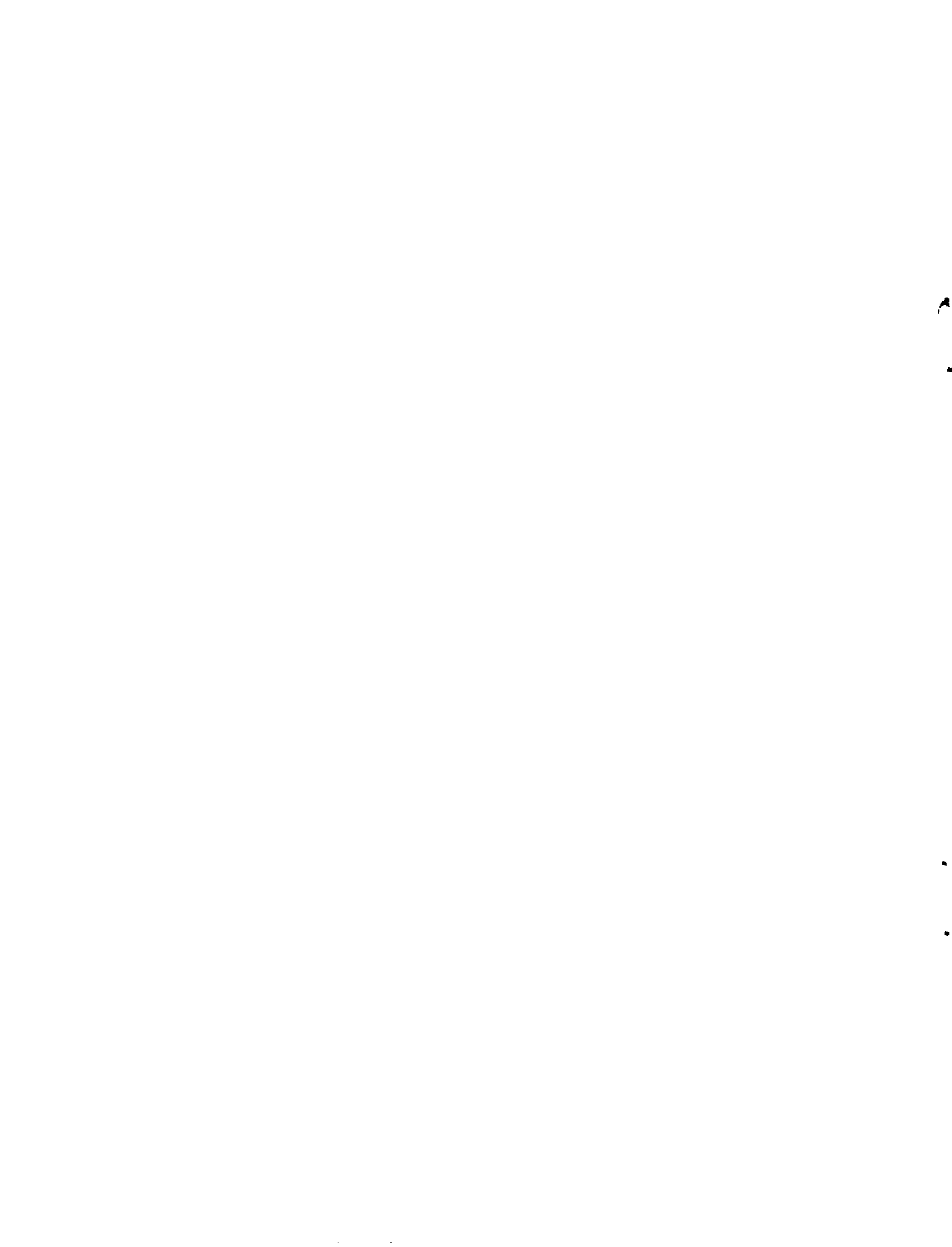


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Working Group on Institutional and Management Options





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Working Group on Institutional and Management Options

report of the first seminar

held from May 31 to June 2, 1994

in Louveciennes, France

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1. SUMMARY

During its 1993 meeting, the Water Supply and Sanitation Collaborative Council called for a working group on Institutional and Management Options in improving water supply and sanitation system efficiencies.

At its first meeting in Louveciennes, France, 14 participants from developing countries, 15 from external support agencies and 9 from water companies, extensively discussed public-private partnerships (as exemplified by the French and English experiences).

It was concluded that the adoption and acceptance of an appropriate water policy and regulatory framework (constituting an 'enabling environment') is fundamental to involving the private sector in water supply and sanitation services.

Different policies and regulatory conditions and a variety of alternative institutional and managerial options were presented by 18 case studies from developing countries.

It was noted that public water authorities are not necessarily inefficient and that the private sector is not always interested have the appetite nor has the capacity to engage itself in the provision of basic services. In a number of cases, community-based arrangements are appropriate under the circumstances prevailing.

The working group will consider these and other case studies, by focusing on key elements of the enabling environment, the institutional arrangements and the human resources and managerial situation. Specific attention will be paid to water demand management as well. It will present case studies and lessons learned to the next meeting of the Collaborative Council (planned in the fall of 1995), as well as recommendations on networking among sector professionals.

2. PROCEEDINGS, CONCLUSIONS AND ARRANGEMENTS

2.1 Introduction

This working group focuses on institutional and management options for expanding water supply and sanitation services and making them more efficient by drawing lessons from different case studies and considering possibilities to intensify communication among sector professionals. Enough is known on what to do. The challenge is now how to do it.

As to institutional development, the government should promote rather than provide services. Various forms of decentralization are to be considered. However, the government will remain responsible for creating an enabling environment, including water policies, legal and regulatory frameworks, quality control, standards, stimulation of research, and mobilization of resources.

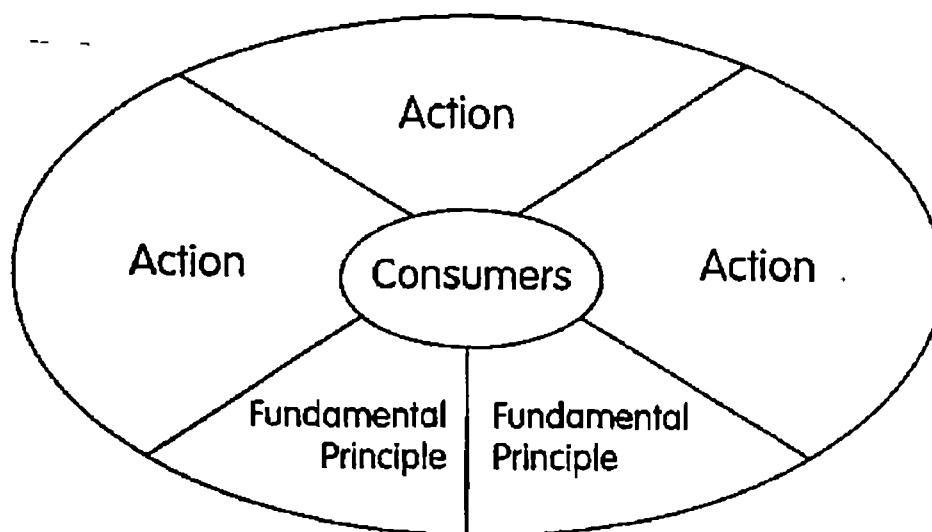
Human resources development is much more than increasing the competence of staff. It involves improvement of employment practices and career structures, and professional and financial incentives.

The 1991 symposium 'A Strategy for Water Sector Capacity Building' in Delft, The Netherlands, articulated capacity building as:

- the creation of an enabling environment with appropriate policy and legal frameworks
- institutional development, including stakeholder participation
- human resources development and the strengthening of managerial systems

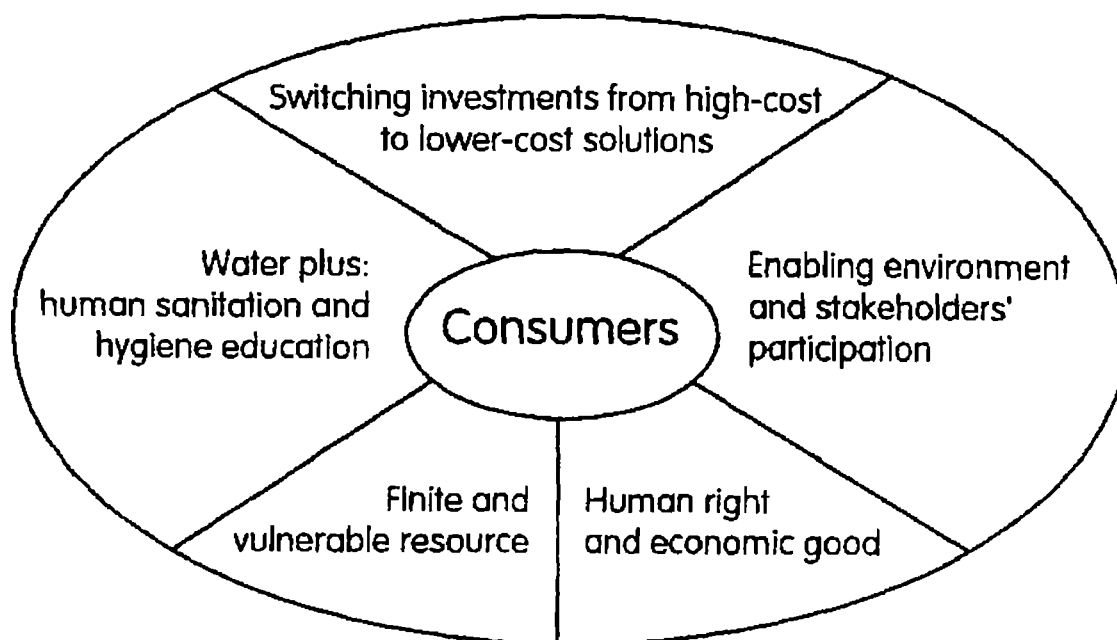
Figure 1 shows the all-importance of the consumers of water supply and sanitation services.

Water and environmental sanitation



Accordingly, the two fundamental principles and the 3 actions are presented in figure 2 below.

Water: protection of health and the environment, poverty alleviation and sustainable development



Five Key Messages

by Mr. Frank Hartvelt, working group coordinator

2.2 Seminar Objectives and Process

In September 1993 the Board of the World Bank approved the water resources management policy paper and requested Bank staff to come up with strategies for implementation. The Rabat meeting of the Collaborative Council decided to create a working group on Institutional and Management Options in expanding more efficient water supply and sanitation services (specific reference was made to demand management options).

In February 1994, UNDP, World Bank and the French Syndicat Professionnel des Distributeurs d'Eau agreed to organise a seminar which would especially feature the French and English models of delegated, respectively privatised water resources management and water supply. Participants from developing countries would present their experiences. Another objective would be the discussion of a network of through sector professionals could propose water management models and share experiences.

The seminar was held at the training center of the Banque National de Paris in Louveciennes. The help of Mr. Pebereau, Chairman of the board of BNP in arranging the splendid facilities was gratefully acknowledged.

The seminar opened with a tour of Louis XIV's water supply service to Versailles and of the Louveciennes treatment plant. The first plenary session was opened by the UNDP, World Bank, WHO and the Collaborative Council. This was followed by a short facilitated discussion of expectations for the meeting. Mr. Coulomb, Président du Syndicat Professionnel des Distributeurs d'Eau and host, then officially opened the seminar.

Presentations on the French and English models of water management followed lunch. A panel discussion contrasted the differences and similarities of the models. Participants then broke into four small groups to discuss the case studies which had been prepared for the seminar. Each group discussed 4 or 5 of the eighteen prepared cases. In the day's final plenary participants discussed, in small groups, the lessons learned from the cases and developed a list of lessons.

Participants remained in two facilitated plenary sessions during day two. In the opening plenary, they discussed cases to be studied during the next year. This caused a debate over the purpose of and expectations for the seminar. Some participants felt that more discussion was needed on the French experience. During the session, the French water companies and River Basin Authorities were asked if they would like to contribute more to the discussion. Also, those from the developing countries who had experience with the French companies were also asked to share some of their experiences. Participants agreed to the French proposal to produce a reader of 15 case studies. Several participants noted that the 18 cases prepared for the meeting needed a common theme to be useful. Participants agreed to revise, in light of the discussion and guidance discussed, the 18 cases.

The final plenary focused on future communications and networks. There was considerable agreement on the need for better information exchange and for matching capabilities and skills. The general sense was to look to building on existing networks and to other cases, such as AWRA, as models. Several participants felt that networks should start at the National then move to the Regional and International.

After lunch a voluntary small group discussion was held to clarify next steps. The group affirmed the French case study reader and that the draft will be ready by Spring 1995. The seminar organizers agreed to provide some suggestions for revisions to those who prepared cases. As next steps for building a network, the organizers agreed to look at an inventory of associations, other cases such as AWRA and possibly do a few case studies of successful networks. The next meeting was set for mid-March 1995.

by Mr. Jerry Delli Priscoli, facilitator

2.3 Focus of the Working Group

Realizing that governments and external support agencies will fall short in financing the necessary expansion of water supply and sanitation services, it was argued that the focus should be on appropriate ways to involve the private sector. The French and English experiences would serve as useful examples, the dissemination of which would be facilitated by a network among sector professionals.

Others did not regard public-private partnerships as an objective in itself. Also, the mandate given by the Rabat meeting of the Collaborative Council presents involvement of the private sector as merely one of a whole spectrum of institutional and management options to be considered in striving towards more efficient water supply and sanitation services. Large utilities as well as community-based services have useful lessons to share. The mandate also called for special attention to water demand management, an issue that may justify a dedicated subgroup.

Besides investigating which institutional and management options worked, which did not and why, working group members suggested to include in its deliberations strategies for reaching out to policy makers and water user groups. It was also suggested to link up with other Collaborative Council working groups, notably those on Operation and Maintenance and Gender Issues.

2.4 Highlights of the Discussions

The presentations and case studies have been included in Section 5.

Although alternative institutional arrangements were presented, most discussions (in plenary as well as in working group sessions) tended to concentrate on the appropriateness of private sector involvement.

2.4.1 On Public-Private Partnerships

There is a continuum of various public-private partnerships, which differ in the degree of financial and managerial involvement of the private sector as well as in the length of period for which the rights are conferred. Total privatization then is but one form of delegated management (it implies the transfer of ownership of installations and equipment) and, in relation to the basic need of drinking water, may not be the most feasible for politicians. (Confusingly, the term 'privatization' is often, though incorrectly, employed in connection with other types of delegated management where ownership remains with the government.) There obviously are no blueprints and no model partnerships that can be adopted. A well-defined legal environment, however, is imperative in any case.

Turning a service aimed at continuity into a company aimed at efficiency may have serious managerial implications: managers and staff need to be re-trained, re-employed (encouraged to 'go private'), paid to quit or laid off. French water supply and sanitation services have been through this process. Privatization in England, on the other hand, did not bring about dramatic organizational changes.

Social implications of the price increases that come with profit-oriented services are another

issue. In England, there is no data yet on failures to pay or disconnections. Water is not metered but paid for in advance. There are no special provisions for people having difficulty paying their water bills. In general, while the government may decide to subsidize water and sanitation for the poor, it seems advisable not to allow welfare considerations to interfere with the commercial management of services.

The public-private partnership in England (and Wales) did not evolve the way it did in France. Corporations were rather hastily privatized, without much public involvement. In France, on the other hand, consumers and politics have been engaged in the process of establishing a public-private partnership throughout. The local system of checks and balances between the mayor, the company and the consumers-alias-voters seems to be working better than the centralized but fragmented regulation in England (where the independence of regulators is a concern). In developing countries, however, water and sanitation may have become too politicized.

The government of France reverted to its principal role and created a truly enabling environment: adequate legal frameworks, autonomous river basin organizations with the democratic mechanisms between all players at that level, a broad consensus among politicians on the nature of the public-private partnership, and a large degree of trust between the concession partners.

Governments gain from involving the private sector because they can avoid or reduce future expenditures in water supply and sanitation. England grossly underpriced its assets, generously waived all debts and discovered that the sale by itself did not yield big profits. The other argument relates to the quality of the service, which is reckoned to improve in a public-private partnership. Financing of pollution control programs from revenues generated by the private sector may be another consideration.

Do the French and English experiences actually apply to many developing countries with lots of poor people and few connections? Companies do not have the incentive to connect the poor and are not likely to take the risk of investing in water supply and sanitation. Here the principal role of governments surfaces: creation of an enabling environment of appropriate policies and adequate legal and regulatory frameworks. It is suggested that external support agencies could assist in sharing the risks involved.

In addition, many developing countries find that the private sector itself is not yet prepared to engage in water supply and sanitation. It does not have the capacity yet to run these services on a commercial basis.

2.4.2 On Decentralization in General

Decentralization and other institutional reforms should be gradually implemented, allowing for pragmatic adjustments to changing conditions and true participation by all stakeholders.

The concept of river basin management and the establishment of river basin organizations is probably fundamental to the decentralization of water supply and sanitation services.

Successful community participation requires that long-term problems as well as short-term needs be addressed. It also requires careful balancing of the means allocated to the

improvement of water supply and sanitation services and the absorptive managerial capacity.

Where central governments are ineffective and water policies non-existent, water supply and sanitation may be decentralized to quasi-autonomous local communities, clans or tribes.

2.4.3 On Other Institutional and Management Issues

In the 'competition by information', data are fundamental to any performance evaluation, to efficient management and to effective advocacy.

Reaching out to policy makers, the sector should try to come up with solutions, not problems.

2.4.4 On Networks

There is no doubt about the desirability of networks: decentralization will bring along more partners in water supply and sanitation and hence a greater need to exchange ideas, facilitate joint action, etc. Networks can certainly become vehicles for the propagation of successful institutional and managerial arrangements.

It is important to start from what already exists. Since networking could best be conducted through professional associations, their establishment and strengthening, first at the national level, would be the way to go. Only then regional and global networks can be formed (the UADE is a case in point). The suggestion is made that examples of successful networks will be collected and presented to national professional associations. Strengthening these associations may also include electronic communications, which have an enormous potential to facilitate and intensify the exchange of information.

Water sector professionals could be encouraged to participate in cross-sector associations and networks, while the networks dedicated to 'water' should reach out to the political level.

2.5 Agreements

A book is being prepared by Mr. Lorrain et al. that will include some 15 in-depth case studies on public-private partnerships in water and sanitation, in France and abroad. Participants expressed their interest in the approach he advocated. The book will be published under the auspices of the Collaborative Council as one of the products of the IMO working group.

Mr. Lorrain will circulate a first draft of the book among working group members by October 1994. It will be presented at the 'water seminar' of the World Bank at the end of this year. Next meeting of the Working Group (early spring 1995) will be asked to adopt the book, which will be published (in French) shortly thereafter. The World Bank has offered its help in translating and publishing of a version in English. A Spanish version shall be ready before the end of 1995 too.

While the book of Mr. Lorrain will focus on private sector involvement, additional case studies may discuss other options to increase the efficiency of water supply and sanitation services. In order to arrive at a coherent and helpful document, their focus would have to be narrowed to a few selected key themes. The respective authors will be asked to re-organize and supplement their case studies (if possible).

There is a wealth of relevant case studies available: on peri-urban issues from Solidarité Eau (presented at the conference in Sophia Antipolis) and on operation and maintenance from the O&M working group. The significant progress in coverage and efficiency made in Chile, Malaysia and Brazil (Curitiba) justifies closer investigation: are there any common elements of success? WHD

Messrs. Bays and Klop will make an inventory of national professional associations already existing in the water supply and sanitation sector. UNDP is assigned a lead role in this.

It seems appropriate to let the next meeting of the working group coincide with the publication of Mr. Lorrain's book, ie. March 1995. At its second meeting, the working group will decide what it is going to present to the Council in November next year.

3. FOLLOW-UP

- In view of the pivotal importance of the discussion on institutional and management options, all coordinators of other working groups of the Water Supply and Sanitation Collaborative Council have been put on the mailing list.
- UNICEF, the UNDP/World Bank Water Supply and Sanitation Programme, the UNDP/UNHCS/World Bank Urban Management Programme and UNDDSMS have been approached for case studies, while other sources are being considered.
- O&M working group members will be asked to look at their case studies from the IMO perspective.
- Some of the case studies that were presented in Louveciennes have been modified.
- Water demand management and water conservation issues will be pursued by the coordinator in fall 1994.
- Another effort will be made to promote the establishment and strengthening of national professional organizations in ongoing or future water programs.

4. PRESENTATIONS AND CASE STUDIES

4.1 Sur la Dimension Internationale des Services Urbains

by Mr. Dominique Lorrain, CNRS Fondation des Villes

De la Comparaison des Contrats

Ce que l'on désigne du terme général de privatisation recouvre en fait des situations très différentes. Ces différences tiennent moins à l'origine nationale des contrats - contrats français, anglais, ou américain, qu'à la solution apportée au problème du partage des responsabilités entre la puissance publique et l'entreprise privée.

Deux critères jouent un rôle essentiel et permettent de classer les formes de contrat sur un axe qui part du tout public pour s'achever au tout privé. Le premier tient à l'importance de l'engagement financier de l'exploitant. Le second concerne la durée des droits qui sont accordés à l'entreprise par la puissance publique. Cette combinaison permet alors de distinguer trois grandes situations contractuelles.

- *La délégation limitée* recouvre dans les pays anglo-saxons les contrats operating and maintenance, le delegated management, le contracting-out et en France le marché d'exploitation, la régie intéressée ou la gérance. La puissance publique accorde des droits à court terme à l'entreprise -de 18 mois à 3 ans- qui travaille selon un cahier des charges précis; elle ne mobilise pas d'actifs importants, ne prend pas de risques.
- A la *délégation partielle*, correspond les formules de l'affermage et de la concession en France, du lease et du BOT au Royaume-Uni et aux Etats-unis. La puissance publique délègue des éléments plus conséquents du service public. L'entreprise travaille sur des durées entre 7 et 25 ans. Elle investit, prend des risques, a une liberté d'action. Mais la puissance publique reste propriétaire du patrimoine qui lui revient de droit en fin de contrat. L'entreprise exploite *pour le compte de*. Le contrat dont elle dispose ne lui accorde que des droits temporaires.
- A la *délégation totale* correspond la privatisation par vente des actifs comme cela a pu se faire en Grande-Bretagne pour la distribution d'eau ou d'électricité. Dans ce cas, la puissance publique transfère la propriété du patrimoine à une entreprise privée et celle-ci acquiert des droits quasi-perpétuels.

Les formes graduelles de recours à l'entreprise privée

privé			Privatisation BOT, BOOM Concession
		Lease Affermage	
		Contracting-out Régie intéressée Gérance	
	Marche d'exploitation Delegated management Operating & maintenance		
<u>public</u>			
droits accordés	Droits à court terme	Droits à moyen & long terme	Droits perpétuels
	Délégation limitée Type 1	Délégation partielle Type 2	Délégation totale Type 3

Cette distinction permet de clarifier quelques éléments de comparaison internationale:

- a) Les différences entre un droit anglo-saxon et un droit français ne sont pas fondamentales même si des modalités d'application les distinguent. A chaque situation contractuelle correspond dans un cas comme dans l'autre des contrats appropriés. Chaque pays a produit un continuum de solutions juridiques. Les véritables différences se situent plutôt entre les trois grandes familles et dans l'usage qui en est fait. Pour ce qui concerne l'exploitation des services d'eau les pratiques américains relèvent de la famille 1 -O&M, delegated management-, les pratiques françaises sont clairement du type 2 -concession et affermage- et la voie anglaise relève de la configuration 3 -privatisation totale.
- b) Les gouvernants qui veulent faire appel au savoir-faire privé peuvent faire des choix graduels et ne se trouvent pas devant l'alternative brutale de la gestion publique ou de la privatisation totale. Ils peuvent faire l'apprentissage du partenariat par des contrats de délégation limitée.
- c) Cette présentation a des conséquences importantes quant aux formes de régulation. L'implication de la puissance publique est très différente d'un type à l'autre. Dans le cas de délégation limitée elle conserve en définitive une large maîtrise des opérations puisqu'elle reste propriétaire des actifs, qu'elle encaisse directement les recettes du service public et qu'elle signe des contrats à court terme. Les formes de contrôle qui devraient en découler devraient donc être légères et largement inscrites dans le contrat. Inversement, la privatisation totale qui s'apparente à un transfert de nombreux attributs de la puissance publique appelle une régulation précise car l'entreprise reçoit des droits perpétuels. Les formules de type concession, affermage, BOT qui se situent entre ces deux types, devraient donc être traitées par d'autres modalités de régulation.

On comprend alors que le mélange d'une régulation importée d'une formule de délégation totale avec un contrat de délégation partielle conduit à une altération des règles du jeu. Avant de choisir des modalités de régulation il faut pouvoir établir dans quel type de contrat on se trouve. Une délégation "totale" a pour symétrique une régulation "dure" car la puissance publique se place dans un schéma dans lequel elle abandonne beaucoup.

