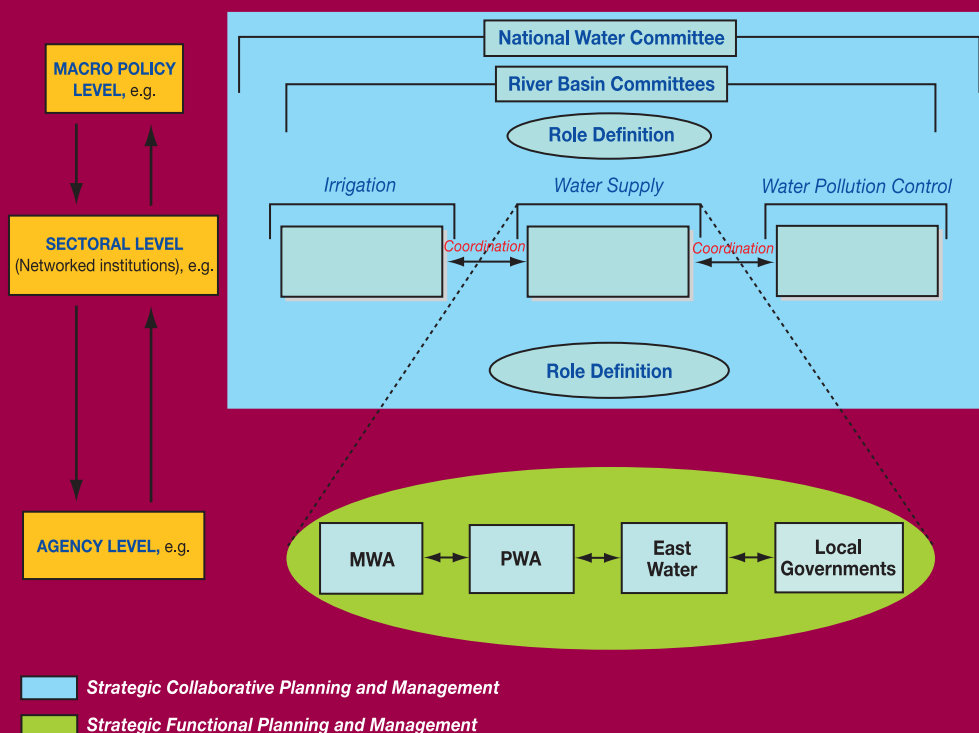


GUIDELINES ON STRATEGIC PLANNING AND MANAGEMENT OF WATER RESOURCES



ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC

**GUIDELINES ON
STRATEGIC PLANNING AND MANAGEMENT
OF WATER RESOURCES**



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FOREWORD

At its nineteenth special session in 1997, the General Assembly called for the initiation of “a strategic approach for the implementation of all aspects of the sustainable use of fresh water for social and economic purposes, including safe drinking water and sanitation, water for irrigation, recycling, and wastewater management, and the important role fresh water plays in natural ecosystems.” Since then, the promotion and development of strategic planning and management methodologies of water resources have become a major focus of regional cooperation in the programme of work of ESCAP.

In that context, with funding from the United Nations Development Account, a project entitled “Capacity-building in strategic planning and management of natural resources in Asia and the Pacific” was launched in 2000 aimed at assisting planners and decision makers in developing strategies to address the trade-offs and complementarities between policies on economic growth, social equity and environmental objectives in three phases.

Under phase I of the project, which took place in 2000 and 2001, efforts were made to review achievements in water resources management in the region, including those of ESCAP, to form the basis for preparing a set of guidelines on strategic planning and management of water resources. Important achievements made by the ESCAP secretariat identified in the review included the results of studies on “Integration of water resources management into economic and social development plans in Asia and the Pacific” and “A synthesis of experience from the FAO-ESCAP pilot project on the formulation of national water visions to action”. These results, together with international experiences and inputs from invited water resources experts in the region, were compiled to form the first draft of the Guidelines on Strategic Planning and Management of Water Resources, which was discussed at the Regional Workshop to Finalize the Guidelines on Strategic Planning and Management of Natural Resources Development, held in Bangkok in December 2001.

The draft Guidelines were then posted on the web site of ESCAP and used for training, during phase II of the project, at the five workshops for South-East Asia (July 2002), Central Asia and the Pacific (August 2002),

South Asia (September 2002) and North-East Asia (October 2002). Additional inputs were received from participants in the five subregional workshops and the revised version, which included a new chapter on “Monitoring outcomes of strategic planning in water management: using indicators effectively”, was then posted on the ESCAP web site in July 2003.

The Guidelines were subsequently used in some 17 case studies in phase III in 2003 and 2004 for the development of strategic plans in the following countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan of Central Asia; China and Mongolia of North-East Asia; Fiji and Papua New Guinea of the Pacific; Pakistan and Sri Lanka of South Asia; and the Lao People’s Democratic Republic, Malaysia, Myanmar, Philippines, Thailand and Viet Nam of South-East Asia.

This version of the Guidelines therefore reflects the common efforts of many people involved in the process, based on the earlier drafts prepared by Mr Douglas Webster of the Asia Pacific Research Center of Stanford University, United States of America and Mr Ti Le-Huu of the Water Resources Section, Environment and Sustainable Development Division of ESCAP in cooperation with Ms Larissa Muller of Stanford University.

The publication is aimed primarily at assisting decision makers, planners and practising water resources experts in their efforts to enhance effectiveness in the formulation and implementation of strategic plans for water-related organizations within the context of integrated water resources management. The publication is also intended to serve as a reference for planners and practising professionals working in other sectors when dealing with water resources development.

