreds of African languages than in interior or Sahelian countries with a more limited number of tongues and a few predominant *lingua franca*. Cameroon, for example, must deal both with official (French-English) bilingualism and a number of different African languages and is therefore still struggling with its policy regarding use of the latter in the educational system.

Why this record of uneven progress? Dominant models of development are difficult to change, it is true, and the more technical the domain the more it is tied into international norms of procedure and performance. Indigenous knowledge is therefore naturally a phenomenon where rhetoric and practice tend to diverge a bit: there is often a political payoff to endorsing it but a real political cost to doing something concrete about it.

But there are other valid reasons for uneven development. The NGO sector provides a good laboratory for experimenting with innovative approaches before trying to incorporate the most successful or appropriate of them into public policy; it is scarcely surprising therefore that new initiatives crop up there. In a multicultural context, *whose* indigenous knowledge will be given prominence is a thorny question, just like the issue of *which* African language or languages will achieve official status. There are good reasons for advancing slowly with such decisions.

One result of this uneven development is of course a lack of coherence and coordination in the "indigenous knowledge sector." Actors in one arena do not know what those in another are doing, there are few commonly accepted standards for work, and there is a good deal of competition. This is not all bad, however. The multiplicity of efforts at least favors the emergence of new ideas and creates a variety of approaches that experience may help to winnow out.

Recognizing different varieties of IK

One result of the increasing experience with the development of indigenous knowledge in the four countries visited is increasing sophistication in understanding the various meanings and applications of IK. A group interviewed in Senegal presented perhaps the clearest analysis of the different and potentially complementary interpretations of local knowledge now embodied in the field. They distinguished three variant approaches:

- *Indigenous knowledge as a heritage from the past* to be carefully conserved and respected—an approach displaying the kind of reverence for the accumulated wisdom of

previous generations so poignantly expressed in the famous phrase from Amadou Hampate Bâ, "each time an elder dies it is as if a library had burned down."

- *Indigenous knowledge as an embodiment of a different and specifically African mode of thought*—an African "epistemology" and therefore a means for rethinking development methods in areas like health, agriculture, and natural resource management. Proponents of this approach point to the failure of current methodologies of development as evidence of the need for new concepts rooted in people's cultural heritage.
- *Indigenous knowledge as a means and process for articulating what local people know, and involving them in the creation of the knowledge required for development*, and so transmitting to future generations the best that the present has to offer. Proponents of this approach insist that IK is as much a question of enabling local actors to produce *new* knowledge—based both on inheritance from the past and a clear-eyed assessment of current challenges—as it is one of simply inventorying and storing up the traditions inherited from the past.

The *synthesis* of these three perspectives seems to have the greatest potential for stimulating widespread respect of indigenous knowledge. But examples are rare, though the language people use increasingly reflects a compound perspective. Our interlocutors talked of "referring" or having regular "recourse" to indigenous knowledge in building new models for development, rather than simply enshrining it. Many were sensitive, moreover, to the virtues of the third approach, which makes indigenous knowledge an active process, rather than purely a question of anthologies and museums, and ties it to an agenda of popular participation and decentralization.

Building the missing links

Where is the movement headed in these four countries? What are the principal challenges facing its proponents? The biggest "missing link" in all sites visited lies in the inability or insufficient opportunity to "inject" the results of IK initiatives into the policies and procedures that govern local development, to move from gratifying forums and towards encouraging experiments to actual changes in policy and standard practice.

The situation is reflected both in the countries visited and in donor organizations such as the World Bank. Indigenous knowledge concerns, if more frequently recognized now than in the past, tend to be compartmentalized in specialized services or agencies that have this mission but have little effect on policy in the "working" sectors of development. At the national level, there may be a ministry or agency devoted to culture, yet operating largely in a vacuum without influence on practical issues of economic and social development. In donor organizations, programs for the promotion of IK may flourish but intersect little if at all with those mainstream offices that determine aid policy and practice. Crossing this divide remains a major challenge. Four dimensions of activity seem particularly important:

- Promoting the incorporation of indigenous knowledge into development projects through *more explicit procedures for involving local actors in the design of intervention methods* and in tactical decision-making. In many cases, this means making participatory management and action research standard operating procedure in development enterprises.
- Systematically developing, preparing and disseminating *tools and methods* for this kind of participatory approach to local development.
- Making *local schools a hub for the collection of indigenous knowledge* and a place of encounter between development agents and local actors in negotiating investments and initiatives that include it.
- Designing, testing and implementing *materials and methods for the pre-service and in-service professional training of development workers* that initiate them to fuller usage of local knowledge and assist them in discovering ways to synthesize the new and the old.

Strategies must evidently be developed country by country, although accompanied by ample means for cross-national exchange. The first step forward might best be a sort of "sector assessment" or *état des lieux* carried out by national researchers in order to inventory and compare the varied initiatives under way in a given country and what is known of their results. This would serve as a prelude and criteria for prioritizing future efforts. Government ministries and donor organizations should be a part of this scrutiny, which would entail as well an "audit" of their own policies with respect to local participation in development planning and utilization of indigenous knowledge.

In all four countries, IK is a domain of increasing activity and immense potential. It is at the same time a realm where support from donor communities can help greatly to strengthen existing efforts and "winnow" the most promising initiatives from the many now under way, but where host country policy decisions must finally govern norms.

Rural Seed Fairs in Southern Tanzania

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Why southern zone rural seed fairs?

The low productivity of agricultural crops is among the factors leading to low income and food insecurity for rural people in the Southern Zone of Tanzania.. The use of improved seeds is one way of increasing the productivity of agricultural crops. It was realized that the seed supply pipeline from the seed-producing regions in the Southern Zone was not flowing freely partly due to the poor infrastructure prevailing in the zone. In the conventional Transfer of Technology Model (TOT), the seed supply pipeline begins with research where breeding work is done and ends with farmers who access a final product of improved seeds/variety. The Multiple Sources of Innovations Model acknowledges the contribution of informal seed systems. Therefore, it is argued by development experts that informal and formal seed/variety development experts can complement each other and improve the supply of seeds of preferred varieties to farmers better than each expert's isolated efforts.

The Southern Zone rural seed fairs have the following objectives:

Short-term

- To create awareness of and accessibility to additional alternative seeds and planting materials from research institutions, seed companies and farmers;
- To enable researchers, extension agents and farmers to meet and exchange ideas on their strategies, the skills they use in seed and variety development and to sell and exchange seed materials; and
- To create working contacts between seed expert farmers, extension agents, breeders/researchers and national seed producers. These working contacts could lead to refinement of extension content and the creation of new seed/variety development programs and schemes including more village-based initiatives and researcher-farmer partnerships for technology development

Mid-term

- To increase significantly the number and availability of crop varieties bred from National Research Institutes, seed companies and farmers' own seed systems in the southern zone
- To promote farmers' own seed and exchange systems such that the official efforts, in addition to normal commercial channels, also work increasingly towards enhancing indigenous systems; and

- To encourage convergence between official variety development/seed production and farmers in their own complementary seed/variety development

Long-term

- To increase agricultural productivity, food availability and income for rural people in the southern zone.

Organization and implementation of the seed fairs

Over the years 1997–1999, seed fairs were organized and implemented by the Agricultural Research Institute (ARI), Naliendele and District Councils with financial support coming largely from the FINIDA-supported Rural Integrated Project Support (RIPS). However, since the year 2000, District Councils have been financing the rural seed fairs.

Before each seed fair, a farmer seed expert survey is conducted and a seed fair site selected in each district. The farmer seed experts are those farmers who in their community are considered experts on certain crops based on experience and who supply seed to others. These farmers are invited to exhibit during the seed fair day. Other farmers not identified as experts are also free to attend and participate. They could bring seeds , local skills and demonstrate to others. The seed fair sites are selected by districts based on the potential of the area for agricultural production, the availability of accommodation, accessibility and how central it is to other villages so that farmers from the neighbourhood can easily attend the fair.

The ARI Naliendele was being assisted financially by RIPS to purchase improved seeds from different places in the country—particularly from research institutions, seed companies, Tanzania Farmers' Association shops and some hard-to-obtain seeds from farmers. Small samples of 5–200 grams of all seed types of different crops including cereals, legumes, oilseeds, vegetable crops and fruits and tree seeds are collected and packed in small packets. These seed packs are sold to or exchanged with farmers who are interested in testing in their fields.

To spread awareness regarding the seed fair, radio spot announcements are made 2–4 weeks prior to the event and there is live coverage on the actual day.

Farmers in selected villages set up booths for seed exhibition. They also organize traditional dances on the eve of the seed fairs to entertain participants and make the seed fair a lively event. To coordinate the seed fair activity at the village level, various committees are formed, e.g., a building committee (ujenzi), a committee for food (chakula), a committee for traditional dance(utamaduni), and a committee for security (ulinzi na usalama).

District Councils provide extension officers with a budget to attend and participate in the seed fairs. They also provide seed experts with food and transport to and from seed fair sites.

The seed fair lasts for two days in each selected village. District Commissioners are invited to inaugurate the seed fair event. It begins in the evening with traditional dances. And from 7.00 pm to 10.00 pm, farmers are shown video films on various agricultural technologies. The actual seed fair goes on from 8.00 am to 5.00 p.m. after which the seed fair team moves to another selected village in another district. On the seed fair day, apart from the seed exhibition, demonstrations are held on grafting, farm tool manufacture, etc. Researchers document the knowledge of seed experts through note-taking, photographs and video films The participation of politicians, researchers, extension, farmers, and private seed entrepreneurs creates working contacts and therefore improves the linkage between stakeholders.

Sustainability of the seed fairs

The Southern Zone rural seed fairs started in 1997 in the three villages of Marambo in Nachingwea, Mbonde in Masasi and Kitangari in Newala Districts. In 1998, the seed fairs were extended to include nine District Councils of the Southern Zone and in 1999 they were conducted in ten District Councils. To sustain the rural seed fairs in the zone, from 2000 District Councils were encouraged, as mentioned earlier, to take the leading role in organizing them without support from RIPS, with the ARI Naliendele playing a coordinating role.

Achievements of the seed fairs

- Increased awareness of improved seeds and accessibility of seeds to farmers. Farmers are now demanding seeds of preferred varieties.
- The seed fairs have demonstrated that farmers have valuable local seeds, skills and knowledge that can be documented, disseminated and commercialized.
- Seed fairs have been a valuable tool of technology transfer from research to farmers.
- Over seventy crop varieties of cereals, legumes, vegetables and oilseeds bred from the formal seed system have been made available to farmers.

- The seed fairs have helped to create awareness among researchers and extension regarding local varieties and have helped them to access the local knowledge of crops.
- The fairs have demonstrated how crops can be protected from genetic erosion; thus, one may recover certain types of seeds which might have been lost in one area/village from other farmers.
- The seed fairs have increased the debate on seed issues in the zone and help zonal initiatives on seed multiplication.
- The ARI Naliendele is now linking local individuals, farmer research groups, local institutions to multiply seeds of preferred varieties such as oilseeds.
- Beans cultivation has been introduced in Chilangala Division as an alternative cash/food crop.

The difference between agricultural shows and seed fairs

There have been some questions as to why rural seed fairs should not be combined with the National Nanenane Agricultural shows (an annual event in each district and at National Level) to minimize costs The reasons are summarized below.

Understanding these differences is very important because most of the farmers in Tanzania are subsistence, small-scale farmers who may not qualify for the agricultural shows. Subsistence farmers grow various crops for food security. Agricultural shows seems to have been designed for the so-called progressive and commercial farmers. It follows that even the poorest farmers can qualify to participate in seed fairs. Rural seed fairs encourage the participation of resource-poor farmers in the conservation of plant genetic resources that contributes to their food security and rural livelihoods. This, consequently, empowers the rural poor and builds confidence in their knowledge and in indigenous plant genetic resources.

Agricultural shows	Rural Seed Fairs
• Extension staff influences what is displayed	• Farmers decide what to display
• Undermines local knowledge and traditional cultures	• Promotes local knowledge and traditional culture
• Demonstrates achievements from formal research only	• Demonstrates achievements from research and farmers' own seed system
• Uniformity is a major concern	• Diversity of crop plants is a major concern
• Stresses increased production	• Stresses food security
• Encourages farmers to adopt best options	• Monitors availability of seeds of various types
• Crops and livestock displayed	• The emphasis is on seed crops
• Encourages mono-cropping	• Encourages farmers to grow many crops
• Commercialization leads to genetic erosion	• Protects crops from genetic erosion
• Some minor crops are neglected	• Minor crops which might have medicinal properties are encouraged to be displayed
• Is conducted after crop harvest in August	• Promotes soil fertility by growing many crops with different nutrient requirement, some of them improving soil fertility
• The major objective is to show formal scientific achievements	• Is conducted at the onset of the rainy season
	• The objective is to improve seed supply bred from research and farmers' own seeds in rural areas.

Uganda

The Contribution of Indigenous Vegetables to Household Food Security

This article was written by E.B. Rubaihayo, Kawanda Agricultural Research Institute, P.O. Box 7065, Kampala, and was first published in the African Crop Science Journal, Africa Crop Science Conference Proceedings, *Vol. 3, pp. 1337-1340. The present version has been lightly-edited and excludes the text of the abstract in English and French.*

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A lot of effort has been invested by the Government of Uganda to produce enough food for Uganda's population and a surplus for export. However, the indigenous vegetables, often referred to as traditional vegetables, have been underrated in favor of introduced exotic vegetables (Rubaihayo, 1995). Hence, the potential of traditional vegetables has not been exploited.

Traditional vegetables are perishable, low yielding and their value as commercial crops has not been explored. Yet, the majority of local farmers cannot always produce exotic vegetables because of the unavailability of seeds and/or high production costs of these vegetables. Unfortunately, the resource-poor urban and rural population often find it difficult to purchase exotic vegetables from local markets because of the high costs. They therefore, depend on traditional vegetables as a regular side dish or sauce accompanying the staple foods such as maize, cassava, sweet potatoes, banana, millet, sorghum and yams (Rubaihayo, 1994). The staple foods provide calories needed for body energy but are very low in other nutrients while the traditional vegetables have a very high nutritive value. They contain vitamin A, B, and C, proteins and minerals such as iron, calcium, phosphorus, iodine and fluorine in varying amounts but adequate for normal growth and health. For example, vitamin A which is required to prevent blindness especially in children is found in all dark green leafy traditional vegetables such as *Amaranthus* (dodo), *Solanum aethiopicum* (Nakati), *Manihotesculenta* (cassava leaves) and *Ipomea batatas* (sweet potato leaves). On the other hand vegetables like *Solanum indicum* subsp.. *distichum* (Katunkuma) are believed to control high blood pressure. The traditional vegetables, therefore, meet the major protein-calorie nutritional needs especially in children, the sick, elderly, expectant and lactating mothers (FAO, 1988). Unfortunately, the consumers have not been sensitized to appreciate the role of the traditional vegetables in fulfilling the above human needs.

Most of the traditional vegetables are produced throughout the developing world mainly in kitchen and home gardens. Because of the importance of these gardens, an international Workshop on Household Garden Projects was held in Bangkok, Thailand in May 1991 to consolidate lessons learned from experience with household garden projects. The workshop analyzed the

relevance and effectiveness of household food production as a development intervention, targeted at the most nutritionally and economically disadvantaged people and identified viable implementation strategies of household gardens (Midmore et al., 1991).

The purpose of this paper is to prompt policy makers and development managers to reassess and give more weight to the neglected production and consumption of traditional vegetables so as to enhance nutrition, income generation and food security for small scale households. The views expressed in this paper are a result of interviews with several people from many countries including Uganda, Ethiopia, Kenya. Tanzania, Zimbabwe, Zambia, Rwanda, Cameroon, Nigeria, Ghana, Ivory Coast, Gabon, Senegal, etc. although there is more focus on the Uganda situation.

Kitchen gardens. Kitchen gardens are common in urban centers and their suburbs. They are normally made up of very small plots of usually pure stands of traditional vegetables as part of the garden of the residence. The vegetables are produced cheaply in these gardens using compost rather than commercial fertilizers (Midmore et al., 1991)

The commonly grown traditional vegetables include *interalia* Leafy *Amaranthus* species, *Basellaalba*, *Solanumaethiopicum*, *Solanum gilo, Solanum indicum sub sp distchum*, *Cqapsicum* species *Colocasiaesculenta, Phaseolus vulgaris, Gynendropsis gynandra, Vigna unguiculata, Bidens pilosa, Manihot esculenta, Corchorus olitoris, Solanum nigrum, Abelmoschum esculenta, Cucurbita maxima,* and *Acalypha biparlita.* Exotic vegetables such as *Brassica oleracea, B. oleracea* and *Daucus carota* are also commonly grown. The yields of some fresh vegetables in Uganda are shown in Table 1.

*Home gardens***.** Home gardens are found in villages. The plots are larger than those of kitchen gardens and a number of vegetables and other crops are mixed are mixed together including fruits, vegetables, medicinal plants, staple foods and shade trees. The home gardens in villages surrounding the suburbs of the urban centers are often planted with cabbages, cauliflower, carrots, Amaranthus lividus (grown in swamps and water logged soils), *Solanum gilo,* Solanum indicum subsp. dischum mostly as monocrops. These vegetables are sold in the neighboring urban and their suburbs markets.

The contribution of indigenous vegetables to household food security

The home gardens of traditional vegetables in the rural setting are characterized by intercropping systems and volunteer plants during the rainy seasons. In many developing countries, where these gardens predominate, the contribution of traditional vegetable gardening as a food production strategy has been overlooked by policy makers and extension staff in favor of exotic vegetables which are mainly produced for commercial purposes (Rubaihayo, 1994). Unfortunately, the resource-poor rural households do not benefit from the remarkable increase in exotic vegetable commercial production due to the costly inputs of agricultural chemicals needed for their successful production. Therefore, it is extremely important to develop research and production strategies that directly enable the poorest of the poor to produce not only traditional vegetables but also staple foods.

Although the contributions from these gardens to family welfare are supplementary in nature, such modest contributions are very important to those who have very little in the rural and urban areas. These poor people often have access to only under-utilized marginal land and others have very small pieces of land. Intensive home and kitchen gardening can turn this land into a productive source of food and economic security by using narrative agricultural practices and the traditional vegetables that are already locally adopted.

Importance of traditional vegetables. A large proportion of the Ugandan population do not consume adequate amounts of traditional vegetables to meet their daily requirement of vitamins, minerals and proteins. Even what is consumed has a large proportion of these nutrients destroyed or lost during preparation and cooking. There is reduced effectiveness in ensuring food security all year round due to the fact that very few traditional vegetables are cultivated, with the majority being collected from the wild or fields and plantations. In some of the ecosystems they are regarded as weeds and are often weeded out and are not available during the dry season (Rubaihayo, 1994). But this situation can be reversed through concerted efforts by the government to educate the general population and extension services to cover traditional vegetables and increase research to produce improved cultivars, processing, marketing and storage methods. This would lead to the increased consumption of traditional vegetables and their contribution to food security will be enhanced.

Family gardens are far more common in less well-to-do households, and constitute the major or the only source of food between harvests or when harvests fail. They provide a critical source of energy and protein, especially to weaning-age children, the sick and elderly. Some of the traditional vegetables can continue to be productive even during the dry season although at a reduced rate due to stunted growth. Habitat destruction and migration to urban areas

mean that wild foods are no longer available to these resource-poor rural farmers. Moreover, the commercialization of agriculture has displaced many indigenous crops that used to ensure a balanced rural diet (Rubaihayo, 1992).

It is important to appreciate that traditional vegetables, especially the leafy ones like *Amaranthus*, (dodo, Bugga) *Solanum aethiopicum* (Nakati), etc. can be handy under emergency circumstances and hardships arising out of civil conflicts and natural disorders that result in the displacement of communities. These traditional vegetables come into production with a short time soon after the onset of rains and can be harvested in three to four weeks after planting. These leafy vegetables could then be followed by crops like beans which take two to three months as cultivated relief food, so that purchased foods are a temporary or supplementary measure (Rubaihayo 1995b).

*Women and traditional vegetables***.** In Uganda, though rural women are responsible for feeding their household, yet they have limited access to resources. Household gardening offers women an important means of earning income without overtly challenging cultural and social restrictions on their activities. Home and kitchen gardens can enhance women's purchasing power and food production capacity which has a direct impact on household nutrition, health and food security.