- d) Le positionnement dans une famille ou une autre a des conséquences sur ce qui peut être attendu de l'entreprise privée. Son comportement sera forcément différent selon l'horizon temporel dans lequel elle travaille. Avec des contrats à long terme, l'entreprise a intérêt et la possibilité de faire des investissements de production qui diminuent ses coûts d'exploitation. Les contrats de concession ou d'affermage incitent plutôt les entreprises à automatiser (capteurs, automates), tandis que les contrats de type O&M les conduisent plutôt à adopter des solutions plus classiques. Autrement dit, dans un partenariat la mobilisation d'un acteur dépend aussi de la liberté d'action qui lui est laissée et du temps dont il dispose.
- e) Ce positionnement a des conséquences quant aux formes de partenariat entre les entreprises. On peut établir un parallèle entre cette relation à la puissance publique et l'association avec une autre entreprise. Au type 1 devrait correspondre des partenariats souples, multiples permettant des apprentissages, tandis que le type 2 devrait entraîner des formes plus stables de coopération.

De la Transférabilité des Modèles

L'examen de ce qui se passe dans les nouveaux pays industriels ou l'observation des solutions mises au point dans les pays développés, fait ressortir qu'il ne suffit pas de transférer des contrats pour que "ça marche". Les relations contractuelles entre l'entreprise et la puissance publique doivent s'apprécier dans un environnement réglementaire global, trop souvent méconnu. L'action collective n'est possible qu'à la condition de s'appuyer sur des règles d'action stabilisées. Si ces règles restent mal définies, ou si elles changent trop souvent, alors il ne peut y avoir action. Pour privatiser il ne suffit pas d'organiser un appel d'offre international et de vendre des morceaux d'entreprise publique. Il faut aussi organiser les conditions socio-politiques, préalables à l'action. Par exemple:

- De quelle légitimité disposent les élus locaux?
- A-t-on une définition précise du domaine public (ce qui permet tout de même d'engager des travaux sur des parcelles dont la propriété ne peut être contestée).
- Quelles sont les règles locales qui touchent aux questions financières. Modalités de règlement des conflits d'intérêts, techniques bancaires.

Quelques problèmes de transférabilité:

1. Le choix de l'entreprise. La tradition française est celle de *l'intuitus personae*. Elle se fonde sur quelques principes i) libre choix des élus, ii) durée de la relation contractuelle, iii) absence d'un grand nombre d'entreprises pour un tel type de contrat. Actuellement, les techniques utilisées dans divers nouveaux pays industriels -appel à concurrence, présélection tendent plutôt à organiser le choix comme s'il s'agissait d'un marché public ou d'un *public procurement*. Ce qui pose plusieurs problèmes:

- On ne choisit pas un partenaire de la même manière selon qu'il s'agit de l'achat d'un équipement ou d'une relation de service établie sur quinze ans.
- Si la puissance publique fait appel à l'entreprise c'est qu'elle lui reconnaît des compétences. Or le système du *public procurement* encadre l'entreprise dans une définition du problème et dans des esquisses de solutions. Ce faisant, la collectivité publique se prive d'autres solutions que l'entreprise pourrait proposer.

Par conséquent, dans les contrats de type BOT, concession, une liberté de solution doit être laissée à l'entreprise dès le stade de la première réponse. Dans les nouveaux pays industriels il faut mettre au point des procédures de choix qui se situent entre *l'intuitus personae*, si celui-ci n'est pas totalement applicable-, et le *public procurement*.

2. La gestion du contrat. Dans un type de contrat à court terme il semble logique et possible de mentionner dans le contrat lui-même, la grande majorité des problèmes envisageables. Sur des durées plus longues le pouvoir de prédiction des contractants s'affaiblit. Dans ce cas, si le contrat ne peut tout prévoir sa rédaction détaillée devient moins impérative, tandis qu'il devient important de prévoir des mécanismes qui permettent de le faire vivre. A nouveau, le facteur temps représente une variable essentielle. On se trouve ici dans un cas de figure assez bien illustré par *les figures de l'obus et du missile* en balistique. Dans le premier cas la trajectoire doit être soigneusement calculée; dans le second cas le vecteur comprend de l'intelligence embarquée et les acteurs peuvent agir en temps réel.
3. Qui régule? Le modèle français de service urbain ne comprend pas de régulateur formel de type Ofwat ou PUC et pourtant il est régulé. Nous en avons exposé les trois grands mécanismes en un autre texte*: régulation par le marché, régulation politique, régulation par la réputation. Le point important qui touche aux recommandations d'architectures institutionnelles tient à la place du politique. Si l'autorité responsable du service public est par ailleurs élue par les usagers du service public, alors les usagers/électeurs exercent un contrôle sur le politique/autorité organisatrice qui exerce un contrôle sur l'opérateur. Le système a une tendance naturelle à s'autoréguler à partir de l'appréciation que les usagers/électeurs font de la qualité du service. L'efficacité du dispositif -légèreté, absence de dérive technocratique- rejoint les objectifs de démocratie locale. Pour que cela soit possible il faut que plusieurs conditions soient réunies: i) que les élus locaux aient une forte légitimité, ii) que le périmètre d'organisation du service public corresponde à celui de la vie politique locale; si un service est organisé dans un cadre national ou régional il a peu de chance d'impliquer fortement le maire.

* D. Lorrain, Les services urbains, le marché et le politique, in L'expérience Française du financement privé des équipements publics. Paris. Economica, 1993. Sur ce point voir p29-33.

4.2 The English Experience of Water Privatisation

by Mr. David Ehrhardt, London Economics

1. Introduction

Privatising the water industry in England and Wales was an unprecedented step. Its successes and its failures offer important lessons for other countries. This paper outlines:

- the structure and history of the industry
- the reasons for privatisation
- the regulatory system which governs the industry.

It sums up the results of the privatisation, and the messages for other countries from the English experience.

2. Structure and History

When people talk about the privatised water industry most have in mind the 10 big Water and Sewerage Companies (WASCs). These are shown in Figure 1.

Thames, Severn Trent, North West and Anglian Water are the largest of the ten. Thames's turnover is around £1 billion, for example. South West, Wessex and Northumbrian Water are much smaller.

The WASCs differ in the strategies they have pursued since privatisation, and in the problems they face. Southwest Water, for example, has had the steepest price increases in the country, driven by its need to finance new sewerage treatment facilities for the many scattered coastal communities it serves. Southern Water faces water scarcity. The population it serves has grown, while rainfall in its area is (by English standards) relatively low. At the other end of the country, Northumbrian has no shortage of water; rainfall is high, and population has decreased.

The similarities between the WASCs are more important than the differences, however. All the WASCs were previously publicly owned Water Authorities. Each covers one or more major river basins. Two of the largest are named after rivers.

The Water Authorities were set up in 1974, inspired by the French model of River Basin Management. Beside responsibility for catchment management and environmental protection, the Authorities owned and operated the water and sewerage systems. When set up, they integrated the patchwork of private and municipal companies which had provided water services previously.

The Authorities were privatised in 1989. Their environmental protection and regulation function were split out into a separate government owned agency, the National Rivers Authority (NRA). The rest of the Authorities, covering asset ownership and operation, were turned into private companies and floated on the stock exchange.

Even before the 1989 privatisation, England already had a long tradition of privately owned water companies. Many private water companies had been set up in the 19th Century to

serve the needs of growing towns. There are still 21 water companies which have always been privately owned. These are shown in Figure 2.

The 21 companies are responsible for water supply in their area. Sewerage services in the areas they serve are provided by the local WASC. The Water Only Companies (WOCs) are on average much smaller than the WASCs, as the turnover information in Figure 2 shows. However there is something of a continuum between the two groups. The largest WOCs, such as Three Valleys and Essex Water are not much smaller than the water supply business of the smallest WASCs.

Even though they were already private, the 1989 reforms did affect the WOCs. Many were bought by French utilities. Lyonnaise des Eaux for example owns Essex, Suffolk and North East Water companies. A significant number however remain independent, including Bristol, Mid Kent and Portsmouth. The other major change following the privatisation of the Water Authorities was that the WOCs were brought under the same system of price cap regulation as applies to the larger companies. Previously the WOCs had been subject to 'dividend control', a kind of rate of return regulation.

Figure 1

Privatised Companies The Big 10....

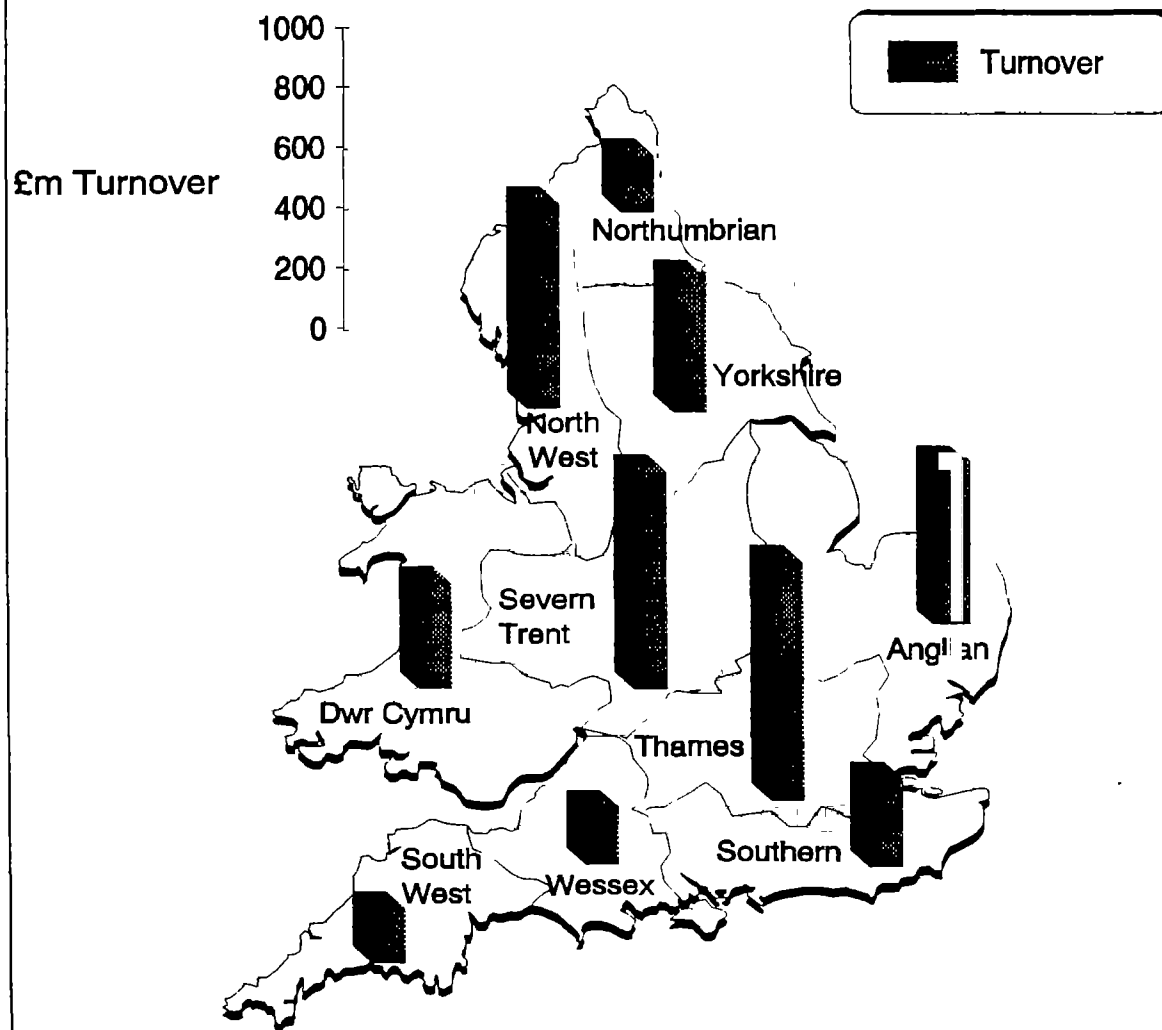
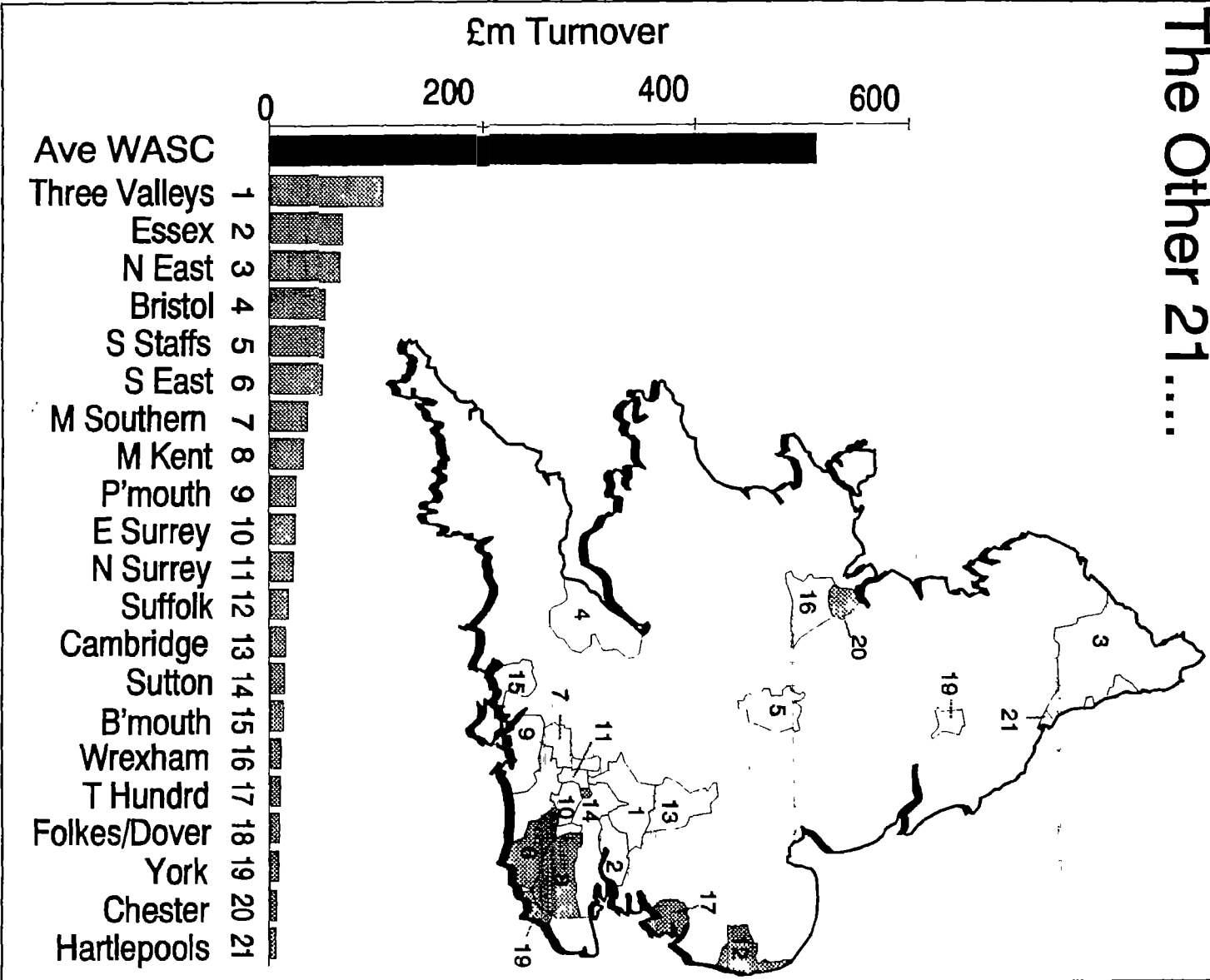


Figure 2

Privatised Companies

The Other 21



3. Reasons for Privatisation

There were two main reasons why the Conservative Government decided to privatise the water industry:

- the desire to mobilise private capital for investment
- the belief that private ownership would boost efficiency and service standards.

In 1989 the water industry faced a massive investment bill. Higher environmental standards, largely embodied in EC regulation, meant that the industry would have to greatly improve the standards of sewage treatment and sludge disposal. Higher drinking water standards required investment in new treatment works capable, for example, of removing a greater proportion of nitrates and pesticides. While in public ownership, renewal and maintenance of the assets had been somewhat neglected, so by 1989 there was a backlog of investment needed just to keep the networks in good condition.

At the same time the Government was grappling with the budget deficit. It knew that to fund all the water industry's investment from public money would push the deficit well above target. Privatising the industry offered a way to bring in private sector money to pay for the investments, helping the government to keep its own expenditure down.

The other reason for privatisation was the belief that the private sector would provide a better and more efficient service. The Government had already privatised other state owned enterprises, such as British Airways and British Telecom, with success. With water, however, it faced a much bigger challenge. Since water companies do not face competition, the pressures on them to improve service and cut costs are lower than on an airline. Some commentators have argued that the Government's belief that the private sector would be better and cheaper than the public was as much a matter of ideology as of analysis.

4. Regulation

4.1 Why Regulate?

Private companies want to earn good profits. They can do this by becoming more efficient - producing the same product at lower cost. The ever-present incentive to cut costs is a key advantage of privatisation. However, a water company could also increase profits by raising prices, or by lowering quality. In most industries a company that does this will lose business to its competitors. But people have no choice over who they get their water from - it would be ridiculously expensive to have two sets of pipes running down every street.

Therefore the Government has to regulate. The main aims of regulation are to ensure that:

- prices do not rise to socially unacceptable levels (while still allowing companies reasonable profits)
- water supply and service quality remain sufficient
- the environment is adequately protected.

4.2 Regulatory Structure

Figure 3 outlines the structure of regulation in the UK. The figures in light grey at the bottom show the basic operation of a water company. The company abstracts water from the environment, treats it, and delivers it to its customers. It collects the sewage its customers produce, treats it, and discharges it to the environment.

The darker figures are the regulatory structure. At the top, the Europe Union (EC) and the UK Parliament provide the overall legal and regulatory framework. The Department of Environment (DoE) is the main Government body with oversight of the area. Actual regulation is largely carried out by other agencies.

The National Rivers Authority (NRA) is the main agency in charge of environmental protection. It is organised regionally on river basin lines which match the areas covered by the WASCs. It controls how water companies abstract water from the environment, and what they discharge to it. Her Majesty's Inspectorate of Pollution (HMIP) has responsibility for the industrial processes with the highest risk of pollution. There are plans to merge HMIP and the NRA into a single Environmental Protection Agency. The Drinking Water Inspectorate (DWI) is responsible for monitoring and enforcing the quality of drinking water.

The Office of Water Services (OFWAT), sets the prices water companies can charge. If a water company is unhappy with its price limit, it can appeal to the Monopolies and Mergers Commission, the UK's competition (antitrust) authority.

If customers are unhappy with the service they receive, and their complaints are not dealt with to their satisfaction, they may ask Customer Service Committees (CSCs) to investigate. The CSCs and OFWAT work closely together.

Figure 3

Regulatory Structure

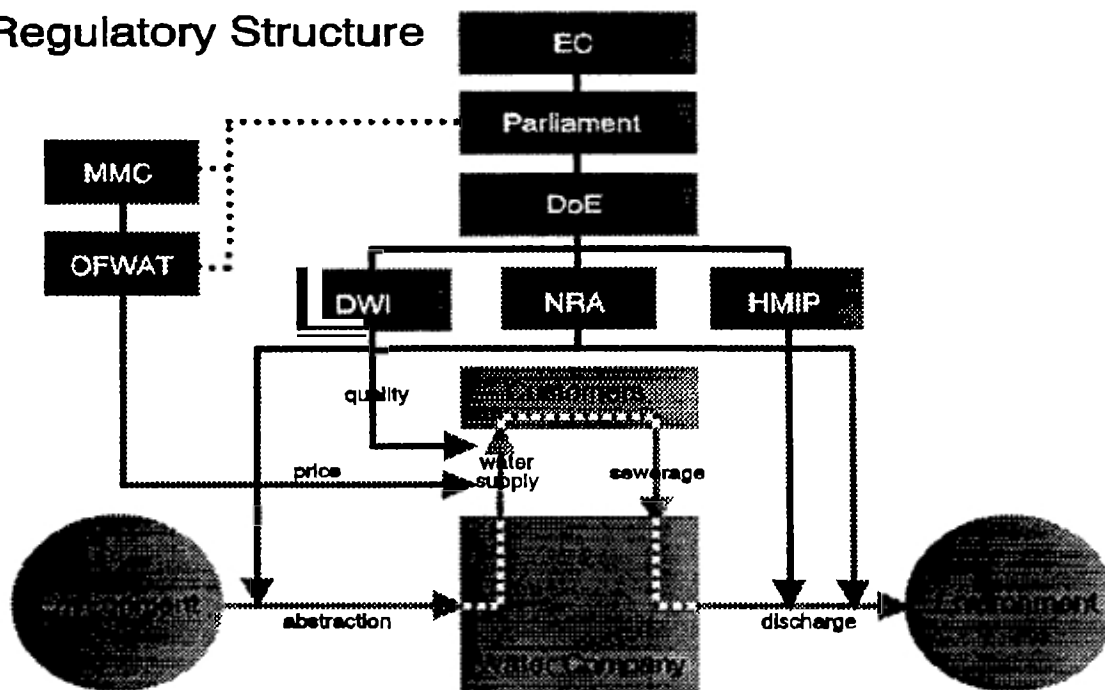
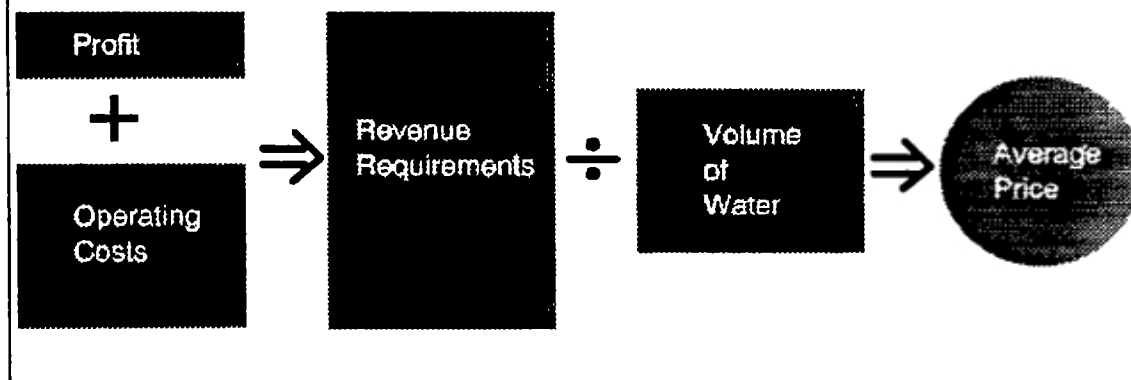


Figure 4

Calculating the Price Cap



4.3 Price Caps

At privatisation, maximum prices were set for all water companies for the next five years. The price was set to cover each company's costs, including a reasonable profit, as illustrated in Figure 4. In summary, the regulator forecast each company's operating

costs, the investments it would need to make, and the profit it would need. Adding together costs and profits gives the company's revenue requirement in each year. Dividing this revenue requirement by the forecast volume of demand gives the average allowable price.

The purpose of setting the price limit for 5 years in advance is to give the companies an incentive to reduce cost. Once prices are fixed, if a company can reduce its costs, it can keep the savings as additional profit.