GUIDELINES ON STRATEGIC PLANNING AND MANAGEMENT OF WATER RESOURCES

BACKGROUND

1. INTRODUCTION

1.1 Importance of foresight and anticipation

Of late, there has been considerable discussion, and publication of technical reports, on the importance, and use, of *foresight* and *anticipation* in planning and management. As conditions change ever faster in Asia and the Pacific in the field of water resources management, and external to it, the ability to *anticipate* change is key to good planning and management. The analogy is to driving a car at night, the faster you move, the further you need to see ahead, and the more important that you consider what you will do next if a certain event, e.g., a truck pulling out in front of you, occurs. It is obvious that the future can not be predicted, so *foresight* and *anticipation* are needed to identify situations that could occur, to ready the system to respond. *Foresight* refers to the ability of institutions to identify (have on the “radar screen”) possible future significant changes in the environment in which they operate, *anticipation* refers to consideration of responses to possible changed conditions. System outcomes, for example in watershed management, beneficial or detrimental, are less the product of what happens to a system, than how the system *responds* to new circumstances. In fact, negative events can result in outcomes superior to what would have been the status quo case, if responses are effective. Appropriate responses are more likely, if changing circumstances are *anticipated*.

1.2 Strategic planning and management

Fortunately, there is an approach to planning and management that assists decision-making in the context of rapid change, namely *strategic planning and management (SPM)*. Although there are many variants of SPM, all strategic planning and management is characterized by the following:

- (i) Resources are focused on achieving a Mission, often embedded in a Vision, which is clear and realistic. Specific time frames are often attached to mission achievement. Wish lists of projects and programmes, ambitious comprehensive plans, unrealistic objectives, are abhorred.
- (ii) The Mission is based on issues (failures to meet expectations) identified collaboratively by key stakeholders rather than pre-set objectives determined by the bureaucracy in isolation.
- (iii) Action is stressed, implementation that leads to mission achievement is valued over plan making. In fact, plans are regarded as valueless unless implemented, and plan – making per se is regarded as not a useful activity.
- (iv) Action is centred on those points in a system where maximum leverage can be achieved relative to resources (human, financial) expended. Accordingly, strategic processes are cost-effective. In virtually all cases, attacking a problem closer to its source, preferably, at the level of causal drivers, is more effective than attacking symptoms of a problem. For example, although responding to floods (disaster preparedness) is important, a strategic process would be biased toward addressing causes of the problem (why are people living in the flood plain, can flooding be reduced or prevented).
- (v) SPM recognizes the importance of champions (leadership) and the quality of institutions. In the short run, strategies need to be tailored that take advantage of institutional strengths, and avoid weak institutional systems. (In the longer run, some weak institutions can be strengthened to undertake strategic roles, but some need to be eliminated or replaced.)
- (vi) SPM stresses the importance of anticipation, through techniques such as driving forces analysis and scenarios formulation, because it recognizes that the world is a fast changing place. SPM recognizes that to try to predict the future could be foolish, but that the range of possible change

and likely future events can, to a significant degree, be anticipated.

- (vii) SPM distinguishes between Internal Environments [the institution(s) with responsibility for implementing the mission and systems directly affected by it (them)], and the External Environment [the context within which the internal institution(s) act]. It is recognized that the external environment is very important and must be understood, and its dynamics anticipated, if a strategy is to be successful.
- (viii) SPM assumes that the world, and the public policy arena, is a place of conflict (adversarial relationships), not cooperation. Thus collaboration in SPM is based on deal making which rewards all parties involved (frequently the result of appropriate incentive structures), i.e. creates win-win situations, rather than a naïve assumption that consensus and cooperation is the norm.

1.3 Brief history of strategic planning and management

SPM was originally developed in military circles, particularly during the post-World War II “cold war” period, by such organizations as the Rand Corporation. It was recognized that the ability to handle fast-changing situations is of utmost importance, but that tactics (day to day actions to achieve an immediate end within limited fields of action), even if successful, are often of limited value in achieving societal visions, if not placed in the context of a strategy. Private sector corporations adopted strategic planning techniques in the 1970s, particularly Royal Dutch Shell (the technique is still sometimes referred to as “the Shell method”).¹ Its success at Shell (particularly during the oil crisis of 1973 when Shell gained considerable market share by anticipating the formation of OPEC) led to adoption of the approach by many private corporations throughout the world.² This diffusion of the approach was amplified and accelerated by management consulting companies, such as McKinsey, who assisted in building capacity within

¹ Economist Magazine, “Scenario Planning: The Next Big Surprise”, London: *The Economist*, October 13, 2001, pg. 60.

² For a description of the methodology pioneered by Royal Dutch Shell, see: Schwartz, P., *The Art of the Long View*, New York: Doubleday, 1991.

private firms to undertake SPM. By the 1980s, the technique was catching the eye of public sector planners and managers in fields such as urban, natural resources, and environmental planning and management. An important player in identifying the value of strategic planning approaches, particularly those based on scenarios, in public policy formulation was the Stanford Research Institute.³ The transfer of the technique to the public sector has not been easy, primarily because most public sector agencies and programmes have multiple goals.⁴ On the other hand, in the private sector a few relatively clear goals such as profit, market share, or share value maximization apply. Secondly, defining the internal environment in the public sector is also very difficult. This is especially true in water resources planning and management where so many institutions exist within the water field. Which of these institutions constitutes the internal environment in terms of a given strategic process is of ten difficult to define.

1.4 Strategic planning and management in the water resources sector

Water is generally accepted as the most important natural resource that will affect the Asian and Pacific region's development over the next 50 years. It is a critical input in agriculture, industry, urbanization, and essential to the well-being of households. In many Asia-Pacific countries water will be in short supply, especially so in certain sub-national regions. Water allocation and management is often a source of conflict among nations, among social groups (particularly between urban and rural), and among sub-national regions (e.g., between water surplus and water deficit regions, and between highly industrialized and more rural or tourist oriented regions).

Given this situation, the stakes are high in regard to effective planning and management of water systems. Water can be put to different

³ The best known output of the Stanford Research Institute work is, Hawken, P., Ogilvy, J., Schwartz, P., *Seven Tomorrows: Toward a Voluntary History*, New York: Bantam, 1982.

⁴ One of the best standard textbooks on application of strategic planning and management techniques to the public sector is: Bryson, J.M., *Strategic Management in Public and Voluntary Services: A Reader*, Amsterdam: Pergamon, 1999.