Where traditional vegetables have been commercialized such as, Malakwang (Hibiscus spp.) Nakati (*solanum aethiopicum*), Egobe *(vigna unguiculata*), Entula (*Solanum gilo*), Katunkuma (*Solanum indicum* subsp. *Disticum*), Doodo (*Amaranthus dubious*), Bbugga (*Amaranthus lividus*) particularly around the city of Kampala and in other urban areas, it is mainly the men who cultivate them. Middle men purchase these vegetables from the farmers (men) and transport them to the markets, and in the market women buy them and retail them to the general public. The sale of traditional vegetables in women-accessible markets do not only provide food security to those with purchasing capacity but the trading women are able to educate their children and, dress and provide their household with essential items in the home thus avoiding abject poverty.

Home and kitchen gardens and the environment. Although there has not been an extensive study of the effects of traditional vegetable gardening on the environment, it is generally believed that household gardens conform to ecologically sound land management systems. Household food production uses organic farming practices which are friendly to the environment. The traditional style of household gardens is also critical in conserving diverse plant genetic resources (Midmore *et al*., 1991).

Conclusion

Traditional vegetables are a common household food and make a substantial, though rarely appreciated contribution to the food security of the rural people in many African countries. Therefore, extensive education about their importance as a nutritionally balanced food and as a direct and indirect source of income, particularly for the resource- poor families, must be undertaken by African governments.

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India

Using Indigenous Knowledge to Raise Agricultural Productivity

This note was written by Siddhartha Prakash of the World Bank, and is based on a field visit to the farmers' school and project sites in 2001. For further information email: Sprakash@worldbank.org

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Knowledge is transferred from one generation to the next and from one country to another through trading ties and social interactions between different communities. This has given rise to a number of cross-country exchanges and knowledge sharing activities within Africa and beyond. Farmers and local healers from Mozambique have exchanged knowledge of best practices with similar communities in Uganda. A number of regional projects such as the Lake Victoria Environmental Management Project have brought together neighboring fishing communities from Kenya, Tanzania and Uganda.

These activities reinforce the universality of IK, which is embedded in the traditional practices of communities in different regions. Despite geographical differences, the ways in which communities in India for instance, make effective use of their environmental and social assets, can provide useful lessons for similar communities in Africa.

The Sodic Lands Reclamation Project in India provides a good example of how the integration of traditional knowledge into Bank-supported operations can help transform barren soils into fertile arable land. In the state of Uttar Pradesh (UP) in North India, agricultural yields declined, while the population continued to rise through the 1980s. Inappropriate irrigation practices salinated the soils, while brown plant hoppers destroyed 40–60 percent of paddy and wheat crops. Most of these lands were owned by poor farmers.

To raise agricultural productivity, government extension agencies tried to propagate the use of new farming technologies and systems. However, these practices were not implemented by local farmers, who, in any case, viewed government agents with suspicion. However, due to poor participatory methods, the technology dissemination did not reach the farmers.

In 1993, the UP Government launched a World Bank supported farmer driven Sodic Lands Reclamation Project. The goal was to strengthen local institutions, empower the beneficiaries and develop a model for transferring service delivery to communities.

The first challenge was to treat the high build-up of salts in the fields. These soils contain high concentrations of exchangeable sodium in which finer soil particles are dispersed. As a result, water and air cannot penetrate, and highly alkaline conditions are created. Known as sodic soils, they are toxic to plants and adversely affect agriculture, human and plant health.

Application of traditional knowledge

Farmers created local site implementation committees and self-help groups. Applying their own knowledge and experiences, farmers reclaimed over 68,000 hectares belonging to 247,000 families. They spread gypsum, built bunds, leached the soil, started multi-cropping, green manuring and crop rotation, used compost and plowed the land. Maintaining continuous ground cover through intensive cropping protected the soils from a return of surface salts.

From the planning to implementation process, the project managers, NGOs and local farmers worked together to develop endogenous strategies. These were constantly innovated, modified, and adapted to suit local or specific conditions. For instance, certain modern practices such as the use of chemical fertilizers were found to be more harmful than good. In this context, farmers developed indigenous technologies based on traditional knowledge and practices that have proved to be cost-effective and environmentally friendly.

In some cases, farmers drew from farming practices in other states. In Maharashtra, a local farmer had developed a new technique of composting. The Nadep compost relies on a compost structure using bricks instead of a pit and was applied in over 100 villages in the project area.

The higher levels of soil nutrients found in this form of compost reduced the need for fertilizers and pesticides by a quarter, and also reduced the costs of farm inputs. Using less chemical fertilizers improved the quality, taste and weight of food grains. The flavor and color of scented grains like wheat and basmati rice were also enhanced, enabling farmers to increase prices.

Previously, farmers used various pesticides such as Melathian dust. Today, they are applying indigenous forms of pest control practices, such as the sowing of Daincha (green manure crop) in paddy field boundaries. In some villages like Jivelly, Devari and Dhanepur, farmers use neem properties to protect crops from pest attacks.

In 1997, there was a massive attack of brown plant hoppers and over 40 percent of the paddy crop was destroyed throughout Uttar Pradesh. Local farmers knew that kerosene oil keeps away snakes and can even kill some types of snakes. One of the more knowledgeable farmers in the region speculated that if kerosene oil could kill a snake, it could also kill the brown plant hopper.

To test this idea, he sprayed kerosene oil in one square meter of his field, where the attack had occurred. Within a few minutes, all the pests had been destroyed. Based on these results, kerosene was sprayed in the corners of the field and subsequently in nearby fields. Initially, 10 liters of kerosene oil were applied on 0.25 hectares. Over time, the farmer modified this technology, using five liters of kerosene oil, mixed with 25kg of paddy husk to treat 0.25 hectares of reclaimed land.

Economic impact

These various practices were tried by 600 farmers in different districts. The result was a substantive reduction in the damage caused by brown plant hoppers from 49 percent down to 2 percent. The success story was soon being replicated, as farmers across the state began to control brown plant hopper attacks with neem extracts, rice husks and green manure. In addition, several other indigenous practices that had been used by generations of farmers were back in vogue. These included traditional animal husbandry practices to treat common diseases such as worms, foot disease and pain common to cows and buffaloes.

Over time, the knowledge and wisdom of local farmers began to bear fruit. Cropping intensity increased from 37 percent to 200 percent. Yields of wheat and rice on reclaimed land were double the projections. After five years, yields and incomes had risen by 60 percent. In some areas, land values have quadrupled after reclamation. Wage rates have doubled as a result of increased economic activity. Women self-help groups are generating incomes by diversifying into poultry farming and horticulture.

There has also been a substantial reduction in seasonal labor migration out of project villages. As one beneficiary in Shobapur village said, “because my *usar* (sodic) fields were barren, I used to go to Bhopal, Bombay and Calcutta looking for work. Now that they have been reclaimed, where is the time?”

Farmers’ School in Pratapgarh, Uttar Pradesh

However, the sustainability of any reclamation project depends upon the effective management of these lands. Regular access to information on new agricultural practices and technologies are some of the vital ingredients needed to sustain multi-cropping systems in such areas. Keeping this in mind and the fact that Bank support would not last forever, a group of key resource persons and trained farmers came together to devise innovative new strategies, drawing upon indigenous resources and knowledge about agricultural practices.

This led to the formation of a Farmers Field School in Pratapgarh. These practices were institutionalized and widely disseminated through the school. Initially there were

twelve master trainers in the school. Each one had to demonstrate in his own field how certain practices proved to be beneficial, before others began to replicate these practices. Training was conducted in the local dialects such as Avdi.

Topics covered included improved drainage networks, green manuring, composting, use of bio-fertilizers, credit management, self help groups and multi-cropping. Each of these drew on years of indigenous experiences in dealing with challenges such as the brown plant hopper attacks. Once the results showed positive gains, they were disseminated from one village to another through trainers.

The training is mostly hands-on and involves farmer-to-farmer exchanges. For instance, a group of farmers are taken to an area reclaimed earlier to see differences in soil fertility and rates of progress. Farmers from the project area have also been taken on study tours and exchange visits to other parts of the country (Haryana, Andhra Pradesh and Gujarat) to share and learn from the practices of other farmers. Such exchanges have broadened their knowledge base through exposure to different types of traditional knowledge systems. Today, Uttar Pradesh has begun to hand over training and extension services to local farmers' schools, which reach more than 7,200 farmers in 65 villages beyond the project area.

The village of Dhanepur

In 1996, in the middle of barren lands in Narangpur, that had been reclaimed, a project worker planted a bale tree. The sodic land was ash white and completely deserted. There was no sign of any vegetation.

Slowly, the tree began to blossom and farmers from nearby villages started to cultivate the land. Soon vegetables were being grown. Small settlements began to emerge around the Saroj tree. Today, an entire village has mushroomed in the areas, known as Dhanepur.

The village has a community-owned water pump, sugar cane processor, flour grinder, paddy thresher and animal fodder processor. These are all near each other, to be jointly operated by electricity or a diesel engine. The machinery has been adapted to local conditions, using local innovations.

Earlier, farmers could only harvest a single crop from their fields. Today they are planting four crops, using the multi-cropping techniques taught by the school, growing pigeon pee, millets and black gram. These are sown together in the fields which are watered through drip irrigation. The result is four/five times higher yields from the same fields.

Incomes have increased by five times as a result of these higher yields. In the past, farmers managed to save $110 per year. Today their annual savings have risen to $555.

These savings have been carefully invested in housing, electricity and roads to connect the village to other areas and markets. Previously, there were poor linkages and communications.

Higher incomes have dramatically improved the quality of life in the village. Most people were illiterate. Today, there are educational programs for children.

There has been a significant change in local attitudes. Initially, the farmers were divided over the project. One group was ready to cooperate with the implementing agencies and the other comprising of larger farm-holders, opposed the project. However, when these farmers saw the lands of those who actively participated in the project turn green, while theirs remained infertile and ash-colored, they soon came around. Today, they are only too eager to participate in the second phase of the project.

Self-help groups empower women

The training provided to women by the farmers school has had a major impact at the household level, driving forward social and economic changes to improve the welfare of the entire family. Today over 175 women's' self help groups have been formed, such as the Kaveri Mahela Self-Help Group.

Formed in 1995, the Kaveri group initially comprised 15 members. Each member saved 10 cents per month, which then increased from 40 cents to 80 cents over the next six months. Today, each member saves up to $6 per month. The funds are saved in the local bank under a joint fund called the Kaveri Self Help Fund.

Having saved a fair amount, the women started an internal lending scheme within the group. They also took out individual loans worth $100-$200 from the local bank to invest in modern technologies such as a sugar cane processor.

These self help-groups have also become effective agents of social change in the countryside and have addressed several sensitive issues, such as the dowry system. Today, a large number of women in this district can read, write and comprehend complex aspects of their business transactions.

The State Minister for Agriculture visited the school and recommended that such innovative methods of self-help agricultural extension should be replicated through-out the state. The European Union is funding a reclamation project

with the same design in three other districts. This will build on the primary lessons learned from the first phase of the project: building on indigenous knowledge increases sustainable agricultural production and provides a model for transferring service delivery to communities.

Community-to-community exchanges could be the conduit for transferring such knowledge across countries and continents. Given that agriculture is the dominating factor in most African economies and in India, the appropriate dissemination and use of indigenous knowledge could prove very fruitful.

The Role of Myths and Rites in Managing Natural Resources along the Mozambican Shoreline

This article was written by Fernando Dava, Zuber Ahmed, and Peter Easton. Fernando Dava is Director of ARPAC—Arquivo do Patrimonio Cultural, Mozambique; Zuber Ahmed is an independent consultant in Maputo, Mozambique; and Peter Easton is Associate Professor, Graduate Studies in Adult Education, Florida State University.

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Mozambique is a country both rich in natural resources and increasingly threatened by the depletion and degradation of this heritage. Years of war, economic pressure, falling crop prices, urbanization and climate change have begun to have drastic effects on the country's resource base. Though 10 percent of the land is kept in forest reserve, large stretches of land have been denuded, particularly along the borders with Zimbabwe and South Africa. Major areas of coastline are suffering from pollution from industrial and agricultural run-off. Population pressure has resulted in the near disappearance of the large wild animals that once inhabited much of the country.

Depletion of natural resources is a national issue, but it is also a local one. As in many developing countries, numerous Mozambican communities depend for their survival on the judicious exploitation of their physical environment. Managing them so they remain available generation after generation is the key challenge. Nowhere is this felt more acutely than along the country's extensive coastline, which stretches almost 3,000 km. from the Tanzanian border in the north to the frontier with South Africa. Communities all along this natural barrier rely heavily on harvesting the resources of the sea: fish, mussels and other forms of marine life. They are a source of protein and a source of revenue. The importance of this bounty to the community's very existence has given rise to a complex of rites, myths and rituals. These serve both to enshrine the sanctity of the environment and to "manage" its communal exploitation.

How do these "indigenous" forms of management function and how—if at all—can they be adapted to master the new challenges to the natural resource base: population pressure and pollution? Local institutions in Mozambique are just beginning to come to grips with the issue, but their experience is instructive.

The mussel farmers of Zimilene

Zimilene is a small village situated at the mouth of the Limpopo River in the Gaza Province of southern Mozambique, a few hundred kilometers north of Maputo. It is also known by the locals as Kamhula, Inhampurra, or Zongoene**.** In this region of the Indian Ocean, rock formations have created the basis for a thriving local economy and the focus for a particular spiritual understanding of the relation of people to their environment.

The rocks lie close to the surface in areas of water rich in phytoplankton, providing a rich milieu for the growth of dense mussel colonies. For years, the villagers have harvested this resource yearly, using it as a source of protein and of revenue. For them, the rocks were placed at that point along the coast by divine intervention and have been there as long as collective memory can recall.

The community believes that their ancestors became the owners and stewards of these rocks when they settled in the region. The principal original families to take up residence along this part of the coast—the Bunzula, the Palate, Machava, Nhancuma, and Nhabanga—parceled out the resource and assumed responsibility for the management of the mussel shoals, guided by the guardian spirits of their clans. Each family assigned guards to watch over the mussel beds. But family representatives function under the supervision of a higher local authority, the Chief Zimila, a lineal a descendant of the first person to have occupied the region, whose clannic spirit is considered more powerful than those of the family lineages. The system ensures a source for resolving conflicts and allotting usage rights that are accepted right down to individual community members.

The catch of the mussels

Mussels are normally harvested during the cold season in Mozambique, between March and August. In the early months of the year the first signs of mussels appear along the shoals, and the colonies start growing. As soon as these signs are detected, the guards of each mussel bed inform family chiefs of the event, requesting permission to begin the cleaning of algae and other weeds that enhances mussel growth and eases harvesting. This weeding of the beds requires care, as it is easy to damage the young mussels. Thin sticks and machetes are used for the purpose. Once the "field" is clean, the mussels grow much more abundantly.

Under normal circumstances, villagers are not allowed to begin harvesting until the mussel beds have reached full maturation. Special dispensation is allowed, however, in cases of emergency or pronounced need, such as famine or visits from unexpected visitors. This early harvest is carefully regulated and limited by the family and supreme chiefs. Also, the role of the chiefs is to ensure an even distribution of the resource between the villagers. This is ensured by a local saying—"the mussel is eaten in community."

When the mussels are fully mature, the guards blow whistles throughout the community to inform everyone, even those who are not from the village itself, that the catch is open. Outsiders have traditionally been allowed to harvest mussels along with local residents as a form of hospitality. Each person collects what their family needs and hundreds of people may turn out to harvest the mussels. The work is arduous and can be dangerous. For this reason, collection is not carried out randomly and everywhere at once. Rather the work starts at one end of the rock shoals and slowly moves to the other end. This allows family and community chiefs to keep control of events and provide immediate care for anyone wounded. They are also charged with ensuring a fair allocation.

The "spirits" and the rule of law

The authority of the chiefs to regulate the mussel harvest is anchored in the firm belief that the spirits of the ancestors watch over the shoals. The guards posted by each family leave the rocks at sunset and the spiritual guardians from each lineage are considered to take over the role of protector until sunrise. That spiritual patronage is celebrated in rite and myth.

"We talk to the spirits embodied in our *curandeiros* (traditional priests) or called by them," explains the chief of the Banzula lineage. "The spirits teach us how to preserve the rocks. It is to keep the spirits happy that we do our ceremonies, so that they will protect the rocks and the mussels."

Ceremonies are in fact held at two levels; within each lineage or family and for the community as a whole. The chief of each of the families takes charge of ceremonies for the portion of shoals under his lineage's responsibility. The community-wide ceremony is presided by the Chief Zimila himself and includes all families in the region. Before organizing the large ceremony, the paramount chief consults with all the family chiefs in a meeting of the council of elders. Family chiefs are responsible for catering the event..

All members of the community are expected to participate in the large event as well as to contribute goods for catering the ceremony. The contributions are remitted to the family chiefs who in turn hands them over to Chief Zimila. One ceremony is held before the catch is open to ask for a good mussel harvest, and another when it is over to give thanks for the bounty received.

The spirits are believed to have an important role in sanctioning those who violate the rules. As one family chief puts it, "During the day each family has a guard who controls access to the rocks. At night the spirits of each family guard the rocks until sunrise. Everyone knows they cannot take this lightheartedly. Violators risk being thrown into the sea [by the spirits] or being unable to leave the collection area, never finding their way back home. The path to their houses becomes deeply dark."

Stolen mussels are also believed to be poor fare. "Once in the cooking pot," the chief says, "the mussels can be boiled for a full day without ever becoming cooked. No one who knows these rules wants to risk the sanctions of the spirits)."

The challenge of cross-breeding systems

The local system of myths, beliefs and rites in Zimilene preserved the mussel shoals for generations, but under the pressure of the changes afoot in Mozambique they have become more than a local resource. In recent years the population of nearby cities like Xai-Xai has had increasingly easy access to the Zimilene shoals, and at the same time the pressures of poverty and population density have pushed them to exploit the mussel beds in ways inconsistent with traditional management and with survival of the resource.

The families of Zimilene appealed to administrative authorities to help solve the problem and save the mussels. After consultation, it was decided to put in place a Mussel Rocks Management Committee, composed of the traditional leaders and and one or more representatives of the administrative authority. The regional chief supervises selection of delegates from the family lineages responsible for each stretch of shoals. On the administrative side the head of the administrative post of Chilaulene, which encompasses Zimilene, either serves on the committee or picks someone to represent him.

The committee serves both to give wider sanction to the rites, ceremonies and regulations of Zimilene and to deal with violations, particularly by urban dwellers and other outsiders who are increasingly drawn to the mussel beds. In fact, "violators" are principally outsiders because, while strong beliefs prevent most local people from poaching on the beds, city-dwellers typically do not have the same belief system. The committee therefore has the authority to recommend a variety of administrative or even penal sanctions for those who violate the usage rules of the mussel beds.

Consequently, in the initial operations of the committee, the traditional and spiritually sanctioned management system was simply placed side-by-side with a more "modern" and administrative one. The first applied to local people, the second to outsiders.

But this "split personality" solution also has its weaknesses. For one thing, outsiders may be able to more easily evade administrative sanction than insiders feel they can evade the wrath of the spirits. For another, increasing outside pressure on the resource base would likely result in the administrative apparatus and system of penal sanctions taking on increasing importance and the traditional and spiritual one shrinking in scope until it was only a folkloric remnant.

The challenge facing the committee is therefore how to "cross-breed" the two systems—how to infuse what must be a more widely administered regulation system with some of the essence of traditional management, with its reverence for natural resource and internally-driven compliance.

Two directions have opened up, but it is not yet sure whether either, both or yet another will be principally adopted. One solution involves expanding the role of family guardians both logistically and spiritually by assisting them in ensuring twenty-four-hour monitoring of the shoals as the embodiment of ancestral concern for the sanctity of the entire nation's resource base. Another, perhaps a complementary but longer-term one entails using some of the *curanderios* to teach ecological responsibility in schools and campaigning for a new region-wide ethos of respect for the environment.

The traditional mechanisms show that rural communities have their own ways to explain the world and to protect their own resources. Such examples can be found in various regions of the country, where resources such as forests, land and fish and seafood are protected through these mechanisms. They allowed for these resources to be used by generations of people without endangering their availability.

Yet the use of such myths and rites cannot easily be generalized, because they are closely tied to place and historical experience, and are sanctioned by a particular set of ancestors. Other Mozambicans do not share the same history and "cosmogony" as the population of Zimilene. But they do share, to some extent, a common fate, as a community, a common risk of resource depletion and alienation from their physical milieu. The challenge of the mussel shoals, repeated in many sites around the country these days, is how to blend traditional systems of regulation, myth, and ritual with a necessary administrative armature to build new communally shared meanings and a new culture of natural resource management.