Some key features in the English approach to price capping include:

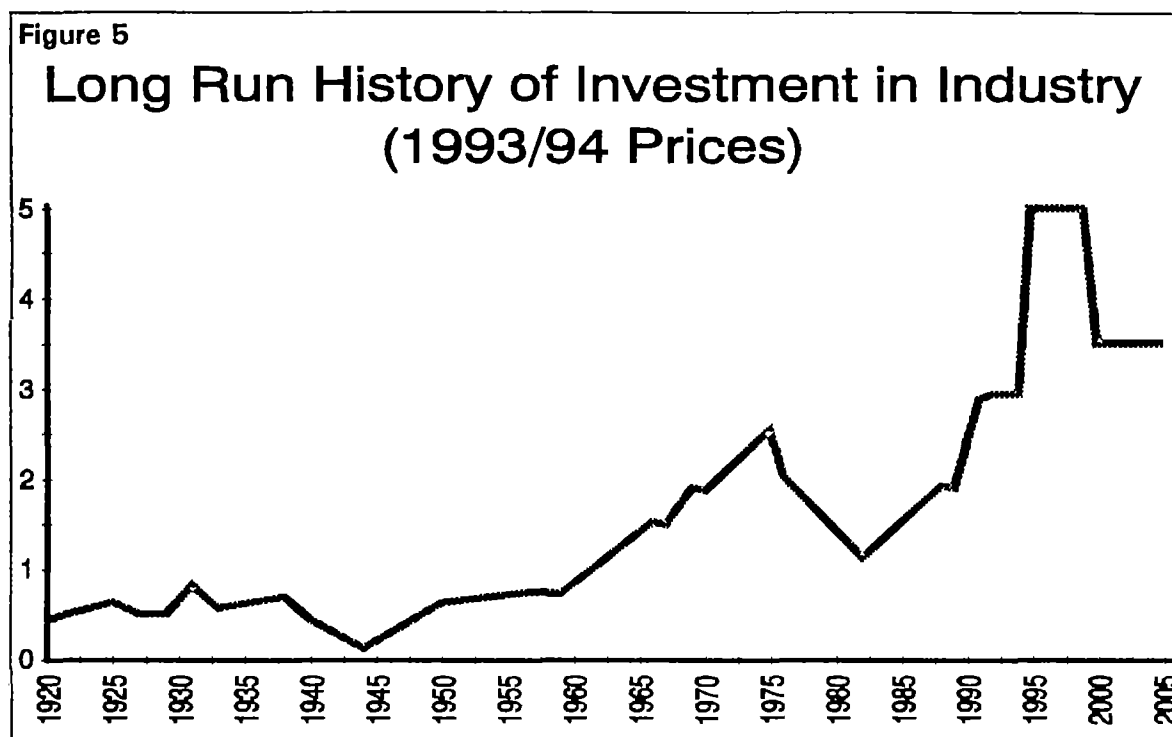
- efficiency gains - in forecasting operating costs, the regulator assumes that companies will be able to increase efficiency and make cost savings each year
- comparative competition - when price caps are set or reset, the efficiency of all the water companies is compared. Less efficient companies are expected to come up to the standard of the best performers. This means the underperformers are given more demanding efficiency targets.
- cost of capital - the regulator tries to set forecast profits at a level that is just high enough to attract the private sector to invest in the water industry
- investment - to fund the huge capital expenditure required, water companies have been borrowing money and retaining profits. This means prices have had to rise to provide investors with a return on the new investment.

5. Results

The following sections assess privatisation on 6 criteria:

- Investment
- Profits and diversification
- Standards
- Demand management
- Efficiency
- Prices

In some areas the success of the reforms is spectacular. In others, there is debate over what has been achieved.



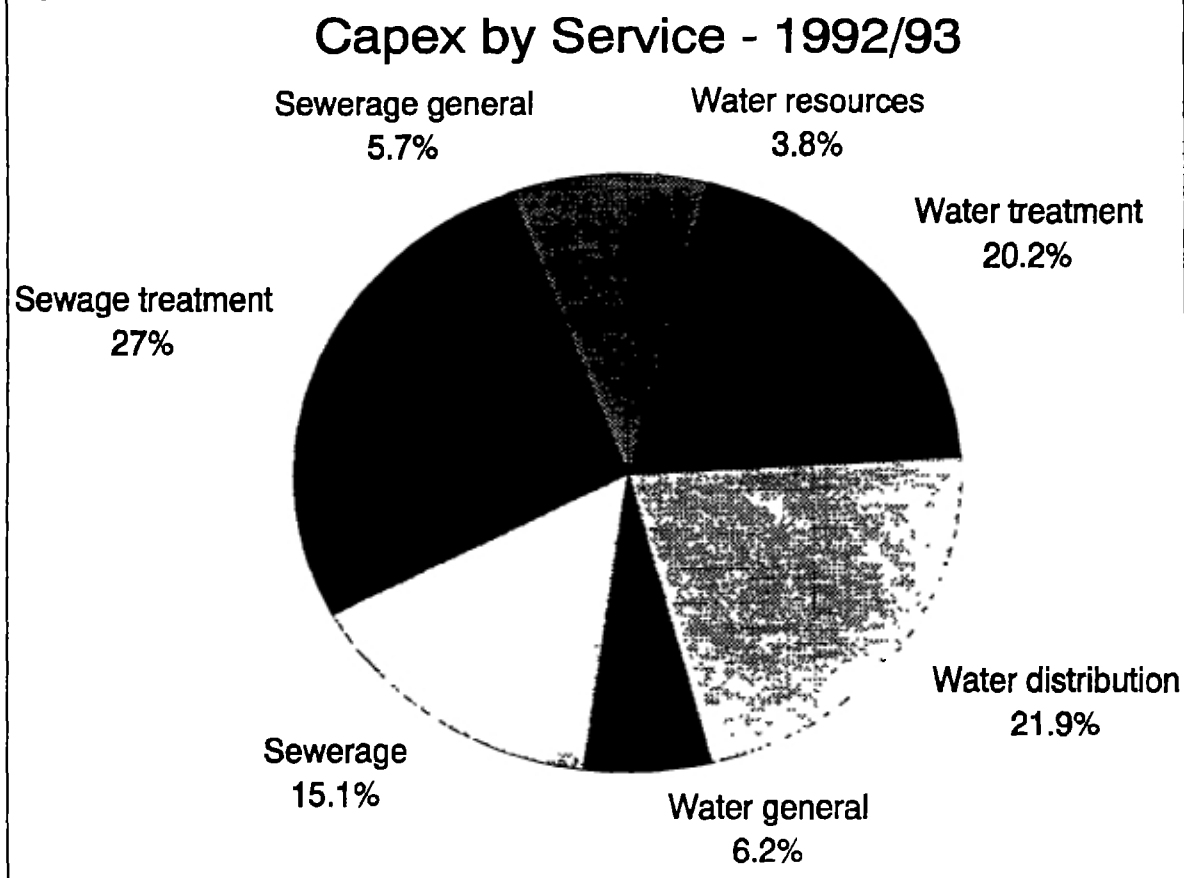
5.1 Investment

Figure 5 demonstrates the clear success of privatisation in increasing investment in the industry. In the 5 years from 1989, investment per year (in constant prices) has been higher than at any time in the industry's history. It is not clear exactly how high investment will be over the coming 5 years, but it could average around £5 billion per year, and is likely to continue at historically high levels in the first five years of the next century. It is very unlikely that the industry could have attracted this level of investment had it remained in the public sector.

As Figure 6 shows, the largest single category of investment has been sewage treatment. This is largely to do with meeting European Directives on bathing water quality. The second largest category is water distribution. Investment in this category is largely for pipe renewal and replacement, to improve quality and reduce losses. Closely behind follows investment in water treatment - for example to remove nitrates and pesticides from drinking water. Relatively little investment (3.8% of the total in 1992/93) has been for developing new water resources.

The volume of investment is impressive. There is however a question about whether it is all economically justified. The investment in water and sewerage is required to comply with environmental and drinking water standards. But no cost benefit analysis was done on the standards. It may that some of the standards are unnecessarily high. If so, it would have been better to have somewhat lower investment, lower standards, and lower water prices.

Figure 6



5.2 Profits and Diversification

Attracting such large quantities of private investment is only possible if the investors get a good return. The privatised water companies have been very profitable - more profitable than people expected in fact. This profitability has been reflected in share price increases (figure 7). The index of privatised water shares rose 160% from flotation to the start of 1994, compared to an increase of only around 40% for the top 100 companies on the stock exchange. While some of the increase in water company share prices was due the companies being underpriced when sold, the majority is a result of better than expected profit performance.

The greater freedom of the private sector has allowed water companies to diversify into new areas of business. In particular, English water companies have become important players on the world scene, making use of their technical and management expertise in many developed and developing countries. However not all diversifications into new business areas have been profitable.

Until now the big 10 water companies have been protected from takeover by special 'Golden Shares'. This protection expires at the end of 1994. There is already speculation about possible takeovers and mergers, either between water companies, or with companies outside the industry. There may be efficiency gains from a merger between a

water company and another utility, such as a Regional Electricity Company. The threat of takeover could also give managers increased incentives for efficiency gains.

5.3 Standards

The massive investment in water and sewerage treatment has improved environmental and drinking water standards. OFWAT has devised a range of indicators designed to measure the quality of the service customers receive. The industry's performance against these service standards is summarised in Figure 8. On all but one criterion the industry has improved its performance over the last two years, often significantly. Some of this improvement may be the result of wetter weather improving supply security.

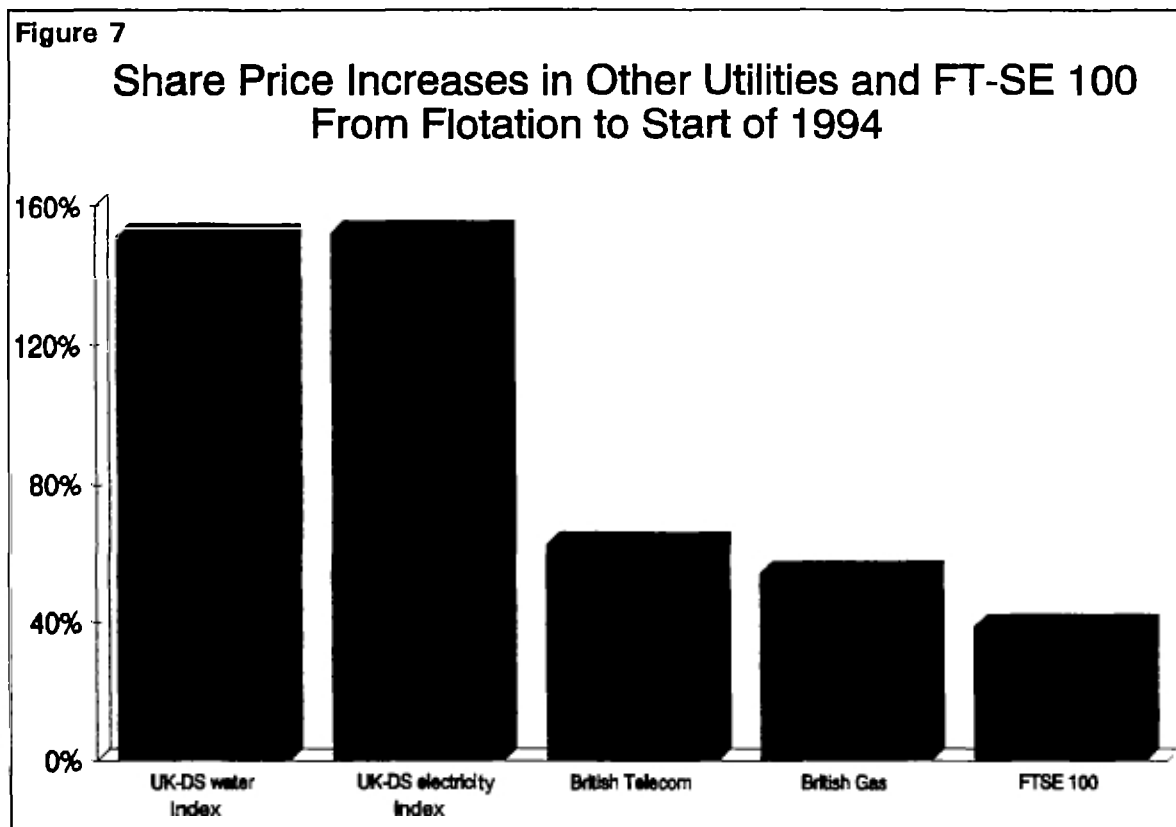


Figure 8

Service Standards 1993

	Level (%)	% Improvement Since 1991
1. Risk of water shortage	12.0	50
2. Risk of low pressure	1.3	32
3. Unplanned supply interruptions	0.3	36
4. Hosepipe bans	9.0	78
5. Risk of sewer flooding	0.1	10
6. Billing queries not responded to in 20 days	4.0	-4

5.4 Demand Management

There are two main tools for demand side management:

- metering and tariff policies
- leakage reduction measures.

The bulk of residential consumers in England are not metered. OFWAT and the NRA have been pushing for increased metering. However there is some doubt about whether the resulting water savings justify the costs of meter installation. Most companies are slowly increasing the proportion of metered customers, but only one of the large companies, Anglian, has opted for a major expansion of metering.

Leakage in England is believed to average around 22%. There are considerable differences between companies, and also some uncertainty about the accuracy of the measurements, given the lack of meters. The industry has developed methods for assessing the optimum balance between leakage control, metering and resource development in areas of short supply. Companies are investing heavily in reducing leakage, but it is not yet possible to quantify the effectiveness of this investment.

5.5 Efficiency

Here too the picture is a little unclear. We have not found clear evidence of major cost savings as a result of privatisation. However, the industry has managed to increase environmental, water and service standards without significant increases in operating costs. There are also indications that some companies will significantly reduce the number of people they employ over the next few years.

5.6 Prices

The water industry's investment boom has required substantial price increases. The average household bill for unmeasured water supply has gone up 60% over the last 4 years. Twenty seven per cent of this was due to general inflation, leaving a real price increase of around 33%. Figure 9 shows how this increase was spread over the last four years. The average household in England now pays around £88 per year for water and £97 per year for sewerage services. As Figure 10 shows, there is a large variation around these averages.

For the average household water is still very affordable (Figure 11). With price increases at the rate currently forecast, the average water and sewerage bill will stay well below 1% of average household income for the foreseeable future. An average income household in the region with the highest water and sewerage bills will still pay only 1.2% of income for water services by 2004.

For low income groups living in areas with high water and sewerage bills it is a different story. Single parents on income support will be spending close to 5% of their income on water services by 2004. For pensioners on income support the situation is even worse. Water bills which are over 5% of household income are generally considered to pose a social problem. The water industry and the government will need to tackle this problem in coming years.

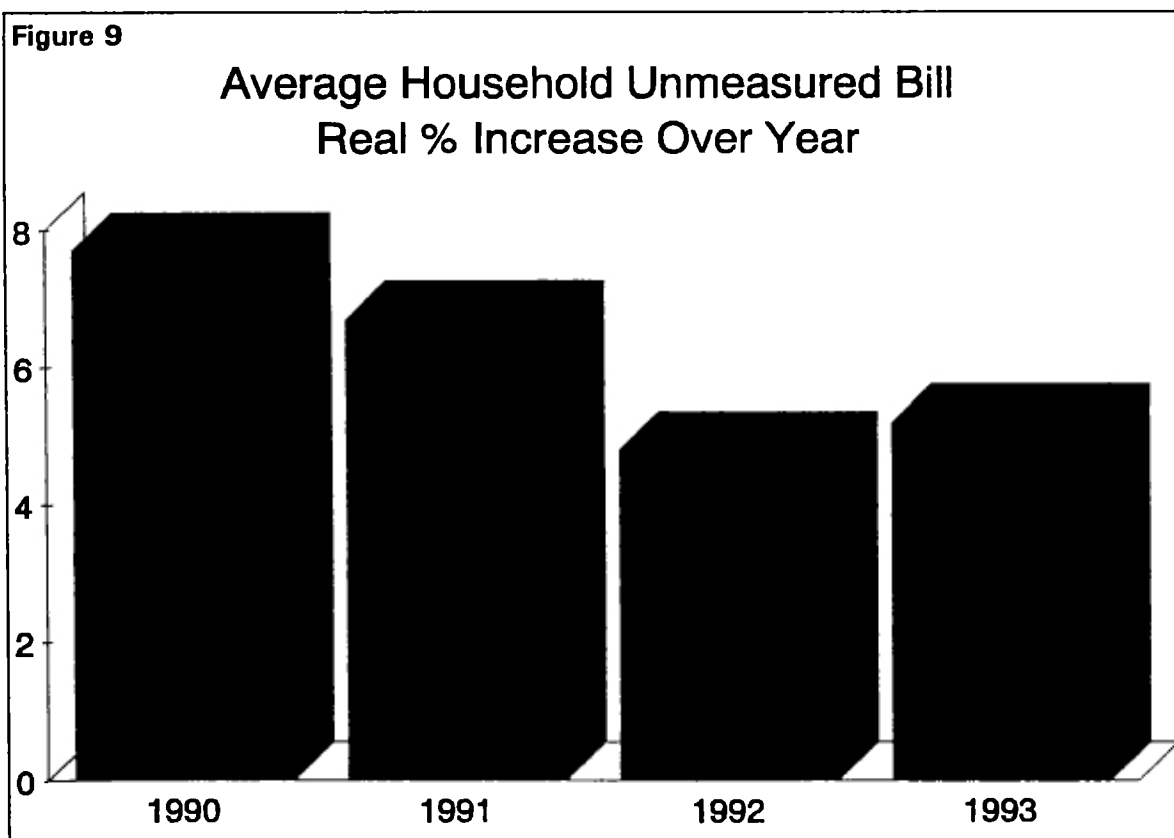


Figure 10

Bills and Prices 1993

	Units	Low	Ave.	High
Household Bill (unmeasured) - Water	£/year	£65	£88	£155
Household Bill (unmetered) - Sewerage	£/year	£77	£97	£160
Price per cubic meter - water	£/year	38p	60p	99p

Figure 11

Affordability

... a real issue for some income groups

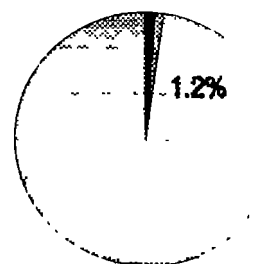
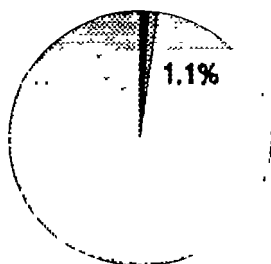
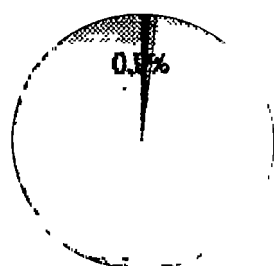
Average water and sewerage bill as % of household income

1994

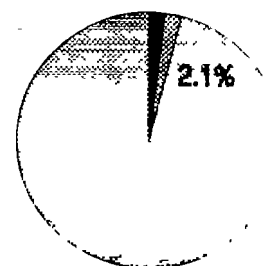
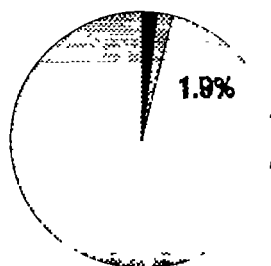
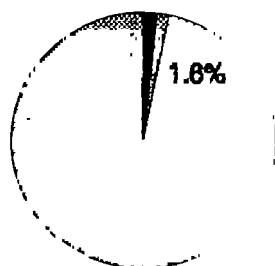
1999

2004

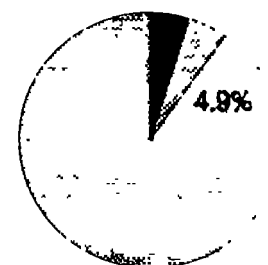
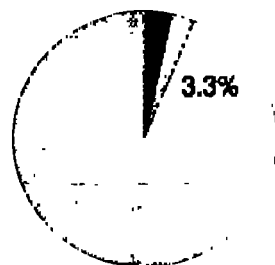
Average income



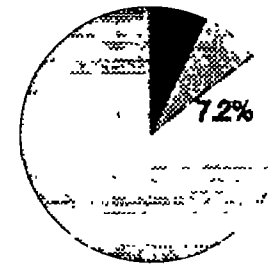
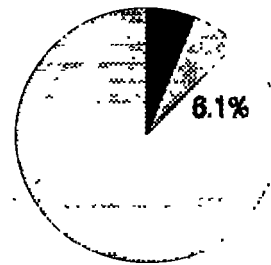
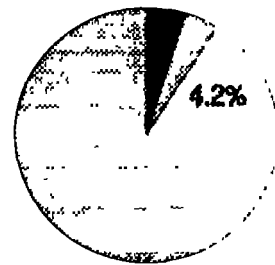
Half average income



Single parent on Income Support



Single pensioner on Income Support



Lowest water bill in E&W



Highest water bill in E&W

6. Lessons for Other Countries

Many people in the Anglo-Saxon tradition used to assume that water suppliers had to be publicly owned. The first and most basic lesson from the English experience is simply that water privatisation is possible - at least in a country with a developed capital market.

The second most important lesson is that privatisation can make possible much higher levels of investment than would be possible in the public sector. It can also transform public sector organisations into entrepreneurs competing on the world stage.

On regulation, other countries can learn from both the strengths and weaknesses of the English system. Among the strengths are:

- price-capping - setting a maximum price for a significant period ahead protects consumers while preserving incentives for efficiency gains
- comparative competition - requiring all companies to match the standards of the best goes some way to simulating the dynamic striving for efficiency which occurs in a truly competitive market.

The weaknesses include:

- the regulatory system in England is very complicated and time-consuming
- splitting responsibility for economic and environmental regulation between different bodies has caused some problems, and the economic regulator has a very difficult job in determining which investments are justified
- the lack of cost-benefit analysis on environmental and quality standards raises the risk that some standards may have been set too high, and thus that some of the investments made to meet those standards were not economically justified.

On efficiency, the evidence is mixed. Cost have been held more or less constant while the quality of service has improved, but it is not clear if this performance is better than could have been achieved in the public sector. The next five years will provide interesting evidence.

Prices have risen sharply since privatisation. The main cause was the ambitious investment programme. Efficiency gains in the private sector may have held these prices lower than they would otherwise have been. On the other hand, the industry's high profits may indicate that prices have been higher than they needed to be.

4.3 The Achievements of a Public Enterprise in a Big City of a Developing Country, EMOS S.A. Santiago, Chile

by Mrs. Raquel Alfaro, General Manager EMOS S.A.

Context and Institutional Framework

Chile is a country of some 13 millions, with an annual per capita income of 3000 US\$.

The Chilean government grants 'concessions' for the installation and indefinite operation of water and sanitation enterprises, which operate as companies by shares (General sanitary Services Law, 1988), subdued to quality control and to technical and economic supervision of the Superintendency of Sanitary Services (SISS).

Tariffs enable the companies to be financially selfsufficient, as long as they are efficient. Studies, which result in tariff formulae, are made by SISS, applying long run marginal cost. The companies can make their own studies. An agreed arbiter will solve controversies. Tariffs are revised every five years and are adjusted for price variations applying polynomial indexes. Fix and variable charges are related to fix and variable costs. The government partially subsidises low income families. The local government (municipality) reimburses the enterprise the discount made to the subsidized people. The government also compensates enterprises if they are required to apply lower tariffs than those which have been approved.

The Production Development Corporation (CORFO), is the principal shareholder of the 13 public water and sanitation enterprises, one for each region of the country, which meet the demand of 94% of Chile's urban population. They also provide technical assistance to more than 70% of the concentrated population. Private enterprises serve some 6% of the population.

The private sector can participate through new concessions, subconcessions of public companies and transference of existing public concessions. The selection of new concessionaires or subconcessionaires is made by open tender. The private sector participates also through services lent to public companies (consultors, work contractors, meter reading, network maintenance, etc.) The subconcession is a long term service contract, for example, to run a sewage water treatment plant.

CORFO gives autonomy to the board of directors of its subsidiaries. Yet, there are some general policies which the board must apply. These are, to meet the standards of quality and to obtain good financial results in the frame of the law and regulations for water supply and sanitation enterprises and for companies by shares. Open tenders as a general principle also must be applied.

Objective

To present EMOS S.A. a successful public company.

Population and Coverage

EMOS serves a population of almost 5 millions in the urban metropolitan region. Coverage is 100% for drinking water and 97% for sewerage. A coverage of some 40% of sewage treatment is planned for the year 2000. The first works started in 1990.

Infrastructure

Annual drinking water production is about 480 millions m³, 85% is superficial water treated in plants and 15% is underground. An 8000 km water network serves some 950 000 housing connections. The sewerage network, 7000 km, serves some 920 000 sewer connections.

Activities and Achievements

Integrated Management

All EMOS' activities are oriented towards the same focus: To supply drinking water and sanitation services, meeting with efficiency, the required standards of quality, and taking into account the principles of water conservation and environment protection.

Standards of quality

EMOS S.A. meets normally all the standards and regulations established for drinking water. The rate of breakage of the water network is 0.32 b/km/year (most of the network is asbestos-cement). Meter coverage is 100%.

The treatment of sewage water is an undergoing activity, and includes the control of industrial wastes which are discharged into the sewerage system.

Tariffs

The present level of tariffs is in average 0.22 US\$ per m³ of registered drinking water, 0.11 US\$ per m³ of registered drinking water, is the average tariff for sewerage.

Efficiency

Unaccounted for water has decreased from 29% to 22% the last four years. A general policy for water conservation, both on the demand side and on the company side is being applied.

The increase of tariffs under the new law, undoubtedly caused a great impact in profitability. However, more financial resources allowed EMOS to elevate the quality standards. On the other hand, there has been a general increase of wages which compete now with market wages (workers negotiate collectively), and more funds are assigned to human resources development. Nevertheless, a general improvement in resources productivity has also been attained.

The general results over the last four years are :

Return on fixed assets raised from	5.7%	to	10.9%
Return on capital raised from	5.4%	to	11.2%
Profitability of sale raised from	23.4%	to	36.5%

Private Participation in EMOS S.A.

Service contracts go from project design to the repair and maintenance of every type of facility. Some commercial tasks are also executed by contractors: meter reading and repair etc. Understudy is a BOT contract for a sewage treatment plant of about 1 m³ per sec.

Research and Development in EMOS S.A.