Also see: Bryson, J.M., and Einsweiler, R.C., *Strategic Planning: Threats and Opportunities for Planners*, Chicago: American Planning Association, 1988.

Box 1. Necessity of strategic planning and management of water resources***At the national level:***

- Priority 1:* (1) to provide frameworks and directions for: overall development, water sector and organizations, (2) to facilitate coordination among: agencies, sectors and stakeholders, (3) to improve implementation: funding, accountability monitoring, resources mobilization, and HRD
- Priority 2:* to bridge the present and future: to identify problems, to overcome present weakness, to respond to uncertainties and to enhance flexibility
- Other:* *Management:* to share water among sectors & regions, and to achieve the targets within a specified timeframe

At the sectoral level:

- Priority 1:* (1) to take into consideration different institutions, stakeholders, agendas of the different sectors (e.g. forestry, environment, lands, mines, protected areas) and encourage their participation, (2) to achieve expected outcomes within an anticipated timeframe, (3) to identify common objectives and a shared vision
- Priority 2:* (1) to enable rapid development competing from limited resources, (2) to provide criteria for allocation of limited budgets, (3) to provide guidance in achieving tangible expected outcomes, (4) to coordinate long term/short term activities
- Other:* (1) to improve the legal framework, reconciling many laws, (2) to re-audit performance, (3) to conserve water resources for sustainable use, (4) to address needs of different target groups with different abilities to pay

At the organizational level:

- Priority 1:* (1) to establish an effective action plan, (2) to identify clear goals, (3) to create partnerships to achieve the mission
- Priority 2:* (1) to establish success (target) indicators, (2) to strengthen internal environments

Source: Results of the Working Groups at ESCAP's Regional Workshop to Finalize the SPM Guidelines, Bangkok, December 2001.

uses that vary widely in their contribution to economic development and human well-being. Even for a given use, water's productivity can vary widely, e.g., drip irrigation can achieve water efficiencies that are a multiple of less targeted irrigation approaches.

Given the importance of the sector, the large number of institutions involved, the high stakes, and high degrees of conflict associated with planning and management of water resources, strategic planning and management approaches are particularly relevant.

1.4.1 Water resources and development in Asia and the Pacific

The Asian and Pacific region extends over a total area of about 36 million km² or 27 per cent of the world's land area (1997). With nearly 60 per cent of the world's population and over 60 per cent of the world's irrigated land, the region is more densely populated and more intensively cultivated than any other region. The region also displays various types of physical features, from arid deserts to the most humid areas of the world.

There is an extremely uneven distribution of precipitation over different parts of the region. For example, precipitation is exceptionally abundant on the southern slopes of the Himalayas, on the western slopes of the mountains of India and Indo-China, and on the islands of Indonesia, which receive annually from 1,500 mm to excess of 3,000 mm of rain and in some locations considerably more. On the other hand, almost all the north-western part of the region is extremely dry, with an annual precipitation of less than 200 mm. Moreover, not only is there a sharp difference in the amount of total annual precipitation, but precipitation also varies considerably from one season to another during the year. The rainfall in a large part of the region is characterized by a monsoon climate pattern with very distinctive dry and rainy seasons. During the long dry season, temporary water shortage is experienced in many river basins, while during the rainy season severe floods may cause tremendous damage in the same river basins.

The Asian and Pacific region has several of the world's most important river systems. Seven of Asia's largest river systems, namely the Chang Jiang, Huang He, Mekong, Ayeyarwaddy, Brahmaputra, Ganges and Indus, have a total drainage area of more than 6 million km², much of which is heavily populated, particularly along their lower reaches.

Therefore, the economic development and the welfare of people in this region are very dependent on the progress made in the development and management of its water resources.

Although the current per capita per year use of 400 m³ appears to be only 12 per cent of the per capita renewable resources of 3,360 m³ of the region, only a small portion of the renewable water resources can be tapped. This amount is less than the relevant estimates for the other regions with the exception of the West Asia sub-region. Naturally, the per capita availability has been decreasing with the high growth of population. By the year 2000, annual per capita water availability would be considerably less compared with that in 1950, about one fourth of the 1950 level in South Asia, one third in North China and Mongolia, and forty per cent in south-east China. The most critical decline, a ten-fold reduction from 7,500 m³ per capita in 1950 is expected to occur in Central Asia, which is now experiencing a severe water crisis in the Aral Sea Basin.

The Economic and Social Survey of Asia and the Pacific-1997⁵ pointed out that the ESCAP region has made major strides in economic and social progress during the past half-century and per capita income growth has been much faster than elsewhere in the world. It also pointed out that nevertheless, some 70 per cent of the world's poor people live in the ESCAP region. Although most countries in the region have been able to reduce the incidence of poverty in terms of the head-count ratio, the rate of reduction appears to have slowed down since the mid-1980s in many countries, and especially since 1997 in the countries affected by the East Asian financial crisis. However, the overall impressive economic achievements together with the rapid growth in the population have put increasing pressure on the limited availability of freshwater resources in the region. Furthermore, the developing countries in the region have generally made voluntary moves towards policy liberalization with the expectation that such liberalization would have a favourable long-term impact on their economies. Such policy liberalization is resulting in significant changes in economic structure in many countries, including substantial changes in farming systems, the result is often very different external environments for water planning and management agencies. Combined with rapidly mounting

⁵ Asia and the Pacific into the Twenty-first Century: Development Challenges and Opportunities, Economic and Social Survey of Asia and the Pacific-1997, ST/ESCAP/1727, New York, 1997.

pressure on the freshwater resources, the result is increasing complexity in the management and development of freshwater resources in the region. Accordingly, strategic planning and management approaches, suitable to freshwater management, are needed more than ever in the region. Important strategic issues that need to be considered in introducing SPM in the region for water resources management and planning, are discussed below.