Using the Indigenous Knowledge of *Jatropha*

The use of *Jatropha curcas* oil as raw material and fuel

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For more information on the Jatropha System see also: www.jatropha.org

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Mali is a landlocked country in the middle of West Africa, just at the southern edge of the Sahara desert. The country's average annual rainfall ranges from 200 mm in the north to 1200 mm in the south. For generations, farmers have protected their gardens with hedges of *Jatropha curcas*, or physic nut, which is not eaten by animals and thus protects the food crops as a living fence.

Jatropha curcas is a plant of Latin American origin which is now widespread throughout arid and semiarid tropical regions of the world. A member of the *Euphorbiaceae* family, it is a drought-resistant perennial, living up to 50 years and growing on marginal soils. A close relative to the castor plant, its oil has the same medical properties. Jatropha seeds contain about 35 percent of non-edible oil. The production of seeds is about 0.8 kg per meter of hedge per year, with an oil yield of 0,17 l.[1] Currently, Mali has about 10.000 km of Jatropha hedges with a growth rate of 2.000 km per year, which represents a potential of 1.700.000 liters of oil per year. The average length of these hedges, in those areas of Mali where they are most prevalent, is between 2 and 15 km per village, with a maximum of up to 40 km per village.[2]

Jatropha curcas is generally well-known among the populations of Mali and has long been recognized as a plant of many uses. If carefully planted, Jatropha hedges not only protect gardens from hungry livestock but also reduce damage and erosion from wind and water. Traditionally the seeds were harvested by women and used for medical treatments and local soap production.

As far back as at the end of the 1930s the oil's potential as a fuel source was also recognized.[3] Currently, it can be used to substitute for the "gazoil" mixture used in the Indian type diesel engines that drive grain mills and water pumps in rural areas of Mali. The high-quality oil extracted by engine-driven expellers or by manual Bielenberg-ram-presses or the sediment of the oil purification process may be used for large-scale soap making in rural areas, giving local women the chance to gain additional income and strengthen their economic position. The press-cake as another extraction by-product can be used as a high-grade organic fertilizer.

The Jatropha activities were initiated in Mali in 1987 by German Technical Assistance (GTZ) in the framework of a renewable energy programme. The Jatropha Project itself started 1993 and ended in 1997. It

worked to combine the above mentioned and other factors into the « Jatropha System ». This system focuses not simply on the use of Jatropha oil as fuel, but rather on the use of this oil as a crucial element to activate a circular system combining ecologic, economic, and income-generating effects, the latter specifically for women.[4]

Thus, the Jatropha system promotes four main aspects of development, which combine to help assure a sustainable way of life for village farmers and the land that supports them:

- Erosion control and soil improvement
- Promotion of women
- Poverty reduction
- Renewable energy

Erosion control and soil improvement

Jatropha "living fences" in Mali not only control unwanted animal access to the fields; they also reduce wind erosion and, if planted parallel to slopes to fix small earth or stone dams, they help control water erosion. The plant's roots grow close to the ground surface, anchoring the soil like miniature dikes or earthen bunds. These dikes effectively slow surface runoff during intensive downpours, which are common, thus causing more water to penetrate into the soil and boosting harvests.

The press cake which remains after oil extraction by the expellers is a very good organic fertilizer, with mineral composition comparable to that of chicken manure. This has great value for agriculture in the Sahelian countries, since soils there are rapidly depleted of humus and chemical fertilizers are very expensive.

The Malian cotton-growing company, CMDT (Compagnie Malienne de Développement Textile), uses Jatropha hedges to assure a program of improved fallow: the cotton fields are protected with Jatropha hedges to keep out cattle, while the fields are sown with legumes to improve soil fertility.

Promotion of women

Many government and non-government organizations provide rural Malian women with engine-driven grainmills to ease their work of food preparation. However, these grainmills need external resources of fuel, lubrication oil, spare parts and maintenance. Consequently, the introduction of such a grainmill tends to lead to an impoverishment of the village because of the cash required both to buy and to transport these external resources to the village. By using locally produced Jatropha oil as fuel and lubrication oil, some of this cash outflow from the village can be stopped.

Traditionally, rural women used Jatropha curcas for medicine (seeds as a laxative, latex to stop bleeding and against infections, leaves against malaria) and for soap production. The traditional soap-making process is very labor-intensive, producing small amounts of relatively poor-quality soap. When Jatropha oil is used, either alone or in combination with other local plant oils such as shea butter, larger amounts of a more refined soap are produced. The women can easily sell this soap in local markets and nearby towns, increasing their possibilities of earning income with local resources.

Some details of the economy of soap production with the means of the Bielenberg hand press are shown in the following table (prices in US$, 500 FCFA = 1 US$):

Poverty reduction

By promoting the integrated utilization of the Jatropha plant, the Jatropha System can provide direct financial benefits to the rural economy. To illustrate this with a rough calculation, assume the average village of the pilot area has 15 km of Jatropha hedges, which represents 12 tons of seeds.

These 12 tons of seeds may generate 1.800 US$ of cash income when the oil is extracted and the products are sold:

• 9.000 kg of presscake for 0.03 =	US$270
• 2.400 liters of oil for 0.60 =	US$1.440
• 600 kg of sediment for 0.15 =	US$90
Total	*US$1.800US$*

If we take the real example of an entrepreneur in a small village near Bamako, who buys the seeds for soap production and hires people for the production process (extraction with Bielenberg ram press, soap production, see table above), the cash income for the village population, including the entrepreneur, amounts to 3.630 US$:

• 12.000 kg of seeds for 0.10	US$1.200
• 5.000 hours of labor for 0.20	US$1.000
• profit of the entrepreneur	US$1.430
Total	*US$3.630*

If these figures are extrapolated to Jatropha plantations, a profit in the range of cotton farming is within reach.

The "Jatropha System" also helps reduce poverty by:

- Reducing crop losses caused by wandering livestock or wind damage;
- Increasing rainfall infiltration, resulting in less work/irrigation water needed for local gardens;
- Increasing soil fertility by use of presscake as fertilizer;

Description	Quantity	Unity	Price per unity US$	Amount in US$
Inputs				
Seeds (give 3 l of oil with handpress)	12	kg	0,1	1,20
Caustic soda	0,5	kg	1,2	0,60
Labour (4 h for pressing, 1 h soap production)	5	h	0,2	1,00
Depreciation/maintenance (5 years, 10 t/a, 240,-)		US$/kg	0,02	0,24
Total expenses				**3,04**
Revenues				
Presscake	9	kg	0,03	0,27
White soap	28	pieces (170 g)	0,15	4,20
Total revenues				**4,47**
Net Profit				**1,43**
Profit per liter of oil				**0,48**
Profit per kg of soap				**0,31**
Price per kg of soap				**0,89**

- Increasing use of inexpensive local resources rather than expensive external resources;
- Reducing disputes between farmers and livestock owners regarding crop damage, as well as among farmers themselves regarding the boundaries of their fields;
- Providing local jobs, lessening the need for local villagers to migrate to cities to find employment.

Because of its economic value the rural people are planting new Jatropha hedges in a large extent. In Kita, one of the pilot regions of the Jatropha project, the average length of hedges went up from 5 km to 15 km in the last 8 years.

Renewable energy

In the rural areas in Mali, Lister-type engines are used to drive grainmills and waterpumps. These inexpensive precombustion chamber diesel engines of Indian origin require only the addition of a fuel filter to be able to run on pure Jatropha oil, thus eliminating the need for gazoil entirely. Furthermore, at maximal load conditions the Jatropha oil.gives even better results than gazoil because of its high oxygen content.[5] Based on tests conducted by the Jatropha Project, the oil can also be successfully used as a lubricant in these engines.[6]

In equivalent terms, the energy needed to produce Jatropha oil in mechanical presses amounts to about 10 percent of the oil obtained. Because Jatropha oil can be produced inexpensively,[7] it can also be sold at prices lower than gazoil's official price at the petrol stations. Even more important than the price is the possibility of local energy production, because of the periodic unavailability of gazoil in the rural areas caused by lack of road access during rainy season.

The technology for using natural pure Jatropha oil as substitute for paraffin oil for lamps and cookers is not yet available. Different research centers are working on it.

Conclusions

The results of the Jatropha Project to date show that the chances of this system being successfully implemented are high, provided that a cautious approach is taken. Above all, care must be taken to ensure that women retain their traditional responsibilities for harvesting and processing the seeds.

Furthermore, Mali is a typical Sahelian country; its large geographic expanse and climatic variations mirror the ecological conditions found throughout the Sahel. Because of this, the efforts already being made in Mali to derive value from oil-bearing plants can be taken as representative and used to elaborate a "concept for production and use of plant oils as fuel" that is valid for the Sahel region as a whole, and even for other African countries.

To summarize, the Jatropha system is characterized by the many positive ecological, energetic and economic aspects which are attached with the commercial exploitation of this plant. The more this plant is exploited, the better for the environment and for food production.

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Ethiopia

Potential of Traditional Social Insurance for Supporting Health Care

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In many developing countries, the inadequacy of current health financing arrangements, typified by progressively declining budgetary allocations and more cost sharing schemes have led to the exploration of additional and alternative approaches to improve the financing situation. Among the alternatives suggested are risk-sharing mechanisms that include community-based schemes that tap the potential of traditional social arrangements.

In Ethiopia, *eders* are forms of traditional arrangements utilized mainly for assisting those bereaved and for executing funeral-related activities. These associations are also called upon for various self-help activities and sometimes act as health insurers, though largely in a less formal manner. They have an obvious potential for serving as social financing mechanisms. Since these are already functioning groups, the administrative costs for the extra health-related activity are not as inhibiting as when forming a new insurance entity. In addition, eders are based on mutual understanding among members, which reduces the possibility of adverse selection.

Organization and structure of *eders*

Eder is a form of traditional social institution that is established by the mutual agreement of community members in order to collaborate with each other whenever any member or their family members face adverse situations. The primary function of the *eder* is taking care of the burial and consolatory activities when death occurs within members. However, *eders* also provide assistance to offset losses to a member (due to theft, etc), during the weddings of members, etc. Besides these, *eders* are of paramount importance in other developmental activities within the surrounding community. *Eders* raise funds or coordinate the free labor of members in activities such as building roads, schools, health institutions and the like. Some *eders* contribute money to members who have lost their houses in a fire or to compensate for the loss of farming oxen, while others also provide assistance to members to cover their medical costs.

The organizational setup of most *eders* is very simple. All *eders* have a chairman or a 'judge' and almost all will have a Secretary and a Treasurer. *Eders* are said to be the most democratic and egalitarian social organiza-

tions in Ethiopia—membership is open to everyone regardless of socio-economic status, religion, sex, and ethnic affiliation. Even though very few respondents mentioned not being able to pay contributions as a reason for non-membership of *eders*, almost all *eders* have provisions for members who face economic problems and are unable to pay contributions after having been members for some time. These members are considered as "pensioned" by the *eder* and are allowed to receive all the benefits that are due to other members.

The potential of *eders* in financing health care

The organizational structure of *eders* that currently have a health care function is not very different from those that are not providing these services—obviously, there would be a clear emphasis in these on health issues. Essential here is a close link and on-going communication with health institutions that give services to members.

The financial logic of the *eder* is not different from any insurance system. In most situations members contribute a fixed amount of money on a weekly or monthly basis. Whenever a member has a problem, a fixed amount (depending on the by-laws of the particular *eder*) is taken out of the common pool and given to that member. There are also a few *eders* which raise the fixed contribution whenever the problem arises. In a community-based health insurance feasibility study conducted by the author and a representative of BASICS* (Basic Support for Institutionalizing Child Survival, an organization that helps to implement USAID-supported programs) in three towns, Adama, in the oromia Region and Yirgalem and Arbaminet in the Southern Region, *eders* were found to provide financial assistance for members' medical problems. For instance, in one of the *eders* included in the study, a lump sum payment of up to US$15 was given to households where a family member needs hospitalization. This amount covers the advance payment required by the hospitals prior to admitting a patient.

A follow-up survey was also conducted by the author in 1999 in systematically selected rural villages of the country. The data for this part of the survey were collected through household and health facility exit interview surveys. According to the findinngs of this latter survey, about 87 percent of household survey respondents and 72 percent of the exit interview survey respondents were participating in *eders* with mean annual payments of US$7 (ranging from1.5 to 60 birr) and US$8 (ranging from 1.5 to 68 birr) for household and exit respondents respectively. More importantly, 21.5 percent of the household survey respondents and 16 percent of the exit interview respondents claimed that their *eders* provide assistance during the time of medical need. The type of assistance provided ranges from loans to covering all medical costs of members. The respondents in both the exit and the household interviews were asked if they would be willing to join a possible *eder*-based health insurance scheme. Eighty six percent in the household survey and 90 percent in the exit survey were willing to join such a scheme. The average monthly contribution which the respondents reported as being able to raise was birr 2.5 (US $0.3) with a range of birr 1 to 36 (US $0.13 to $4.5) in the household survey and birr 3.4 (US$ 0.4) with a range of birr 1 to 48 (US $0.13 to $6) in the exit interview survey. Respondents in the exit survey (who had a recent experience of the financial cost of illness) sowed a higher propensity to join possible *eder*-based health insurance schemes with a slightly higher willingness to pay in terms of monthly premiums. The benefits most valued by the respondents were emergency services followed by drugs. It is obvious that people in rural areas where there are inadequate facilities for emergency services (including obstetric services) would be willing to join schemes that would make these services available to them. A case in point is an *eder* in one of the sampled villages that gave a loan of about US$25 to a pregnant mother-to-be facing obstructed labor. The money was used to hire emergency transport service to take the mother to a health center located about 40 kilometers from the village.

The popularity of the *eder* amongst people from all walks of life has been growing. These non-profit-making institutions based on solidarity, friendship and mutual assistance among members may possess both the techniques of enforcement and the appropriate incentives for applying them—vital qualities that one looks for when examining the role of indigenous institutions in socio-economic development. Overall, it can be surmised that *eder*-based schemes would improve the efficiency of service delivery.

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Farmer Experimenters: Self-developed Technology

This article was written by Roland Bunch, coordinator, and Mateo Canas, researcher, COSECHA, Honduras.

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In Honduras, as the result of the work of some 20 agricultural development agencies up through the early 1990s, hundreds of farmer experimenters (FEs) have been experimenting totally on their own for anywhere from two to ten years after the closing of the programs in which they were previously involved. In 1999, the Association of Advisors for a Sustainable, Ecological and People-Centered Agriculture (COSECHA) in Honduras decided to find out what technologies these FEs had been developing on their own, and how these technologies could best be disseminated to other farmers. To that end, COSECHA has systematically interviewed 50 of these FEs. The technologies counted were only those that small farmers had developed on their own, after program termination, and that had not been promoted or known within the country prior to the FE's discovery of the technology.

The study shows that FEs are able to develop large numbers of significant and original technologies, providing evidence that the collection and dissemination of FE technologies in other nations around the world could be a useful activity for institutions involved in agricultural development.

Participatory technology development (PTD) programs in Honduras

Starting with the initiation of the World Neighbors-managed Guinope Program in January of 1981, PTD has become a fairly widely used methodology of agricultural development in Honduras. Some 20 development organizations taught farmers to experiment in at least 30 different programs around the country. Many of these programs ended by the early 1990s, with the result that Honduras is one of the richest nations in terms of its per capita concentration of FEs who have been experimenting without any institutional support. However, no institution had ever studied this phenomenon.

The study

COSECHA has made visits to both the FEs homes and the fields where they apply the technology they developed. During these visits, an interview is carried out, which consists of an informal conversation in which the interviwer tries to make sure thateach of a list of some twenty issues is covered. After each visit (which typically takes at leasthalf a day), the list of questions

prepared at the beginning of the study is checked to make sure all the questions have been dealt with, and those that have been missed are asked.

The questions deal with such issues as what technologies the FE has experimented with, and what technologies seem to be successful (i.e., which ones the farmer has adopted for continuing use). Detailed descriptions of the successful technologies are made, with a cost/analysis in each case comparing this technology to control plots. Data as to the elevation, amount of rain, total size of landholding, slope of the fields, etc. are also taken. The farmer is also asked about other farmers' responses to, and adoption of, the technology. COSECHA also inquired into such issues as what the farmer feels are his/her limiting factors, whether he/she would be interested in working with certain marketing ventures, whether the farmer would be interested in joining a nation-wide organization of FEs and, if so, what the principal objectives of the organization should be.

The results to date: technologies discovered

Fifty-two FEs from 10 of Honduras' 23 departments have been interviewed. These FEs include farmers who had been originally trained by 17 different organizations, ranging from 12 NGOs to 3 governmental and semi-governmental organizations and 2 academic institutions. They also include 7 women FEs, even though women in Central America, by and large, are not heavily involved in extensive cropping (that is, outside the homestead garden) until after the harvest, nor had they been trained to be FEs by the programs in the 1980s and early 1990s.

These 52 FEs have developed 82 technologies, mostly having to do with extensive agriculture, but including a small minority of post-harvest and food preparation technologies. An attempt has been made to grade these technologies in three categories. Category A represents those technologies which seem valuable enough in terms of farmer benefits accrued and width of applicability among other farmers in Honduras rendering them worthy of further validation and then, depending on the results of the validation process, disseminating to other farmers. Category B includes those technologies that might be worth validating, but which would be done later. Category C includes those technologies that very likely are not worth disseminating. Although these are necessarily rather subjective evaluations, COSECHA does work with a list of 19 criteria of an appropriate technology (Bunch 1982) that helps us evaluate each technology.

Of the 82 original technologies developed, 39 have been classified as being in Category A. Of these 39, the following number pertained to each of the categories listed below:

Insect control	15
Fertilization	10
Control of plant diseases	8
Weed control	2
Food preparation	2
Animal husbandry	2
Plant propagation	1
Green manuring	1
Soil conservation	1
Others	3
	45

The total of technologies is greater than 39 because some of the technologies included aspects of two categories.

It can be observed from this list that FEs have chosen to experiment with a wide variety of different technologies, including even some (e.g., food preparation) which are not commonly included within the purview of agriculture.

It is also interesting, however, that a few categories of technologies have been totally left out. Not a single FE experimented with water harvesting or use, even though many areas of Honduras have moderate to severe droughts;in much of southern Honduras, periodic and overall water shortages are without doubt the critical limiting factor in the production systems of villager farmers. Furthermore, experience with FEs in current programs provides major evidence that while they are very interested in experimenting with water harvesting and more efficient water use, none of these FEs are included in the study because this COSECHA program is still in operation.

It is also interesting to note that none of the technologies have to do with the introduction of new crops (although the criteria used in the study, perhaps too restrictive, would eliminate the inclusion of the introduction of any crop that already existed anywhere else in Honduras) or the use of tree crops or agroforestry. First of all, it is very likely that some categories of technology (e.g., water harvesting) were never experimented with because farmers either never thought any solutions were within their grasp, or simply because working with such technologies had never occurred to them. Thus, future agricultural programs should discuss with farmers before they terminate their work in an area, what possible future technologies might be used.

Second, farmers may be aware of certain types of technologies they could work with, but may not perceive those technologies as being of a very high priority for them. For instance, in the case of tree crops, FEs are certainly aware that they exist and are profitable, but may feel that the many years one must wait before payback make these technologies of less priority than those with a quicker payback. This might also be the case with agroforestry systems, although farmers in southern Honduras in the FAO program, which is emphasizing dispersed trees, are experimenting quite a lot with various modifications of the dispersed tree system.

Of course, FEs probably did not experiment with new crops because the crops, in order to be included within the study, would have to be crops only grown outside Honduras, in which case the FEs would have had considerable difficulty learning about the crops or obtaining planting material.