The company has invested in studies and applications to elevate the efficiency of systems. Automation and mechanization of facilities is increasing gradually. Modern instrumentation is being installed. Meter quality is increasing. Leak control and irregular connection detections is now a normal task. Education and orientation of clients to water conservation and environment care is also now a normal task. There is as well, a close link with universities to develop applied research in EMOS, through students and academic staff.

Specific Lessons Learned and Conclusions

Under a sound institutional frame and integrated management policies a public enterprise can be efficient.

The main future goals of EMOS are to meet the targets in sewage water treatment, to develop a new organisational structure and new technological developments to allow higher quality of services and higher productivity of resources. The big target is to have workers, clients and shareholders satisfied and proud of EMOS.

4.4 Urban Water Supply Sector in Morocco, Institutional Development and Management Autonomy

by Mr. Abdelali Filali Baba, Director Office National de l'Eau Potable

1. Institutional Development

The institutional evolution of Morocco's drinking water sector has been the result of a continuous adaptation to the structural constraints of this sector in front of economic development, rapid urbanization and demographic pressing whereas water resources are scarce and funds limited. This situation has demanded from the public authorities several adaptations of their water policy and the progressive creation of the necessary infrastructures as well as the relevant institutions and mechanisms.

This sector is benefiting since 1967 of a vast programme of water resource mobilization in order to respond to the food self-reliance, the satisfaction of the drinking water demand and the contribution in the hydroelectric production of the country.

The drinking water sector has been one of the main beneficiaries of that policy. A national master plan for the urban areas was elaborated and an institutional adaptation was achieved through the creation of municipal offices, the National Office of Drinking Water (ONEP) and by the regression of the private sector. This strategy has allowed an important development of infrastructures thus ensuring today in the urban areas a 80% rate of water connections, the remaining being supplied through standposts.

The drought crisis of the country of the early 80s has made it possible to prove the good foundations of the policy adopted in Morocco's water sector and the good condition of the institutional system that is followed. Yet, it is necessary to complete it by some relevant arbitration, coordination and regulatory mechanisms. This role was entrusted to the Higher Water Council which was created in 1981 and presided by the Highest Authority of the State.

This council has created a participatory dynamic between the operators in the field of the planned allocation of water resources by defining a special priority for drinking water. The themes discussed during the annual sessions have interested inter alia, the water basins master plans, sanitation, water regulations and water code etc... and more recently on the drinking water master plan for rural areas as well as waste water reutilization.

The sector of drinking water in the urban areas is a fragmented one while four Ministries share its responsibility:

- The Ministry of Public Works which is entrusted with the planning and mobilization of water resources while it ensures in the same way a technical tutelage over the National Office of Drinking Water (ONEP).
- The Ministry of Interior which ensure the tutelage over the Local Councils and the autonomous municipal companies entrusted with water distribution.
- The Ministry of Finance which ensures the financial tutelage over ONEP (budgetary subsidies, State warranty for external funding, the financial control, etc...)
- The Ministry of Health which ensures the control over the potability of water.
- The Ministry of Economic affairs which is entrusted with the study of tariff revisions.

Two major operators:

- The National Office of Drinking Water (ONEP) which is in charge of the planning of the production of drinking water at the nation's wide level for urban areas as well as its distribution in the small and medium size cities.
- Sixteen autonomous municipal companies of water distribution in 16 big cities.

In so far as the rationalization of investments and the management of public enterprises in front of the drought phenomenon (1981-1985), the country's indebtedness, the Standing Interministerial Committee for Public Enterprises and the Vigilance Committee were created. They have made it possible especially for the drinking water sector to be strengthened up by improving the autonomy of public enterprises.

In this sector, thus, a contract programme was signed in between ONEP and the State in 1987 and renewed in 1993. That contract defines the reciprocal commitments between these two parties. ONEP is therefore more and more autonomous and the State is disengaging progressively through a noteworthy reduction of its previous financial support.

2. Contract Programme between the State and ONEP

The main idea of the Contract programme is to engage the State and its public enterprise in a common and negotiated programme for a defined period of time (3 years). This programme stems from a decennial plan for investments and the rationalizing of the enterprise management. The funding of that programme is ensured by this latter in a more and more important share under the kind of cash-flow or loans. The complement is ensured by the State within the framework of progressively diminishing equipment subsidies at the long term.

This disengagement of the State is nevertheless possible only if this latter pledges an increase of the tariffs according to negotiated percentages before the signing of the contract. These rates are the result of a deep nation wide price study carried out in collaboration with all the concerned parties (Ministries, producers, distributors..).

The first contract programme signed between the State and ONEP covered the 1987-1989 period. It aimed at improving the financial condition of the office in order to grant a larger autonomy in the field of management. It also demanded a progressive reduction of the priori control exercised by the State over ONEP. The negotiations prior to the signing of the contract have allowed the two parties to clarify their relations and to build up a more positive communication between them. On the other hand concrete actions were specified over the period of the contract.

At the realization of the contract, the study of the results which were obtained and piloting indicators have made it possible to engage discussions in order to explain the eventual gaps as compared with the provisions. It was also understood that both the results and the respect of the commitments from both parts were to be taken into account. Some adjustments are also brought by and by for some aspects linked to the conjuncture or to unpredictable phenomena without even though neglecting the spirit of the contract.

This first experience has been evaluated and judged as being positive. The internal cashflow by ONEP has reached 15% of the amount of investments, the State having participated for

35% while the remaining part was financed by foreign loans. This contract has also revealed the limits of the State's commitments because the State could respect them only but partially especially in the field of tariff revisions and the diminishing of the amounts of its equipment subsidies. Yet, it remains that from a qualitative and organizational point of view, the contract has been a catalyst for the detection of concrete problems and the research for an adequate approach for solving them.

A second contract programme between ONEP and the State is operational since 1993 for a period of three years with a programme of investments bigger than the first one and a bigger contribution of ONEP which represents 30% of internal cash-flow. The contribution of the State will be only 20%. In addition to its objective of improving the management of the office, it is getting committed to extend its drinking water service by allowing an increase in the nation's rate of connections. It will on the other hand absorb the water deficits in several small cities and will develop their service and connecting within the scope of a middle term plan related to local councils.

HIGHER WATER COUNCIL

Advisory body under the High Authority of His majesty the King

- General guidelines for the sector
- Master plans approval
- Study of draft legislative texts
- Arbitration of issues related to resources allotment

NATIONAL OFFICE OF POTABLE WATER

- ◆ Water supply planning of the Kingdom
- ◆ Study, implementation and management of water networks
- ◆ Pollution control of resources liable to be used of human consumption

MINISTRY OF EQUIPMENT, VOCATIONAL TRAINING AND MANAGEMENT TRAINING

(ADMINISTRATION OF HYDRAULICS)

- ◆ Inventory and planning of water resources and control of water use

MINISTRY OF INTERIOR AND INFORMATION

Tutor of Local Councils

- ◆ Water distribution in urban areas
- ◆ Water supply and distribution in rural areas

MINISTRY OF AGRICULTURE AND AGRARIAN REFORMS

- ◆ Technical assistance to rural communities

MINISTRY OF PUBLIC HEALTH

- ◆ Drinking water quality control at the national level

OTHER INVOLVED AGENCIES

- ◆ OFFICE CHERIFIEN DES PHOSPHATES ET CHARBONNAGES DU MAROC (OCP): Water supply and distribution in some linear centers
- ◆ S.M.D. (SOCIETE MAROCAINE DE DISTRIBUTION) concessionary since 1945 Production of 2 m³/s supplying a part of Casablanca city.

4.5 Rural Water Supply and Sanitation Project in Lumbini Zone, Nepal

by Mr. Han Heynen, IRC

Context

In the eighties Nepal's water sector was characterized by two main programmes for the delivery of water supply and sanitation services. The Department for Water Supply and Sewerage (DWSS) provided water supply services for some urban centres and for larger villages, while the Ministry of Panchayat and Local Development (MPLD) supported community water supply and sanitation (CWSS) services.

In 1989 the DWSS and MPLD programmes were merged under the newly formed Ministry of Housing and Physical Planning. This has caused a lot of damage with respect to implementation of rural water supply as the CWSS style projects now were forcibly put under the rigid policies of DWSS. Several CWSS donors reconsidered their positions and reduced funding became available for the CWSS type of projects.

Source of Funding:	
HMG/Nepal	US\$ mio. 0.8
Finnida	US\$ mio. 4.5
Location: Lumbini Zone, Nepal	
Duration: 5 years (1990-94)	
Resp. Agencies:	
Department for Water Supply and Sewerage (DWSS) and Plancenter	
Associated Agencies:	
District Development Councils, Helvetas, GARDEP/EU, World Bank, ADB, UNDP Decentralization Project	

In the early 90s the UNDP/World Bank programme, WHO, the Asian Development Bank and FINNIDA started to provide support to sector development in Nepal. Simultaneously calls for democratization led to a change in Nepali society and brought about demands for greater public involvement in decision making. Decentralisation and a change in the roles and responsibilities of central and professional government institutions has caused a complete overhauling of planning and implementation procedures. The initiative for community improvement lies with the people, with government and district level agencies facilitating the process rather than executing it on behalf of the people. The political realities and the support provided for these by external support agencies demand a change in attitude with DWSS in order to support the demand driven, decentralized approach.

The Department has recently adopted a new organigram at district level that reflects the new requirements (1994). Apart from an Administrative Services Section the District Water Supply Office (DWSO) has a Technical Services Section and a Human Resources and Community Development Services Section, both headed by an assistant district engineer. The Human Resources and Community Development Services Section has a Sanitation Sub-section with one overseer and one women worker and a Users Trainings Sub-section with one overseer and one water supply and sanitation technician.

Objectives

Since 1990 HMG and Finnida have been collaborating in the six districts of the Lumbini zone to test a community based approach for water supply and sanitation. The Ministry of Housing and Physical Planning (MPHH) through the Department for Water Supply and Sewerage is the lead partner in the Rural Water Supply and Sanitation Project (RWSSP). The Project was scheduled to run to the end of 1993, but has been extended to the end of 1994. The stated objectives of the project included:

- development of institutional capacity;
- the provision and promotion of use of safe, sustainable water supplies and improved sanitary facilities ... to 100 000 (later changed to 175 000) inhabitants.

To reach its objectives the Rural Water Supply and Sanitation Project has focused on five sub-projects: district water supply development plans; physical improvements; socio-economic studies, hygiene education and sanitation; training and human resources development; and community involvement.

RWSSP aims to establish a replicable and sustainable approach to water supply and sanitation development in Nepal based on community involvement and management of the facilities by the users. In the past DWSS has employed a technocratic approach in which the role of the community was often very limited. Community orientation is very much in line with present trends in Nepal in respect of democratisation and decentralisation. However, it requires technical departments to take a new look at their procedures and amend these to demands of the day. The RWSSP has tried to assist DWSS in the Lumbini zone to develop and operationalise an approach that can work at the district level.

Activities and Achievements

1. Essential to any development plan is a clear division of roles and responsibilities of the various actors involved. The step-by-step approach developed by RWSSP has proved a good way of visualizing the various inputs and actions required to plan and implement a water supply and sanitation scheme. Simultaneously it is clear that any approach is useless without clear guidelines and procedures and above all without field staff capable of applying the approach.

Key to proper project preparation is the quality of the feasibility study. During the feasibility study rapid rural appraisal like mapping techniques are used to determine the technical, economic, health and social feasibility of a proposed scheme. These resource maps are made by the villagers with facilitation by project staff and are supplemented by detailed site inspections and discussions on project implementation procedures and conditions.

2. Physical improvements amount to 80'000 people served by some 1100 shallow wells and tube wells in the terai areas of Southern Lumbini zone, and 20'000 people by around 100 small and medium size gravity schemes (150-500 pop.) in the hill districts. To enhance sustainability, equipment and hardware used in project implementation favours local materials and skills available through the local private sector.
3. RWSSP has assisted district to draft District Development Plans on water supply and

sanitation. These have proved very useful in targeting hardship areas and to lift the political discussion on water, sanitation and health to a higher qualitative level in the DDC deliberations.

Problems Encountered

1. RWSSP has been relatively successful in getting its workplans moving in this project phase. However, except for one district, no District Water Supply Office has yet adopted the step-by step approach for non-Finnida supported projects. As such the institutionalization of the approach within the DWSS system at district level has not been very successful.
2. The on-going decentralization process raises the profile of political decision-makers with respect to district development at all levels. The political leaders want the professionals to support them, consult with them and follow their instructions as agreed upon in the DDC. Nationally initiated projects in which the district has little say will find it harder to receive support at the district level.
3. The decentralization and the change in role of the DWSS leaves responsibility for water resources management at present unassigned.

Lessons Learned

1. The step-by-step approach assigns clear responsibilities to all partners, leading to clear discussions about inputs and expectations.
2. Community level resource mapping generates a considerable improvement in quality of project design (with respect to source, drainage, starting point for improvement).
3. Community level mapping in combination with the district development plan leads to greater political participation of community representatives at (sub) district level.
4. The coordinating role of the DDC and the number of WS&S partners (government line agencies, NGOs, donors) active at district level encourages choice of intervening agency, thus enhancing a certain degree of competition in WS&S delivery and a greater diversity in WS&S products and services.

Conclusion

The political and administrative developments in Nepal force new role on all actors. A major challenge is found in the need to carefully develop a new institutional framework and an approach that suit the changed environment. As an elected decision-making body, the District Development Committees play a lead role in district development and represent the users of water supply and environmental sanitation services and facilities. The DDC is responsible to facilitate the provision of service to the population in collaboration with other sector partners at district level. In a next phase a change in organisational set-up of the RWSSP will reflect the new realities and provide support as needed to all sector partners through district umbrella agreements: DDC, district level line agencies, NGOs and the private sector.

The step-by-step approach combined with the community level resource mapping exercise offers a great opportunity for physical improvement of WS&S facilities in a context of greater social and health awareness at household and community level, and with a great potential for taking political responsibility at sub(district) level, all contributing to enhanced sustainability of the services and facilities constructed.

To further support capacity development and service delivery the World bank is preparing a RWS&S development Fund aimed at providing grants to improve rural water supply and sanitation in parts of Nepal. Any accountable organisation which goes into contractual relation with an organized user group to support the group, can apply for financing from the Fund. The emphasis of the project is on the private sector development but it does not necessarily exclude any support organization, provided it is accountable and professionally capable. The Fund idea is in line with the global trend of privatizing and changing the role of governments from provider to facilitator as well as separating the function of water resources management, legislation and monitoring from implementation.

The role of the DWSS is re-oriented towards its function as a service agency to the users and their representatives in improving their water supply and sanitation services It should probably also become the guardian of the water resources in the country. There is also a trend to gradually separate the management of the water resources, the quality control and monitoring of the implementation of projects and the legislation from the actual implementation.

Author: Han Heynen

References.

- * Evaluation Report RWSSP, March 1994, Heynen et al.
- * Project Document RWSSP (formulation), March 1994, Wihuri et al.

4.6 Community Water Management in Yemen

by Mr. Piet Klop, UNDP/DGIP

Context

In many regions of the Republic of Yemen, tribes enjoy a large measure of autonomy. The country does not have a comprehensive water policy in place yet, with the departments concerned busy competing for a dominant role in water resources planning and management. But then, even if a comprehensive water policy were adopted, the central government in Yemen would not have the capacity to impose its rules and regulations on the tribes (besides the current turmoil).

Like most of the country, the region around Rada' has minimal rainfall (200 mm a year) and little surface water resources to speak of: sitting on a major water divide, most of the area is made up of small catchments.

Remittances from Yemenites working abroad paid for heavy investments in groundwater exploitation (deepwells and pumps). Rada' in particular has over the past 20 years witnessed a vast expansion of the pump-irrigated area under 'qat', the mildly addictive and highly profitable national drug.

As a consequence of groundwater mining (discharge largely exceeds recharge), agricultural and drinking water supplies are in acute jeopardy in many places.

From 1977 the Rada' Integrated Rural Development Project has been the region's principal development authority. Although implemented under the responsibility of the Ministry of Agriculture and Water Resources, the Project operated as a largely independent entity. With Dutch financing coming to an end, it is presently being reorganized.

Objective

Water-related activities of the Project in Rada' included groundwater exploration, construction of water supply and sanitation facilities, surface water conservation, rainwater harvesting and irrigation water saving. These activities were increasingly integrated in an effort to establish sustainable water management at community level.

Activities and Achievements

The concept of drilling-free zones was introduced with a number of communities actually deciding to prohibit drilling within a certain distance from existing wells. The introduction of irrigation water saving techniques and materials led to real reductions in pumping rates. Groundwater depletion could thus be delayed (but not quite reversed).

Source of funding: DGIS,
The Netherlands

Budget (for water-related
activities, from
1987): approx. 5
mln US\$.

Location: Rada', Al Bayda
Province, Republic
of Yemen

Duration (of period under
consideration): 6
years

Responsible agency:
Ministry of
Agriculture and
Water Resources

As incentives for water saving served the 'on demand' construction of water supply and sanitary facilities, small dams and roads (all at a 30% financial contribution from the benefitting communities). The Project offered a wide range of services, too: agricultural extension, introduction of new crops and varieties, crop protection, health education.

With the water situation worsening, the Project began concentrating its efforts in retaining surface water, harvesting rainwater and saving irrigation water in selected catchments. Environmental extension and health education were geared at creating an understanding of the interdependencies between water management and long term prosperity, between water use and health.

Underlying the tentative success of this approach may be the coincidence of community borders with small catchment boundaries. Yet another important factor is the tribal authority structure, which is usually well-established and well-respected.

While understanding of the need to conserve water is indispensable, its profitability remains the very incentive to a farmer. In Rada' it actually paid to use less: saving irrigation water came with lower pumping costs, less irrigation chores, and often higher yields. It helped that in 1990 subsidies on diesel were cut and unit pumping costs almost doubled.

Problems Encountered

As a matter of fact, irrigation water saved can be expended on a larger area. Another problem was that although drip irrigation methods could be used in qat (the principal water guzzler), its introduction was long prohibited as the Government of Yemen regarded water savings in qat cultivation as support for 'our perfidious habit'.

The pressure by the different interested parties to come up with 'showable' results quickly threatened the process of securing community participation in the financing of activities, in integrated water use planning, in setting up management mechanisms, etc. With limited implementing capacity, the generous budget became a surprising liability: only by concentrating on construction works, funds could be consumed 'in time'.

Lessons Learned

Crucial is a basic understanding within a community of cause, consequence and remedy of its water crisis: water should be perceived as a communal and finite resource, impacts of current water use practices on future generations must be clear, etc.

Then, the timing of incentive and 'core activity' is important. People are opportunistic: their commitment to sustainable water management and actual assistance need to be carefully balanced. The Project learned to maintain its leverage.

Activities that address long-term problems of resource management need to be integrated with services that respond to people's short-term needs (merging 'environment' and 'development').

Project credibility is a precious thing to waste when assisting communities to plan and manage their water resources. People's initiatives and demands must swiftly be responded to, and

interventions must be sound.

Conclusions

The Yemeni government created an enabling environment by allowing communities to play a big role in water use planning and management. The Project worked, as much by design as by necessity, closely with the tribal authorities, who have proven to form a sustainable structure, along their rules and at their pace.

Short-term needs and long-term problems must be addressed in an integrated way. All parties should understand and agree, right at the beginning, where their efforts should lead to, what they will be required to do and what benefits they can expect from their input.

Over-funding is as much a threat to the process of establishing community water management as under-funding. It generates a pressure to construct things, rather than to build capacities or to invite true community participation. It also creates a non-sustainable project organization.

Author:	Piet Klop, May 1994
References:	personal experience from 1990 to 1993

4.7 Water Sector Institutional And Management Options - Ghana's Experience

by Mr. E.K.Y. Dovlo, Managing Director, Ghana Water and Sewerage Corporation

1 Background

1.1 The Country

Ghana is located on the West Coast of Africa and has a tropical climate with mean annual rainfall varying from 850 mm to 2000 mm; daily temperature range between 24°C and 35°C and relative humidity between 20 and 70.

The population of Ghana is 15.5 million with a growth rate of about 2.6% and 67% of the population live in communities with less than 5,000 people, regarded as rural and life expectancy at birth is 55.

The country attained independence from British colonial rule in 1957. It is divided into 10 regions which are further divided into 110 districts (political map). It is administered by a central government with decentralised functions to the district level.

The economy is heavily dependent on agriculture with gold, cocoa and timber as main exports. Over the past few years, GNP per capita averaged US\$ 440.

As a result of steady economic decline beginning 1976, the government launched an economic recovery programme in 1983 which has resulted in a steady GDP growth rate of about 5% since 1986.

1.2 The Water Sector

Public water supply started in Ghana in 1928. At independence in 1957 there were only 35 systems. Currently there are 209 piped systems, and 6,600 boreholes fitted with handpumps throughout the country.

Water supply coverage is 76% in urban areas and 46% in rural areas. With respect to sanitation, it is only 61% in urban areas and 11% in rural areas.

2 The Sector Institution

2.1 Introduction

The Ghana Water and Sewerage Corporation (GWSC) evolved from previous division and departments responsible for water supply. GWSC was established by an Act of Parliament in 1965 to:

- i) plan, construct and operate water supply and sewerage systems throughout the country.
- ii) cause its affairs to be managed in accordance with the practices observed in public utility enterprises and ensure that, taking one year with another, its revenues are equal or greater than its outgoings.

The Corporation was mandated to have preference over other authorities in the use of water resources for public, domestic and industrial purposes.

2.2 Past Arrangements

When set up in 1965, the organisational control was central consisting of the Board of Directors, the Managing Director and six Head Office departments namely: Staff Services; Planning and Programming, Design and Construction, Operations, Finance and General Services. Each of the ten regions was headed by a regional engineer.

There were subsequent changes in structure in 1970 and 1981. Figs I-1, I-2 and I-3 show typical Head Office and Regional/District Structures in 1981.

The various departments and divisions had specified missions aimed at the corporate success of the Corporation. The regional and district offices were entrusted with the day-to-day operation of the Corporation's facilities throughout the country.

The regional and district offices gave greater attention to urban water supply to the detriment of the rural population which constitutes 67% of the country's population.

The rural population's demand for greater attention was not met by the organisation and management structure then in place hence further review became inevitable.

2.3 Current Institutional Set-up

The current organisational structure of GWSC was introduced in 1988 after a study sponsored by the World Bank and modifications to typical organisation structure recommended for state owned enterprises in Ghana. Figure II-1 and II-2 show the organisation structures at the National (Head Office), Regional/District levels respectively. New feature introduced include a second Deputy Managing Director for Finance and Administration; the first for operations and engineering. Also there is a new Rural Water Department in Head Office and the regions and a Corporate Planning Department in Head Office.

The current framework is conducive for improved water supply delivery and most important enhanced decentralisation.

Decentralisation has been categorised into four types; deconcentration, delegation, devolution and privatisation. The category into which GWSC's falls is delegation. This means simply the transfer of managerial responsibility for specifically defined functions to the regions and districts with defined limits of authority.

The current structure of GWSC, its functional nature and intent is a marked departure from past practices. Though there is emphasis on decentralisation, policy making, monitoring and evaluation. Thus Head Office Department Heads have no direct managerial control over the regional heads who now report to the Deputy Managing Director of Operations. However regional heads follow rules regulations, systems, procedures, reporting formats and schedules, operating and managerial standards prescribed by Head Office Department Heads.

Regional Directors have direct managerial responsibilities for effective running of their regions on a day-to-day basis. They are the principal line managers of the Corporation since it is at their level that the work and mission of the Corporation is centred.

To enhance decentralisation, policy guidelines, procedures and authority limits were introduced for personal management and engineering project management. Similar documents are in preparation for operation and maintenance management and for purchasing and stores management.

Under the State Owned Enterprises Reform Programme, the Corporation prepares a four year rolling corporate plan and signs performance contracts with its sole shareholder, the Government of Ghana.

3 Recent Developments

An organisational structure is not a static entity. It is subject to a number of internal and external influences. Changes in Corporate or national policy, personnel changes, economic factors etc. do affect an organisation and its structure can change to be better placed to solve perceived problems and implement new plans and programmes.

Community organisation is an integral part of the tradition and culture of Ghana. Women have also been playing significant economic roles in Ghana. These entities are getting more involved in all aspects of water supply delivery now.

3.1 National Community Water and Sanitation Strategy

This new programme will be managed by up-grading the existing Rural Water Department of GWSC to a semi-autonomous Community Water and Sanitation Department. Services will be provided on a demand-driven approach.

The prime objectives of the strategy are:

- (i) To provide basic water services to communities that would contribute towards the capital cost and pay the normal O&M costs of their facilities.
- (ii) To ensure sustainability of these facilities through community ownership and management including active involvement of women, the private and public sector.
- (iii) To maximise health benefits by integrating water, sanitation and hygiene education interventions.

3.2 Urban Water Supply Strategy and Organisation

GWSC's prime objective is to provide and maintain acceptable levels of service to the consuming public along economically viable especially in the urban areas.

Based on above goals, management strives to: improve water production and productivity, increase operating profit, expand services and coverage, improve efficiency of operations and improve corporate performance.