1.4.2 Urgent strategic issues in freshwater resources management

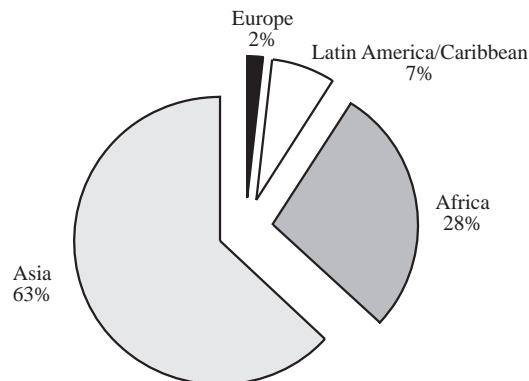
The most urgent strategic issues are faced by the *developing* countries of the region, and are closely related to pursuit of poverty alleviation and equitable economic development. A major problem in most countries of Asia and the Pacific, as in developing countries in other regions, is inefficiency in the use of water resources. The widespread use of flood irrigation leads to low efficiency, poor crop yields and degradation of the soil. Water utilities in the large Asian cities have been notoriously inefficient in the past, with enormous quantities of water unaccounted for. Hundreds of millions of people live at the margins of cities in peri-urban areas where water management systems are often particularly underdeveloped relative to the rapid industrial and population growth. Throughout most of the region, uncontrolled solid and liquid waste disposal into water courses and open areas has put an enormous burden on the ability of urban water utilities to keep up with the demand for good quality water. Industries mainly use “once-through” processes, with little thought of recycling or in-house water treatment. Toxic effluents are often discharged directly into the watercourses, causing existing water supplies to become contaminated.

Many of the countries in the region are experiencing problems in major project structures and related systems, including dams, canals, pipelines and equipment which are approaching the end of their useful life, requiring huge public investments for their renovation. Most of the countries and areas in the region expect such problems in the future. Preventive maintenance is insufficient, resulting in general degradation of the hydraulic structures and equipment and frequent failures. Interruptions in water supplies not only inconvenience the public but may result in economic losses as well.

a. *Water supply and sanitation*

Although domestic water use accounts for only about 7 per cent of total withdrawals in the region, the rapid growth of urban centres in many developing countries has put a severe strain on the availability of safe water in large cities. The lack of, or inadequate availability of, water has in turn become one of the limiting factors in socio-economic development – adequate supplies of potable water is an important indicator of the quality of life in urban areas. Inadequate operation and maintenance procedures have traditionally been a major stumbling-block to the improvement of water supply and sanitation services in Asia and the Pacific, not only in the urban but also in rural areas. A number of water supply systems in the region are lying in disrepair and require heavy expenditure for rehabilitation, reflecting this situation.

Figure 1. Water supply, distribution of unserved populations



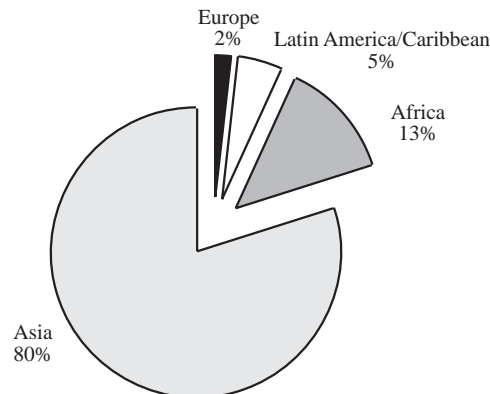
Source: WHO/UNICEF, 2000.

The first priority is to improve efficiency in municipal water utilities, which often have volumes of unaccounted-for water amounting to up to 50 per cent of total water supplied in some of the largest cities of Asia. Some deferment or reduction in the urban water supply investment requirements could be achieved if the countries were able to improve the operating efficiency of the existing infrastructure, particularly in large cities. Considerable water savings may be achieved by reducing leakages and wasteful consumption practices. Leak detection programmes in Bangkok

and Manila, for example, have led to a greatly decreased quantity of unaccounted-for water usage, allowing for the postponement of construction of new facilities. Water pricing, including effluent charges, is also an important instrument for stimulating efficient use of water in the household and at commercial establishments.

However, progress has been made during the past 10 years despite an increase of 15 per cent in the global population, still, the number of people without any form of improved water supply stands at 1.1 billion globally. The number of people without basic sanitation is 2.4 billion. These figures represent one sixth of the world's population without water and two fifths without sanitation. Most of the unserved are in Africa and Asia. The highest number of unserved people is in Asia while the highest proportion of unserved is in Africa.

Figure 2. Sanitation, distribution of unserved populations



Source: WHO/UNICEF, 2000.

b. Agricultural water use

Irrigation in Asia has been one of the most important factors accounting for the increase of agricultural production since the early 1960s. Following the rapid growth of the 1960s and 1970s, the pace of expansion in irrigation slowed considerably, owing to a lack of suitable sites for reservoirs, and opposition to new construction by environmentalists and local farmers who feared displacement. Further increases in yields and production

in the region will therefore have to come primarily from increased efficiency and more rational use of water on existing irrigated land, and on rainfed agricultural land, rather than from expansion of irrigated areas. Currently, about 40 per cent of Asia's cropland is irrigated and helps produce about 70 per cent of its food.

In the region, traditional agricultural water policies have concentrated on supplying water for irrigation to meet national development goals. In many countries the methods of irrigation employed lead to low efficiency, poor crop yields, and loss of fertility of the soil. There has not been much effort to promote the efficient use or reduction of wastage of irrigation water. The irrigation efficiency level for most schemes in Asia is between 30 and 40 per cent. As a result, the ratio of actual irrigated area to planned irrigable areas is also low, especially on large-scale projects. If the water wasted were made available for use, many water supply expansion projects could be postponed and much larger areas of agricultural land could be irrigated. Common problems are: inadequate planning and design; deficiencies in on-farm irrigation and drainage facilities; and poor operation and maintenance.