Promising technologies developed

- Farmers observed that aphids died if dried out. They therefore tried using wheat flour diluted in water to spray on fruit trees in their tree nurseries, and found they could control aphids and other similar sucking insects fairly easily this way.
- Sugar water or slightly salty water, applied to the growing tip of the plant, was tried successfully as a way of controlling the corn borer.
- Another FE noticed that leaf-cutter ants did not like living near neem trees. By planting neem trees immediately over several troublesome nests of leaf-cutter ants, he was able to get rid of them (they moved their nest elsewhere).
- Foliar fertilizers were developed using either animal manure, mother of cacao leaves, the leaves of several common weeds, or even wood ashes (the last one also proving to be very useful in disease prevention).
- One woman FE found that coffee pulp could be dried just by spreading it out to dry in the sun. Another FE found that just mixing the wet coffee pulp with chicken manure or sawdust would also dry it out. Once dried, the coffee pulp is an excellent fertilizer, one that previously just polluted the country's rivers.
- A solution of leaves of mother of cacao and eucaliptus was found to be very good as a fungicide for tree nurseries.
- One farmer found he could apparently disinfect the soil in a nursery by cultivating the soil well and then covering it with clear plastic so that it heated up thoroughly under the mid-day sun.
- Both spraying crops with wood ashes dissolved in water, as well as placing wood ashes around the stems of plants, have been found to control a series of plant diseases, even very treacherous ones like late blight (*Phytophthera infestans)* in tomatos and potatoes.
- A maize-based animal feed was made including leaves from the Tithonia and eggshells, thereby increasing egg production.
- One FE found that, at altitudes over 500m, grafting neem material on to the locally available "paradise" tree rootstock resulted in much faster growth of neem trees.
- Another FE found that by intercropping jackbeans (Canavalia ensiformis) among his cassava plants, he greatly reduced his weeding time and increased his cassava productivity by over 25 percent.

It should be noted that these technologies are in almost every way technologies that would be included under the label of low-input or ecological technologies, and in many cases, in the category of totally organic technologies. They are also technologies that are highly appropriate for poorly capitalized villager farmers. By and large, they are extremely inexpensive (most require absolutely no cash output), they use locally available resources, they do not increase risk, they provide fairly quick, recognizable returns, most of them are highly cost-efficient, and most of them are fairly widely applicable. The above list shows quite clearly that villager FEs not only can develop innovative technologies, but that the technologies they develop are highly appropriate for other small farmers.

One of the most disappointing results of the study was that the technologies developed by small farmers had not been disseminated very widely. In no case did FE-generated technology spread to more than 10 other farmers through the exclusive efforts of local villagers.

Lessons learned

- This study leaves little doubt as to whether villager FEs can develop, on their own, both adaptive and basic technologies that appear to have considerable potential for farmers around the country, if not around the world. While these technologies still need to be further verified, their potential, according to established criteria of appropriateness and their economic cost-benefit ratios, would seem to be quite high.
- Different organizations in Honduras have used different techniques to train FEs. It was noticed, in the course of this study, that organizations which had used the tech-

nique of maximizing success in farmers' experiments during the first few experiments they did, had motivated far more farmers to experiment in the future than did the remaining organizations. Achieving rapid, recognizable success among farmer experimenters right from the start is thus an important part of the total motivational process necessary for people to expend the effort to experiment frequently.

- In some cases, programs will not be able to find any already validated, successful technology already being used by any programs in a similar situation (ecologically, culturally, etc.). The program may have to experiment with several technological possibilities before working with the farmers. Nevertheless, as time passes, fewer and fewer programs find themselves in such a situation.
- Thus, programs that have given a high priority to having the PTD process start with future FEs selecting the technologies from a long list of potentially useful technologies, might consider reducing the list to a rather short one of technologies already proven to provide rapid, recognizable success in the vast majority of cases.
- The study provides major evidence that the collection, validation, and further dissemination of FE-developed technology may well be a very valuable activity for some researchers and/or NGO's to become involved in. Development agencies should therefore help disseminate ideas around the world through various printed media, information technology, international conferences, such as the present one, and courses and workshops to spread information about this possibility and its usefulness.

Eritrea

Collective Responsibility for War Orphans

The source for this article is the Ministry of Labour and Human Welfare, Government of Eritrea, Asmara, Eritrea. The article was written by Peter H. Wolff, M.D., Harvard Medical School, Boston, Massachusetts, USA. For more information, e-mail wolff_p@tch.harvard.edu

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Before the thirty-year conflict between Ethiopia and Eritrea, the concept of "orphans" as usually defined in western societies, was virtually unknown. The only exception was children who had been abandoned for various reasons and were cared for in institutions (orphanages) supported by foreign church agencies. Within traditional Eritrean society, it was generally assumed to be self-evident that children who had lost both parents would be taken in by members of the extended family; or if no relatives could be traced, they were taken in by neighbors or family friends. Children who had lost both parents automatically become members of the new family and had all the rights and responsibilities of other children in the same family. This "grass-roots" pattern of caring for children in urgent need of protection was wide-spread throughout the country, and especially in village communities and among the nomads. Because the process was taken for granted, no formal agreements or legal documents were required, and adoption and foster care were alien concepts.

As a result of the thirty-year war, the number of children who lost both parents increased in geometric proportions. At the same time, the social structure of the traditional society was grossly disrupted. As a result, the indigenous practices of caring for unaccompanied children no longer functioned, and the Eritrean administration had to make special provisions of group care as long as the war lasted. Immediately after independence, a nation-wide survey conducted by the Social Affairs Authority of the newly-formed Eritrean government determined that a total of at least 14,000 children below the age of sixteen years had lost both parents due to the violence of war; and that, in addition, a minimum of 100,000 children were in need of special protection because their surviving parents were no longer able to provide the basic necessities of food, shelter and educational opportunities for their children. In order to help, foreign NGOs and church organizations began to construct or rebuild and enlarge orphanages in population centers, and made a concerted effort to introduce the concept of adoption to foreign countries and foster care as the strategies that were widely accepted as the preferred remedies of caring for unaccompanied children. However, the social service agencies in Eritrea had had very negative experiences with foreign adoptions during previous occupations. Therefore, they rejected all offers of help that involved adoption.or foster

care, and made concerted efforts to close all orphanages as soon as possible. Instead, they formulated a nation- wide plan for the rescue and rehabilitation of unaccompanied children that was largely built on indigenous practices of child care.

The main component of this plan was the reunification of orphans and other unaccompanied children with their extended family. A nation-wide search was implemented to first trace the extended families (aunts, uncles, grandparents and the like), and then to select those members of the extended family who were in the best position to provide the children with the necessary economic and social protections However, most of the families, including those in relatively good economic circumstances, had been so impoverished by the 30 years of war that accepting one or more children would have imposed unacceptable additional burdens on their lives. An income-generating scheme was devised and implemented whereby every potential host family that accepted one or more children received financial assistance *in kind* that would enhance their economic capacity in accordance with their usual means of livelihood. For example, farmers were given one or more cows, a plough or several goats. Town dwellers received materials that allowed them to open small stores or start up cottage industries.

This program of reunification by means of income enhancement has now in place for at least seven years. It is carefully monitored to ensure that the material assistance is used for its intended purpose and does in fact provide economic and social protections for the reunified children and the host families. In short, the Eritrean social service agencies have been able to provide decent family environments for many thousands of unaccompanied children by relying on, and slightly modifying, traditional practices of child care that have been an implicit part of indigenous Eritrean culture for centuries. At the same time, the Authority of Social Affairs was able to resist the well-intentioned but culturally alien proposals for international adoption of Eritrean children (without or with parents) that, according to past experience often had serious consequence that were not in the best interests of the children.

Despite extended and prolonged searches it was, however, not possible to trace the extended families of all war orphans. Therefore, an alternative plan was implemented in parallel to provide protection for children who could not be reunified with their own extended families. Small group homes are now being constructed in the various zones of the country. They are designed to provide decent physical and social environments for twelve children who live together with one or two permanent surrogate house mothers. Wherever possible, orphaned siblings are assigned to the same group home, and any group of twelve children living in one small group home is deliberately selected so that they will be of different ages ranging from two to sixteen years, so that over time they, together with their house mother, will form their own new extended family. Moreover, children are placed in group homes close to their village or town of origin, so that in time they will be reintegrated into their own communities. The alternative plan is still in relatively early stages of development, but monitoring of the group homes that have been in existence for at least two years indicates that they appear to be very successful in addressing the needs of the children. Like the reunification program, the group homes are based on indigenous traditions of child care in which the larger community, rather than the nuclear family takes on the responsibility of caring for children who have no parents and are in need of special protection.

Traditional Medicine in Tanga Today

This article was written by David Scheinman.

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For centuries, traditional healers have been the main providers of primary health care to most Tanzanians. Today, healers in Africa, especially in Tanga, still play crucial roles since—in addition to their roles as primary health care providers—they carry the burden of care for treating people with HIV/AIDS. In Tanga, the Tanga AIDS Working Group (TAWG)—situated in historic Cliff Block of Bombo Hospital—has been successfully collaborating with traditional healers since 1990. This is the story of a promising partnership between the ancient and modern worlds to combat HIV/AIDS.

A thumbnail sketch of medicinal plants

Plants have been used as primary sources of medicine for thousands of years and were our very first medicines. Over 4,000 years ago, the Red Emperor of China published a list of 4,000 medicinal plants. Literature about Babylonian medicinal plants was compiled in 1770 BC. The ancient Egyptians even placed medicinal plants in Pyramids to treat their Pharaohs after death. The mummified Pharaohs were preserved by using plants, herbs, spices, and minerals. Up until 150 years ago, the sciences of botany and medicine were the same.

Plants have medicinal qualities due to the substances they produce to protect themselves from insect pests and pathogens. We just "borrow" these substances to treat our own viral, fungal, and bacterial infections. Many medicines are extracted from the roots, root bark, and bark of plants since these areas are the most vulnerable and provide a plant's first line of defense against an invader.

Within seconds of an attack, plants begin producing and excreting a potent array of substances that are lethal or toxic to the invading virus, bacteria, fungus, insect—or even mammal. Individual plants can produce up to approximately 1,000 unique chemicals. Hence a natural anti-viral produced by a plant to defend itself can also be used by a human as an anti-viral.

Traditional healers in Tanzania have been identifying, experimenting, and using these substances to treat patients for millennia. By combining forces with them, we have access to thousands of years of research results. This is commonly known as indigenous knowledge (IK).

Many of today's modern medicines are derived from plants. Over 120 pharmaceutical products are derived from

plants, and 74 percent were first used by native cultures! The correlation between healer use and positive lab results is clear. Data clearly indicates that plants collected from healers provide more solid leads toward developing new drugs than random screening. Twenty-five percent of our present perscription drugs are derived from plants. The best known are quinine from the cinchona tree, morphine from the poppy, aspirin from the willow, digitalis from foxglove, vinblastine and vincristine (first choice drugs treating Hodgkin's Disease, Acute Leukemia, various lymphomas, Advanced Breast Cancer, and now HIV related Kaposi's Sarcoma) from the rosy periwinkle—which grows right here in Tanga—and now cotexin from Artemisia annua for treating malaria.

Traditional healers in Tanga

Tanga District has approximately 670 traditional healers (Waganga). 337 are in Tanga Urban District and 333 are in Tanga Rural. The average age of a healer is 52. Most are Muslim and have been practicing for an average of 19 years. There is one healer for every 343 residents of Tanga town and one healer for every 146 rural residents. There is one western trained medical doctor in Tanzania for every 33,000 residents. Therefore, many more people receive health care from healers than from conventional health workers. Many healers have participated in TAWG Seminars.

These figures positively correlate with data from Sub Saharan Africa. Healers are already in place; health ministries do not have to assign them since virtually all villages have residential healers and traditional birth attendants. This is especially true in rural areas where modern medicine is much less available than in towns. Hence, combining forces with healers to combat HIV/AIDS and promote public health makes very good sense.

Healers in Tanga are mostly herbalists, diviners, mediums, surgeons, midwives, and traditional psychiatrists. The majority use some of the many medicinal plants available in this biologically diverse region. The Eastern Arc range of mountains, which includes Amani in Muheza district, is one of only 20 biological hotspots in the entire world. A hotspot is a region characterized by an unusually diverse range of species, many endemic to the area. Amani has the second highest amount of biodiversity in Africa—a site in Cameroon is first.

Healers have specialized knowledge for treating physical, cultural, and psychological ailments. Healers are accessible, affordable, usually have credibility, and in Tanga have a treasure trove of biological diversity from which to collect efficacious plants.

Healers and doctors join forces in Tanga

In order for public health goals to be realized in Africa, healers should be active participants in the health system. This makes good sense, since each community has it's very own indigenous healers. In Tanga, TAWG has received international recognition of its innovative work with traditional healers, and has received support from OXFAM, the World Bank, and USAID.

Today in Tanga, traditional healers and modern physicians and health workers have combined forces in an exciting and promising program implemented by TAWG. TAWG is an innovative non-governmental organization (NGO) that links traditional healers, physicians and health workers, botanists, social scientists, and people living with AIDS (PLWAs). TAWG's goal is to bridge the gap between traditional and western biomedicine by treating PLWAs with traditional medicine.

TAWG evolved from meetings that a German physician and his Tanzanian colleagues initiated with traditional healers in Pangani, a coastal town 50 kilometers south of Tanga in 1990. The health workers observed that many patients—this is true throughout sub-Saharan Africa—visited both the hospital and traditional healers. Hence, they decided to make contact with local healers in hopes of initiating a referral network. They were successful, and their network evolved into TAWG.

Healers responded enthusiastically to the initiative. They relished being taken seriously and treated like fellow professionals. The initial dialogue evolved into meetings where participants discussed how to treat various ailments, when to refer a patient to the hospital, public health issues, and how to cooperate with biomedical personnel. One day the subject was HIV/AIDS.

Waziri Mrisho, a 84-year-old healer, asked if he could try treating HIV/AIDS in-patients. The group agreed, and Waziri treated a few confirmed HIV+ patients with three plants TAWG still uses today.

Bio-medical personnel soon observed that patients treated with Waziri's three plants generally had improved appetites, gained weight, suffered from fewer and less severe opportunistic infections, and enjoyed improved health and well being. The plant remedies soon became the hospital's standard HIV/AIDS treatment for patients who preferred herbal medicine.

The original three plants—along with others that have been added—are still used to treat a variety of opportunistic infections commonly caused by HIV/AIDS. Waziri was a real pioneer. He readily shared his knowledge and generously agreed to have his plants scientifically identified by bota-

nists from the Lushoto Herbarium in Lushoto, Tanga Region.

TAWG eventually developed a home care service to deliver the plant remedies to HIV/AIDS patients and their families. Home visits are the foundation of the TAWG's day-to-day work. Activities include monitoring general health, administering traditional remedies, and providing counseling for patients and their relatives.

In 1994, TAWG was officially registered as the Tanga AIDS Working Group (TAWG) with the Ministry of Home Affairs.

TAWG is the leading HIV/AIDS NGO in Tanga Region. Its staff are highly qualified, dedicated, and committed to improving the quality of PLWAs lives. Members have expertise in counseling, psychology, medicine, education, botany, research, medical anthropology, and management. TAWG's work is an outstanding example of how positive results can be achieved in the fight against AIDS by synergistically combining local expertise, indigenous knowledge, and modern health workers to provide effective low cost treatment for people living with AIDS.

TAWG's treatment program

TAWG's signature activity is treating patients in the hospital or at home with medicinal plants. In the newspaper Nipashe dated February 23, 2002, TAWG has reported that its treatment generally lengthens patients' lives and that some patients who were in bad shape clearly improved after taking the traditional medicines (Dr. Samuel Mtullu, Nipashe, February 23, 2002). The medicines are more effective, however, if treatment is initiated during the early stages of HIV/AIDS. The medicines are low cost, effectively treat selected opportunistic infections, readily available, are provided to patients free of charge, and have been used for Tanzanian healers for centuries. Given in the proper form and dosage, they are very safe.

TAWG's medicines increase appetite, help patients gain weight, stop diarrhea, reduce fever, clear up oral thrush, resolve skin rashes and fungal infections, treat herpes zoster, and clear ulcers. Treating patients extends their longevity, improves the quality of their lives, and reduces the number of orphans since parents remain alive.

TAWG also works closely with the government, runs seminars for traditional healers, and has an effective education and HIV/AIDS prevention program.

It currently treats around 400 patients in Tanga, Pangani, and Muheza Districts. Since TAWG began in 1990 they have treated around 2,000 patients. During the last six months, the amount of patients treated has doubled, indicating the rising number of HIV/AIDS cases.

TAWG's collaboration with traditional healers and the Ministry of Health has created a small island of hope in this seaside town. Patients are now living longer and better lives, and consequently there are fewer recently-orphaned children. Healers have taken the prevention and public health messages back to their villages and many know when to refer a patient to the hospital.

Though not a cure, the traditional medicines prolong life by combating pathogens similar to those that attack plants. At least now, patients in Tanga region, and Tanzania, have a low-cost alternative to expensive imported therapies.

Incidentally, these expensive new therapies often tend to lose their knockout punch over time. Hence, treating patients with traditional medicines has as much validity now as it did thousands of years ago. By having healers and doctors synergistically combine forces, new trails are being blazed which benefit everybody.

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Ethiopia

A Qualitative Understanding of Local Traditional Knowledge and Medicinal Plant Use

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The *real* figures behind that 80 percent figure

At this very moment, somewhere in a remote rural community in the Ethiopian Highlands, a local farmer may have just gathered the leaves or roots from a medicinal plant found near the homestead. In a nearby hamlet, a mother may be in the midst of preparing a traditional plant treatment believed to 'restore strength', relieve stomach cramps, heal a skin condition, or perhaps alleviate symptoms of a respiratory tract infection affecting her child. It is such routine use of plants by ordinary members of local communities across Ethiopia's diverse rural landscape, which largely accounts for the widely cited 80 percent estimate of the population who continue to rely on traditional plant-derived medicines for their basic health care needs (Bannerman, MOH, 1985; Abebe and Hagos, 1991; IBCR, 1999).

While there is now growing recognition that the study of indigenous health knowledge and practices requires an essentially multidisciplinary research framework, to date, botanists, natural chemists, pharmacologists, anthropologists and health-workers have generally pursued their specific research interests in this area in relative isolation from each other. In Ethiopia, there have been few cross-disciplinary linkages among the various approaches of researchers or the analysis of their findings.[1]

Moreover, much of the existing literature on Ethiopian traditional herbal medicine is dominated by plant-focused work, resulting from the 'mainstream research agenda', which has been largely driven by an overriding interest in the specific therapeutic properties of individual plants. In search of information on the properties of various Ethiopian medicinal plants, researchers have generally focused their attention on two main sources: (i) the professional traditional health practitioners and (ii) Ethiopia's ancient medico-religious manuscripts herbal letters containing elaborate recipes of plant-derived treatments for a wide range of health conditions (see, e.g., Abebe and Ayehu, 1993).

By contrast, there have been few studies focused specifically on traditional knowledge and practices outside the 'professional' realm of traditional medicine. The purpose of this article, derived from a larger study, is to share some of the findings of current research[2] envisaged focusing explicitly on the 'lay domain' of traditional knowledge in the Ethiopian context.

Objectives and methods

The fieldwork-based study aimed to gain insight into the local distribution of traditional health knowledge and the uses of various medicinal plants among ordinary men and women in rural communities, who constitute the vast majority of Ethiopia's population. The overall aim of the research is to contribute to the growing body of literature and experience pertaining to the role of indigenous/traditional systems of knowledge in development. Underlying this objective is the fundamental premise that health constitutes the linchpin of the development process, viewed at once, both as the means as well as the end of development.

The fieldwork was carried out with the participation of communities in the rural Bahir Dar Zuria district of Gojam (now part of the Amhara Regional State) located in the North Western Highlands of the country. A combination of research tools from various disciplines were employed. Gender considerations constituted an integral and cross-cutting aspect of the methodology, as important gender factors were expected to be involved, *inter alia*, in the distribution of traditional health knowledge and its inter-generational transmission. Among the instruments applied for gathering data were:

- household surveys (viewed as the main component of the fieldwork);
- oral histories (based on open discussions with widely recognized knowledgeable elders);
- focused discussions with mothers at local health centres;
- local market surveys;
- questionnaires administered to high-school students; and
- structured interviews with (both modern and traditional) professional health practitioners.

Preliminary assessment of the data

In-depth quantitative and qualitative analyses of the data gathered from these various sources are still under way. Following are some highlights of the preliminary findings of the research.

The tacit and pervasive nature of traditional health knowledge

In general, traditional knowledge about medicinal plants and its application are very much taken for granted by both men and women in all the study communities. Such traditional knowledge and practices constitute routine aspects of daily life and are deeply engrained in the socio-cultural and economic fabric of these rural societies. This is a significant finding in itself, as it clearly demonstrates the sheer scope and significance (actual and potential) of local traditional knowledge.

Gender and age dynamics

Some general trends could be discerned suggesting considerable gender and age differences in the type and extent of traditional health knowledge. For example, middle-aged and older women and men generally appear to have a greater breadth of medicinal plant knowledge. In addition, men more often demonstrated knowledge of plants primarily procured from the wild, whereas women generally showed greater familiarity with the therapeutic uses of weedy and semi-domesticated plants found around the homestead.