The sector strategy formulated to achieve set goals are to rehabilitate systems to

restore lost capacities, manpower improvement programmes, institution of appropriate cost recovery policy by charging adequate, fair and affordable tariffs and institutional reforms like the setting up of a Projects and Construction Management Unit to effectively supervise GWSC's Urban Investment programme.

Institutional restructuring is proposed and includes decentralisation of decision making, seeking greater autonomy for the regions and introducing private sector participation where appropriate.

4 Prospect for Sustainability and Accelerated Growth

4.1 Future Needs and Priorities

A national water and sanitation Master Plan is to be prepared for the period 1995-2005. The target coverage by 2005 is 100% for urban areas and 85% for Rural areas with respect to water supply.

4.2 Future Institutional and Management Options

With current trends the future management of the sector will involve the main sector institution, the private sector, district assemblies and beneficiary communities. It is an unending process and linkages will be better defined in the near future.

4.3 Prospects

The Ghana Government attaches great importance to the provision of good drinking water. The sector institution is thus being continuously assessed, re-organised and strengthened. With a policy of decentralisation, self reliance, mobilization of local resources and donor support, the sector is making visible impacts on peoples standard of living.

It is hoped that access to potable water and safe sanitation will become a reality for the majority of our people in the next decade through common participation and dynamic management.

4.8 Buguta/Makwasinyi Community Water and Sanitation Project, Kenya

by Mrs. Ilse Marks, UNIFEM

Context

The Buguta/Makwasinyi Community Water and Sanitation Project is located in the Voi Division of the Taita-Taveta District in the Southern part of Kenya. The project covers 8 villages in an area of approximately 88 square km. The annual rainfall in this semi-arid area ranges between 480 mm and 650 mm. The sandy soil is suitable for dry land farming and ranging.

The project area is a newly settled area, inhabited by indigenous people from the region and immigrants from upcountry and coastal areas. The current population of Buguta-Makwasinyi is estimated at 12,000 people (ref. trial census 1989). The population is divided in three major ethnic groups. Most people belong to low-income families relying on subsistence farming with livestock as a major source of income.

Source of funding:
WaterAid (London)

Budget: \$ 80,000

Location: Taita-Taveta
District, Kenya

Duration: 5 years

Responsible agencies:
KWAHO, Ministry for
Water Development

The project area has a poor ground water potential and the only water sources available are small springs in the Kasigau Hills. Women have to travel between 6 to 20 km a day to fetch water from the springs. This means a tremendous burden on the women, who are not only responsible for water collection and other household activities but are also involved in farming and income generating activities.

The area is administered by the Makwasinyi sub-location assistant chief, assisted by village elders, public leaders and other civil servants. A number of NGOs, including the Kenya Water for Health Organization (KWAHO), act as intermediaries between the communities and the regional and national governmental organizations.

Objectives

The development objective of the Community Water and Sanitation Project is to improve the quality of life of the community of Buguta/Makwasinyi.

This case study focuses on the main immediate objectives of the project: to improve the availability of clean and safe drinking water and to decrease women's workload.

Activities and Achievements

The project has been initiated by the women who are organized in women's groups. The women felt that an improved water supply system could improve the health situation in their villages and increase their time and energy available for income generating activities.

The women approached the Kenya Water for Health Organization (KWAHO) for assistance.

KWAHO and the Ministries of Water Development, Health and Culture and Social Services organized a meeting with representatives of the communities in order to plan the development and implementation of the project. During the project formulation, special attention was given to the development of an appropriate community management system and a manageable local financing mechanism in order to ensure the sustainability of the project.

With the financial support of WaterAid (London) and the technical assistance of KWAHO, the communities were able to establish a gravity water supply system with 35 km of main and distribution water pipelines, water storage tanks, water kiosks in each village and demonstration sanitary facilities around each water kiosk. The water supply system is serving about 10,000 people.

All involved villages have selected a man and a woman to represent their community in the Water Management Committee. The committee is responsible for the overall management of the water supply system, including the financial management. All households are required to pay a monthly membership fee which covers the maintenance costs of the system and the salaries of the kiosk attendants. The kiosk attendants are trained in operation and maintenance of the water supply system and are responsible for the equal distribution of scarce water. The attendants only provide water to those who can show proof of payment of the membership fee.

The villages have elected the chief of the administrative area to act as chief advisor to the project and provide the link between the communities and KWAHO and the responsible ministries after the phasing out of the project.

As a result of the project, the majority of the population now have easy access to clean and safe drinking water. Through the health education programme, hygiene standards in the community have improved, therefore improving the health condition of the families.

Given women's responsibility for water collection, the project had a very significant impact on women's lives, decreasing their workload and improving the health situation. Women use the extra time for income-generating activities.

The formation of a water management committee and its training in management, operation and maintenance was of utmost importance for the success of the project. The establishment of a local financing mechanism contributed to the sustainability of the project.

Problems Encountered

After the completion of the construction of the water supply scheme some community members were not willing to pay their monthly fees. This problem was tackled through the introduction of the membership card, which enabled the kiosk attendant to deny access to people without this proof of payment.

Lessons Learned

Involvement of the community, with special emphasis on women, right from the identification of their problems and prioritization of their needs to the project implementation improves the sustainability of a community project.

There is a need to develop a continuous link between the community and the implementing agency. In this case, the community selected the area chief to act as the patron which supervises all project activities and provides the link between the community and KWAHO.

It is important to plan a phase-out period during which the community takes over the operation, maintenance and management of the system. The patron plays a crucial role in this period.

Conclusions

This project is a clear example of how community management and a local financing system can promote the sustainability of a rural water supply and sanitation project.

Author: Ilse Marks

References. Interregional Workshop on the Role of Women in Environmentally Sound and Sustainable Development, 1992, UNDES and INSTRAW
Case study by Margareth Mwangola, Executive Director KWAHO.

4.9 Polish Water Supply and Sewage Disposal Companies - Their Organisation and Ownership Transformations

by Prof. Marek Roman, Warsaw University of Technology

1. The Conditions of Water Supply and Sewage Disposal Services in Poland

The fulfilment of the population needs concerning the supply of drinking water can be generally illustrated by the scope of households connections to water supply networks and by the standards of water supply installations in the households. The data in Table 1 is composed to illustrate the changes taking place in this field in Poland during 1960-1992. The percentage of the urban population supplied by the water supply and sewage disposal networks depends on the size of the town and is significantly larger in big cities than in the small ones, what is presented in Table 2. In rural areas the network water supply and sewage disposal systems are significantly less common than in towns. According to the data of 1987 only about 43% of the rural areas population were served by the water supply networks and about 11% by the sewage disposal systems.

Table 3 presents data concerning the overall length of the water supply and sewage disposal system networks in urban and rural areas. It can be noticed that the length of the sewage disposal networks is significantly shorter than that of water supply networks. It is due to the fact that in small settlements and in the rural areas, equipped with water supply network the sewage is often discharged via local solutions such as effluent-free pits and seeping drainage.

Table 4 illustrates the unit changes in water consumption in the households. It can be generally said that in towns the consumption of tap water is high, however the standard of the water supply installations in the households is not especially high. In a lot of cases it is due to lack of adequate maintenance of the in-house water supply installations. It is assessed that water losses in in-house installations often constitute 30% or more of the whole water uptake in the residential building. In the recent years, however, one can notice some reduction in water consumption by the households. This can be the result of the new economical conditions and very sharp rise in water prices in Poland.

The quality standards of drinking water are set in Poland according to the guidelines from World Health Organisation. However, the quality of the water supplied by the central water supply system is not always satisfactory. According to the data from 1992, based on the results of the controls carried out by the National Sanitary Inspection in towns 3.6% of water supply systems were supplying bad water and 7.1% uncertain water; for the rural areas the values were respectively 4.5% and 7.6%. The situation of population obtaining water directly from wells is significantly worse in this respect. The Table 5 presents sanitary condition of the water obtained from the wells - according to the data from 1992.

Table 6 presents the situation in equipping Polish towns with sewage treatment plants. On this basis it can be said that on 835 towns only 338 have mechanical and biological treatment plants and the same number (also 338) discharges the sewage without any treatment.

2. Organisational Structure of the Water Supply and Sewage Disposal Systems in Poland during 1918-1990

After regaining the independence in 1918 the local authorities were set up, in Poland, having its legal rights and right to own property - the communal property. In the field of water supply and sewage disposal the organisational units which were operating after 1918 usually jointly covered both water supply and sewage disposal. They had their own place among various legal and organisational forms found within communal companies which were classified as follows:

1. Companies remaining under their own control
 - public and legal (not separated or separated from local authorities),
 - private and legal (operating in form of the share or limited company)
2. Mixed companies - having private or co-operative funds operating in form of share or limited company.
3. Licensed or leased companies.

The communal water supply and sewage works usually had the organisational and legal form of the company under the control of the town as units separated or not from the local authorities. They did not have their own legal rights and its assets were the communal property. The companies separated from the local authorities had some degree of independence but it was limited by the lack of legal rights. The companies not separated from the local authorities were forming one of the municipal departments. The separated companies were generally created in big towns and not separated in the small ones. Special legal and organisational solutions were used in relation to the water works in Silesia in 1924 the "National Water Works of Upper Silesia" were formed. It obtained its own legal rights in 1928 and obtained the status of public services company. The region of operations of this company covered: Katowice, Krolewska Huta, Sosnowiec, Bedzin and Dabrowa Gornicza and Swietochlowice, Tarnogora, Katowice, Bedzin and Chrzanow regions.

After the Second World War, after initial reactivation of the previous forms of local authorities, in 1950 the decree of local uniform authorities were introduced which eliminated the communal property and did not allow for towns to have legal rights. The municipal water and sewage works were run as companies operating under rules of so called economical calculations in form of single discipline companies or within the scope of multidiscipline company or as budget-founded works or units. The multi or single discipline companies were operating as national companies and in 1981 were given the status of public services companies. The same legal and organisational status of the municipal water and sewage works was existing until 8th of March 1990 when Polish parliament passed the decree on local authorities.

At the beginning of 1990, prior to introduction of the local authorities decree there were about 50 single discipline water and sewage companies, out of which 80% had provincial or regional character. In smaller towns not covered by the provincial and regional companies the water and sewage works were operated within the multi-discipline companies - so called communal services or communal services and housing companies, in which structure there often were individual departments separated to carry out services in individual disciplines - as water and sewage works, town cleaning, greenery and others. Apart from that in small towns the water and sewage works were operated not within the companies but as budget-founded works or units.

3. The Organisational and Ownership Changes in the Municipal Water and Sewage Work Introduced in 1990

On the basis of the local authorities decrees the water supply and sewage disposal companies became, in 1990, the property of local authorities. Previously they were national - the municipal or communal often found in their names did not relate to their actual situation as they were neither the property of towns nor local authorities.

The local authorities took over the water and sewage works as their own communal property, obtained on the basis of the local authorities decree and simultaneously there were the obligatory tasks defined by that decree to fulfil the needs of the local population concerning the supply of water and disposal and neutralisation of the sewage. The decree has legalised and obliged the local authorities to choose the legal and organisational form of conducting the economical activities in this filed setting the deadline by which the choice should have been made. However, this deadline is continuously extended by the subsequent amendments to that decree. Until this deadline the companies, although renamed as communal and being the property of the local authorities have to operate on the basis of regulations for the national companies.

The following organisational and legal forms can be taken theoretically into consideration in transformation of the existing communal companies:

1. Companies under public control
 - a) separated from the local authorities
 - b) not separated from local authorities
2. Companies under private control
 - a) share companies
 - b) limited companies
 - c) licensees and leases to legal or physical person.

In order to investigate how transformed are municipal water and sewage works in practice, the Institute of Water Supply and Water Construction of Warsaw Technical University carried out, at the end of 1993, a questionnaire sent to 539 institutions running communal water and sewage works. The answers were received from about 40% of the questioned companies. During that it became apparent that significant proportion of the institutions underwent such changes that their previous addresses were out of date and it was difficult to find the addresses of their new institutions which took over the function of the previous ones.

On the basis of the carried out questionnaire the various legal and organisational forms were identified amongst 223 institution that had send the information - they are presented in Table 7. Table 8, however, presents the process of transformations of the municipal water and sewage works after introduction of the local authorities decrees, that is from 1990 to IIIrd quarter of 1993.

The data obtained from the questionnaires indicates that by September 1993 81 of the previously existing municipal water supply and sewage disposal companies did not undergo transformations. That constitutes 36% of the total number of municipal water supply and sewage disposal companies that provided information on this subject. Those companies operate on the basis of regulations for national public services companies, although due to the decree they have changed their ownership forms and stopped being the property of the state

and became the property of local governments.

So far 142 out of 223⁷ companies which sent the answers to the questionnaire have undergone transformation. The most often chosen, by the local authorities, solutions concerning the organisational and legal forms were: budget-founded works (47% out of 142 transformed companies) and one-person partnership of the local authority funds (37%). It can be assumed that these both forms constitute the first stage of the transformation of those, in total, 113 institutions. With this background in mind it has to be noted that local authorities approach with great care and reserve all the transformations taking the water supply and sewage disposal out of the public (communal) ownership sector and out of public (subordinate to local authorities) management.

It is interesting to note one special case of forming large, regional national company, which aim is to provide water to smaller companies dealing with distributing water to the receivers. This is the result of transformation of the Provincial Water Supply and Sewage Disposal Company in Katowice into Upper Silesia Water Supply and Sewage Disposal Company in Katowice. Such solution is in agreement with the decree on local authorities, as it allows for formation of the national company in the communal sector, if its scope of activities exceeds the area of one province. In the above mentioned case the following layout was formed: wholesaler (central company) - retail saler (local companies - named in this case as area companies). It is difficult to asses so far whether this solution is more favourable than the previous one. It would require a complex analysis and assessment of this type of restructurisation.

The conclusion can be drawn from the presented situation regarding the transformation of the municipal water supply and sewage disposal companies that there was not a single company formed as a water supply and sewage disposal company under the direct control of local authority, though this is the natural form and used to a good effect in other countries, among others in Germany. Sadly in the current legal situation there is no clear place for such form of communal companies. The obstacle is that there is no decree about the economical activities of the local governments.

4. Comments and Final Conclusions

1. The presented here results and progress of the transformations regarding the legal and organisational structure of municipal water supply and sewage disposal companies during 1991-1993 have to be treated as some sort of approximate description of the situation, as it is the result of the studies based on the questionnaires, in which the information from about 220 institutions dealing with the problem of water supply and sewage disposal in towns. In Poland there are 835 towns (according to the data from 1992) - the quantitative range of matters is significantly wider than it was possible to present in the studies carried out.
2. It arises from the carried out analysis that majority of the transformations carried out is down to use of two ownership and organisational forms: 1) local authority budget-founded works and 2) one person partnership of the local authority funds. Those two forms covered over 80% of the water supply and sewage disposal companies transformed (this relates to the group of companies which have sent replies to the questionnaire). It indicates that local authorities do not intend to take the municipal

water and sewage works out of public sector of ownership and public management. Large proportion of local authorities still has not carried out transformation in their water supply and sewage disposal companies (36%).

3. It is urgently necessary to correct and amend the legal regulations in such a way as to allow local authorities to transform their water and sewage works using various legal and organisational forms of conducting the activities within that field as follows:
 1. budget-founded works within the local authority structure,
 2. communal company owned by local authority,
 3. limited or share company,
 4. licensees and leases,
 5. national public services company.

The regulations should not favour anyone of the possible solutions and only create possibility for taking decisions by the local authorities or their organisations or by the national administration (this in case of national companies).

4. The leading rule should be conduction of such a transformation which would not destroy reasonably well functioning organisational structures and worsening the condition of fulfilment of the needs of the local community.
5. It is desirable to carry out systematical and wide studies on progress and results of the ownership transformations of both urban and rural water supply and sewage disposal companies.

Table 1 Changes in water supply installations in the households during 1960-1992

details	years				
	1960	1970	1980	1990	1992
1. households equipped with water supply installations in % 1)					
in total	29.9	47.7	65.5	85.9	87.6
in towns	55.4	75.2	87.8	95.3	95.9
in rural areas	3.7	12.1	37.4	67.6	71.2
2. households having bathroom in %					
in total	13.9	30.7	54.6	73.6	75.5
in towns	26.0	48.4	71.0	83.5	84.7
in rural areas	1.4	5.8	27.1	54.2	57.3

1) % in relation to the total number of all households in a given group

Table 2 Population in the towns equipped with water supply and sewage disposal networks in 1992

town size group (number of inhabitants)	population using water supply network % 1)	population using sewage disposal network % 1)
less than 5000	61.6	30.4
5000-9999	77.1	56.9
10000-19999	81.4	68.6
20000-49999	88.6	79.0
50000-99999	91.6	83.3
100000-199999	94.9	89.0
200000 and more	96.6	91.5
in total	90.5	81.5

1) % in relation to the total number of all households in a given group

Table 3 The length of the water supply and sewage disposal network in Polish towns

details	years			
	1980	1990	1991	1992
distributive water supply network				
towns km	27700	37400	39309	
rural areas km	25400	55700	62393	
in total km	53100	93100	100707	112611
sewage disposal network				
towns km	18000	23700	24300	
rural areas km	2500	3000	3500	
in total km	20500	26700	27800	28815

Table 4 The changes in water consumption in households using water supply systems during 1980-1992

years	unit water consumption in l/day for 1 inhabitant	
	towns	rural areas
1980	203.6	29.0
1985	214.2	39.2
1986	217.5	41.1
1987	218.4	45.0
1988	219.2	49.0
1989	216.4	54.8
1990	209.6	57.5
1991	203.0	50.7
1992	203.0	62.8

Table 5 The sanitary assessment of the water taken by the population from wells in 1992

type of well	water quality in % of the controlled wells		
	good water	uncertain water	bad water
public wells			
towns	30.0	26.8	43.2
rural areas	25.9	19.9	45.8
private wells			
towns	50.1	7.2	42.7
rural areas	38.2	8.2	53.6

Table 6 Urban sewage treatment plants in Poland (acc. to date from 1992)

details	years			
	1980	1990	1991	1992
1. total number of towns	804	830	833	835
2. number of towns served by treatment plants				
a) mechanical only	357	467	478	497
b) mechanical and biological	158	165	160	159
	199	302	318	338
3. number of towns not served by the sewage treatment plants	447	363	355	338

Table 7 The ownership and organisational forms in communal water supply and sewage disposal companies in Poland at the end of 1993 1)

ownership and organisational form	number of institutions with a given ownership and organisational form
1. communal companies on conditions for national companies	81 (36.6 %)
2. local authority budget-founded works	67 (30.05 %)
3. one-person partnership of local authority fund	53 (23.8 %)
4. multi-person capital partnership	2 (0.9 %)
5. share company	5 (2.25 %)
6. company with foreign capital	1 (0.45 %)
7. providing services on basis of agreement with local authorities	1 (0.45 %)
8. others	13 (5.8 %)
in total	223 (100.0 %)

1) Data on basis of the questionnaire answers sent by 223 municipal water supply and sewage disposal companies

Table 8 Changes in ownership and organisational character in municipal water supply and sewage disposal companies during 1990-1993 1)

years and quarters	number of institutions transformed		number of institutions left not transformed
	in a given time period	together with previous period	
before 1991	1	1	222
1991			
I quarter	3	4	219
II quarter	7	11	212
III quarter	11	22	201
IV quarter	13	35	188
1992			
I quarter	35	70	153
II quarter	17	87	136
III quarter	16	103	120
IV quarter	8	111	112
1993			
I quarter	19	130	93
II quarter	4	134	89
III quarter	8	142	81

1) Data on basis of the questionnaire answers sent by 223 municipal water supply and sewage disposal companies

4.10 Project of Irrigation of New Zone of Golodnaya Steppe, Aral Sea basin, Uzbekistan

by Dr. N.I. Goroskov, Deputy Director SPA SANIIRI

Source of funding:	State budget
Budget:	2974 million US\$
Location:	Uzbekistan, Syrdarya river
Duration:	16 years
Responsible agencies:	GLAVSREDAZIRSOVHOZSTROY

The irrigation has the age-old traditions in Central Asia and the agriculture was always being the main water consumer with a tendency to the increase of water consumption. In 1960 the level of water consumption reached the critical limit (61% from total flow in Aral sea basin - 120 km³), although the ecological situation in region was stable as yet. The fast increase of population (1960 - 14.2 mln, 1975 - 24.8 mln, 1990 - 36.4 mln) and the inertness of economy development of region have determined the permanent building up of irrigation areas with the weak tendency to decrease a water consumption per unit of agriculture production and per unit of irrigation area (12...25 th.m³/ha).

In 1980 the water intake in region reached 121.7 km³ (taking into account the return water) and it became the reason of Aral sea crises. Side by side with the water deficiency the qualitative characteristics of water in sources have changed, especially this processes affected on middle and lower reaches of rivers. For example the mineralization of water in Syrdaraya river increased upto 1.12 g/l and 1.73 g/l respectively in vegetation period and upto 1.41 g/l and 1.70 g/l in nonvegetation period. Apart from the common increase of mineralization the exceeding of utmost permissible concentration (UPC) of matters which connected with the application fertilizers, pesticides and defoliators was registered. The industrial and urban effluents also cause the pollution of water, for instance UPC for oil-products has been exceeded in 5 times.

Objectives

The main object of this project is the complex development of virgin lands to ensure the maximum saving of nature resources by way of a practical application of scientific-technical achievements to create the conditions for high water productivity and normal life of population.

The main results of project: The net irrigated area is 316.3 th.ha. The length of main distribution canals is about 716 km., including 74% with the antifiltration lining. The on-farm irrigation network is 3722 km, including 87% flume canals and about 13% of irrigated pipelines. Most part of area is irrigated by surface irrigation and the flexible hoses and other control systems of watering are used for water distribution into furrows. The area is drained by the modern types of drainage: subsurface drains (on the average 50 m/ha) or systems of vertical drains (about 200 wells).

Thanks to the high irrigation efficiency (0.82), water application efficiency (0.75) and the drainage system the optimal moisture of soils is provided with the summary water consumption which exceeds the irrigation water-supply on 17...35% taking into consideration

the precipitation. With result that the water exchange between the zone of aeration and groundwaters is minimum, no exceeding 15% of absolute value, and consequently the drainage flow with bad quality of water is minimum too. The project provided the runoff of more part of water with bad quality to Arnasay depression of Kyzilkum desert and prevents the pollution of Syrdaraya river. If to compare the specific water intake in new zone of Golodnaya steppe (8500 m³/ha) and one in its old part (14000 m³/ha) then taking into consideration same productivities after the reconstruction of old irrigation systems it's possible to save upto 30% water for improvement of environment and the development of new lands in conditions of water limitations for all states of region. The production of raw cotton on project area reached 500 th.t. All expenses were justified in 16th year from the beginning of development.

The ramified infrastructure was created in region: roads - 2 th.km, lines of high-voltage electro-transmission 1.5 th.km, gas-main - 560 km, water-mains - more than 700 km, communication lines - 700 km, modern settlements - 49 (with a schoolhouse, a hospital, shops and another facilities), 90 th. new working places.

Problems Encountered

The real rate of lift of groundwater table was in 2...3 times more than it was forecasted by the project. In consequence of which the terms of drainage construction have been corrected and moreover a new technology for the construction of subsurface drainage with high groundwater level and trenchless drainer (DT-252) were created.

Conclusions

The method of the complex development of virgin lands, which was worked out in Uzbekistan, allows considerably to decrease a specific water consumption and negative influence on water sources with the expansion of irrigated lands.

In process of the perfection of irrigation systems of alluvial valley it is necessary to watch that the rate of reduction of specific water consumption accords strictly with the possibility of reduction of leaching quota, otherwise it may be to intensify the process of salt accumulation in soils.

Additions

The Interstate Coordination Water Commission was created to regulate the water distribution between 5 new independent states of region and to develop the strategy of water management in the future taking into consideration the socio-economic development of the region.

However, on the republic level, we have no material change in the system of management water resources. There exist only approaches to the decentralization, paid water use and privatization.

4.11 Organisation des Systèmes de Gestion de l'Eau Potable en Algérie

by Mr. Benblidia, Administrateur - Fonds de Participation Construction

Depuis l'indépendance, l'organisation du secteur de l'eau potable en Algérie a connu une évolution importante, marquée par une série de modifications, de restructurations et de créations d'entreprises. Ces nombreux changements traduisent d'une part les préoccupations d'adaptation au contexte politique (socialisme et planification centralisée) et à son évolution (décentralisation, ouverture sur l'économie de marché à partir de 1988) et d'autre part, le souci de satisfaire au mieux des besoins croissants de la population (taux d'accroissement démographique supérieur de 3%) et surtout des demandes des villes.

Evolution de l'Organisation du Secteur de l'Eau Potable

De 1962 à 1970: mis à part certains ensembles complexes, réalisés et gérés par l'Etat, l'exploitation des installations relève exclusivement des communes. très nombreux opérateurs (services communaux, régies, sociétés intercommunales, sociétés privées). On assiste à une dégradation constante de la situation, en raison des moyens financiers faibles des communes et de leurs services techniques.