Urgent action is required to improve on-farm management in countries with a poor record of efficient usage. This would include: education and training of extension staff; a clearly defined division of responsibilities between farmers and irrigation authorities; strengthening of water and soil management research under irrigation and rainfed conditions; monitoring and evaluation of irrigation performance; and establishment of realistic water pricing policies to reduce wastage of water in agriculture. Implementation of such measures will vastly increase the yields, reduce water use, keep the systems functioning well, reduce problems (such as salinity and water logging), increase incomes, and reduce investment requirements.

c. Industrial water use

In developed countries with an established industrial base and where water pollution laws are strictly enforced, industrial water demands are relatively stable or even decreasing, owing to the introduction of water-saving technologies. In the developing countries of Asia, however, water demands in industry are rising rapidly, with increased concentrations

of effluents being released. Direct investment from industrialized countries sometimes involves the establishment of polluting industries in developing Asian countries which have less strict controls on pollution than in similar establishments in the home country. Many industrial products require the use of large quantities of water for each unit of output, high rate of water withdrawals per unit output industries are over represented in the region, and even controlling for type of industry, water inefficiency in production processes is high in the region. Furthermore, there are great variations in water withdrawals among industries producing the same product. Therefore, there is considerable scope to increase the efficiency of water use by attaching regulations related to the amounts of water to be used per unit of production and disposal of effluents, and also by introducing market based instruments.

1.4.3 Other strategic freshwater issues on sustainable development

a. Water resources assessment and quality monitoring

In order to improve the management of water resources, there is a need for greater knowledge about their quantity and quality. In many countries/areas of the Asian and Pacific region, there are considerable inadequacies in the availability of data on their water resources, specially on groundwater and water quality. There is a need for regular and systematic collection of hydrological, hydrometeorological and hydrogeological data together with introduction of adequate systems for processing quantitative and qualitative data on various types of water bodies. In order to be able to collect, analyze and disseminate reliable information on water resources, it is necessary to strengthen the existing mechanisms. In some countries, different agencies collect water resources data with no coordination between them at all. There is a serious need for strengthening and coordinating arrangements in collection and processing of data and for improvement of data gathering networks, as well as for improvements in monitoring systems. An inventory of the country's water resources, including quality of water at each source, needs to be prepared as soon as adequate data become available.

b. Other water management issues

In many countries of the region, national water policies have been developed, some of which have been translated into national master water

plans. In several countries, including China and India, master plans have been prepared at both the national and provincial levels. However, there is a serious need to improve management (not just planning) of the water resources in order to satisfy the freshwater requirements for sustainable development of the countries of the region. Traditionally, water resources management has been supply oriented, without paying sufficient attention to options for influencing water demand and increasing water use efficiency. The emerging trend is to take concerted integrated action towards conservation of water resources. The holistic management of water as a finite and vulnerable resource and the integration of sectoral water plans and programmes within the framework of national economic and social objectives are therefore of utmost importance to the countries of the region. Consequently, there is a need for the national governments of the region to adopt policies and methodologies for integrated management of their water resources based on comprehensive ecosystem assessment, taking into consideration that the main task is the allocation of available resources among competing uses in an environmentally-sound, economically efficient, and equitable manner in order to satisfy the present and future demands of society for water and water-related goods and services.

Watershed management is an area that needs immediate attention. Denuded watersheds have given rise to higher flood peaks and lower discharges during the dry season. Perennial flow patterns of rivers have changed over time. Erosion processes have increased, and higher sediment flows threaten the survival of costly big reservoirs, particularly in China and India. Vegetative cover in the catchments needs to be restored by reforestation and conservation. It is feared that unless the threats of deforestation, waterlogging and salinization are checked, large schemes may end up with only marginal benefits.

There is a need for strengthening of the international cooperation in the region in the field of water resources management. The experience accumulated by some countries in the efficient management of water resources has to be made available to other countries. Cooperative arrangements are particularly important for the joint management of transboundary water resources by all riparian states concerned.

c. Institutional and legal frameworks

One of the major obstacles to efficient water resources management in the region is the sheer number of public, semi-public and private agencies involved in the exploitation of the resource. Government agencies dealing with water supply include ministries of agriculture, health, rural development and industry, while semi-autonomous water utilities in some urban areas provide municipal water supply. Groundwater resources may be exploited by mineral resources agencies or semi-public agricultural cooperatives. In some countries, each river basin authority manages the water resources of one hydrological basin. Various agencies dealing with different water uses often carry out their activities in isolation. In addition, in many countries of the region, private businesses, industries and farmers are pumping both surface water and groundwater with very little overall regulation. This uncontrolled use of water has led to imbalances in the hydrological cycle, shortages for some essential uses, a lowering of the water table in many areas, salt-water intrusion and increasing costs for exploitation. The lack of a clear division of responsibilities between organizations for urban and rural water supply, between central and provincial or local activities and between public and private sector agencies results in duplication of efforts without achieving national development goals.

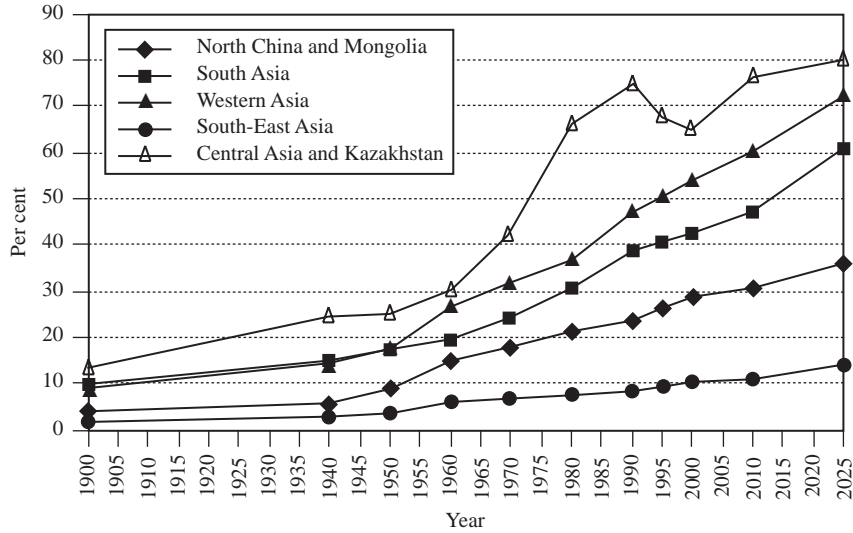
Legislation, regulating ownership, use and protection of water resources support the national water policy statements in many countries of the region. Such legislation cover at least the ownership of and the right to use surface water, as well as the protection of surface-water quality. Several countries, including Bangladesh, India, Malaysia, the Republic of Korea, the Republic of Palau and Sri Lanka, have indicated that their water legislation had not yet been formulated to regulate ownership or the right to use groundwater. This may contribute to uncontrolled exploitation of groundwater in many areas, causing a decline in the water table and land subsidence. In many countries, such as China, India and the Philippines, water is defined as public property. In these countries and others, national water policies emphasize the multi-purpose use of water and provide for the coordination of the development of water resources.