Main sources of traditional knowledge

'Routine observation and practice' or 'learning by doing', was the most widely-cited method through which knowledge is acquired. Here again, a relatively larger proportion of men indicated having obtained their knowledge in this way, suggesting some notable gender differences in terms of the mechanisms by which traditional knowledge is imparted.

The medicinal plant resource base

The local names and specific uses of more than 80 plants with medicinal value were documented throughout the study. The large majority of these are wild/weedy species, often occurring around the homestead or farm and requiring little management. This finding alone is strongly supportive of the original research hypothesis, i.e. that significant knowledge about medicinal plants resides in the 'non-professional' or public domain. In addition, the local names and specific uses of most medicinal plants cited by different informants were appreciably consistent.

Role of rural professional health practitioners

In general, professional traditional health practitioners seem to play a much less pronounced role in the rural communities than has generally been presumed. It appears that most ailments are diagnosed and treated at the household level. Very few informants reported seeking professional traditional help on a regular basis. Where professionals are consulted, it is often for their specialized traditional knowledge and skills pertaining to a relatively limited range of health problems.

The qualities of traditional knowledge

Further reflections about the various features of the traditional knowledge characterized above raise some questions, inherent paradoxes and eye-openers. These relate to the potential role of traditional health knowledge, the nature of the traditional learning process and the intrinsic contrasting features of traditional knowledge.

The potential role of traditional health knowledge: challenges and limitations. The term 'challenge' immediately brings to mind the single largest health problem in the study area—malaria. However, no specific traditional plant medicines for malaria were reported. While this raises questions regarding how 'new' malaria is to the area, it also seems compellingly related to the fact that overall understanding of malaria aetiology is extremely poor among the local people. The latter underscores the urgent need for community-based health education and prevention programmes. Nevertheless, some traditional perceptions regarding the general 'ecology' of the disease could be discerned, which may provide an advantageous basis for effective locally adapted health education and promotion efforts.

Another basic challenge has to do with the dire sanitary conditions in the rural communities. Indeed, it would seem that such communities that rely heavily on traditional plant treatments are caught in a vicious cycle, as many of the ailments that the local plant medicines are used for are linked to poor environmental sanitation. Thus, the lack of proper latrines, waste disposal and clean water can be viewed as the *raison d'etre* for many traditional treatments. Conversely, however, it can also be argued that, were such very basic and vital provisions in place, then health care efforts at the local level could perhaps, have been more effectively and appreciably targeted at the prevention of some of the more difficult health problems in the area, *such as malaria.* Hence, these very shortcomings can, in a sense, be viewed as among the greatest impediments to the realization of the full potential of indigenous ingenuity and traditional approaches in meeting local health needs.

The knowledge transmission process. Exactly how is traditional health knowledge transmitted over generations? Are the traditional mechanisms that have been in place in the past still intact? These are complex questions, requiring detailed contextual longitudinal evidence, which is extremely elusive and difficult to unearth. However, one observation that may have some relevance to these questions concerns traditional knowledge among children. It was observed that boys and girls as young as 6-7 years had remarkable 'botanical' knowledge, i.e. the ability to distinguish various medicinal plants growing around the homestead. But what of other aspects of traditional knowledge pertaining to the preparation and administration of plant medicines and the diagnosis of diseases? Could knowledge about these aspects be 'selectively' threatened? Such important issues will be investigated through further analysis of the information gathered.

Contrasting features a/traditional practices. With increasing interest in the role and value of traditional knowledge systems, such knowledge and its application have often sweepingly but perhaps, precariously, become associated with positive outcomes. Yet, if traditional health systems are to be strengthened as a whole, due attention should also be given to those practices that appear, at least *prima facie*, to be less than beneficial. Gases in point are, traditional surgical procedures such as the removal of the uvula, tonsils and teeth, and even graver practices of bloodletting and female circumcision[3]—all of which remain widespread in the study communities. Perhaps even more so than in other aspects, the particularly complex issues entailed in such traditional practices, necessitate the utmost socio-cultural sensitivity and a sound understanding of the local context in which they persist.

Conclusion

It is anticipated that some significant conclusions will emerge from the ongoing study. What can be generally surmised at this stage, are some of the broader implications and expected contributions of the research.

First, over the last decade or so, increasing interest in traditional knowledge, particularly regarding medicinal plants, has been fraught with debates regarding intellectual property and traditional resource rights. Often, driven primarily by interests and forces external to indigenous communities, these remain extremely complex and indeed, urgent issues with which policy-makers and stakeholders from both the North and South are actively grappling in various international fora. But this highly politicized focus at the global level seems to have diverted research attention away from the local context, i.e., from a *real* understanding of the actual and potential roles of traditional health knowledge and practices in addressing arguably the most urgent healthcare needs of growing populations in resource-constrained developing countries like Ethiopia. Hence, it is hoped that the present study and others like it can, in the first instance, help to redirect some research attention to the community level.

Second, as this study has demonstrated, at least in the context of rural communities in the North-Western Highlands of Ethiopia, traditional knowledge regarding the use

of medicinal plants is far from being a corpus of wisdom or expertise generally presumed to be restricted to the male-dominated elite of professional traditional health practitioners. Indeed, most of the traditional treatments used in the communities studied are collected, prepared and administered by ordinary men *and* women at the household level. Hence, this implies that those 80% of the population, who are said to rely on traditional plant-derived medicines, do not invariably consult professional practitioners. Indeed, the fact that traditional health knowledge is so pervasive and the use of local medicinal plants so widespread has paramount implications, which simply cannot be ignored by those concerned with health development and practitioners in the closely allied field of natural resources management.

Finally, it has become evident that research and development efforts must also identify and address the challenges and threats faced by traditional health knowledge systems, *in toto*. The ultimate goal is to strengthen and improve this vast knowledge base for the benefit of the great majority of the developing world who have survived on it for centuries and will continue to do so for the foreseeable future.

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1 One notable exception is the promising cross-sectoral/ multidisciplinary framework adopted by the recently launched World Bank-supported national R&D project on the conservation/sustainable use of medicinal plants used for human and livestock health care (see *IK Notes No. 35*).

2 Research in progress (final phase) in partial fulfillment for a DPhil (PhD) degree in Development Studies at the University of Oxford, Oxford UK.

3 Viz.*: IK Notes No 41*: Eritrea; *Eliminating a Harmful Traditional Practice.*

The Economics of African Indigenous Knowledge

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African Indigenous Knowledge (IK) is labeled variously and misconceived at international discussions and in modern literature. The most commonly used phrases are "static," "low-value-added" and "prior art," primarily in the context of the Trade Related Aspects of Intellectual Property Rights (TRIPS), of the World Trade Organization. Frequently one finds expressions like mystery, charlatan, irrational, or miracle in relation to traditional medicine, for instance. Achievements of traditional medicine are considered anecdotal or beyond scientific validation. The misconception is further aggravated by the little or no growth in the sector and a lack of understanding of the context in which practitioners apply traditional medicine. Yet, the literature produced on this sector has not given much attention to the factors that underpin these misconceptions.

This article therefore provides a basic explanation to the apparent lack of understanding and growth from African indigenous knowledge. The argument is anchored on the African customary law system that only recognizes communal ownership of knowledge and apportions little reward for individual innovations. The impact of this communal ownership of knowledge had produced different reactions from innovators and ingenuous knowledge bearers, in various sectors. In the high-income sectors like the medicine, innovators use "secrecy" to protect their knowledge. In the low-income sectors such as agriculture, innovators are "indifferent," in the absence of public incentive and protection to making their knowledge public. When the knowledge bearers die, the knowledge disappears with them. The result is what we call a "continuous but non-additive innovation" as against "continuous and additive innovation." In the absence of additivity in innovations, the knowledge remains basic and cannot produce much macroeconomic growth.

In line with the above, the study argues that the "static semblance" labels and stigma are the product of the lack of incentive for individual IK innovators, in the customary law systems. In particular, it argues that traditional medicine is not a profession of charlatans, but rather a part of Africa's development resource not well-studied, not adequately appropriated and developed. African traditional healers (and other practitioners of IK) are equally capable of research, innovation and healing as their "allopathic" counterparts. Bone-setting, anti-snake venom

production, active immunization practices or treatment of post-traumatic stress disorders are good examples of highly-appreciated products of African traditional medicine. As such, the study makes a case that it is the secretive applications that have beclouded the true value of the activities. This secrecy, however, has some economic rationale. The aim of this article, therefore, is to explain the economic rationale behind such secret behaviours—in what the author call the "the Secrecy-Motivation Model."

The questions expected to be answered, using African traditional medicine as an example are: why are African traditional medical practitioners secretive? Are the motivations for the secretive behaviours economic? What specific healing powers do the practitioners have, requiring secrecy? What are the economic impacts of such secretive behaviors?

To answer these questions, the study posits that three factors determine the secret behaviours of African traditional healers. These are: the inadequacy of rents from innovation; absence of public protection of intellectual property rights in the African customary law system; and the threat of business-stealing and obsolescence by the arrival of new innovations. Innovation, has very little predictability. This is particularly so in medicine and agriculture, where research can be costly and long-term, and where the results are uncertain. In this situation, the innovators and bearers of the unique knowledge consistently work to regulate against any threat of knowledge stealing or obsolescence.

The explanation

The author named the explanation the Motivation Model because of the motivational effects that explain the secrecy (search for innovation, investment in the research process and expected income effects). Initially, the study supposes that under normal economic circumstances, any new product is created not by a single innovation/imitation but by a whole sequence of innovations. The existence of the last innovation leads to further developments and innovations. Some of what will result from it will be more fundamental (horizontal), some will be more secondary, hence vertical. That said, the study explains why an innovative traditional healer would choose to remain indefinitely secretive.

In this explanation, the principal input/resource a traditional healer invests in the production and innovation processes, is himself/herself, defined as his/her physical power and knowledge. Having done so, innovation arrives randomly at a rate expressible as a fraction of the invested knowledge, indicating the productivity of the research. Randomness means that at the current time, the possibility and specificity of the innovation cannot be guaranteed. The innovator may find another innovation in the process of solving a particular health problem at a time *unknown* to him/her. Even by allocating a large amount of his time and knowledge resources, it is still uncertain, to the innovator, when the next innovation may take place. The individual that succeeds in innovating prefers to monopolize the production sector until replaced by the next innovator.

When researching, the healer has to balance opportunity costs of marketable goods or services against the uncertain results of research. Costs are likely to be high given the uncertainty of results of the research. Sharing the results of the innovation in the community would deprive him/her of the income deriving from the innovation, since it could easily be copied not only by other healers but also by his/her fellow community members in a do-it-yourself application of the new treatment.

It is the possibility of a business-stealing effect as a result of openness that is of serious interest to the study and of concern to the *knowledge bearer*. Through this effect, it is entirely possible for a new entrant in the innovation field to successfully destroy the monopoly rent attributable to the previous generation of innovators, by making their products obsolete.

Relating this to cost of innovation, one assumes that research costs/expenditures are financed at the proportional rate that is equal to the resources and labour force committed to research. Only a portion of the resources and finance will produce research objectives. If the costs and benefits are also measured in units of final outputs, the marginal cost is the amount over and above initial investment.

When the expected net income from the use of the innovation is included, one gets a different effect, where profit is the exponentiated at the time**.** In the case of business stealing, therefore, the loss will be expressed as a loss of both the invested resources as well as the expected profit. The double loss of both, investments and expected income is thus a driving force to hide the new idea or innovation in the absence of institutional and other legal support or protection.

Within the above framework, any "new" innovation poses a serious challenge to the livelihood and means of existence of the previous incumbent of the previous innovation. It is in anticipation of the loss of income and the threat of obsolescence, to be associated with the introduction of the superior rival good from the "new" innovation, that the incumbent will create confusion regarding the value of goods and services that he/she produces by keeping the technical information anonymous and secret.

Also aware of the absence of any public institutions to protect his/her indigenous knowledge, the owner has to find a creative way to shield his/her monopoly earnings from imi-

tators and the process of business/knowledge-stealing. In terms of application, other disguises follow in the form of incantation, masquerading, diversionary sacrifices and scare tactics. In this way, even the patients or customers who are allowed to come in close contact with the products may not easily and freely understand which among the array of acts contributed the actual solution that they required. It thus appears *magical*.

In the absence of guises and disguises, the probability increases that consumers of the medical products may imitate the innovation and increment the frequency of do-it-yourself (DIY) self-treatments, thus depriving the practitioner of monopoly income. This self-protective approach thus helps the innovator or bearer of the new knowledge to continue collecting monopoly rents as well as to protect against "intruders" who may steal and improve on the intermediate input and render the original idea obsolete.

The main argument once again is that those working in African traditional medical sector have finite resources, just like anyone else, and interest invested in their work. In the absence of public protection of their innovations and uncertainty associated with discovering a new solution, they hedge against getting these innovations into the public domain. The objective they achieve through this is that the public cannot engage in imitation and do-it-yourself, thus depriving them of their monopoly rent. The process of hedging induces the distortions and magical performances associated with the activities. The above explanations have been tested using empirical data. The results strongly support the main argument of the model.

In the other low-income sector such as agriculture, what one found was that the innovators/indigenous knowledge bearers do not pro-actively hide their knowledge. Commonly, they tend to be *indifferent* to whether their discoveries are made public or not (partly, because most of their activities can easily be studied on their fields). When asked, they reveal what they know but most of the time, nobody asks. Also, since there are usually no forums to share their knowledge, the owners keep it to themselves.

In the end, however, the impact of both "secrecy" and "indifference" are unambiguously negative on the macro-growth of the economies and the original knowledge itself. When the knowledge-bearers cease to operate, they disappear with their knowledge. This means that the next generation has to start afresh on the same process. The result is what the author calls "continuous but non-additive innovation" as against "continuous and additive innovation," In the absence of additivity of innovations, the knowledge cannot produce much growth. The conclusion from this is simple. African countries have not put in place the incentive policy that can help achieve a "continuous and additive innovation" in the indigenous knowledge system. The customary law system has also not self-corrected for this. Therefore, the growth-enhancing effects of indigenous knowledge system will remain minimal, thus falsely supporting the misconception of the whole knowledge as static.

What are the other conclusions that one can draw? The incentive structure to promote indigenous knowledge innovation and development has to be put in place. Doing this, may neither be inherently good nor bad, but holds the potential for great benefits. More research might also bring about a change of heart about African indigenous knowledge, in particular, medicine, natural resource management, and agriculture and livestock keeping. The abandonment of the associated stigma and lack of policy attention could be overcome by enabling the creation of constituencies; traditional healer associations are a first step.

The potential for growth and poverty reduction and the expected contributions to the stock of knowledge for resolving several intractable global problems, that could come from this locked potential, are an *incentive for action*.

Traditional Medicine Practice in Contemporary Uganda

This report was written by Anke Weisheit, freelance consultant, based on a study visit to the Traditional Healers Associations and Projects in Uganda 2002 in co-operation with Male Moses, IK Consultant. *This study was supported jointly by the World Bank and the MAKO Herbalist Association.*

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Traditional medicine practice involves a complex combination of activities, order of knowledge, beliefs and customs to generate the desired effects for the diagnosis, prevention or elimination of imbalances in physical, psychological or social well-being.

Traditional medicine practice is based on the indigenous knowledge of a given people, a given community, and their experiences in the context of the local culture and environment—it is dynamic and changes with time depending on the prevailing situation.

Traditional medicine practitioners (TMP) comprise herbalists, bonesetters, psychic healers, traditional birth attendants, faith healers, diviners, and spiritualists who use indigenous knowledge for developing materials and procedures.

The health service situation

The relative ratio of traditional practitioners and university-trained doctors in relation to the whole population in Uganda is revealing as is true for many parts of the African continent.

In Uganda, there is at least one traditional healer for nearly 290 people compared to one Western-trained medical practitioner for every 10,000 people in the urban areas and 50,000 people in the rural areas respectively. The majority of the population in Uganda have greater access to traditional than to western health care. Traditional healers are an integral part of the local culture and are appreciated as key and sustainable sources of care and knowledge on disease and illness. About 80 percent of the population of Uganda rely on traditional medicine because western-trained medical personnel are limited or not really accepted by the community, and traditional healers are easily consulted, living in the same community (Bannerman, et al. 1993).

The country imports most of its drugs from abroad and often experiences serious shortages. That points to the demand for TMPs for medicinal plants and the fact that the majority of the people, rural and urban alike, depend largely on herbal medicines for treating a variety of diseases (Esegu, J.F.O. 2002). This reliance is mainly due to the high cost of conventional medicine and inaccessibility of modern health care facilities in most areas.

Economical advantage of traditional medicine

The lack of foreign exchange and the high cost of western manufactured drugs make modern health care inaccessible to the majority of the population. This consequently requires the conservation, domestication and growing of medicinal plants.

Propagation techniques are needed in some cases as propagation will lead to the conservation of rare medicinal plants and ensures that the wealth of the products remains in the country through using local knowledge, skills and materials. The health system thus becomes less dependent on external sources such as multinational companies. Developing conservation and propagation strategies of the currently-known medical plants is based on the communities' local knowledge of the environment, and shared experiences of institutions like the Entebbe Botanical Gardens, of the National Agriculture Research Organisation, and the National Chemotherapeutics Research Laboratory.

Governmental efforts in promoting traditional medicine

The Uganda Law Reform Commission is developing a law for the recognition, the protection and practice of traditional medicine (Kakooza, J.M.N. 2002). This enables national institutions and international organizations to promote and integrate herbal medicine into their development plans.

T*he National Agriculture Research Organisation* is integrating the modernization and commercialization of indigenous knowledge for wider economic and social benefits in areas such as food, cosmetics, pharmaceuticals, aromatics and handcrafts.

The Ministry of Health Strategy and Policy has recognized traditional medicine and it is developing regulations for integrating it into the primary health care system.

The Ugandan National Council for Science and Technology (UNCST) is implementing a project on indigenous knowledge and institutional development.

The National Chemotherapeutics Research Laboratory is the main research laboratory appointed by the government and is internationally funded—it has done the following:

- Mass screening of herbal remedies
- Toxicological testing
- Formulation and preserving herbal medicine
- Standardization of products.

Non-governmental organizations promoting traditional medicine

Prometra Uganda, an affiliate of Prometra International, is an Association for the Promotion of Traditional Medicine and is promoting traditional medical knowledge and practices for improved health through mutual co-operation amongst health systems. The headquarters of Prometra Uganda is in Kawempe -Kampala, the capital city of Uganda. The symbol of the organisation is a clay pot with holes and these holes are to be symbolically filled through collaborative effort of other professions. The summarized objectives of Prometra Uganda are:

- To generate and disseminate knowledge on traditional medicine so as to increase its utilization
- To strengthen and advocate for the use of traditional medicines across the entire rural and urban population
- To identify and fight against harmful traditional health care practices through educational programs, establishment of cultural centers and centralized treating areas
- To strengthen collaboration between traditional and other health practitioners so as to increase information sharing on traditional medicine
- To initiate, encourage and support community programs on the sustainable utilization of the environment, conservation and preservation of all species of medicinal value.

THETA—Traditional and Modern Health Practitioners Together against Aids and other diseases, is a Ugandan organization where traditional and modern health practitioners (THs) are working together. Its activities include:

- Training THs as community counselors and educators on sexually transmitted diseases (including HIV/AIDS), as well as training for other organizations targeting THs country-wide
- Training THs in basic HIV/AIDS patient care and supporting their efforts to provide quality health care
- Exchanging information through a Resource Centre created in 1995 for research documentation and dissemination of information on traditional medicine and AIDS
- Hosting a library, publishing a newsletter, organizing a monthly speaker bureau and carrying out advocacy for traditional healing systems
- Comprehensive training of traditional healers as trainees in THETA district outreach
- Herbal medicine processing and packaging as well as the maintenance of a herbal garden.

IIACM—the International Institute of Alternative and Complementary Medicine does the following activities:

- Managing over 10,000 different medicinal plants from Uganda and abroad on the institute's farm
- Improving formulation of herbal medicine
- Medicine processing and packaging
- Teaching various local and foreign traditional healing methods, including Chinese Herbal Medicine, Indian Herbal Medicine, Acupuncture, Music Therapy and Yoga.

MAKO Herbalist Association, whose activities include:

- Training herbal medicine users on the basis of clinical diagnosis and supporting their efforts to provide quality patient handling and care
- Generating information through documentation and research about herbal medicine and making information available to and co-operating with researchers
- Complementing the activities of traditional birth attendants by using skill and knowledge in areas such as traditional family planning methods
- Bridging the gap between elders with indigenous knowledge and the young herbalists for better knowledge regarding herbs, i.e., transfer of knowledge
- Interacting with partners who have an interest in promoting herbal medicines
- Continuously identifying indigenous plants with medicinal value in order to benefit patients
- Emphasizing the need for medicinal plant/tree cultivation among the public.