En 1970: Regroupement de toute l'activité hydraulique et création d'une société nationale SONADE - chargée de la distribution de l'eau potable et industrielle sur tout le territoire.

De 1970 à 1988: la mise en oeuvre de la politique de décentralisation conduit à modifier les attributions de SONADE en 1974 en lui assurant les responsabilités des activités de production mais en redonnant la fonction distribution aux communes.

En 1983: Nouvelle modification dictée par le constat de l'échec de la politique de séparation de la fonction adduction (SONADE) de la fonction distribution (communes). Création de 13 entreprises régionales chargées de la gestion des installations (dans un certain nombre de Wilayas) de la production, de la distribution l'eau potable et industrielle et de l'assainissement.

En 1987: pour assurer la couverture de l'ensemble du territoire, le gouvernement décide en 1987 de modifier encore l'organisation du secteur en créant 26 entreprises de Wilaya, coexistant avec 9 entreprises nationales à caractère régional.

Ces 35 entreprises publiques (EPIC) représentant 80% de la production globale de l'eau potable dans le pays (le reste étant assuré par des régies communales).

Au plan institutionnel, un facteur favorable pour la conduite d'une politique cohérente de l'eau se trouve dans l'unicité de responsabilité gouvernementale confiée au Ministre de l'Equipement en matière d'alimentation en eau potable.

Il existe un code de l'eau et un code de l'environnement qui fournissent un cadre juridique et réglementaire complet. Le code de l'eau accorde la priorité à l'eau potable par rapport aux autres usages.

Amélioration de l'Organisation du Secteur de l'Eau Potable et de l'Assainissement

La situation actuelle des entreprises de gestion de l'eau potable et de l'assainissement (qui sont toutes des entreprises publiques) est caractérisée par:

- une qualité de service très hétérogène selon les régions (parfois excellente, souvent médiocre)
- une certaine surcharge de personnels de qualification moyenne
- un comptage en évolution mais encore insuffisant
- une sensibilisation insuffisante des usagers aux économies d'eau.

Les modifications successives n'ont pas permis la stabilité nécessaire à la mise en place des systèmes performants de gestion et surtout à la formation des hommes et des équipes nécessaires. Il y a lieu de noter cependant que grâce à des investissements importants de l'Etat, et à de nombreux grands travaux d'adduction et d'extension de réseaux, la situation au plan de la fourniture de l'eau aux usagers s'est considérablement améliorée. Il est certain qu'une organisation de la gestion basée sur la formation des hommes, et sur la participation accrue et réelle des usagers permettrait d'améliorer convenablement l'efficacité de l'alimentation en eau potable en différenciant les nouveaux investissements qu'appelle la croissance urbaine.

Un projet de financement par un prêt de la Banque Mondiale est en cours de mise au point - Il porte essentiellement sur la réhabilitation des infrastructures existantes tant en matière d'eau potable (pour la résorption des fuites) qu'en matière d'assainissement pour la remise en état des stations d'épuration à l'arrêt.

Dans le cadre de ce prêt, des financements sont réservés au renforcement des moyens humains, organisationnels et matériels des établissements en charge de l'exploitation de ces infrastructures.

Une évaluation de l'ensemble des entreprises de conduite d'eau régionale et de Wilaya doit être faite pour:

- évaluer l'efficacité technique
- évaluer l'efficacité financière
- définir les améliorations au plan des équipes et des hommes
- définir les améliorations au plan de la planification des usagers.

Les réformes actuelles dans lesquelles s'est engagée l'Algérie offrent les conditions de participation privée dans la gestion et même dans le financement des infrastructures d'eau potable et d'assainissement.

4.12 Projet d'Appui aux Villages Dotés de Points d'Eau Modernes: Animation et Sensibilisation à l'Assainissement autour du Point d'Eau, Hygiène et Utilisation Rationnelle de l'Eau, Mali

by Mrs. Assa Soumare, Présidente de l'ONG AID

durée: 3 ans
 source de financement: Caritas Centrale Vienne (Autriche)
 coordination: ONG AID (Assistance aux Initiatives de Développement)

Contexte et Situation Socio-économique

La Zone du Projet

Le projet se situe dans la zone d'intervention de Mali Aqua Viva. Elle couvre 5 cercles (Bla, Kouiala, San, Tominian, et Yorosso) et 2 régions (Ségou et Sikasso).

Les types de population intéressés par le projet sont: les Banbara, Bobo, Marka, Minianka et Peulh. Les habitants de ces régions sont principalement des agriculteurs et éleveurs. L'artisanat et le petit commerce sont pratiqués par les hommes et les femmes.

Le Projet d'Appui aux Villages Dotés de Points d'Eau Modernes

Depuis 20 ans Mali Aqua Viva réalise des forages, installe des pompes et forme les réparateurs villageois. Compte tenu de la permanence du projet Mali Aqua Viva, les zones d'intervention sont en effet les mieux couverts en points d'eau modernes du Mali (4000 forages réalisés).

Les pompes tombent fréquemment en panne faute de bonne maintenance. Les pièces de rechange sont disponibles sur le marché dans un cercle. Les artisans-réparateurs existent déjà pour faire des réparations courantes.

C'est à partir du potentiel qui existe en points d'eau modernes que l'ONG AID (Assistance aux Initiatives de Développement) s'est fixée comme l'objectif principal, la mise sur pied d'équipes spécialisées dans le domaine de l'animation et la sensibilisation. La finalité est d'aider les villageois à mieux s'occuper de leurs points d'eau (surtout les femmes)

Contraintes Dominantes

Les objectifs des programmes d'hydraulique villageoise étaient de sécuriser les villages dans le minimum de temps, par la création de points d'eau modernes : forages équipés de pompes pour les populations, puits à grand diamètre pour l'abreuvement des animaux, sans tenir compte des charges récurrentes liées à la maintenance des installations.

Au fil des années, les pannes successives des moyens d'exhaure ont contraint les différents intervenants à trouver les solutions qui leur semblaient les mieux appropriées.

- l'uniformisation du matériel de travail et d'exhaure
- la mise en place d'un service après vente de pièces détachées

- la formation des artisans-réparateurs
- la mise en place des comités de gestion d'eau dans chaque localité.

Toutes ces solutions ont été envisagées en vue de responsabiliser les bénéficiaires des ouvrages qui en sont aussi les propriétaires.

Dans la majorité des cas, ces démarches ont conduit à la prise en charge partielle ou totale des frais d'entretien et de réparation des moyens d'exhaure par les villageois eux-mêmes.

Objectifs

- généraux:**
- améliorer la qualité d'eau pour les enfants et la population en général
 - améliorer les conditions d'hygiène et d'assainissement autour du point d'eau
 - améliorer le niveau d'organisation des villages afin d'atteindre l'auto-développement.
- spécifiques:**
- permettre aux populations de disposer de suffisamment d'eau potable pour la consommation,
 - faire le petit arrosage (arbres, pépinières...)
 - promouvoir des actions d'éducation pour le traitement de l'eau de boisson (javellisation, filtrage, désinfection des récipients...)
 - faire le maraîchage avec les femmes à partir des excédents d'eau
 - créer les comités d'hygiène autour des points d'eau (petits aménagements autour du point d'eau, antibourbiers, construction des aires de lavage...)

Activités et Réalisations

- Animation: le projet d'appui au villages dotés de points d'eau modernes cherche à responsabiliser les villages pour que ceux-ci puissent:
 - 1 apprécier l'avantage de l'eau potable par rapport aux eaux de surface
 - 2 s'engager pleinement dans le système de gestion des pompes afin de réduire leur dépendance du projet d'hydraulique villageoise.
 Au cours des causeries débats dans les villages, nous avons remarqué qu'une information et une éducation sanitaire sont indispensables pour motiver les populations à consommer l'eau de la pompe. Pour ce faire, le technicien du service d'hygiène est sollicité pour travailler avec l'équipe du projet.
- Formation et recyclage des artisans ruraux, du personnel du projet et des services impliqués.
- Alphabétisation des membres du comité de gestion de l'eau et des femmes.
- Redynamisation des comités de gestion des points d'eau.

Résultats en Termes Quantitatif et Qualitatif

Pour le moment on ne peut pas parler de résultats, car le projet a démarré il y a juste 4 mois. Sur 60 pompes à pied visitées, 35 sont fonctionnelles et 25 non fonctionnelles, sur les 5 pompes solaires vues, 4 marchent et une est en panne. Suite à la sensibilisation et à l'animation, des caisses pour l'entretien des points d'eau sont créées.

Impact sur les Couches Sociales

- amélioration des conditions d'hygiène autour du point d'eau
- diminution des maladies liées à l'eau
- création d'activités génératrices de revenus pour les femmes (maraîchage...)
- prise de conscience des collectivités à la notion d'eau potable et d'assainissement.

Un des problèmes que l'animation cherche à résoudre, c'est de changer les mentalités en ce qui concerne l'hygiène et la santé. Ce changement de mentalité touche surtout les femmes.

En campagne, la femme veut le point d'eau à proximité de sa maison. Dans certains cas, les points d'eau sont éloignés du village. En ce moment, la femme préfère s'approvisionner en eau à partir du puits traditionnel ou de la mare plus proche des habitations car elle est surchargée par les travaux domestiques (corvée de bois, de mouture et d'eau).

En milieu rural, la femme ne mesure pas encore de nos jours les relations entre eau et santé. Les relations entre la qualité de l'eau et les maladies liées à l'eau sont encore très mal perçues par les populations rurales, principalement les femmes.

Un adage dit en milieu bambara "Il y a des mauvaises gens, mais pas de mauvaise eau". Si en sortant du forage l'eau est très bonne qualité, elle peut être contaminée aussi facilement lorsque le récipient pour son transport et sa conservation ne respecte pas certaines conditions d'hygiène (désinfection, javellisation, filtrage...) La femme en milieu rural ne fait pas attention à la propreté de l'eau.

En milieu rural, le point d'eau est un ouvrage collectif contrairement au milieu urbain où l'ouvrage est individuel et privé. Les femmes se retrouvent alors autour du point d'eau pour échanger des nouvelles. La réalité est qu'elles souhaiteraient avoir leurs puits ou leur forage privé dans leurs concessions. Les coûts élevés de ces ouvrages poussent les collectivités rurales à réaliser des points d'eau collectifs dans les villages. Toute la population y participe en fournissant la main-d'oeuvre, soit en faisant une contribution financière.

Or l'exploitation des ouvrages collectifs causent les problèmes ci-après:

- encombrement à certaines heures de la journée
- création de borbier favorisant la pollution de l'ouvrage
- mauvaise utilisation des moyens d'exhaure entraînant des pannes fréquentes
- manque d'hygiène et insalubrité des eaux liées à la fréquentation des animaux autour du point d'eau (le cas de puits mixtes: villageois et pastoral)
- l'eau du puits souillée par les cordes qui traînent dans le borbier.

Ces problèmes favorisent la détérioration de la qualité de l'eau dans la plupart des ouvrages traditionnels et même des ouvrages modernes équipés de pompes.

Pour remédier à cette situation, une sensibilisation des utilisateurs aux règles élémentaires d'hygiène et de propreté est nécessaire. Aussi une éducation sanitaire dans ces domaines s'avère indispensable.

Ces actions concernent surtout les femmes qui sont les pourvoyeuses d'eau. L'hygiène et l'assainissement du point d'eau doivent être des soucis constants.

Raisons du Succès

- Suivi régulier
- séances d'animation et de sensibilisation
- causeries débats sur l'hygiène, la maintenance des ouvrages et l'utilisation rationnelle de l'eau
- Implication des hommes et des femmes dans la gestion des points d'eau.

Problèmes Rencontrés et Expériences Recues

Il n'y a pas eu de problèmes majeurs dans l'exécution du projet. Le projet étant à ses débuts, on ne peut pas tirer de leçon pour le moment.

La Gestion du Point d'Eau en Milieu Rural - Conclusions

La gestion est en général confiée à un comité qui est formé au niveau du village. Les femmes sont faiblement représentées dans les comités de gestion du point d'eau. Cela s'explique par le fait que ce sont les hommes qui cotisent pour l'achat des pièces et pour la réparation de la pompe en cas de panne.

La gestion se limite en réalité à la réparation en cas des pannes, étant donné que la vente de l'eau n'est pas encore rentrée dans les coutumes en campagne. Pour faire face aux frais de réparation, des prestations de service sont faites par les jeunes dans les champs pendant l'hivernage, tantôt des cotisations sont fixées par famille ou par nombre d'imposables.

Les seuls cas de vente d'eau se font autour des pompes solaires, mais la gestion des recettes cause des problèmes car il n'y a pas de banque dans les villages pour sécuriser l'argent.

Actuellement, à la suite de l'animation faite par notre ONG, les femmes acceptent de payer pour l'eau et même les hommes.

Les prix varient d'un village à un autre (50 FCFA pour 200 l = 1 fut = une barrique, 25 FCFA pour 200 l d'eau dans d'autres villages...). L'eau sera vendue à tout utilisateur, une caisse pour la gestion de l'eau sera constituée, ce qui facilitera les entretiens et les réparations des ouvrages.

Il faut tenir compte des dimensions culturelles. Dans les campagnes, la répartition des tâches est faite selon le sexe. Pour les actions communautaires mixtes, la gestion des fonds est confiée aux hommes (cas des puits par exemple). Les femmes ne sont même pas consultées quant à l'utilisation des fonds et ne sont pas souvent informées. Elles acceptent cette façon de faire, car elles trouvent que ce sont les hommes qui payent les frais de réparation des pompes.

Participation

Il y a des reliquats de fonds à rembourser par les collectivités pour l'installations des pompes (manuelles, à pied, solaires). Beaucoup de collectivités ont payé leur participation à l'installation des pompes. Les populations participent à la prise en charge de l'équipe de forage (nourriture, logement...).

4.13 Plan Directeur de Développement du Secteur Eau et Assainissement 1991-2010, Zaïre

by Mr. Tshiongo Tshibinkubula wa Tumba, PDG de la Regideso

Contexte

Conditions socio-économiques et culturelles: Pays en voie de développement.

Arrangement institutionnel: BAD - Gouvernement Zaïrois.

Contraintes globales:

- Retards dans le décaissement de fonds en devises;
- Déblocage non assuré des fonds en monnaie locale;
- Difficultés de tous genres dans la finalisation de l'étude à cause de retards dans la remise des rapports intermédiaires entraînant des prestations supplémentaires et un surcroît des coûts.

Source de financement:
BAD/Gouvernement
Zaïrois

Budget:

Localisation:
Rep. du Zaïre

Durée: 5 ans

Agence Responsable:
Comité National d'Action
de l'Eau et de
l'Assainissement
"CNAEA"

Objectifs

Doter le Zaïre d'un Plan Directeur Bi-Décennal du Secteur Eau et Assainissement. Les objectifs du Plan Directeur Bi-Décennal:

	AEP		ASN	
	urbain	rural	urbain	rural
Desserte	100%	80%	40%	100%
Dotation	80 l/hab/jr	20 l/hab/jr	-	-

Activités et Attentes

Résultats en Termes Quantitatifs et Qualitatifs

- . Elaboration de 11 Plans Directeurs Régionaux;
- . Identification de 3.945 projets répartis dans les 11 Régions;
- . Valorisation des investissements nécessaires par Régions pour atteindre les objectifs en 20 ans.

Impact sur les Groupes Sociaux

- . Le Plan Directeur identifie des projets couvrant l'ensemble de la population;
- . L'augmentation du taux de couverture entraîne une diminution de la corvée de l'eau pour la femme;
- . Education de la population à la gestion du point d'eau; développement des activités communautaires.

Raisons Fondamentales pour le Succès

- . Organisation de l'étude qui ayant permis la visite de 181 centres pour 348 centres urbains et ruraux identifiés, a donné lieu à une planification à partir de la base;
- . Adoption d'une stratégie basée sur la participation communautaire dans les projets identifiés dans le plan;
- . Agencement des projets en 4 plans quinquennaux disponibles pour une Conférence des Bailleurs de Fonds.

Problèmes Rencontrés

- . Turbulences sur le plan politique et social;
- . Instabilité gouvernementale;
- . Certains Bureaux d'Etudes n'ont pas mis, dès le départ, assez de sérieux pour le travail demandé;
- . Les 2 premiers points ont entraîné un allongement des études;
- . départs des Bureaux d'Etudes après les troubles de 1991;
- . Arrêt de la coopération internationale ayant entraîné la suspension de plus de 48 projets d'un coût global de plus de 175 millions \$ pour l'ensemble des s/secteurs.

Leçons Tirées

- . Il est avantageux de planifier sur une longue période;
- . Vu la superficie du pays, il est indispensable de prévoir une planification par Région et une planification partant de la base.

Conclusions Générales

- . Les études du Plan Directeur ont pu être achevées malgré les difficultés rencontrées grâce à la ténacité et à l'efficacité des Experts Zaïrois, à la compréhension des Bureaux d'Etudes et surtout à la présence et à la continuité du financement de la BAD;
- . Le Zaïre est pour la première fois de son histoire, doté d'un Plan Directeur du secteur Eau et Assainissement.

4.14 Mise en Place d'un Cadre Juridique de la Gestion du Service Public de l'Eau Potable (et de l'Energie Electrique) au Gabon

by Mr. François Ombanda, Directeur Général SEEG Gabon

Caractéristiques du Gabon

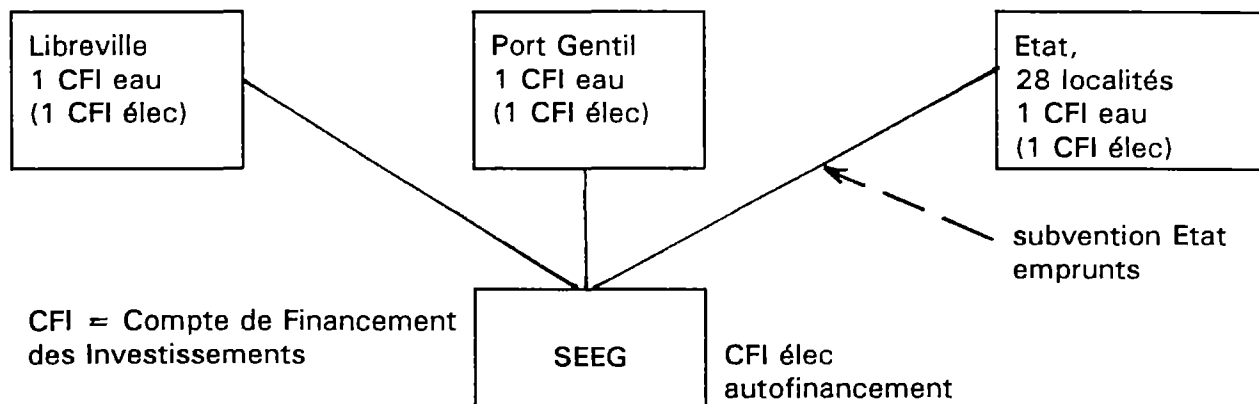
- . 250 000 km²
- . 1 million habitants
- . 50 localités administratives
- . capitale: Libreville (300 à 350 000 habitants)

Activité Eau

- . 30 millions m par an produits
- . 50 000 abonnés
- . capitale: 60% de l'activité
- . volume vendu: environ 80%

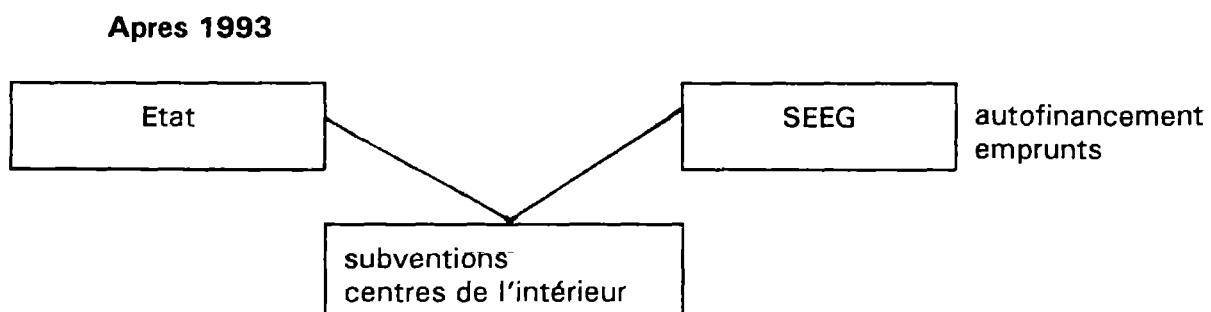
Avant 1993

- . 3 autorités responsables (Libreville, Port Gentil et l'Etat sur la reste du territoire)
- . 1 concessionnaire SEEG: société d'économie mixte: 65% Etat et 36% banques et industriels



Inconvénients:

- . Multiples modalités de financement
- . Plusieurs tarification
- . Plusieurs centres de décision
- . Incohérence d'ensemble

**Avantages:**

- . modalités de financement limitées
- . tarification harmonisée
- . cohérence plus facile à obtenir

Perspectives

- . préparation désengagement de l'Etat dans la gestion de l'activité

4.15 Revenue Enhancement, a Neglected Procedure of Public Waterworks, Malaysia

by Mr. Kam U Tee, waterworks management consultant

Abstract: Although demand management has been achieved in Malaysia, nevertheless, waterworks are run less efficiently due to lack of attention to the commercial aspects of a supply organization. This paper argues that revenue enhancement procedures, hitherto neglected aspect of operations has to be made into a main business priority.

Introduction

Demand Management: an Attained Objective

All waterworks in Malaysia have adopted a full regime of meter reading and billing, some of them as long as 50 years ago. As a result, per capita domestic consumption has been stabilized between 200 to 230 liters per capita per day (lcd). In contrast, some waterworks in neighboring countries that do not supply through meters would, if a full day's pressure could be maintained, return per capita consumptions in excess of 400 lcd. In such cases, however, wastage leads to inadequate supplies and many areas obtain supplies only for a few hours a day, and this had been achieved by allocating inordinate manpower resources to manipulate valves to distribute available water. This daily quest for water can get so intense that local ward politicians have been known to take over control of the valve manipulation crews in order to secure supplies to their wards.

Failure of the Malaysian Systems

Despite the above successes in controlling demand, the process of reading meters, issuing bills and ensuring collections has been, comparatively speaking, neglected over the last 30 years. A 1987 National Non Revenue Water (NRW) study estimates NRW to vary between 40% to 50% in many States of Malaysia. Penang is an exception, with only 20% NRW.

It is now argued that where losses over 40% occur, about 20% of this can be attributed to Under Registration and Under Billing compounded by low efficiencies of collection. The remaining half can be attributed to theft or to physical losses but even so, in the Malaysian context where over 60% of mains are of asbestos cement of over 30 years age, some of them of immediate post World War II vintage, many are now beyond their economic life spans. These pipes have been attacked by acid and sulphate ground waters; the cement matrix of these pipes have been softened and the pipes weakened. Recurrent bursts rather than long standing leaks contribute to losses to the ground. (At a burst rate of 1 pipe burst/km/year, a 6000 km system will have 6000 bursts per annum or 16 bursts per day. If each burst remains unattended for 24 hours, which is common, a considerable wastage from bursts results)

A prioritied pipe replacement program, based on analysis of frequency of bursts and type of breakages, rather than a costly but inconclusive leak detection exercise is required. This is a long term exercise which is more amenable to an annual budgetary provision, made say, from depreciation allowances rather than from a massive injection of capital raised from a loan and

to be implemented within a few years.

Revenue Enhancement: an Immediate Objective

Revenue enhancement procedures - long neglected in the post independence period because of the mind-set that water is an amenity that should be provided either free or at least in highly subsidized form to the new electorate by governments, must now be given priority. Because social welfare costs have been heavy and because growth has been high-up to 7% per annum or a doubling of demand every 10 years, there has never been enough money available to pay for renewals and replacements - the emphasis being on new constructions and more and more mains and capacity. As a result. service has been poor and standards have spiralled downwards.

Revenue Enhancement will focus on the commercial aspects of a water supply. A commodity is supplied, for which certain agreed standards of pressure, flow and quality are assured. In return, supply is metered; bills are issued and payment is expected: if necessary enforcement procedures are implemented. Much of this is the outcome of internal control, such as meter maintenance and audit of readings, externalities relate to consumer satisfaction, consumer consumption profiles, and pricing policies to ensure the product is affordable. Where neglect is manifest in internal processes - these can be remedied with comparatively low expenditures, but with immediate and sometimes spectacular returns of investments.

The following observations are based on a composite study of waterworks encountered over the last 20 years in Malaysia and some neighboring countries.

The Consumer Profile

A. The Rural Demand

Due to increasing pollution of streams and surface wells, and as a matter of social policy, a drive to supply 100% of population with piped water has put pressure on waterworks. In the case of widely dispersed rural populations, it is not economic to supply individual services to households, however stand-pipe supplies are frequently abused and self closing taps are immobilized leading to waste.