1.4.4 Demand management and other economic issues

As mentioned earlier, demand management has not been practiced widely in the region. There is a strong need for realistic alternative measures to increase the efficiency of water utilization through demand management rather than providing more water. Unless water prices are raised significantly and effluent fees are introduced, there are no economic incentives for industries to save water. Through enforcing effluent standards and providing subsidies to reduce waste loads, pollution levels could also be significantly reduced. The industrial sector could also be motivated to use appropriately treated municipal waste water in processes, which do not require good quality water. In India, for instance, industrial enterprises in the water-short city of Madras have been willing to buy treated wastewater from the city authorities for reuse in their factories.

In most of the irrigated lands of the region, there has not been much effort to reduce wastage of irrigation water through pricing mechanisms. The countries have only recently attempted to collect water fees for irrigation, mainly under conditions of water shortage. If properly implemented, however, pricing policies could reduce the wastage of resources by ensuring the development of optimum-sized water systems. The difficulty of implementing irrigation pricing policies in Asia is that, except for tubewell or pumping projects, it is very difficult to assess the quantity of water actually consumed in most irrigation areas. Moreover, the majority of farmers may be unwilling to pay for an unreliable and inadequate supply of water in some of the large irrigation projects because operation and maintenance have been inadequate, resulting in systems deterioration, and unreliable water supply. The poor operations and maintenance is often the result of inadequate revenues. This is a vicious cycle found in many developing countries of the Asian and Pacific region.

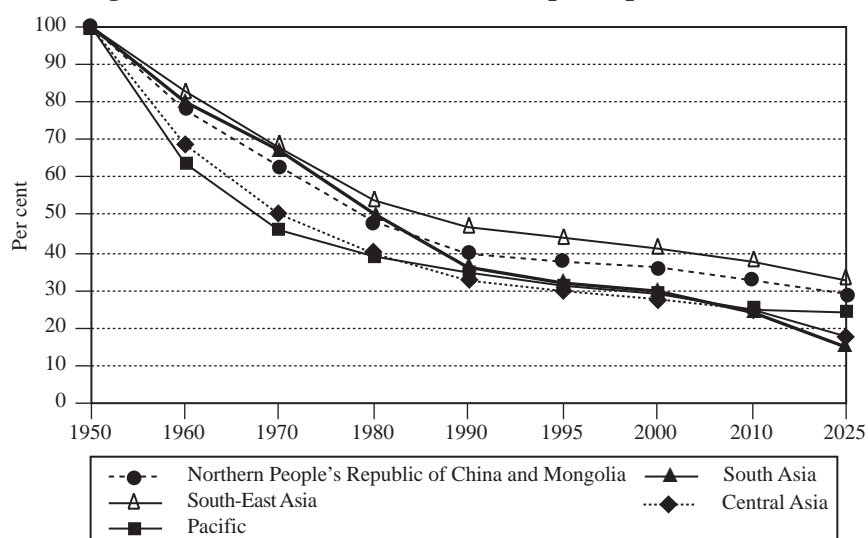
The pressure on water resources is compounded by Asia's limited freshwater endowments, which are among the world's lowest. South Asia, home to over a sixth of the world's population, has the lowest level of water resources per capita. As noted earlier, water availability per capita has declined dramatically throughout the region. This decline has mainly corresponded to rapid population increases at rates previously not experienced. Larger populations have meant increases in water consumption with higher levels of waste. Since all waste is not captured in the water

Figure 3. Water withdrawal trends versus availability

Source: "World Water Resource: Modern Assessment and Outlook for the 21st Century" by Prof. I.A. Shiklomanov for IHP-UNESCO, St. Petersburg, 1999.

balance, overall availability has declined. Industrialization, too, has been responsible for higher water consumption (water efficient technologies are only now beginning to be introduced) with correspondingly higher levels of waste. Low water availability, when coupled with high water withdrawals, and high levels of waste generation, accentuates scarcity.

Globally, water withdrawals have increased by over six times during the last century, or at more than double the population growth rate. Within the Asian and Pacific region, water withdrawals are the highest in Central Asia (85 per cent), followed by South Asia (48 per cent), and Mongolia and northern PRC (25 per cent). Correspondingly, these regions suffer from a high degree of water stress reflected in serious water scarcity and groundwater use that exceeds replenishment. The stress is heightened by rainfall variability and the uncertainty of dependence on water from international rivers. For instance, Bangladesh, Cambodia, Uzbekistan, and Viet Nam are highly dependent on the Padma, Mekong, and Amu Darya rivers; over half their annual water resources come from these rivers. Similarly, Bhutan, the Fiji islands, and Sri Lanka experience high rainfall variability

Figure 4. Decline in water resources per capita (1950-2025)

Source: Shiklomanov, I.A. 1997. "Assessment of Water Resource and Water Availability in the World", adapted by ADB in "Water for All: The Water Policy of the Asian Development Bank", 2000.

The atoll islands in the Pacific are deficient in surface water and prone to prolonged droughts. Surface water supplies are highly unreliable and groundwater resources are limited.