Various other institutions are also involved in promoting and integrating Traditional Medicine into the health care system : religious organizations, private companies, media, and individuals. However, there is no systematic national program.

Future research

Increased urbanization and change in societies make it necessary to modernize and develop traditional medicine and practice to meet demand in the context of changes in habits, cultural values, the environment, and economic conditions. This will require a new legal framework to prevent the exploitation of indigenous knowledge and resources. The picture that emerges is that overall, Uganda has a supportive environment for promoting traditional medicine.

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An Example of South-South Cooperation

Indigenous Knowledge: the East Africa-South Asia Learning Exchange

This note was written by Siddhartha Prakash of the World Bank. The IK Learning Exchange was jointly conceived and organized by Siddhartha Prakash, Krishna Pidatala and E.V. Shantha. For details contact: Sprakash@worldbank.org or Kpidatala@worldbank.org

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In March 2002, a multi-sectoral team of 33 World Bank staff from the Africa Region embarked on a learning tour of five East Asian countries—Japan, Singapore, Malaysia, Thailand and Vietnam—in order to better understand the Asian development process. The main objective of pioneering learning across regions was to enable staff to provide better quality service to clients by helping expand their knowledge of successful development practices, and by enhancing their behavioral skills in adapting good practices from one region to another.

Inspired by the success of the pilot study tour, the Africa Region embarked on an initiative to build cross-regional partnerships between E. Africa and S. Asia seeking to integrate indigenous knowledge and practices into Bank-supported operations. The aim was to leverage the experience of IK good practices from South Asia into Bank-supported projects in East Africa. This would also help foster new partnerships for South-South dialogue, cooperation and technical assistance.

The focus was on indigenous knowledge as it is a key element of the social capital of the poor, assisting them in their struggle to improve their livelihoods. For example, farmers have used organic fertilizers to increase soil fertility in parts of Asia and Africa for centuries; similarly, local healers have used medicinal plants in India and Tanzania to treat common human and animal diseases.

Many local organizations, institutions and communities have a wealth of knowledge of IK practices. However, these practices are not disseminated effectively because community-based organizations lack the capacity to capture, document, validate and share them. As a result, IK is underutilized in the development process, and local communities are constrained in their ability to shape the debate on development priorities and lack the means to achieve them. To bridge the knowledge gap, the Africa Region organized a cross regional IK learning exchange between East Africa and South Asia.

The first step was to identify potential projects in South Asia and East Africa that had either already developed effective IK components to promote community driven development and those lacking these elements. The purpose was to match knowledge-seeking communities with those that made good use of their local assets for development.

Proposed activities

The cross-regional partnership is being built in four phases. The first phase will build linkages between the East African and South Asian projects. The second phase will involve a learning exposure for project personnel and CBO partners from project communities on actual project sites in India and Sri Lanka. The third phase will focus on building capacity for integrating IK into project activities and strengthening country-level initiatives in the East African projects. The fourth phase will help the projects to continue the partnership for further cooperation and learning. The activities are designed in these four phases to emphasize the importance of building and continuing the partnership rather than merely undertaking study tours.

Phase I. Building linkages

Mapping exercise. The first activity to be undertaken was to identify nodal persons from each of the participating projects and develop shared perceptions on the purpose of the initiative and role of the partners. Information and guidelines already available on integrating IK and practices into project planning and implementation were shared with the projects.

Initiating dialogue. Contacts between the various partners was initiated and initial information on the initiative was exchanged. The use of IT for exchange of information was encouraged. Those projects already having web sites will be encouraged to post IK-related information and the progress that has already been made in identifying the IK and practices. If needed, a common web page for the partnership will be created to link to project specific information.

Finding a facilitator. Given the broad range of clients and variety of topics to be covered during the exchange, it was necessary to identify a facilitator to ensure a structured learning process during the exchange. The Executive Director, Uganda National Council for Science and Technology (UNCST) was selected as an appropriate facilitator.

Video conference and exchange of information. A video conference was arranged involving all participating clients where specific information on the use of IK (case studies) was presented and discussed. This gave them an opportunity to understand the importance of IK and to voice their opinions on what they hoped to get out of the exchange, thereby giving the organizers an opportunity to design the study tour in way that met the needs of the clients. A separate video conference was held with the facilitator, to familiarize him with the planned activities and agree upon a modus operandi.

Phase II. Learning exposure for EA countries

In September 2002, a group of clients (16 development practitioners) from Ethiopia, Kenya and Uganda, accompanied by 5 Bank staff visited India and Sri Lanka. The participants included project staff from early childhood development and medicinal plants projects, civil society representatives, a traditional healer, a parliamentarian and a minister. The learning exposure comprised of (a) field visits to selected project sites/communities to understand how the process worked, (b) interaction with field functionaries to understand how IK catalyzed the communities' environmental and social assets into economic gains (c) meetings with three State Chief Ministers in India to understand how good governance and leadership have led to relatively sustainable development policies.

Learning through reflection: In addition to discussions with counterparts and visits to project areas in South Asia, the learning exchange included opportunities for the group to reflect on their learning through debriefings. This learning approach, recently pioneered in the Africa Region, involves video-taped narratives based on open-ended questions designed to distill a "story". Over five debriefings the participants were encouraged to reflect on what they learned, how relevant the learning was in the East African context, and what adaptation to the observed practices will be needed to replicate it in East Africa. The debriefings results were synthesized into short video clips that are available on-line on the Intranet.

Phase III. Capacity building at country level and strengthening country level initiatives

The participants from Kenya, Uganda and Ethiopia developed Country Action Plans for strengthening the incorporation of IK and practices in their projects and also to share their learning experiences with other partners in their country such as NGOs and Ministries of Health. The activities will involve training and technical support for initiatives using IK for development and also for networking with other partners in the country. Each country team focused on the following areas for South-South Cooperation:

- *Partnerships and networking* (mainstreaming IK into development policies, documentation and exchange of IK practices, use of ICTs for rural development)

- *Cross-institutional capacity building* (institutionalization of traditional medicine, collaborative research on medicinal plants, policy formulation and resource mobilization)
- *Policy level* (legal protection of traditional knowledge, validation of IK practices, and integration into ECD programs)
- *Grassroots* (integration of women's empowerment in all programs, involve communities in project design and implementation, use ICTs to link communities with markets)
- *Awareness raising and dissemination* (seminars to share South Asian experiences with national stakeholders, inter-ministerial Meeting to raise IK at the policy level, press conferences to disseminate experiences to public).

The East African delegation felt that South Asia was more advanced in several key areas related to the application of indigenous knowledge in early childhood development practices, the conservation of medicinal plants and the use of ICTs for rural development. They were particularly impressed by India and Sri Lanka's holistic approaches to development and were keen to test some of these methodologies in an African context. In exchange, they also felt that South Asia could learn from East Africa, particularly from their efforts to tackle the HIV/AIDS epidemic. The key lessons learned and areas for future cross regional cooperation include the following.

Ethiopia
The Conservation and Sustainable Use of Medicinal Plants Project seeks to initiate support for the conservation, management and sustainable utilization of medicinal plants for human and livestock healthcare in Ethiopia. The Project is into its second year of implementation. Project staff visited a similar project on medicinal plants in Sri Lanka that is near completion. There were a number of lessons learned from the Sri Lankan experience that the Ethiopians plan to integrate into their project. These include the legal protection of IK and benefit-sharing mechanisms, documentation of IK practices and exchanges of experiences, institutionalization of traditional medicine, in-situ and ex-situ cultivation of medicinal plants. To this end, the project team intend to consult IUCN Sri Lanka on the Medicinal Plants Project and the Tropical Botanic Garden Research Institute of India on conservation and benefit-sharing mechanisms.

Uganda
The Nutrition and Early Childhood Development Project seeks to improve the growth and development of children under five years of age, in terms of nutrition, health, psycho-social and cognitive aspects. The project is near completion and a second phase is in the pipeline. A number of lessons learned from India and Sri Lanka are planned to be integrated into the new project. These include the integration of IK into ECD policies, integrated approaches to early childhood development, training of care-givers and adolescents in integrated ECD services and parenting, use of ICTs for community data collection, documentation and information-sharing to improve access to information for decision-making and market access. In this context, as a follow-up to the Learning Exchange, the Minister for Primary Healthcare recently took another official delegation to India and plans to host a regional training workshop in Uganda on traditional medicine. The Uganda National Council for Science and Technology (UNSCT) is sponsoring a group of IK practitioners to visit India and Sri Lanka. UNCST also plans to develop an IK proposal for South-South Cooperation, with NASTEC—its counterpart in Sri Lanka.

Kenya
The Early Childhood Development Project seeks to improve the quality and education of poor Kenyan households, with a focus on improved teacher performance and community capacity building. The lessons learned from South Asia related to IK and ICTs were similar to the ones mentioned in the Uganda case. The project is in its third year of implementation and also plans to focus on issues that were being dealt with in India and Sri Lanka. These include: community empowerment, women's self-help groups, income-generating activities, microfinance, multi-sectoral approaches to development and poverty reduction that involve the community at all levels of planning and implementation.

Phase IV. Continuing linkages for further cooperation

The last phase will have activities that will ensure that the partnership is continued beyond the initial exchanges and visit. Two activities are envisaged at this stage: (a) The South Asia and East Africa projects will access and use information on IK already available to them through the web and be part of a regional partnership that builds on IK and people's participation; (b) The participating projects will also put together a newsletter on IK initiatives and participatory M&E. In case more than one project is involved in a country, one of the institutions/projects will be chosen as a nodal agency.

Client feedback
In a client survey, the East African delegation provided the following feedback on the study tour:

- This is a window of opportunity for opening up institutions to each other's programs.
- One can see the different options and approaches that can be used to implement development activities.
- Such exchange visits are beneficial in guiding policy objectives and targeting vulnerable groups; and help redirect efforts to move towards holistic approaches towards development.
- Participants should be selected from multi-sectoral and interdisciplinary activities to include legislators, researchers and community workers.
- There is a need to develop networking for both regions and also between the institutions that have common programs. The East African country teams should organize exchange visits among themselves.
- Learning experiences once documented and disseminated to rural communities can strengthen poverty alleviation efforts in each country.

Ghana

Kanye Ndu Bowi: An Indigenous Philosophical Context for Conflict Management

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Since the late 1980s there has been a search for new conflict management[1] concepts and methods in order to deal with Africa's ubiquitous and apparently intractable conflicts. It can be argued that the main problem militating against conflict management in Africa is that the contemporary conflict management systems of the region's modern states are generally not continuations or adaptations of those of the indigenous communities over which they have gained jurisdiction since the colonial period. In other words, the main drawback in the conflict management in Africa is that there exists a disconnect between the conflict management systems of the modern states and those of their ethnic constituents. Thus, an understanding of the indigenous conflict management systems in the Africa in general may go a long way towards improve our knowledge and strategies in addressing the ever increasing conflicts in the region.

This article intends to summarize findings from a study carried out by the author between the winter of 1995 and spring of 1996 among the Buems on the Ghana side of the Ghana-Togo border. The objective in this paper is to identify and discuss the main philosophical contexts within which the indigenous Buem conflict management system operates. The paper also assesses the relevance of these principles to the management of modern conflicts in the area, particularly land-related conflicts.

For administrative purpose, the area under study is called Buem-Kator[2]; it constitutes the eastern half of the larger Buem chiefdom in the Jasikan District of the Volta Region of Ghana. In terms of Ghana's current decentralization program, the area is an area council, one of the six area councils that constitute the Jasikan District Assembly establishment. The indigenous people about whom this article is written are called Buems. Because the area is generally covered with tropical rainforest, which is highly conducive to the cultivation of cocoa and coffee, it has since the turn of the last century attracted large numbers of migrant farmers.

Kanye Ndu Bowi

Buems maintain that the paramount concern of their community is to sustain harmony within the social system. The philosophical foundation of this world view is encapsulated in the phrase, kanye ndu bowi, which translates literally to mean the "ingredients of social harmony." Kanye ndu bowi is a

broad ideological orientation, which provides the moral and legitimate basis for all manner of social control[3] and is translated into practice through the imposition of "intrinsic sanctions." Intrinsic sanctions in the Buem context are both positive and negative. They are the subtle, though pervasive, means by which the members of the community are molded to uphold the normative order. Whereas the positive sanctions consist of the psyche rewards that the people receive when they conform to the approved mode of behavior, negative sanctions are the feeling of moral discomfort that they experience when they default.

Even though Buems insist that social harmony is the overriding ideology in their relationship with each other, needless to state, the people do not follow the dictates of the rules of conformity with undeviating passion. Conflicts are part and parcel of Buem social life. Conflicts occur within kinship units and between members of different kin groups. They also occur between communities and between them and their non-Buem neighbors. In defining their conflict situations, Buems distinguish between anger (konyi), quarrel (kador), duelling (bekpeligiti), and war (kekpe). Disputes usually involve breach of contract, slander, and witchcraft and sorcery accusations. Conflicts can also result from the problems of political succession, marital misunderstanding, injuries against persons, and damage to property. Land boundaries and rights of access to land are often contested. However, in conformity with the principles of social harmony, disputants are essentially expected to settle their disputes by the most amicable means available. Thus, recidivism in particular is severely sanctioned by the community as a whole whose duty it is to provide the public officials with support in enforcing the community's normative order.

Pillars of social harmony in Buem-Kator

The Buem philosophy of social harmony is supported and sustained by other political values, among which are the people's notions of benyaogba ukpikator and lelorkalorbunu and their uncompromising emphasis on institutional and personnel trustworthiness.

(i) Benyaogba ukpikator

One means by which the ideology of kanye ndu bowi is sustained is through active emphasis on mediation, which the people refer to as benyaogba ukpikator. Benyaogba ukpikator, as an essential pillar in the ideology of kanye ndu bowi, provides adversarial parties a forum to underplay conflicts and convince each other that irrespective of the nature and cause of the conflict between them, the prospects of non-adversarial relationship is greater than that of disputes. In other words, by emphasizing benyaogba ukpikator as the chief conflict management method, disputants are made to avoid the winner-loser mentality that is fundamentally associated with adjudication, which the people call bate kate. By its nature, benyaogba ukpikator is a generally flexible and amicable method of resolving disputes. This is appropriate for a community whose members live on a face-to-face basis and are bound by webs of social, ritual and economic relationships.

The managers of benyaogba ukpikator are usually lineage elders, priests, and influential individuals who are known for their wisdom and skills in their official and professional capacities, as well as in their private dealings. These individuals are normally known widely within their communities and have the capability to persuade disputants who have been summoned to attend hearings. It often happens that such individuals are often invited to mediate conflicts outside of their own kin group or community. While doing the fieldwork, the author came across cases of this nature. One elder in New Ayoma was often mentioned as an adept mediator. He was particularly remembered for his success in resolving a chronic land boundary dispute between two farming settlements in the area. This mediation was deemed a success because, at the time of the interview, it had been over thirteen years since the dispute was settled and had not been reactivated.

(ii) Lelorkalorbunu

One other pillar in the ideology of kanye ndu bowi is the strife for, and emphasis on, lelorkalorbunu. Lelorkalorbunu represents the people's concept of fairness and justice. Buems maintain that the primary objective of their disputing forums is to achieve lelorkalorbunu. Lelorkalorbunu literally refers to a mutual acceptance, not only of the dispute-handling process, but also of the verdict. It is a basic principle among the Buems that until parties to a dispute have accepted the verdict that is reached at any dispute-handling forum, the conflict cannot be deemed resolved and, as a result, settlement and/or penalty (kornu) cannot be suggested. In other words, once lelorkalorbunu has been attained, which means that the disputing factions have accepted both the process and the verdict, managers of the disputing process will then begin to suggest courses of action to repair the damaged relations between the former disputants in order to return them to the previous state of their social relationships. It is believed that a good dispute-handling forum does not force a decision on the parties but gets them to concur.

(iii) Institutional and personnel trustworthiness

The third pillar, which undergirds the indigenous Buem conflict management system, is the uncompromising emphasis on institutional and personnel trustworthiness. It must be noted that there is no explicit separation of powers among the indigenous organs of the Buem political system. The same public officials—the chiefs, fetish priests, and lineage heads—who exercise the powers of state administration are also the lawmakers as well as the law-enforcers. However, contrary to the modern expectation that such concentration of powers can be a recipe for autocracy, despotism, and even dictatorship, power concentration among Buems has rather made imperative political openness, trust, and transparency at both personnel and institutional levels. By resolving disputes, these politico-judicial officials meet not only the expectation of the disputants that their conflict has been resolved, they also strengthen the trust that people have in them. In other words, successful resolution of conflicts does not only restore marred social harmony, it also enhances the legitimacy and political standing of the public institutions and officials.[4] Buems often say that any community leader who cannot be relied upon to settle community disputes is a *kwesia panin*—a worthless elder.

Conclusion

One key question regarding the sustenance of the indigenous principles of conflict management in Buem-Kator is whether the conditions that made them effective in the past are still intact to cope with the dramatic social changes that the area has been experiencing since colonial times.[5] This is because the apparent effectiveness of the indigenous principles in the past was possible because they evolved with, and were tailored to, the scale of society and exigencies of the time. As in all other areas in Ghana, and, in fact, in all Africa, indigenous principles and values have been significantly altered with the advent of the modern state, the introduction of Western-style education, world religions, increased monetization of local economies, and the development of modern infrastructural and communication facilities. The Buem with whom the author spoke conceded this fact. The changes have posed a challenge to the effective mobilization and utilization of the indigenous principles in the management of the modern conflicts.

One area in which indigenous Buem principles are in conflict with those of the modern state is the determination of land rights, which has become the major source of conflict in the area. This clash of principles is most obvious in the conflicting notions of statute of limitation, as applied to the occupancy and use of land. For example, in 1972, the Government of Ghana passed a law, Section 10,[6] which specifically provides that a person who has been in continuous possession of land for twelve or more years cannot be evicted from the land. The central tenets of this law are fundamentally incompatible with the indigenous Buem land laws. The indigenous Buem land laws do not restrict the length of time within which an action to recover land from an occupant can be effected. Thus, the Buems have contended that the mere occupation of the land, particularly by migrants (who are often viewed as outsiders), irrespective of length of stay on the land, is not a sufficient condition to make it a property that they can perpetually hold.

The central issue therefore is: Is it not appropriate for the Government of Ghana and, in fact, African governments in general and their development partners to seek means by which the relevant aspects of the conflict management systems of the indigenous communities can be synthesized with those of the modern states in order to harness the potential benefits of both systems.[7]

1 The term conflict management as used here refers to any means by which conflict is prevented, reduced, or resolved.

2 The area is a cluster of farming communities, the main settlements of which are New Ayoma, Dzolu, Old Ayoma, Baglo, Odumase, Kute, and Lekante.

3 Social control in this context refers to the community's moral code, comprising its beliefs and value systems, which influence the people's attitudes and behavior.

4 More elaborate views regarding this can be found in Marc J. Swartz, "Bases for Political Compliance among Bena Villages" Marc J Swartz, Victor W. Turner, and Artheu Tuden, eds., Political Anthropology, Aldine Publishing Company, Chicago, 1966 and a more recent work by Ben K. Fred-Mensah, "Bases of Conflict Management among the Buems of the Ghana-Togo Border Area , I. W. Zartman, ed., Traditional Cures for Modern Conflicts, Lynne Rienner Publishers, Boulder, 2000.

5 A similar question was earlier raised by Hareya Fassil in the article, "A Qualitative Understanding of Local Traditional Knowledge and medicinal Plant," IK Notes, No. 52, January 2003, p. 2.

6 Ghana Government, Limitation Decree, 1972. This legal system dates back to the British legal tradition, particularly its Limitation Act, 1833.

7 Such an attempt has been suggested by Ben K. Fred-Mensah in his article, "Capturing Ambiguities: Communal Conflict Management Alternative in Ghana," World Development, June, vol. 27, no. 6, 1999. It must also be noted that by virtue of its Interpretation Act, 1960 and 1992 Constitution, the indigenous laws (called customary laws) of the country's ethnic constituents are recognized as part of the country's legal system. However, in principle the national laws have precedence over them and also their application is limited to the ethnic group in which it has evolved.