Much thought has been given to meet this problem, but so far, the best solution is the Philippines Barangay Water Cooperative, where a village forms a cooperative under the auspices of the water Supply Company, they are given a subsidized bulk supply which is metered and they in turn sell water to their constituents at fixed prices (about P 0.07 per US gallon) - any profits made assure regular payment of water bills, and excess profits are shared by the members.

B. The Urban Slums

In the case of urban slums, (up to 20% to 50% of urban population in Asian cities may be so classified), due to density of population, privacy of users is a problem. Usually stand-pipe taps are immobilized and rubber hoses, which keep branching in binary fission, are laid to households. This again leads to waste and danger of contaminated water. A good solution practiced for many years in Penang and now almost universal in Malaysia is to give interest

free loans to consumers to make connections to their houses, and to input instalment payments, some of them lasting over 5 years into their water bills. This has proved successful and there are few defaults of payments. But what of their capacity to pay?

C. A Social Survey of Consumers

The ability of consumers to pay, is a prerequisite for a successful billing system. A social survey carried out in Penang in the early 70s was the basis of a three stepped domestic tariff in Malaysia. Arising out of a survey carried out between the then City Water Department and the newly formed University Science, a profile of consumers at that time can be summarized in the following table:

Table A: Consumption Profile, Penang Island 1972

type of dwelling	sample size	avg. month consumed	avg. no. heads	avg. per capita consumption
fishing village	50	28 m ³	7	136 lcd
squatter slum	52	30 m ³	8	116 lcd
detached bungalows	38	71 m ³	5	440 lcd
housing estate	56	39 m ³	6	230 lcd
shop houses	98	69 m ³	10	220 lcd
city terrace houses	51	53 m ³	9	200 lcd
total	345	50 m ³	8	208 lcd

D. Affordability of Water

It is to be noted that although the above sample was not exactly representative, nevertheless, the average monthly consumption of 50 m³ was average for domestic consumers as a whole. By 1990 the average occupancy per customer account was nearer to 6 heads due no doubt to the proliferation of flatted condominiums and speculative ownership of these, nevertheless, average per capita demand remains at 230 lcd and average monthly consumption had dropped to 42 m³/month. This process is a common occurrence in the cities of South East Asia.

Notwithstanding the above, a recent survey (1989) indicated that slum density remained at 8 heads per account. The difference between 120 lcd for slums and 220 lcd for city houses must be due to the existence of a water flushing cistern or otherwise.

Because of this, it was successfully argued that significant concessions could be given to the low income consumers by charging the first 20 m³ of consumptions at a subsidized rate, the next 20 m³ consumed at an "average" cost and consumption above 40 m³ at the cost of new water - the same as charges for industry/commercial premises.

E. The Three Tiered Domestic Tariff

If the first block were charged at RM 0.35 and the next block at RM 0.60, the impact on squatter slums would be as follows:

0 - 20 m ³	20 x 0.35 =	RM 7.00
20 - 29 m ³	9 x 0.60 =	RM 5.40

		RM 12.40

Assuming a family income of RM 300 per month, the above represents 4% of monthly income.

In other States, average occupancy per consumer premises can be nearer to 5 heads, it is therefore usual to have lower cut-off points such as 215 m³ and 30 m³ respectively.

A case can be made that even if average costs go up to over RM 1.50 (which will happen when water needs be ported over 100 km) water can still be affordable. In such a scenario, the first block can be reduced to 10 m³/month to be charged at RM 0.50/m³ and the next block between 10 to 30 m³/month, charged at RM 1.20/m³ whilst the 3rd block as well as industrial/commercial consumers can be charged at RM 2.00/m³.

For such a case, a marginal user must reduce his consumption to 16 m³/month, when he pays:

0 - 10 m ³	10 x 0.50 =	RM 5.00
10 - 16 m ³	6 x 1.20 =	RM 7.20

		RM 12.20 or an average of RM 0.76/m ³

This is still better than the Barangay Association charge of P 0.07 per US gallon which works out to be RM 1.9/m³ for which they could only afford 7 m³ of usage per month. (4 jerrycans of water of 50 liters may be a limit of transportability).

F. Industrial / Commercial Water

This can vary between 10% of total demand to 40% of total demand, which is an average for the three cities of Bangkok, Singapore and Penang.

The average consumption per industrial/commercial account in Penang is 200 m³/month; that of Bangkok is only 100 m³/month. Even at RM 2.00 per m³, the average monthly bill is RM 400 per month - less than the pay of a labourer.

In a recent analysis, the industrial ratio in Kuala Lumpur was shown to be only 27%. If it were 37% instead of 27% an increase of 10% metered water of 300 million m³ at a charge rate of RM 1.20 would mean an increase in revenue of RM 36 million per annum. Considering there were only 70 000 industry/commerce meters out of a total of 700,000 meters a good strategy would be to concentrate on the meter reading process and meter change process on these 70,000 meters. This could achieve an immediate and most cost effective return on effort and investment. The returns on this effort can be re-invested in control of the remaining 630,000 domestic meters.

Revenue Enhancement Processes

The Billing Process

The poor results of reading and billing crept up on Malaysian Waterworks in the late 60s and early 70s when billing was done by Addressograph machines and payments posted into electro-mechanical ledger card machines. Growths in excess of 7% per annum were experienced, but this was not reflected in the staffing ratios of the Addressograph operators nor of the ledger card machines. Moreover, mechanical ledger card machines were getting obsolete and no new purchases were added - no spares were readily available. Posting of payments fell behind the issue of bills by 5 months or more. This made it nearly impossible to enforce payments, and collection efficiencies dropped to below 80%. Again, the process of input output of cards was so cumbersome that no analysis of billing statistics were possible - low reading efficiencies and poor control of meter readers resulted. Computers were introduced in the late 70s but there was a slow learning curve, and it was not until the 80s that collection efficiencies rose to above 95%.

The billing process is a scheduled and batch controlled process - reading is organized into reading blocks, each of which should be read in a fixed schedule. No straggling blocks can be allowed. Early attempts at billing, which only catered to systems analysts and their machines, failed. The interposition of a data control and in-put section, controlled by a disciplined "sergeant major", was necessary between the computer room and the meter readers. Internal control of process is vital - Penang Waterworks provided the necessary controls and succeeded the first time around; KL waterworks did not, and several degrees of failures ensued over the years.

Collection Procedures

In order to service consumers, some waterworks employed bill collectors who went to consumers premises. Apart from poor security, it was not possible to keep track of consumers who did not pay on first or second visits. It became impossible to tell whether a non-updated payment was due to non-collection or due to the collector not reporting payments on time. Such a dilemma was solved in Bangkok, by the collector leaving a bill if no payments were made after the first visit. Subsequently it became the responsibility of the consumer to go to the waterworks branch office to pay his bill. Collection efficiencies of over 90% became possible. Computerized receipting machines and tight communication procedures followed by stringent enforcement subsequently improved collection efficiencies to above 48%. In Penang, efficiencies of collection are consistently above 99.5%.

Consumer Satisfaction

Enforcement procedures can become a cat and mouse game between consumers and meter disconnectors. In the end, the axiom that a satisfied customer is willing to pay for goods received holds true. For collection efficiencies above 95%, a satisfactory service, both as regards to pressure and quality is a prerequisite. Often a fall in services is followed by poor payments which further exacerbate the situation. Very close coordination between capacity building and revenue enhancement and improvement of distribution systems has to be incorporated into an integrated plan. This means integrated and competent management.

A Need for Integrated and Competent Management

The practice so prevalent in Malaysia of privatisation only involving the privatisation of the treatment processes, followed by bulk sales to the water undertaking, without due regard to the overall business practices of the organization is therefore very short sighted. Under these circumstances it is hard to see how privatisation can bring the effects of improved efficiency to waterworks.

Analysis of Data

This has been shown necessary to transform a poorly controlled billing system into a viable system. Types and sizes of meters; date of fixing in consumer premises, serial numbers of meters - these and other strategic information can be stored in computer memory available for reference within an instant. Other statistical data such as consumption per premises and ratio of industrial/commercial consumptions, give invaluable information for management.

However, the storage of more data is also a double edged sword. A well controlled system of inputting changes must be devised. For example, when meters are changed and the new meter readings are not input into the computer, some astronomical sums may be billed to consumers.

Lately, there has been much talk that privatisation by itself, can lead to improved performances of waterworks. The immediate riposte to such claims is that many do not see how the replacement of a public monopoly by a private monopoly can lead to improved efficiencies. It has been agreed that some form of standardized performance parameters can be used to measure efficiencies, but not much progress has been made. The waterworks of Bangkok, Singapore and Penang have cooperated in this field and some performance parameters have been incorporated into their annual reports. Some graphs are included in the Appendices to indicate some of these parameters and how they may be used to induce comparison, competition and encouragement between water undertakings.

As another example, even before the output meters is filtration plants in Perlis, (which were subject to a 5 year maintenance programme by a private company) could be read accurately, a control of the average meter consumptions per consumer account per meter reading block, enabled control to be placed on meter readers in Perlis. Over a 1 year period, average returns per account increased from 23 m³/month to 27 m³/month. (See Table B)

Conclusions

It is agreed that long term planning and capacity building is necessary to keep up with demand of the burgeoning populations of Asian cities. However, after the consultants walk away, the waterworks must be run to achieve adequate returns on the investments. The only proper way to achieve this is to focus on the commercial aspects of waterworks, taking into account the whole gamut of processes from collection of water, treatment of water, distribution, billing collection and customer relations, inclusive of enforcement of payments.

The current trend to equate privatisation as a means to achieve commercialization, but stopping with BOT schemes is not satisfactory.

Table B: Analysis of Consumptions: Perlis Supply C2.1993

	m ³	accounts	m ³ /month	comments
Sanglang	90,122	3,832	23.5	rural
Berembang	28,911	1,281	22.5	rural
Kl. Perlis	119,551	4,316	27.7	commerce
Arau	170,887	7,419	23.0	residential
Kangar	249,621	9,498	26.3	city
Santan	204,212	6,992	29.2	industrial
P. Besar	44,022	3,303	13.3	water stress
etc. etc.				
total	1,829,778	67,826	27.0	
average cost	RM 0.417/m ³			

4.16 Innovation and Management of Water, Sanitation and Environmental Problems in Urban Areas - an Integrated Flood Control, Water and Park Policy - the Case of Curitiba, Brazil

by Mr. Jonas Rabinovitch, UNDP

Context

Location

Curitiba, Brazil (Pop. 1.6 million in 1992)

Physical Setting

The city of Curitiba is located at 25 degrees South and 49 degrees West. The setting is characterized by rolling hills with plateaus to the North, South and Southeast towards the Iguazu basin, main river of South America's South Cone region. The municipality has an area of 432 km², situated 87 km West of the Atlantic Ocean at an average altitude of 908 meters. The climate is subtropical and the area of the municipality is composed of a series of micro river basins. The abundance of water bodies also explains the development of the city in the region.

Socio-economic / Cultural Aspects

A minimum wage in Brazil is approximately US\$ 75. The table below illustrates the socio-economic conditions in Curitiba, in comparison to Sao Paulo (biggest Brazilian city with 9 million inhabitants) and Brazil (including socially contrasting rural areas).

Table 1: Income Distribution - Curitiba, Sao Paulo, and Brazil

number of minimum wages (monthly)	Curitiba (% of households)	Sao Paulo (% of households)	Brazil (% of households)
1	4.9	4.4	18.0
2-3	28.1	29.9	38.5
4-5	25.7	17.6	18.4
6-10	25.6	27.2	14.1
11-20	11.4	13.6	6.8
21 +	4.3	7.0	4.0

Source: IPPUC household survey 1990 (Curitiba); IBGE National Census, 1990

Constraints

The constraints were mainly of a financial and managerial nature. During the 60s, the city of Curitiba was spending the 'average cost of an automobile per linear meter of underground drainage ducts', according to a city official. The technological decisions were made by bureaucratic layers within city hall. Expensive, conventional and unnecessary solutions were being suggested by administrative personnel who were physically, technically and managerially distant from the problem. The city experienced constant and serious flooding

problems, while proposed conventional solutions were much more expensive than the municipal budget could afford. The creation of the Curitiba Research and Urban Planning Institute, and its coordination with the Municipal Secretariat for the Environment, under the leadership of a progressive mayor, allowed for more direct and creative action.

Objectives

Among other urban development objectives, the city aimed at controlling the flooding problem, while, at the same time implementing a sustainable environmental policy. This policy resulted in the substantive increase of the green area ratio per inhabitant and in the effective control of urban growth.

Results and Achievements

During the last twenty years, green space per capita has increased from 0.5 m² to 52 m². The flood control programme was successfully implemented at a reasonable cost. Artificial lakes were built in most of the new 16 parks, which, in practice, also work as gigantic water stabilization ponds, helping with drainage objectives. The area of these parks varies from the large Iguazu (8 million m²), to the medium-sized Barigui (1.4 million m²) and the small Barreirinha (80,000 m²). Land use legislation was gradually enacted to protect river/stream bottom valleys, allowing for a policy to implement cycleways lining the various park. The average total cost of implementing these works was at least five times less than conventional drainage facilities. It also resulted in a self-financed approach, as the real estate property tax paid by those who settled near to the parks helped fund this initiative. The managerial coordination of IPPUC also allowed for the spatial relationship between park implementation and the configuration of the Curitiba Integrated Public Transport Network.

Problems Encountered

Many areas had private owners and juridical processes had to be undertaken so that the municipality could legally buy those areas and turn them into public parks. The formation of the correct managerial equation was a time-consuming exercise and did not happen instantaneously.

Lessons Learned

The case study seems to demonstrate that it makes institutional/managerial sense to separate the institution that develops the planning from the institution that executes the works. It also demonstrates that technological solutions are dependent on a balanced administrative/managerial organization, with a clear definition of responsibilities. It also demonstrates that water/sanitation/drainage interventions can and should be integrated to environmental policies, allowing for other positive by-products such as bicycle planning, land use control and implementation of green areas.

Conclusions

Cities of the developing world (and increasingly the ones of the developed world) do not have the financial resources to provide conventional infrastructure services to its growing populations, mainly to the lower income segments. If there are no financial resources to solve

problems conventionally, a strategic approach involving non-conventional technologies should be managed. Creative and integrated solutions, counting on a well defined planning and implementation scheme, can be developed at a fraction of the cost of conventional approaches, provided the correct institutional and managerial equation is developed.

Notes

Funding - Provided by the municipality budgeted, which is of the order of US\$ 250 million annually.

Cost - Total costs are not available.

Executing Agency - The programmes were planned by the Curitiba Research and Urban Planning Institute (IPPUC) and executed by the Municipal Secretariat for the Environment (SMMA), in coordination with Urbanization of Curitiba (URBS - Public Transport).

Duration - The paper does not refer to a specific project, but to a whole programme that virtually changed the spatial configuration of the city throughout two decades of continuous work.

4.17 Institutional Strengthening: Hyderabad Metropolitan Water Supply and Sewerage Project, India

by Mr. V. Lakshmi pathy, RCUES-OU

1. Context

Hyderabad - composed of the twin cities of Hyderabad and Secunderabad - is the capital city of the state of Andhra Pradesh, India. The service constituency (the Municipal Corporation of Hyderabad, the 9 municipalities (towns), Cantonment and a few villages in the Hyderabad Metropolitan Area) for provision of water supply by the Hyderabad Metropolitan Water Supply and Sewerage Board, is spread over an area of 169 km².

The city acquired the status of state capital in 1956, and became the centre for development/ location of industries, trade & commerce and educational institutions. The consequential rise in employment opportunities attracted large scale influx of population from the other regions of the state as well as the other parts of the country, adding to the burden of the already extended service of water supply.

Even after the completion of major water exploitation works, a deficit of 30.5 mld is expected to continue. The Government of Andhra Pradesh, therefore, constituted an expert committee, to explore new sources of supply. and possibilities of further augmentation of water supply to the city. The expert committee carried out detailed studies and identified the river Krishna (at 125 km from the city) as the potential source. The rising demand, by tradition as can be seen, was always sought to be met by additional impoundments from time to time.

The city population grew from 0.5 mln in 1911 to 3 mln in 1991, at a rate of almost 40% over the last decade. The urban agglomeration is projected to increase at an even faster rate up to 10 mln inhabitants in 2011.

Despite the numerous additions, the gap between demand and supply persisted, leading to increasing exploitation of ground water. The two strategic approaches to improve the level and quality of service viz. 'demand driven management' and 'management of unaccounted for water' and the tools and techniques for their adoption are yet to be appreciated in the organisation.

Source of funding: World Bank

Budget Rs 34.911 millions
(relevant component only)

Location: Hyderabad, India

Duration 5 years (estimated)

Responsible agencies:

Hyderabad Metropolitan Water
Supply and Sewerage Board &
Regional Centre for Urban and
Environmental Studies, Osmania
University.

The projected demand for water supply by the year 2011 is profiled in the table below.

demand category	in mld
domestic requirements 70% population @ 175 lpcd, 30% @ 85 lpcd	1480
industrial requirements @ 15% of the domestic demand	222
fire fighting and miscellaneous	10
enroute villages and fringe areas	23
total	222
supply from existing sources	682
net additional demand by 2011	1053

Administrative organisation: Water Supply and Sanitation Service is a part of the mandate of Local Government in the State (AP). However, the state government, following the tradition of the founding fathers of the city, took it upon itself to administer the water supply component of the service to the extent of the city though being the only city of corporation class. The sanitation component was assigned to the MCH.

In the year 1986, financial assistance of the World Bank was sought for augmenting the city water supply and on the suggestion of the Bank, an independent and autonomous organisation -the Hyderabad Metropolitan Water Supply and Sewerage Board- was created by an Act of State Legislature. The sanitation component of the service which was with the Municipal Corporation of Hyderabad all along the time, was also transferred to the newly constituted Board.

2. Hyderabad Metropolitan Water Supply and Sewerage Board, Corporate Objectives

The HMWSSB is charged with the responsibility of achieving the following objectives:

- i. Planning, designing and construction of capital works for water supply;
- ii. Planning, designing and construction of capital works for sewerage;
- iii. Maintenance and operation of both water supply and sewerage facilities in the city;
- iv. Collection and accounting of revenues, in manner to ensure HMWSSB as a financially viable organisation;
- v. Planning and implementation of the low-cost sanitation program under the project; and
- vi. Planning and organizing comprehensive employee knowledge and skill development programmes through the establishment of a captive training centre.

3. The Project

The project is conceived to improve the services of water supply, sewerage and sanitation as well as the environment and health in the city. 'Manjira Phase III Stage 2', as originally presented to the Bank Group, envisaged financial and technical assistance from the Bank. Each stage was planned to supplement the existing supply by 135 mld of treated water. The project was arranged into the following 6 components:

- Manjira Phase III Stage 2;
- Rehabilitation and Strengthening of the Existing Water System;
- Rehabilitation and Strengthening of the Existing Sewerage System;

- Low Cost Sanitation;
- Resettlement and Rehabilitation;
- Institutional Strengthening.

4. Organisational Weaknesses

- 4.1 The conceptual trap imposed by tradition and historical practices of increasing the supply to meet growing demand.
- 4.2 The organisational stance of a provider rather than a service entity, arising out of administering the service as a government department.
- 4.3 The limitations on management autonomy arising out of being a government department.
- 4.4 Institutional reluctance to step out of the zone of comfort arising out of the principle of bureaucratic anonymity of a govt department.
- 4.5 Absence of the need or responsibility to generate adequate revenues, to sustain service operations characteristic of public grant and expenditure systems.
- 4.6 The conflict arising out of the need for operational flexibility to ensure cost effectiveness and efficiency and the traditional rigidity characteristic of the government systems pertaining to personnel, administration, finance and accounting, materials and stores, function/ reporting relationships.
- 4.7 The traditional reluctance coupled with lack of systems as well as personnel skills and abilities, to estimate the 'cost' of providing the service, to define and to modify tariff structure for generating adequate revenue returns as against the traditional concept of treating water as a 'gift from God', and therefore, should not be charged.
- 4.8 Lack of expertise to modify and redefine the existing procedures for financing and accounting which are more in accordance with the features of public grant and expenditure (Government Revenue Administration) rather than shaping them as 'management tools' to maintain effectiveness and efficiency in delivering the service.
- 4.9 The traditional practices of personnel induction where in the employees acquire necessary skills through on-job learning rather than deliberately designed training systems.
- 4.10 Limitations on personnel management imposed by absence or non availability of tools and skills to carry out job analysis, job description, job specification, performance standards, manpower planning, recruitment, positioning, performance evaluation, job rotation and enrichment, career planning, data generation and documentation.
- 4.11 Systemic inability to view training as a developmental input to improve efficiency and effectiveness.
- 4.12 The unique political system of 'zoning' - a historical legacy on manpower deployment and the welfare oriented policies on recruitment, career advancement created a bind on the organisation against the implementation of a need based policy on deployment as well as career advancement resulting in litigation and frustration amongst the employees
- 4.13 The handicap of lack of exposure and experience of working with ESAs e.g. Being the first of the Bank aided Projects in the state, even the senior level personnel were at a disadvantage in introducing organisational or function changes and working styles, to suit the Bank's systems and procedures pertaining to project formulation, appraisal, implementation, management, accounting, evaluation and documentation.

5. Human Resource Development and Management, a Diagnostic Study

As can be seen, the government of Andhra Pradesh, initiated the important administrative reform of reorganisation of the institution, from a department to an independent and autonomous board, with a view to improve systemic efficiency and effectiveness of the city water supply and sewerage service. The emergent board was empowered to formulate and adopt policies, programmes, projects and schemes free from external interference or control. A board of directors with the chief minister of the state as the chairman and other directors of the level of secretaries/heads of departments from the related organisations was constituted, to facilitate inter-agency coordination in implementing the schemes and action plans of the Board. The newly constituted board, initiated various administrative measures to implement the project within a time bound horizon. The top management appreciated the fact that effective implementation of the project stipulate integrated management of various functions such as project planning, survey and investigation, construction, storage, treatment, distribution, leak detection, pollution control and quality assurance, technology transfer, materials and inventory control, operations and maintenance of tools, plants and systems, personnel, revenue, finance and accounting, information systems, etc.

The RCUES-OU, being the nodal agency in the sector, was identified as the resource institution and entrusted with the task of carrying out the diagnostic study to provide inputs for human resource development and management and to formulate a scientific Training Action Plan (TAP), with the objective of enhancing staff abilities to meet the emergent performance demands. The diagnostic study was undertaken by the RCUES-OU, primarily to develop policies, strategies and plans for efficient and effective utilisation of the available human resource, to develop an inventory of training needs in the context of the ongoing project and to formulate the TAP, under the component 6: Institutional Strengthening.

6. Study Approach

Based upon preliminary meetings with sample segments of employees from all categories, the following were identified as the thrust areas for immediate action by the HMWSSB:

- i. Improvement of the service delivery system, to make it more effective and efficient; and
- ii. Improvement in the quality of work environment in the Board through formulation and implementation of personnel policies in tune with contemporary concepts on Human Resource Development and Management.

7. Task Group

A task group consisting of members from RCUES-OU and the Project Management Group (PMG) of the HMWSSB, was constituted to develop the detailed study design and action plans.

The strategy of involving the senior managerial personnel in every phase of the study and to encourage intensive participation and interaction with all other categories of employees was adopted to minimise confusion pertaining to the purpose and objectives of the study and for gaining corporate consensus on the potential plans for action and implementation

Methodology: an extensive field survey of various units of the HMWSSB, was carried out

which led to the identification of the following for a systematic study and analysis immediately:

- i. Job content of all the positions - operating, supervisory, middle and top levels in the technical and administrative segments;
- ii. Job profiles - descriptions, specifications, contents, standards and methods of performance evaluation;
- iii. Personnel performance with a focus on gaps between the actual and expected standards/norms;
- iv. Blockades - institutional, individual and environmental -affecting the corporate/employee performance; and
- v. Training needs - identification, development of appropriate inputs for improving personnel performance.

The techniques for analysis included 'on-job-observation', structured interviews and open ended discussions with the employees of all levels, categories and functions, participatory workshops, group discussions on simulated scenarios, problem analysis and identification exercises, primary literature survey, and study of policy documentation.

Concurrently, a HRDM orientation program for the first and middle level personnel was also conducted to facilitate familiarity with the study purpose and techniques in order to remove apprehensions if any on the part of the employees.

At the same time a study on 'Level and Quality of Service- User Perceptions' was carried out on a sample of 2000 users spread out through the entire distribution network, for developing employee sensitivity to user participation and to design the techniques for improving the staff-user interface and to develop appropriate training material.

8. Achievements

8.1 Development of a new Corporate Charter for the HMWSSB, covering the following organisational elements:

- a. the corporate mandate to provide the direction for extending the services.
- b. management ethics
- c. quality and consumer orientation
- d. public relations
- e. business environment- structure and staff
- f. productivity
- g. work culture
- h. research and development

8.2 Need analysis and formulation of the following:

- a. new job nomenclature, activities, responsibilities, descriptions, classifications, evolved through direct participation and consensus.
- b. clear cut inventories of employee training needs arising out of the emerging demand and scale of skills especially with reference to the goal of becoming an autonomous business organisation in the sector.
- c. the design and action plan for establishing a captive training centre which in due course of time reduces dependence on external institutions for employee training.