Saltwater intrusion and pollution from human waste are increasing. While water scarcity is less pronounced in the larger volcanic islands, the pollution of water bodies is becoming a serious problem in the urban areas. Water quality is also declining in villages in riverine and estuarine environments.

Floods and droughts are a common natural hazard in Asia and have strong links with water and its management. Watershed degradation (comprising mainly deforestation and soil erosion) and unplanned urbanization (where urban settlements disrupt natural drainage systems) are the two principal factors for flooding. Ill-conceived river improvements and flood control measures also exacerbate natural flooding. Bangladesh, China, and Pakistan suffered serious flood losses from 1988 to 1998. Over 140,000 people died in Bangladesh in 1991 due to cyclonic flood surges. In 1998, an estimated 3,600 people died in China during severe flooding of the

Yangtze and the northeastern rivers, which resulted in over \$20 billion in economic losses. In the same year, more than 1,000 people died in a devastating flood that inundated 66 per cent of Bangladesh, affecting 30 million of the population. Drought damage has been less easy to quantify, but large parts of China and India as well as in several other countries have been seriously affected by drought from time to time. The poor are particularly affected by these calamities as they are less able to protect themselves. Global climate change may heighten the impact of floods and droughts in parts of Asia. In the absence of effective policies and infrastructure to manage water-related natural calamities, their impact in human and economic terms will continue to be severe.

Overall, water stress levels are high and increasing, and demand will continue to outstrip supply. Water security has become a key issue for survival of all the people, whose lives depend critically on water, not only the poor. Industrialization and rapid urbanization will continue to increase pressure on the management of the limited water resources. Within the complexity of water resources management, stakeholders increasingly recognize the importance of changing the planning paradigms, from static conventional planning to more pro-active, and socio-economic and environmental focused, planning approaches.

1.5 Levels of planning and management

For purposes of this paper, we have identified four levels of planning and management in water resources planning and management:

- (i) National water resources planning/management. This may be the function of a single coordinating agency, a cabinet-level committee, etc. For example, in Thailand a National Water Resources Committee exists.
- (ii) Sectoral level planning/management. This involves inter-agency cooperation in one sector, e.g., potable water supply in a nation. Even within a sector, there may be many agencies operating because of duplication, Functional sub-division of the sector, or creation of separate agencies for different geographic areas.

- (iii) Single Organization planning/management. For example, an urban wastewater authority or an irrigation authority.
- (iv) Sub-national Area Based planning/management. Examples would include Thailand's 25 river basin committees, and the Laguna Lake Development Authority in the Philippines. Area based organizations may have broad powers and operate essentially as a single agency (similar to case iii above) or may be more coordinative in function, more closely resembling case i above.

1.6 Drivers of the SPM process

What drives SPM processes in the area of water resources? SPM can be (i) legally mandated, as in the United States under the *Government Performance and Results Act (GPRA)* of 1993, it can be (ii) the result of leadership in the bureaucracy/political realm, whereby senior officials champion a strategic planning process to improve performance, or it can be (iii) instigated through civil society activity. The latter is more often the case at the sub-national level where local organizations work together, as key stakeholders, to produce a strategy for the development of a watershed, critical environmental area, etc. Often the results are best when two, or all three, of the above drivers are involved. A SPM process simply undertaken to meet a legal requirement may lack enthusiasm and "buy in", on the other hand, a SPM process driven solely by civil society may lack access to key resources and levers needed to truly effect significant and sustainable change. A process that relies too heavily on bureaucratic initiative, particularly if associated with a few individuals, without a legal mandate, may run into political roadblocks.

2. RATIONALE FOR UTILIZING STRATEGIC PLANNING/MANAGEMENT IN THE ASIAN CONTEXT

2.1 Merits of the SPM approach

The standard strategic planning model (see Figure 5) has several significant attributes that have resulted in increased popularity of the approach.⁶ These include:

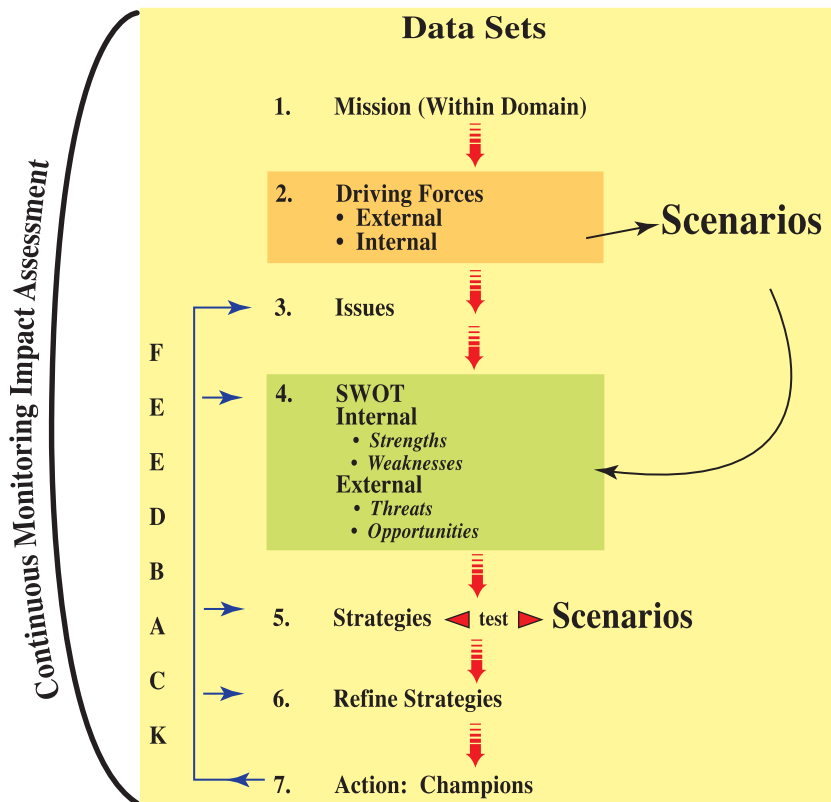
- (i) It does not presume objectives but works from a Mission Statement, or in the absence of a mission statement, issues. This mission statement is derived from a process that involves key stakeholders (those who influence or have a stake in the outcome), it is not formulated in isolation within a bureaucratic agency.
- (ii) It recognizes that internal organizational environments are very important in implementing strategies. A good policy, strategy, or instrument has no value without the existence of an institution (or network of institutions) with the capability and commitment to implement it. Related, institutions are composed of people, leadership or *champions* within organizations play an important role in determining the success of initiatives.
- (iii) SPM recognizes that the external environment (of an institution charged with catalyzing a strategy) is changing very quickly and is unpredictable, but that the *range* of likely futures can usually be identified. Strategies can be tested against *scenarios* positioned along the *continuum* that represents this range of possible futures.
- (iv) Related to the foregoing, SPM recognizes that the external environment is becoming increasingly important because of