Cultural Rights for Zimbabwe's *Sui Generis* Legislation

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Throughout two decades of development activity, reports on the "crisis" of desertification, food scarcity, and economic inefficiency have been challenged by local counter-narratives which show local people uniquely engaging in their environment in ways that deny the relevance of economic incentives (Lansing 1995; Leach and Mearns 1996; Appadurai 1990).

Recently, the Food and Agricultural Organization (FAO) characterized plant genetic resources as the "heritage of mankind" (Cullet 2001) in order to globalize conservation of them. Likewise, the World Trade Organization (WTO) and World Intellectual Property Organization (WIPO) legislation has enabled biotechnology companies to enclose aspects of this heritage within intellectual property rights (IPR) in ways that primarily fuel international industry. As a result, the local cultural practices related to biological resources have been dismissed as inefficient or discussed as barriers to development. This may begin with the fact that the relationship between territorial cultural practices, biological resources, and intellectual properties has not been made explicit. The author has found the following distinctions helpful:

Biological resources (plants, minerals and animals): are the natural sources of medicinal, agricultural, cosmological, veterinary and ecological utility. Their presences helps balance the overall ecological and social health of specific territorial environments. They are also the substrates of cultural resources, practices and traditional knowledge systems.

Cultural resources (practices): are the inherited territorial (customary and non-customary) practices that follow local systems of production, circulation and reproduction of the environment—natural and social—which characterizes them. They continue to evolve in conjunction with individuals and the territorial environment. They are also the substrates of intellectual resources.

Intellectual resources (capital): are products that have been abstracted, derived or synthesized from prior cultural or biological resources. In order to receive protection, cultural or biological resource had to have been transferred from their original territorial environment and are either (a) transported (as impersonal information bytes) to a new milieu so that they may be reckoned "novel;" or (b) components of them are reduced, standardized, and miniaturized for mass reproduction and distri-

bution to be deemed "commercially applicable." Hence, they are synthesized or abstracted to receive an intellectual property right (IPR).

In regional, territorial and national contexts it becomes clear that there can be no intellectual properties (even related to plant genetic resources) without the reproduction of cultural knowledge and practice.

Hence, significant initiative on the part of developing countries has brought unique (sui generis) national legislation to facilitate both international and local interests in accessing, keeping, using, sharing and valuing biological, cultural and intellectual resources simultaneously (Seattle Ministerial Meeting of the WTO 2000). The African Union (AU) has been especially concerned with maintaining the unique relationship between plant genetic resources and cultural practices and has subsequently handed down the *African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources* (African Model Law 2001) as a guide for its member states in developing National Sui Generis Legislation. However, because National Sui Generis Legislation (in accordance with Trade-Related Intellectual Property Rights Article 23(b) of the World Trade Organization) counters globalizing initiatives it has little to no international aid. Hence, it is being drawn up without the participation of local communities who access, keep, use, share, and value biological and cultural resources in customary and non-customary ways.

Research question

Because the requisite institutional reforms of WTO membership create new needs in developing countries such as Zimbabwe, development practitioners might effectively aid national development by working in conjunction with the national goal to create Sui Generis Legislation. This could be done most effectively by taking an anthropological study of how repertoires of knowledge exist in *a priori*[1] local conditions first. Based on this qualitative data, an analysis of the cultural practices that both vitalize and sustain traditional knowledge systems should follow. The author endeavored to do this with one repertoire of knowledge in Zimbabwe, Traditional Medicinal Knowledge (TMK), by exploring how it is accessed, kept, used, shared, and valued in both customary and non-customary ways. Subsequently, this has helped her develop several recommendations for Zimbabwe's own National Sui Generis Legislation.

Methodology

With a cognizance of cosmopolitan movements and high activity border zones, the author's fieldwork was carried out in three varied locales: (1) in the capital of Harare where a variety of Bantu linguistic traditions from sub-Saharan Africa meet in creolized forms commonly exchanged through English, (2) along two border areas—in Zimbabwe's Eastern Highlands that straddles Mozambique, and to the North going to the wetlands that seep across to Zambia, and (3) in the central high-grass, *veld*, region of Zimbabwe where Shona[2] customary traditions are still strongly reproduced.

The overall study and analysis was made with key informants, oral traditions, oral histories, participant-observation in ritual and medicinal plant use, former ethnographic studies completed by anthropologists, as well as the official discourse of a national association of traditional healers. The author spoke to traditional healers (*n'angas)*, healers' assistants (*makumbi*), spirit-mediums (*svikiros*), plant (*muti)* merchants, elders, chiefs and their councilors, rural district officials, and urbanite Zimbabweans. All of these interviews were conducted, with the help of a translator, in Shona.

Findings

In Zimbabwe, the natural substrates of TMK are conceived of both as magic[3] and as medicine (*mishonga).* Yet, these substrates manifest as a magic and/or a medicine only when they are wielded by an individual possessing an entire repertoire of practices, rituals, divinations, symbols and acute timing based on a familiarity with the social, cultural, environmental and physical milieu (the *hun'anga*).[4] In addition to the individual practitioner, the individuals who comprise the greater social field validate by their own consecration whether the magic and medicine become effective (*kushanda*).

Access to the full repertoire of ancestral TMK (*vadzimu hun'anga*) begins when the juvenile kin of an elder family healer selects one among their descendants to assist them in their practice (Chavanduka 1997; Reynolds 1996). While the apprenticeship demands hands-on practice with TMK—identifying, collecting and preparing plants; identifying,understanding and healing illnesses—it also requires lessons in the greater customary, symbolic and social milieu. The sum of the extended apprenticeship is the attainment of invaluable intuition (*mapipi*) related to the re-

lationships and cultural codes that direct an entire TMK system. For Zimbabweans, the elders (as well as the deceased ancestors) are the key to continuing access to and inheritance of TMK through special dreaming (*kurotswa*) and ritual divinations (*kusvikirwa*) where the knowledge is revealed as a gift (Frommer 2002).[5]

Hence, while a general familiarity with traditional medicinal plants is possessed by many within the local community, only selected and trained individuals gain enough familiarity with TMK to know with certainty what combination of plants, rituals, charms, divinations and diagnoses are effective under what conditions. As a result, different lineages and bodies of TMK have evolved—some more specialized, customary, effective or powerful than others, depending on the different territories or situations.[6]

Symbolic and social capital

While innovation in TMK is necessary to meet the changing needs of local Zimbabwean communities, it is not economic incentives that fuel this process. Traditional healers who have been specially selected to access and keep the ancestral knowledge finds themselves entrusted with a duty in which they are expected to share and cure before remuneration is even considered.[7] Further, it is not required that the insights, intuition, and innovation of a personal practice be shared in order to gain remuneration because healers are valued first as cultural authorities, second as practitioners, and third as practicing scientists. Hence, traditional healers receive a different type of payment—that of community consecration (symbolic capital).[8] The highest authority and rewards are given to those healers who appropriately revere the TMK (*kuchengetera*) and demonstrate respect for the customary rituals, healing, figures, symbols, proverbs, and narratives that are used to enrich and illuminate the entire social field.[9] For instance, in addition to healing, *mishonga* is used symbolically to give impetus to culturally ordained responses, rituals, and activity that may manipulate any set of factors in the environment, e.g., for success in business, politics, winning arguments, extending influence, or settling disputes. Because these practices exist in a realm where they are accepted, spoken of, and understood they become "*kushanda*," or, effective. However, just because these practices are "cultural" and rely on the traditional codes does not mean they are not scientific or innovative. In fact, one of the strengths of these practices lies in their flexibility in diagnosing and healing each problem or illness individually. As a result, careful customization (opposed to a standard set of diagnoses) yields many opportunities for innovation and advancement in practice.

Non-customary practices

Presently, however, several non-customary practices that appropriate the physical substrates of TMK (*mishonga*) also neglect the importance of the cultural and ritual matrix that may spark individual insights and innovation. As Zimbabwean merchants, scientists and a trade union of traditional healers have begun to remove the physical *mishonga* for product development and distribution, the entire reproduction of TMK practices (*hun'anga*) as well as the entire cultural symbolic system is threatened. Further, when these non-customary practices are linked with foreign pharmaceutical companies, the focus on product development weakens the emphasis on ancestral gift and heritage and thereby also the expectations of duty and responsibility with respect to the local communities who rely on these practices (Wyneberg 1999; 2000). Because TMK has always had a degree of collective sharing, unconsecrated and non-customary practitioners have been able to take liberties with the *mishonga* in ways that have begun to breed local misuse, misdiagnoses, and fraud.[10] As a result of these divergent practices, an estrangement between traditional healers and their communities is settling in to such an extent that the entire reproduction of cultural practices and relationships that fuel innovation within the traditional medicinal knowledge system is threatened.

Prognosis

Nonetheless, Zimbabwe has a changing and evolving culture. Recent years have seen specific customary figures from the distant past (*PasiChigare*) or from the "Liberation War"[11] used to encourage the tourism industry. In theory, new local practices cannot be conceived of as not "cultural" simply because they do not flow directly from the orthodox tradition. Hence, so as to not conscript and freeze the processes that reproduce culture as a resource, both customary practices and non-customary practices must have legislation to support and protect traditional medicinal knowledge as part of the social service sector.

Conclusion

While industrial countries believe that IPR for intellectual resources fuels innovation through reward, the value-added to biological resources by cultural resources has symbolic engines that move it. The singular focus in development circles on protecting "plant genetic resources" overlooks the relationship between it and other resources and denies that

cultural resources are crucial for the continued health, reproduction, and innovation in each type of resource.

The author's findings show that TMK is accessed, kept, and used by individual practitioners in order to share it effectively and to attain full valuation in the surrounding community combats the assumption in development circles that TMK is primarily a collective resource. It is important to look past this assumption, which is married to the expansion of an intellectual property rights regime, especially since this has served to justify the alienation between individuals, families and communities and their cultural and biological heritage.

While plant genetic resources have been called a "green-gold" in recent years, in reality it is has been the access to territorial cultural resources (based on customary and non-customary practices with local medicinal plants) that have yielded the pharmaceutical applications receiving protection as intellectual property (Wyneberg 1999; 2000). Therefore, cultural (customary and non-customary) practices related to biological heritage need a system of protections that enhance a capacity to keep relationships, social systems, social/symbolic matrices that reproduce territorially important knowledge alive. The author has outlined how this may be done in accordance with the United Nation's International Covenant on Social, Economic and Cultural Rights (1966) in more detail for Zimbabwe.

[1] A prior, or "*a priori* " right is recognized for local communities in the African Union's Model Law (2001).

[2] Shona is a national language of Zimbabwe from the Bantu heritage. The importance of doing fieldwork in a territorial language is illustrated in the discovery of concepts unique to Bantu tradition that can not be easily translated into English without casting doubt on their non-superstitious reality, e.g., charm, magic,

[3] Magic, according to Leach (1976) is an index of the possible. While the cause of an identified effect is not verified, the potential effects still have very real implications for believers. In the author's research this includes an affirmative belief that banal empiricism may be transcended with ritual and *mishonga*.

[4]The customary and the cosmological, the magical and the spiritual, the bureaucratic and the modern all of these may represent simultaneous realities, sub-realities and hyperrealities for Zimbabweans who traverse the beliefs, practices and ways of individuals inhabiting rural, customary, urban, scientific, entrepreneurial, spiritual and magical realms and communities.

[5] A special phrase, gift of the ancestors, (*chipo vadzimu*) indicates the special rules pertaining to a heritage and gift as opposed to a commodity. Anthropologists such as Marcel Mauss, Bronislaw Malinowski, and Annette Weiner, have all written about the engines and rules of gift giving. Common to each analysis is the emphasis that these special items do not follow economic rationale but are rather tied into social and symbolic status aquisitions.

[6] The author's research found that the "*godobori' n'anga* is said to have the most customary appeal and therefore the most powerful wielding of *mishonga*. Further, she found some patterns suggesting-distinctions between regional, family, childbirth, environmental and magic *mishonga*.

[7] Often, a token or a delayed reimbursement is satisfactory.

[8] In recent years, development officials have begun to pay more attention to symbolic capital (Bourdieu 1977). Yet, that this capital is a convertible form that can encourage particular products, services and values or even efficiency in the absence of monetary input has not to date received adequate credit in the development of individuals, practices or societies. Symbolic capital is also most evident vis-à-vis ones position in a family.

[9] This helps build status and power for that family, clan (*dunhu*) and/or totem (*mutopa*).

[10] I write about the case of the African Potato (*Hypoxesis hemericallidae*) in my published research: *The Cultural Right to Traditional Medicinal Knowledge in Zimbabwe*" (2002) McGill University.

[11] The second *Chimurenga*, the Liberation War, was fought for Zimbabwe's independence from the British Colonial goverment.

Grassroots Women's Approach to Capacity Building

The narrative presented here is part of the doctoral research study prepared by Preeti Shroff-Mehta at the State University of New York at Buffalo during 2000–2002. Prof. Anil Gupta at Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), India,www.sristi.org, guided the field study in Gujarat and Tamilnadu states in India.

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Indigenous knowledge context of a grassroots woman innovator

Malatiben Chaudhari is a female farmer in Gujarat, India who has struggled with her life in a challenging rural environment and disenfranchised community. In the face of these constraints, she has built and improved indigenous capacity to create efficient and profitable livestock enterprises, and supported sustainable development in her community and beyond.

Through her innovations, Malatiben has successfully transformed the economic activities of an agriculturally depressed region in the Mehasana district of Gujarat. Over the years, she has successfully built a thriving farm and livestock enterprise.

Malatiben Chaudhri's narrative summary presented here highlights two aspects of indigenous knowledge:

- Understanding by local community members of specific needs and their ability to find unique and sustainable solutions to seasonal and long-term problems; and
- The ability of grassroots women to overcome constraints and build capacity within their communities and regions

Malatiben Chaudhari's narrative

I am a woman farmer and livestock keeper. I always feel the urge to do something new despite difficult circumstances. I was born in a *Prajapati* family (a marginal caste group) in a poor rural community in Gujarat, India. As a child, I observed a local teacher who used to walk to the *Harijan* (Dalit) community every evening to conduct adult education classes. After a while, I gathered the courage to ask him whether I could also attend classes. These were my early lessons in 'literacy'. We had no school or classroom materials. We all wrote with a stick in the sand. I managed to study up to the 4th standard and then had to drop out because the high school was too far away. In those days, not many girls could continue their education beyond the primary school.

My husband belongs to a Chaudhari caste family. Its social status is higher than the status of my family. After marriage the family gave us a small room in their home in the village. My husband's family did not own agricultural land and did not earn much. We tried to start a small grocery shop but failed. I was not happy and wanted a profession of my own that would make me proud

of my work. Because of my parents' background as poor *prajapati* (pot makers), my husband's family never fully accepted me and considered me not capable of thinking on my own. My Sasri and the gam (in-laws family and village community) considered me ill-equipped for land ownership or farming. I had to face humiliations every day. They told me in many ways that my knowledge was not valuable and that I did not posses *'Avadat'* (worthy skills).

I remained silent for a long time but continued to observe the village situation. Almost all families produced a monoculture cash crop Bajara (*Pennisetum glaucum,* Pearl Millet**)**. Poor land quality and continuous droughts prevented viable or profitable commercial farming. People kept livestock mainly for farm work. They concentrated on agriculture and not on livestock rearing and milk production as a source of income. Buffaloes and young calves were not given proper care. The livestock was always kept in crowded and unclean spaces. The young calves were given left-over fodder and received poor quality care. It took 6-7 years for the buffaloes and cows to produce milk. The average milk production per buffalo was 2-3 liters a day. It was clear that people in the region were wasting their money on the livestock. It was too much of a burden for the women to manage agricultural activities, children, household work and livestock husbandry.

I thought that it should be possible to grow local fodder in the poor quality soil. Why not try livestock management and earn money through selling milk? I was convinced that if we focused on livestock husbandry, the animals should produce milk within 2-3 years and we would save 4-5 extra years' expenses and efforts. The challenge was to achieve it all: no pesticides, utilization of local resources, high quality care for the livestock, manageable workload, improved overall milk production and incomes and community recognition of my knowledge. No one believed me. So it was important to demonstrate the new approach to the entire village.

Kudarati Niyam and scientific approach (*natural logic and systematic efforts)*

The way our children require nutritious food and constant care, calves also need special care. So in 1970, I decided to try out dairy livestock. I was determined to prove that I had the knowledge and the capacity to perform difficult tasks on my own. No one gives an opportunity to a woman…we have to find one and pursue it.

Initially I borrowed money and bought two calves for Rs. 40 in the local market. I looked after them day and night like my children. I thought carefully about the daily needs of the buffaloes and young calves, such as dry and green fodder requirements, health problems and home remedies, continuous water supply, clean environment, pregnancy cycle and other seasonal needs. My own family members and the village people ridiculed me to remind me that I did not have the required skills and knowledge to manage the livestock and that I was crazy to look after the livestock as my children. Yet, I was determined to work hard and learn more despite the lack of encouragement from my own family and community. I needed the milk money to support my family.

I always wanted to understand the 'science' of livestock management and at the same time rely on my *Kotha Suz* (context-specific knowledge and intuition). *Kotha Suz* is not exclusive like formal schooling and expert knowledge—even illiterate and poor women have it and use it. My mother taught me about taking care of animals. She had found homemade and quickly available remedies from the household or the nearby forest for treating livestock. I have also learned—and continue to learn—a lot by observing ecological and economic changes within my village.

I always believed that *Chila per chalava karata chilo padvo vadhare agatyano che* (it is more significant to set a trend rather than follow it). I agree that it is important to learn from external knowledge but the critical task is to understand the application of any knowledge within our specific context. It is also important to focus on innovation process and optimize it in order to facilitate a broader impact at the regional and national level.

Planning a locally successful enterprise: key principles and values

The critical aspects in livestock keeping are: knowledge of the daily care process; knowledge of available fodder material; continuous learning about innovative livestock husbandry practices. From the beginning I have focused on an integrated farming and livestock management approach.

Utilization of agricultural waste: I observed that many residues of dried Bajara (*Pennisetum glaucum*, Pearl Millet) were left behind after harvest in the fields. I tried to mix the residues with fodder grasses and created a special ration for my livestock. *This has become a highly nutritious fodder formula used by other farmers and communities in the re*gion. The mix is always prepared especially for the animals depending upon their health, weight, height, size and current condition. A special mix of several local ingredients including green and dry fodder, crop residues, government recommended nutritious feed additives and other secret homemade ingredients such as Jaggery (unrefined brown sugar)are mixed to prepare a local feed. I am strongly against the use of chemicals and artificial ingredients in

farming and livestock management. *The total milk production per buffalo/cow in my stable is 2-3 times higher than the average in the region.*

High-quality care

People in the village were shocked when my buffaloes produced a total of 17.3 liters milk per day for the first time. This was double the average of milk produced by other animals in the village. Soon the livestock management experts, agriculture scientists and government veterinarians came to see my small farm and innovative practices. Both buffalos won awards in the local livestock and regional milk quality contest. For the first time in my life, I won Rs. 25 (approximately US$0.50 at present rates) and Rs. 200 as a reward in various contests. Finally my hard work had paid off and someone had recognized my efforts. My knowledge had become valuable.

Once my livestock enterprise got stabilized and I could hire more help, I began to focus even more on the special needs of my animals rather than on increased milk production alone. The question I asked myself was "If I feel the need to drink water anytime, animals probably feel the same way". So I installed a continuous water supply system for drinking and insisted on keeping the animals and stable clean.

At present, five workers look after the stable day and night. All animals are given baths three times a day. I make sure they do not get ticks. A clean environment and not medication prevents ticks. Residual fodder from the trough is removed immediately to maintain a clean stable. The young calves, buffaloes and cows receive fresh fodder mix according to their age, size and weight. All workers ensure that fodder is not mixed up with droppings. Many other farmers do not pay attention to these details. Most male farmers own 4–6 animals and use family labor (mainly women) to manage their livestock. It is very difficult for a woman to take care of so many animals, given the household, family and farm responsibilities. It is so important to have a small number of livestock that is manageable for the women in the family.

Knowledge sharing and learning

I also believe that specialists in the field and professional institutions must test local experiments and new knowledge. I attend local and national innovation-related workshops and livestock management related events. I always interact with government and foreign veterinarians, agricultural scientists and other dairy-management experts during their visit to the area and during a village level meeting or a workshop. Women are not supposed to attend these kinds of institutional gatherings but I make it a point to participate. I am trying to convince other women in my village to do the same —but it is not easy. *It is so important for rural women to have access to institutions of knowledge and external networks.*

Regional impact

A few years ago, I heard about a specially prepared animal feed mix distributed by the AGRO Research Company and the Doodh Sagar Dairy (Regional Milk Dairy Cooperative), which was not popular in the area. The animals did not like it very much and therefore farmers did not buy it. I mixed the feed with the locally available fodder in a particular way and animals started to eat this new, very nutritious feed. *Now I feel proud because farmers in the district are using the same feed by using my methods to increase milk production*. I am happy to have set a trend. Company representatives visited my farm and thanked me for developing the local version of their product.