9. Immediate Output

- 9.1 A comprehensive corporate plan prepared through employee participation and within a short period of one year.
- 9.2 Creation of a full-fledged training division within the Board.
- 9.3 Greater appreciation of the need to share knowledge and skills with colleagues, on the part of knowledgeable employees as demonstrated through their offer to prepare learning material for various modules.

10. Underlying Reasons for Success

- 10.1 Transparency of the study efforts.
- 10.2 Support, commitment, involvement and participation of the top management group in the study efforts.
- 10.3 Employee involvement, participation and consensus at every stage of the study.
- 10.4 The work philosophy of RCUES-OU, in designing and planing the implementation of reforms on a participatory basis and the close rapport between the two organisations at every stage of implementation and monitoring.

11. Problems Encountered

- 11.1 Short tenure of the chief executives of the target organisation. With a change of the chief executive the organisational priorities were changing.
- 11.2 Inter-function conflict between the line and staff, especially in respect of roles, responsibilities, importance and authority.
- 11.3 Lack of familiarity with research methodologies and procedures.
- 11.4 Expectation of quick results from the training inputs.
- 11.5 Reluctance of specialists within the organisation to step out of the precincts of specialisation.
- 11.6 Employee reluctance to contribute meaningfully, as a result of the preconceived notion of threat potential of the removal of function overlap and redesigning of the organisation. The perceived loss of power caused a high degree of suspicion on the objectives of the development inputs and reforms The top management as well as the study group were attributed with motives of bias against employees.
- 11.7 Lack of a exposure to the culture of action research because of which the diagnostic attempts at times suffered the odium of camouflaged departmental investigation to weed out 'the unwanted'. Consequently, the employee at times were reluctant to contribute information. Data generation was therefore very slow and cumbersome.

12. The Present Scenario

- 12.1 Over sixty percent of the supervisory cadre of the employees have already undergone the first phase of orientation training.
- 12.2 A perceivable change in the employee outlook on the role of the funding agency, the utility of training and the need for interaction with the consumers.
- 12.3 Greater visibility of the willingness on the part of the employees to share their knowledge and experience with their colleagues- as measured through increasing contribution and willingness to participate in developing training materials and the formation of a full-fledged training division.

12.4 Considerable reduction in the level of user grievances in the category of lack of sensitivity to their difficulties.

13. The Future Scenario

13.1 Enlarged scope for action oriented research and sustenance of the university and user linkages on a longer time frame, rather than being confined to the present project.

13.2 The RCUES-OU, having been accorded the status of centre for excellence in research and advanced studies by the University Grants Commission, Government of India, leading to increased availability and access to professional education programmes in the Urban Utility Sector.

13.3 The nascent training centre in the HMWSSB may emerge as a sector institution in the state of Andhra Pradesh.

13.4 The project is also expected to have a useful demonstration effect on the other projects in the country.

References:

1. Training Action Plan, RCUES-OU and HMWSSB, 1992
2. Water Supply and Sewerage System in Hyderabad. Level and Quality of Service -User Perceptions, RCUES-OU, 1993
3. Service Regulations - HMWSSB, RCUES-OU and HMWSSB, 1992

4.18 Institutional Arrangements in Water Supply and Sanitation in Brazil

by Prof. Alex Abiko, University of Sao Paulo

Socio-economic Context

	Brazil	France
area (km ²)	8,511,99	543,965
population (1991; million)	151,6	57,0
urban population (1991;% total)	75	74
population density (1991; per km ²)	17,8	105,0
pop in cities > 1 million (% urban population)	47	26
GNP (1990; US\$ billion)	402,8	1,100
GNP per capita (1990; US\$)	2,680	19,590
infant mortality (1991; per 1,000 live births)	59	7
maternal mortality rate (1988; per 100,000 live births)	230	13

Water Supply and Sanitation

- before 1969, the responsibility for water and sewerage was of the local authorities (Municipalities) that couldn't solve the deficit of these services;
- in 1969, the military government (that took power in 1964) created PLANASA (National Sanitation Programme), under the jurisdiction of the BNH (Housing National Bank), centralizing all the financial and normative activities;
- PLANASA decided to work with States (24) rather than Municipalities (4200) having in mind the following advantages:
 - . operational facilities;
 - . basin management;
 - . possibility to introduce cross subsidies for the consumers and/or Municipalities.
- the fall of the military government in 1985 is a result of various crisis in the Brazilian institutions including the biggest, the financial crisis that remains until nowadays with high inflation rates (42% last month of April);
- in 1986 BNH and PLANASA were extinct; since 1976 the central government established the price of water, with readjustments below the inflation rates; this resulted in an expressive deficit for the water companies;
- PLANASA indicators:
 - . total investments: US\$10 billion
 - . additional customers reached: 56 million
 - . additional households served: 15 million
 - . financial resources:
 - . from BNH (compulsory saving as % of all the salaries): 50.95%
 - . from States and Municipalities: 40.30%
 - . World Bank and international agencies: 8.75%
- since 1986 when of the extinction of PLANASA, there is no centralized institution that coordinates the water supply and sanitation in Brazil; what has thus occurred forced by demand pressures is the involvement of State and Municipal authorities, as well as central government that participates in a less influential way that it did in the past;

- through the numbers and the graph shown below it is possible to trace the achievements attained during PLANASA existence (1967/1986); the goals obtained in such a period have been eroded by the financial crisis and the institutional indefiniteness;
- during the water decade (1980/1990), the percentage of the population served by water supply remained unchanged; however there has been a greater attention paid to aspects referring to the sewerage system;
- the new Constitution of 1988 establishes enhanced attributions of the Municipalities, as well as endowing them with a larger amount of financial resources; with regards to water supply and sewerage the Municipalities are autonomous to implement their systems, directly or through state-owned companies.

Population, Water Supply and Sewerage

	1960	1970	1980	1990	2000
population (million)	72.6	93.1	119.0	151.6	172.8
urban pop. (million)	32.7 (45%)	52.1 (56%)	81.0 (68%)	113.7 (75%)	140.0 (81%)
access to water (million)	39.3 (54.1%)	53.4 (57.4%)	100.8 (84.7%)	127.8 (84.3%)	-
access to sewerage (million)	17.3 (23.8%)	24.6 (26.4%)	47.1 (39.6%)	84.1 (55.5%)	-

Institutional Arrangements

- at present day, Brazil is moving from a centralized state, with rigid and inflexible procedures to a decentralized state, with flexible procedures and heterogeneous options; to put these ideas into practice it is necessary to implement a radical institutional reform;
- the difficulties exist due to disagreement between technical, administrative, political and financial parties and to the enormous social and economical differences within the country;
- in the urban system it is pointed out that segmentation of the sectorial policies is responsible for the accumulation of inefficiencies;
- the institutional arrangement in water supply and sewerage in Brazil should have as basic principles the elimination of inefficiencies and the optimization of production processes, distribution and commercialization of services, through instruments that:
 - . create conditions to supply water and sewerage to all the population, mainly to low income people;
 - . create public agencies acting with a business like approach not leaving aside the compatibility between economical rationality and social objectives;
 - . stimulate the participation of the private sector, in an open and transparent competitive basis, with a strong regulatory system;
 - . enable greater institutional flexibility in the supply of public services;
 - . ensure the social control by the consumers of the public services;
 - . create alternative resources to finance the expansion of the supply.

- there is a rising trend of projects that take into account environmental sanitation in opposition to basic sanitation; the recent projects include solid waste, drainage and other aspects of the environmental theme (in Brazil, only 8% of the sewage is treated); the institutional arrangement should be prepared for this challenge;
- an example is the Integrated Environmental Sanitation Project for the Guarapiranga Reservoir Basin, in the metropolitan region of Grande Sao Paulo, that aims at controlling and rehabilitating the water quality of the reservoir through the progressive improvement of the environmental conditions of the reservoir basin; in order to reach this objective the project proposes integrated interventions having in mind the conservation of natural resources with the promotion of activities that give sustainability to different kinds of basin protection.

4.19 Water Sector Restructuring Study, Jordan

by Mr. Nabil Sweis, Ministry of Planning

Socio-economic and Cultural Conditions and Overall Constraints

Jordan is a small country of four million people with an economy of \$4 billion. It has few natural resources, very limited water resources, little agricultural land and its short history is one of unexpected challenges.

The economy grew during the 1970s and early 1980s. Assisted by foreign transfers and remittances of Jordanian workers abroad, Jordan based its development on a skilled labor force, expansion of state institutions and public investment and employment. Literacy became widespread. Universities and polytechnic institutions were built and staffed. Health standards rose and, by the mid-1980s, poverty was negligible.

In the late 1980s, external and internal factors shocked the economy and burdened the poor. Regional tensions and conflict required high military expenditure. The private sector was weak and reliance was on government to create employment. The Gulf War disrupted trade patterns and about 300,000 Jordanians returned from living and working abroad. Workers' remittances and transfers from outside were interrupted. The world-wide economic slow down was unfavourable for exports. The government's reform programme has stabilized the economy but it has not resolved underlying structural problems. Poverty and unemployment became pressing social issues.

Institutional Setting

The Ministry of Water and Irrigation (MWI) has emerged from a number of largely independent organizations that had specific roles in the water sector. Most of these bodies were created with donor supported projects. Beginning in the 1980s, a series of mergers were begun which eventually resulted in two semi-autonomous bodies, the Water Authority of Jordan (WAJ) which is responsible for municipal and industrial water supplies and waste water; and the Jordan Valley Authority (JVA) which is responsible for irrigation water. Until 1988, these authorities were independent, each with its own operating procedures and personnel system.

In early 1988 the Ministry for Water and Irrigation was created, bringing the Water Authority and the Jordan Valley Authority under one umbrella, with a Minister who is Chairman of the Board of Directors for both. The Secretary General of each authority is the Vice-Chairman of the other authority's board.

Since the merger referred to in (2) above, MWI has been studying the roles and functions to determine which should be ministry-wide and which should remain with the authorities (WAJ & JVA) and whether to create a new structure integrating the two authorities within the ministry. The ministry has an estimated 8,700 staff. It is becoming very urgent to streamline the activities of MWI and suggest a future institutional framework, thus MWI initiated an institutional and financial restructuring study.

Objectives of the Study

The main objectives of the study are: (a) to strengthen the newly established Secretariat at MWI to enable it to develop and manage: a long-term water policy; a water resources data bank; a water quality control program; and strategic planning and development of water resources programs, which would serve as a foundation stone for integrating policy formulation and development in urban, industrial and agricultural sectors; and (b) to reorient the management of the services agencies to enable them to provide good quality, efficient and financially viable services. In this regard, consideration should be given to the role the private sector can play in the effective and efficient management of utility services.

Scope of Work

The scope of work involves the following services:

Phase I

- (a) review existing water policy objectives and legislation;
- (b) review the role of JVA as it regards integrated management of the Jordan Valley;
- (c) review existing organizational structures and resources at MWI (new secretariat), WAJ and JVA with the purpose of: defining functions and responsibilities, staff qualifications and needed facilities at MWI; identifying overlapping functions and gaps at WAJ, JVA and MWI's new Secretariat; assessing staff qualifications at WAJ and JVA with a view to identifying staff resources that could be transferred to MWI and to strengthening them; and identifying available facilities and equipment at WAJ and JVA which should or should not be transferred to MWI;
- (d) propose recommendations for: (i) transferring qualified staff and facilities from WAJ and JVA to MWI; (ii) keeping and strengthening complementary functions at WAJ and JVA and recommending procedures for working together; and (iii) amending water policy and legislation regarding the role of WAJ and JVA as operating entities, and, if JVA, should reinstate its functions, give specific recommendations to strengthen integrated management of resources in the Jordan Valley; and
- (e) propose options for restructuring WAJ and JVA;

Phase II

- (f) develop detailed restructuring programs of organizational changes at MWI;
- (g) develop detailed restructuring programs for WAJ and JVA based on the preferred option;
- (h) develop WAJ's and JVA's financial viability and operating efficiency programs.

Phase III

- (i) provide technical assistance for implementing the proposed recommendations.

Status of Study

A contract for consulting and professional services has been signed with Deloitte and Touche Management Consultants and financed by the Canadian International Development Agency (CIDA). The estimated cost of the work is about 1.5 m Canadian dollars and the responsible Jordanian agencies are the Ministry of Water and Irrigation (MWI) and the Ministry of Planning (MOP). This study (Phases I & II) will take 14 months to complete, so the results should be available by August 1995.

4.20 Quelques Notes sur la Présentation du Père Verspieren, Mali

Le Mali, pays de 1.25 millions km², au coeur de l'ouest africain, est un pays aride:

- la moitié du territoire est occupée par le désert du Sahara
- un quart, la zone sahélienne, reçoit moins de 600 mm, de pluie par an
- seul le dernier quart, la zone soudanaise au sud du pays, reçoit plus de 600 mm, pendant "l'hivernage" entre juin et septembre.

Le Père Bernard Verspieren, arrivé au Mali en 1950, a d'abord été missionnaire dans la région de San (400 km au Nord Est de Bamako, à la limite de la zone sahélienne). L'arrivée de la sécheresse en 1975 le conduisait à créer une association, Mali Aqua Viva, pour alimenter en eau les villages de la région et apprendre aux villageois à exploiter au mieux les ressources en eau disponibles.

Cette structure avait pour objet de réaliser les forages en mesure d'exploiter les nappes d'eau souterraines (les eaux de surface sont rares car il ne pleut que trois mois par an); il fallait aussi fournir les moyens d'exhaure (sans pompe un forage ne sert à rien): pompe à pied 'Vergnet' à la maintenance aisée, pompes solaires photovoltaïques immergées ou de surface, ...

Mali Aqua Viva étendait ensuite ses activités à l'utilisation de l'eau sous tous ses aspects: fermes modèles, reboisement, pisciculture, santé, écoles, oeuvres pour handicapés,: la liste des actions entreprises depuis 20 ans par le Père Verspieren est trop longue pour figurer dans une note aussi brève.

Pour situer l'oeuvre entreprise un seul chiffre: en 20 ans Mali Aqua Viva et les diverses associations travaillant avec cette ONG, ont investi au Mali plus de 100 millions US\$ fournis, pour l'essentiel, par des dons de particuliers, d'entreprises et d'associations d'Europe ou d'Amérique.

Mali Aqua Viva dotée à l'origine d'un atelier de forage moderne, s'est progressivement agrandie en faisant fonctionner jusqu'à quatre ateliers: aussi elle a réalisé en 20 ans plus de 3000 forages d'une profondeur moyenne supérieure à 60 m. Ils permettent d'alimenter en eau environ 1 million d'habitants des campagnes soit 10% de la population du Mali. Cela représente un investissement, pour les seuls forages, d'environ 40 millions US\$.

Ils sont équipés de pompes à pied choisies pour leur facilité de maintenance: des mécaniciens spécialement formés peuvent, sur appel des villages, remplacer les pièces défectueuses. Ces pompes au débit moyen d'1 m³/h équipent les forages peu productifs. Les bons forages sont dotés de pompes solaires immergées en mesure de donner 40 à 50 m³/jour d'eau: on peut alors créer, pour les écoles, des jardins irrigués exploitées par les écoliers. En 20 ans l'investissement en pompes (à pied et solaires) de Mali Aqua Viva présente la plus forte densité au monde de pompes solaires photovoltaïques.

Leçons de cette expérience: au cours du séminaire de Louveciennes le Père Verspieren a rapidement décrit Mali Aqua Viva; il a ensuite présenté les enseignements tirés de ses 40 ans au service des populations pauvres du pays, et de ses 20 ans de fourniture aux villages du service de l'eau essentiel dans un pays où il ne pleut pas.

En premier il constate que les ouvrages donnés à une collectivité ont une durée de vie généralement faible: aucun habitant ne trouvant son intérêt dans un fonctionnement permanent, personne ne sera incité à réparer une panne. Le "Comité de gestion" ne lui paraît donc pas une solution. Mais il y a plus grave, en particulier avec les équipements les plus coûteux comme les pompes solaires: depuis peu on vole les panneaux solaires car les habitants ont découvert que le vol est plus rentable et moins fatigant que le travail avec l'eau produite par la pompe.

En second il constate que les ouvrages donnés à un particulier ont une pérennité mieux garantie: le particulier fera attention à l'équipement mis à sa disposition et essaiera d'en tirer le bénéfice maximum. Mais donner ces équipements lourds à des particuliers provoque la jalousie surtout si le bénéficiaire gagne de l'argent par son travail. Des voisins envieux peuvent alors être incités à casser (ou voler) l'outil.

Aussi le Père Verspieren considère que ces équipements doivent être donnés à la collectivité (pour éviter les jalousies), alors que leur exploitation doit être donnée à des particuliers. Pour éviter tout abus des bénéficiaires, cette "propriété limitée" (ou concession en langage juridique français) doit être soigneusement définie par la collectivité.

En conclusion il souhaiterait voir une assemblée analogue consacrée aux plus pauvres: il va falloir utiliser les connaissances et l'expérience des grandes entreprises pour le service des foules innombrables (des campagnes et des zones périurbaines) qui vont se presser demain aux portes de nos villes.

5. HIGHLIGHTS OF PRESENTATIONS AND CASE STUDIES

1. Sur la Dimension Internationale des Services Urbains, by Mr. Dominique Lorrain

There is a **continuum of various public-private partnerships**, which differ in the degree of financial involvement of the operating enterprise as well as in the length of period for which the rights are conferred. Regulatory arrangements vary accordingly. Total privatisation is merely the case of maximum and permanent financial involvement of the private sector. Governments can gradually extend private sector involvement. A well-defined enabling environment is imperative.

2. The English Experience of Water Privatisation, by Mr. David Ehrhardt

Total privatisation requires a developed capital market. It has made possible much higher levels of investment. Prices have risen sharply, while profits are high and shares have soared. Affordability has become an issue. So far, there is not much evidence of efficiency gains, but the quality of services has improved. Centralised regulatory system is fragmented and complicated.

3. The Achievements of a Public Enterprise in a Big City of a Developing Country, EMOS S.A. Santiago, Chile, by Mrs. Raquel Alfaro

Concessions for operation of water supply and sanitation are awarded to public or private companies. A regulatory body sets standards and tariffs. The government subsidises lower incomes. The public company for Santiago is productive and efficient thanks to sound institutional framework and integrated management policies (incl. water conservation).

4. Urban Water Supply Sector in Morocco, Institutional Development and Management Autonomy, by Mr. Abdelali Filali Baba

Administrative reform yielded a National Office for Drinking Water (ONEP) and High Water Council. By a contract programme the State is disengaging, gradually reducing subsidies to a more autonomous ONEP. Tariffs are set among all concerned parties, enabling ONEP to increase its revenues.

5. Rural Water Supply and Sanitation Project in Lumbini Zone, Nepal, by Mr. Han Heynen

In line with trends in society, government retired to a decentralized, demand-driven strategy. Water supply and sanitation are now planned at district level. Gradual **evolution of a community-based approach**. Central department may be charged with water resources management (to be separated from project implementation).

6. Community Water Management in Yemen, by Mr. Piet Klop

Creating an enabling environment meant facilitating '**tribal water management**'. This required integration of people's short term needs with their long term problems.

7. Water Sector Institutional and Management Options, Ghana's Experience, by Mr. E.K.Y. Dovlo

The public Ghana Water and Sewerage Corporation restructured to become more demand-responsive by **delegating responsibilities** to more autonomous districts, according to specific guidelines, procedures, authority limits. Rural water supply and sanitation strategy includes community ownership and management. Private sector is involved where appropriate.

8. Buguta/Makwasinyi Community Water and Sanitation Project, Kenya, by Mrs. Ilse Marks

NGO acts as intermediary between rural communities and government. Special attention was given to the development of a community management and **local financing mechanism**. Kiosk attendants only serve those who can prove payment of membership fee.

9. Polish Water Supply and Sewage Disposal Companies - Their Organisation and Ownership Transformations, by Prof. Marek Roman

Water supply and sanitation companies are now owned by local authorities. However, **legal vacuum hampers transformations**. Two arrangements dominate: local authority budget-funded services and one-person partnership of local authority funds. Local authorities tend to adhere to public ownership and management.

10. Project of Irrigation of New Zone of Golodnaya Steppe, Aral Sea basin, Uzbekistan, by Mr. Goroskov

5 newly independent states in the Aral Sea basin have set up a Water Commission to develop a water management strategy. Careful approaches are made towards decentralisation, paid water use and privatisation, but focus remains on developing more **efficient irrigation techniques**.

11. Organisation des Systèmes de Gestion de l'Eau Potable en Algérie, by Mr. Benblidia

Regional and local public water supply enterprises have been created and are overseen by a single national ministry. Heavy investments improved water supply situation. Efficiency would require more **capacity building and public participation**. Present reforms facilitate private sector involvement.

12. Projet d'Appui aux Villages Dotés de Points d'Eau Modernes: Animation et Sensibilisation à l'Assainissement autour du Point d'Eau, Hygiène et Utilisation Rationnelle de l'Eau, Mali, by Mrs. Assa Soumare

Improving rural water supply and sanitation by standardisation of hardware, 'after-sales' service, vocational training, establishment water management committees, health information and education. Provision of **money deposit facilities**.

13. Plan Directeur de Développement du Secteur Eau et Assainissement 1991-2010, Zaire, by Mr. Tshiongo Tshibinkubula wa Tumba

Rigorous planning and active coordination by the government (who remains the partner of donor agencies). Need for regulatory framework and rationalization before privatization. After failed privatization, Regideso (urban water supply agency) became a public agency again. Present masterplan opts for maximum decentralization. Political and social turbulence, and the current financial crisis hardly make for an enabling environment.

14. Mise en Place d'un Cadre Juridique de la Gestion du Service Public de l'Eau Potable (et de l'Energie Electrique) au Gabon, by Mr. François Ombanda

In a **simplified judicial framework**, the public/private (64/36) concessionaire deals with fewer responsible authorities.

15. Revenue Enhancement, a Neglected Procedure of Public Waterworks, Malaysia, by Mr. Kam U Tee

Revenues can be enhanced by management reforms, ie. disciplined meter reading and billing, revenue collection and recording. Rural water supply: water company sells a metered volume of water at subsidized rate to village cooperative that in turn sells to its constituents at fixed prices. Peri-urban water supply may benefit from interest-free loans. Good service is a prerequisite for **commercial management** as there is a close relation between capacity building and revenue enhancement. **Data collection** induces comparison and competition between water companies.

16. Innovation and Management of Water, Sanitation and Environmental Problems in Urban Areas - an Integrated Flood Control, Water and Park Policy - the Case of Curitiba, Brazil, by Mr. Jonas Rabinovitch

Water and sanitation and drainage interventions are to be integrated in environmental policies to facilitate **creative cross-sectoral solutions**.

17. Institutional Strengthening: Hyderabad Metropolitan Water Supply and Sewerage Project, India, by Mr. V. Lakshmi pathy

Water Supply and Sanitation Service was transformed into an autonomous Board. A thorough analysis of human resources and managerial needs was carried out. **Managerial reforms** included: job profiles, personnel performance evaluation, formal training. Staff was involved throughout. Reforms were agreed upon by consensus.

18. Institutional Arrangements in Water Supply and Sanitation in Brazil, by Prof. Alex Abiko

Water supply and sanitation used to be organised by limited number of states (24), rather than municipalities (2400). Good results were obtained under **centralized management**. Current decentralisation proves difficult due to the financial crisis, huge social discrepancies and technical as well as political disagreements.

19. Water Sector Restructuring Study, Jordan, by Mr. Nabil Sweis

Administrative reform: merging water supply and irrigation authorities.

20. Quelques Notes sur la Présentation du Père Verspieren, Mali

In rural water supply, hardware may be given to communities, but **operation shall be trusted to individual(s)**, under a community-accepted arrangement.

by Mr. Piet Klop

6. POSSIBLE FRAMEWORK FOR FURTHER DISCUSSION

1. institutional development

- decentralization
 - public-private partnerships (ranging from private management to private ownership)
 - level of private sector involvement
 - checks and balances by democratic or regulatory mechanisms
 - social implications (price increases)
 - stakeholder participation
 - identification of stakeholders (governmental agencies, user groups, women, NGOs)
- gains for the government and its enabling role
- extent, pace and ways of institutional reform
- effectiveness and efficiency of participation
 - integration of short-term community needs and long-term problems
- options when there is no effective government, policy or legal framework

2. managerial and human resources development

- managerial implications of turning a corporation (aimed at continuity) into a company (aimed at efficiency)
- private sector preparedness and capacity building
- collecting data on system efficiency: competition by information

3. enabling environment

- investment risks
- prerequisites for successfully involving the private sector
 - river basin management: condition or complication?
- reaching out to policy makers

by Mr. Piet Klop

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