Many farmers in the area are now focusing on dairy keeping rather than farming. Initially, the women in the region observed my practice carefully and adopted them. The male farmers took some time to recognize the new approach. Now we grow crops for subsistence purposes only and fodder for milk production. Many farmers and communities in the region now rely on dairy keeping. *We support the second largest Milk Cooperative—Mehsana Doodh Sagar Dairy—in the region.*

Grassroots women's participation and asset ownership

Today I own two buffalos and nineteen cows (Sankar Gai—the local breed). My livestock averages 10–12 liters of milk per animal per day, which is more than double the average in the region. I am earning well and live a comfortable life. The Mehsana Dudh Sagar dairy in the village has computerized its functions and now we women can measure the fat percentage in our milk and receive the appropriate price for the milk. This way it is easier to keep track of daily production and monthly income. I have purchased land with this income, employed four full-time workers, renovated the house, installed a bore-well in my farm and sent my son to the university.

My status in the family and within the community has changed—now I command respect and moral authority. Life is never easy for women, but they have to learn to struggle despite difficult circumstances. I believe that 'Mushkeli to Sanshodhanni Janamdata Che' (Hardship is the mother of innovation).

My only fear is that the next generation expects quick results and forgets that details such as a clean stable or continuous water supply are critical components of successful livestock keeping. The younger generations have received formal education and do not respect 'rural professions' or the knowledge of the rural poor people. *It is a tragedy that acquiring formal education means the loss of Kotha Suz and Atmagyan (indigenous knowledge and wisdom).* My only hope is that organizations like SRISTI, which recognize and support our efforts, will preserve innovative and sustainable indigenous practices.

Narrative by Malatiben Chaudhry, Gujarat, India.

Documentation, translation and adaptation to the IK Notes format by Preeti Shroff-Mehta, Washington, DC, USA. (prtshroff@aol.com)

Adzina: An Indigenous System of Trial by Jury on the Ghana-Togo Border

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In a recent article in this series, the author discussed the indigenous principles that undergird the maintenance of social control among Buems of Buem-Kator on the Ghana side of the Ghana-Togo border in the Buem Traditional Area in the Jasikan District in the Volta Region of Ghana. The current article, too, is about the same Buems. In this one, the author presents the indigenous Buem jury system, known as *adzina*. But before discussing the nature and process of *adzina*, he first discusses *bate kate*, which is the Buem forum for adjudication of which *adzina* is an integral part.

Bate Kate

Bate kate can mean adjudication and can also mean arbitration. In the indigenous Buem conflict management system, *bate kate* is a means of external control which disputing parties seek from a third party. This form of control, which can be exercised by a lineage head or the town chief, becomes necessary when disputants can no longer rely on trust between them. The consequences of lack of trust are thus mitigated by the external control, which provides an alternative source of confidence that expectations will be met.

According to the Buem elders, Buems make it a point to try to avoid *bate kate* which they consider to be adversarial and time-consuming, not only to the disputants, but also to their respective kinsfolk who are customarily obliged to accompany them to hearings. Unlike *benyaogba ukpikator*—discussed in the article earlier mentioned—*bate kate* is a more elaborate process, which proceeds in stages and normally involves intensive cross-examination and assembling of witnesses and, where necessary, exhibits. In terms of monetary outlay too, *bate kate* can be expensive. This is because fines, and in some cases, costs are imposed on convicted parties.

Cases that are submitted for *bate kate* normally include cases that either have failed to be resolved through the *benyaogba ukpikator* option or are constitutionally defined to be criminal. Criminal cases include murder, treason, and disparaging statements against chiefs or public officials. Infringements of well-revered taboos of the chiefdom are also a criminal case for which settlement must be sought at *bate kate*.

Bate kate suggests a number of characteristics of both procedure and content. It can be conducted either at a lineage head's court or the town chief's

court, depending upon the gravity of the offence. In theory, *bate kate* can go through a number steps before a dispute is finally settled. In other words, one or both parties to a dispute can express dissatisfaction with a settlement and may decide to forward the matter to a higher court. Appeals from lower courts have to be sent to the most immediate higher court. For example, an appeal from a lineage head's court has to be sent to the town chief's court and an appeal from the town chief's court must be forwarded to the court of the senior chief' of the area, known as *akwamuhene*. The *akwamuhene* is the most senior divisional chief in Buem-Kator; hence the paramount chief's direct representative in the area. If settlement cannot be reached at the *akwamuhene*'s court then the case must be referred to the paramount chief's court in the traditional capital.

In practice, however, most disputes are settled at the town level, especially because of the costs (in terms of time and physical resources) that are incurred when cases are allowed to go through a number of steps before they are finally settled. There is the notion among the Buems that if a dispute can be settled at all, it must be possible for lineage heads or the town chief and his elders to settle it at the lowest possible level. Since kinsfolk of disputing parties are traditionally expected to support kin members and accompany them to all courts, they tend to prevail upon kith and kin to accept a settlement at the lowest possible court.

Deliberations at *bate kate* can be an elaborate process. In line with its usual procedure, each disputant presents his or her version of what has occurred. After both have been heard, adjudicators closely question each disputant on the basis of what he or she has said. The objective is to reach an agreement on a single story by eliminating ambiguous elements in the statements of the adversaries. There is an extensive use of evidence, witnesses, and cross-examination. Court deliberations are usually opened to the general public and everyone present has the privilege to cross-examine any of the disputants. Order at court is strictly enforced and the use of abusive language is discouraged as this can lead to contempt of court.

Adzina

For the purpose of this paper, the word *adzina* may be translated as "going into seclusion to meditate on an issue." *Adzina* provides a mini forum within which a verdict (*badunkortor*) from *bate kate* proceedings is determined. This step in the *bate kate* process is primarily meant to ensure fairness to the adversarial parties or an accused person brought before a hearing. *Adzina* is said to offer the managers of *bate kate* an opportunity to "consult with the *abrewa*". *Abrewa* literally means grandmother or an old woman who is believed to be endowed with supernatural wisdom, an unquestionable sense of fairness, and the capabilities to preside over *adzina* deliberations.

As the Buem version of trial by jury, *Adzina* works this way: to arrive at a verdict in all manner of cases that come before a lineage head or town chief, some of the court participants, who have been present throughout the court hearing and have been following the proceedings, are selected at the end of the hearing to deliberate and come out with a verdict. The jury is normally made up, among others, of the respective representatives of the presiding judge, the adjudicating council, and the disputing parties. This newly appointed jury will then leave the courtroom and go and find a place where they are both out sight and ear reach of the other court attendants. There, they will deliberate among themselves until reaching a verdict. In doing so, they are said to be consulting with the *abrewa*.

When a verdict is reached, the jury will return to the courtroom and present their findings to the judge. Through the returning jurors, the *abrewa* will send words of admonition to the guilty party and words of consolation to the innocent. The verdict is either accepted wholly and a fine is imposed on the convicted party, or it is rejected and the case forwarded to a higher court.

The presiding judge will deliver the verdict this way:

> *Abrewa onini, fula le temi libo emimi. Osu boda mi borsaka. Bokisi bobo mi nte. Osu ni bafouo. Osi mui, siwu tsuedi otilikpidi na onwa lelormi benu nkudor. Omui ni keny kenui kebo kuboryo* (Translated to mean that "according to the Old Woman's verdict, to which they, the panel members, have agreed, so and so has been found guilty. The Old Woman has sent a message of admonition to the guilty party and words of consolation to the innocent").

Once a case is settled, it is assumed that *lelorkalorbunu*, which represents the people's concept of fairness and justice, has been attained. Fines (*banyinkortu*) are thus suggested. The fines are normally in kind, involving alcoholic beverages usually palm wine—called *kubo nte*—and livestock. The size of the fine depends on the gravity of the offence, the manner in which the convicted party has conducted himself or herself in the course of the deliberation, and previous offence records. Once the fines are paid, it is assumed that the settlement has been accepted by the disputants. The drinks are used as a libation in order to propitiate the gods (*atibluku*). It is poured by the fetish priest, in the absence of whom an elder will do it.

With a calabash of drinks in hand, the fetish priest will pour the libation accompanied by statements such as:

> The almighty God up in the heavens, the earth on which we stand (*Oh! Atibluku atsa kator, kalor kemenge*), with this drink, we beseech the gods to help us to restore peace between the adversarial parties. As both parties drink from this calabash, none should nurse malicious intentions against the other. Strike down whoever will nurse malicious intention towards the other, or flout the authority of the judges, or attempt to bring calamity into the community.

It must be noted that in more grievous cases, particularly cases in which a culprit was found to have used a weapon which is more harmful than the fist in a fight and, in doing so, has spilled the blood of a fellow Buem, the party is liable to fines, which involve livestock, usually a ram (*kofonu*). This fine is imposed whether the party is found guilty of the offence or not. In such a case, the fetish priest will pour a libation and call the spirits of the ancestors of the disputants three times, mention the earth (*kalor*) three times, and implore them to "cleanse the community of the sacrilege and danger" (*ntedie musue*) that the blood-spilling may bring upon the community. After this, the ram will be slaughtered at the very spot at which the human blood was spilled. Both the drink and the flesh of the animal will be shared among all those present. With this ritual ceremony, the gods are believed to have been propitiated and the earth and the parties cleansed.

Analysis

Unlike the modern jury system, whereby jurors are selected before the start of the trial, jurors in the Buem *adzina* system are appointed after the prosecution and defense arguments are over. The benefit of this manner of selecting jurors derives from the fact since no one can tell who the jurors will be and since anyone present at the proceedings, and who are considered to be of good standing in the community can be selected, everyone at the trial is compelled to attentively follow the process. Also, because members of the Buem communities live in close contact with each other and are connected by webs of ritual, political, and economic ties, jurors cannot afford to be deliberately biased.

The invocation of supernatural forces as a means of enforcing court decision among Buems shows that the people's conflict management methods provide not only the secular means and guidance to disputants to strive for reconciliation, but that the fora are also the media through which the gods are expected to sustain the rules of social control.This should not be surprising given the fact that the Buem politico-judicial system lacks any form of legally approved use or threat of use of physical coercion, normally carried out by the police and incarceration of the guilty, as associated with the state in the modern systems.

Institutional Constraints in Promoting IK

Community Access to Social Networks and Formal Institutions

This article is written by Preeti Shroff- Mehta and is based on her Ph.D. field research study conducted in India during 2000-2001. The research study documented personal narratives of sixteen local innovators and community members experiences in reviving and transforming Indigenous knowledge practices. The study was supervised by Prof. Anil Gupta at Society for Research and Innovations for Sustainable Technologies and Institutions (SRISTI) and Mr. P. Vivekanandan at Sustainable-Agriculture and Environmental Voluntary Action (SEVA). Ms. Shroff-Mehta is affiliated with the University of Maryland and will teach Indigenous Learning and Global Action courses starting Spring 2004.

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In recent years, many international development agencies and non-government organizations have renewed their efforts to provide and promote indigenous knowledge orientation in development planning and practice. These efforts emphasize local knowledge systems and practices as valuable resources in global development. The four distinct aspects of indigenous knowledge oriented development interventions frequently debated are:

- *Documentation*: indigenous knowledge documentation, communication and adaptation;
- *Ownership*: local ownership of specific knowledge practices;
- *Reward system*: rewarding local knowledge innovations (through documentation and dissemination, cross-region recognition, global application and value addition); and
- *Access to knowledge and institutions*: linking modern and indigenous institutions for sustainable development and enhancing local community access to markets, government agencies, financial institutions, university based research centers and international development publications.

This study of local innovators in India reflects on the IK aspects outlined above, but emphasize the institutional access dimension in promoting innovative local approaches. Clearly, there are likely to be more similarities than differences between what is described here and the situation in other developing countries of the South.

Indigenous knowledge revival and adaptation: Local community goals

Ongoing efforts to revive community and region-specific agricultural, health, education and economic livelihood practices in global development efforts point to the value of local knowledge initiatives in international development. In a series of interviews with local innovators conducted during an IK research study, the sixteen community members across two states in India outlined the goals of IK practice revival:

(1) Addressing poverty and livelihood issues;
(2) Cost and labor efficiency in agriculture production;
(3) Environmental sustainability and conservation;

(4) Managing seasonal externalities such as drought, floods, labor shortages;
(5) Community self-reliance and preservation of values;
(6) Improved socio-economic status and employment gen eration;
(7) Women's representation;
(8) Community members' need to learn.

While outlining the goals of indigenous knowledge revival and adaptation, the local community members also pointed out a series of institutional constraints in adding value to local knowledge innovations.[1]

(1) Family and community constraints: Many local innovators face opposition from immediate family members and/or broader community members. In some cases, such as experimental agricultural plots on existing farm land, family members feel hesitant to invest years of hard work as well as forgo immediate income without a clear sense of the final outcome of crop innovations. Community members do not adapt innovative farming and natural agriculture practices unless the benefits of mass-scale production are well-demonstrated in the short run and the innovative product is well-established in the market. In many cases, poorer local farmers also do not have access to farm land for seed and technology cultivation and knowledge of legal certification and appropriate marketing channels.

*(2) Seasonal constraints***:** The greatest local constraint in reviving and modifying innovative local knowledge systems is seasonal factors. A group of local farmers in Tamilnadu and Gujarat states pointed out that their investments in agriculture and herbal farm experiments have often failed due to poor monsoons and consequent droughts, lack of drinking and irrigation water, loss of livestock and labor migration. Another critical dimension is understanding the historical context within which a traditional practice was viable, for example the size of land, land-people ratio, food patterns. Reviving certain traditions in contemporary times requires adaptation and modification in order to incorporate evolving context.

(3) Formal institutional constraints: The formal institutional constraints identified by community members reflect local people's lack of access to 'new social networks' such as agricultural technology and extension agencies, higher education and research institutions, financial institutions, political parties, NGOs and international organizations (as opposed to the village based and community specific traditional social networks.[2]

The table summarizes the perceptions of local community members regarding institutional constraints in promoting local innovations and their efforts to overcome specific constraints. It outlines a series of institutional constraints identified by local innovators and other community members. These include their concerns pertaining to 'negative social capital'—i.e., the cost of maintaining access to and participating within social networks, the 'exclusive' nature of certain dominant urban and rural networks and the burden of conforming to social networks (over-embeddedness, parochialism and rigidity).

1 The local innovators identified a range of institutional constraints that reflect their limited access or the lack of access to established formal and informal institutions and associated social networks. Institutions represent organizational structures, ideologies, adherence to particular development approaches, internal and external networks and explicit as well as tacit value set and beliefs. Also, institutions follow established rules and regulations and adopt certain mechanisms to ensure the enforcement of rules.

"Institution builders can be diverse—such as policy makers, business people, or community members. Corporate, collateral, and bankruptcy laws are public institutions, as are the judiciary, tax collection agencies, and regulatory agencies. Banks, reciprocity between community members, and land inheritance norms are private institutions. Many private institutions exist under the aegis of public institutions. Private banks, for example, operate within the framework of public law. Social norms exist within (or without) formal laws." (*World Development Report 2000*, Box 1.2, p.6)

2 The notion of social capital refers to the actual and potential resources individuals obtain from knowing others, being part of a social network with them, or merely from being known to them and having a good reputation. The two distinct aspects of social capital are: an individual's ability to access resources given his positioning within a specific social network, and a communities' access to multiple social networks. "Both Bourdieu and Coleman emphasize the intangible character of social capital relative to other forms. Whereas economic capital is in people's bank accounts and human capital is inside their heads, social capital inheres in the structure of their relationships. To possess social capital, a person must be related to others, and it is those others, not himself, who are the actual source of his or her advantage. [……] the motivation of others to make resources available on concessionary terms is not uniform. At the broadest level, one may distinguish between consummatory versus instrumental motivations to do so."

Institutional Constraints in Adapting Local Knowledge Innovations

Innovation [Maturation Stage]*	Institutional/Sector Constraints	Innovator Strategy	Outcome
Livestock Management Process **[Advanced]**	• development planners and local communities' lack of faith in 'rural women's knowledge' • the female innovator's lack of access to rural and urban institutional and social networks	• establishment and demonstration of the innovative practice to the village community and outside institutions • educating the outside 'experts' and various development agencies	*regional livelihoods transformation * the innovator's active participation in the emerging grassroots knowledge network
Energy Free/green Agricultural Technology , machinery **[Advanced]**	• lack of commercial investments in locally developed machinery • limited marketing and dissemination	• collaborative product development and marketing efforts with SRISTI	• regional and national demand for the products and growing sales
High-Yielding Organic Crop **[New]**	• poor agricultural drought management mechanisms – lack of water • government encouragement of commercial farming inputs and methods	• development of a range of innovative organic crops, seasonal innovations	* rapid local dissemination of high-yielding and high returns organic seed varieties
New Organic Crop Varieties **[Advanced]**	• lack of agricultural and scientific community interest and support • politics of government managed 'seed' quality verification process • lack of government sponsored and alternate employment during the drought seasons •	• collaboration with an NGO network	• recognition of new varieties • collaborative efforts to set up an experimental seed development farm and private seed testing agency
	• lack of laboratory facility to standardize livestock herbal medication, need to experiment with diverse local medicines and dosage combinations • Allopathy medicine doctors' lack of faith in local herbal treatment	• Collaboration with Society for Research and Innovations for Sustainable Technology and Institutions (SRISTI) herbal medicine research laboratory	• plan to distribute standardized herbal medication packages
Herbal healer **[New]**	• Lack of certain processed organic/herbal dry raw materials(reliance on a commercial supplier)	* herbal treatment focus on young dalit (scheduled caste) women's seasonal health problems	* the female innovator's lead role in organizing poor dalit women's savings
Organic (Farm, Bio-Gas, Livestock) Management **[Advanced]**	• long duration required to make a transition from commercial to organic agricultural practices • financial loses incurred due to the past reliance on 'hybrid' goat varieties and commercial farming methods	• family involvement in the organic farm, livestock management and bio-gas enterprise • participation in local social networks (farmer's association) • networking with the district collector's office, organic farming organizations and national agricultural research institutions	• dissemination of organic farming methods • the local farmer's association to support organic farming methods and self financing mechanisms for area farmers
Technology for De-husking Coconuts **[New]**	• the growing urban demand for coconuts and limited seasonal labor available in the village • timely management of coconut supply to the urban company • lack of financial investment to develop the commercial products	• development of a single product to maintain consistent coconut supply and to overcome labor shortages	* regular and consistent coconut product supply to urban companies
New Drought-resistant Paddy Crop Variety **[Advanced]**	• lack of support from the government and ongoing conflict with 'expert agricultural scientists' • competition with new modern varieties introduced by agricultural scientists • legal actions taken by government to challenge the dissemination of the 'indigenous' variety in the market	• collaboration with the local NGOs to fight the legal case • local demonstrations of the drought resistance, better quality and better tasting Paddy variety	• rapid and successful dissemination of the 'indigenous' and innovative paddy seeds and cultivation technique in the district
Organic Toy Die Making **[New]**	• lack of returns in agriculture, need to diversify • lack of certain organic raw material (lacquer) in the state • lack of access to government development agencies	• development of the prototype line of organic toys (the use of organic die) • collaboration with the local NGO and the marketing unit of SRISTI(GYAN)	* ongoing research to ensure the supply of 'lacquer' from another state to develop the organic toy die
Farm Weed Cutter (New)	• lack of finance to develop the product prototype • competition in the market – a similar product introduced in the national market by a multinational corporation	• desperate search for an investor and ongoing collaboration with the local NGO based in Madurai city – Sustainable-Agriculture and Environmental Voluntary Action (SEVA)	• the innovator is now a member of the local innovators' network in Tamilnadu State • partnership with local investors
Organic approach to livestock rearing	• the hybrid livestock variety could not survive the tough mountain region conditions • the government managed forests, local herders are struggling to find the fodder for the indigenous variety of the livestock	• reliance on the indigenous livestock breed • conflict with the forest authority	• NGO intervention and mediation in the conflict between the government agencies and

* The financial aspects of local innovations were shared with the Researcher, the local innovators, however, requested that this information be kept confidential for personal and community specific reasons.