⁶ Strategic Planning in the public sector focuses on issues confronting organizations. The issues emerge from forces and trends in both the external and internal environments (and interactions of the two) and are shaped by the value preferences of various organizational decision makers, including the strategic planners. Strategic plans are then prepared that outline specific strategies to be pursued by specific actors (typically organizations) within specific time frames. For an overview of the standard public sector strategic planning model, see: Bryson (1999).

the growing significance of a number of factors including: (a) technology (the internet, mobile telephones, easier travel), (b) increasingly large scale physical developments, e.g., major dams, industrial complexes, mega urbanization, that affect the environment significantly over large (sometimes global) geographic areas, (c) liberalized global trading, finance, and labour systems, and (d) rapid diffusion of information which leads to more individuals and organizations perceiving that they have a stake in the outcome of strategies.

- (v) Related to (iii) and (iv), *networks of institutions* are becoming more powerful in formulating and implementing strategies. Power is increasingly moving from institutions to networks. Sometimes the best way to implement a strategy is to empower the network. By recognizing the importance of the external environment, SPM implicitly recognizes the importance of networks. (The *Strategic Collaborative Planning* model discussed in this paper focuses on the importance of networked institutions.)
- (vi) Strategic planning recognizes that the world is a conflict-prone place. Stakeholders and interest groups do not share the same values, goals, or socio-economic interests. Thus strategies must be based on deals among the various stakeholders, often involving trade-offs, compensation, amelioration, mitigation, etc. Public participation processes do not usually lead to consensus, what they do is make explicit the range and variety of values, positions, and interests that are in play. Strategic planning approaches accept that this is the case, and are designed to facilitate plotting of strategies that reconcile, to the greatest extent possible, divergent interests. Plotting and achieving agreement on strategies is usually best facilitated through negotiation based on mediation processes.

Figure 5. Standard strategic planning model



2.2 Trends of governance in Asia and the Pacific

Two key trends are affecting governance in many, if not most Asian and Pacific countries, these trends are impacting the field of water resources management substantially.

The first trend is *decentralization*, i.e., increased fiscal, administrative, and political power is being devolved to the sub-national level relative to the national level. This means that the role of national government agencies in water resources planning and management will increasingly move toward: (i) monitoring performance of policy and instrumental interventions, and states of ecological and physical systems, (ii) institutional capacity building, (iii) facilitation of change, and (iv) enforcement of standards. On the other hand, more power and resources

will be devolved to the sub-national level, e.g., river basin authorities and committees, making SPM at that level more important. The implication is that if SPM is applied only at the national level much of its potential may be lost.

The other trend is toward more accountability and transparency in governance, utilizing techniques such as *results based budgeting*.⁷ Jurisdictions such as Hong Kong, China, Thailand, Malaysia, and China are rapidly introducing such systems. Under *results based* budgeting systems, line agencies essentially enter into contracts with budget allocation agencies, e.g., bureaus (offices) of budget, agreeing to meet certain performance based objectives in return for certain inputs (budget, personnel). If performance objectives are not met, sanctions are delivered in terms of decreased budget, personnel re-assignments, decreased personnel allocations, or in extreme cases, closing the agency in question. Under such models of governance, SPM becomes more important than ever, for limited resources have to be maximized to achieve an agreed upon mission – essentially the definition of SPM. *Results based budgeting* approaches to governance make performance monitoring very important, shifting the emphasis in monitoring processes from inputs to results (outcomes). Furthermore, there is a shift in emphasis to policy and programmatic performance rather than the state of systems per se, i.e., linking interventions to changes in the state (ecological, physical) of systems. The increased emphasis on monitoring means that formulation of powerful indicators that best measure mission performance is increasingly important.

2.3 Conflict resolution

Conflict resolution is becoming increasingly important in most Asian and Pacific countries. As population, urbanization and industrialization all continue to increase rapidly, the demand for limited water creates conflicts. In particular, farmers who consume the vast majority of water (circa. 80 per cent) in most Asian and Pacific countries feel threatened by initiatives that would price water, allocate more to urban-industrial uses, etc.

Processes that involve mediation and negotiation are needed. Much conflict resolution needs to occur at the micro level and is thus outside the

⁷ Sometimes also referred to as *performance based budgeting*.

purview of SPM. However, involving key stakeholders, including importantly the agricultural community, in formulation of visions, missions, and strategies, may set the stage for more effective conflict resolution (through more appropriate policy frameworks, incentive structures, participatory and collaborative decision mechanisms) that set the framework for decision-making at the micro level. For example, if a water allocation strategy recognizes that water property rights should be recognized as well as user charges implemented, there may be more potential for conflict resolution involving agricultural and non-agricultural users of water. If farmers become owners of water, not just purchasers of it, they themselves may see the importance of allocating water, in some cases, to higher value economic uses, benefiting by selling water rather than using it to grow, perhaps marginal, crops.

APPROACH

3. PROPOSED APPROACH

3.1 Societal trends

The world in which planners and managers work has changed dramatically in the last decade in most countries of the Asian and Pacific region. In particular, two strong societal trends have resulted in new variants of strategic planning being developed – the subject of this paper. These societal trends interact closely with the two changes in governance (decentralization, accountability and transparency) described above. These trends are:

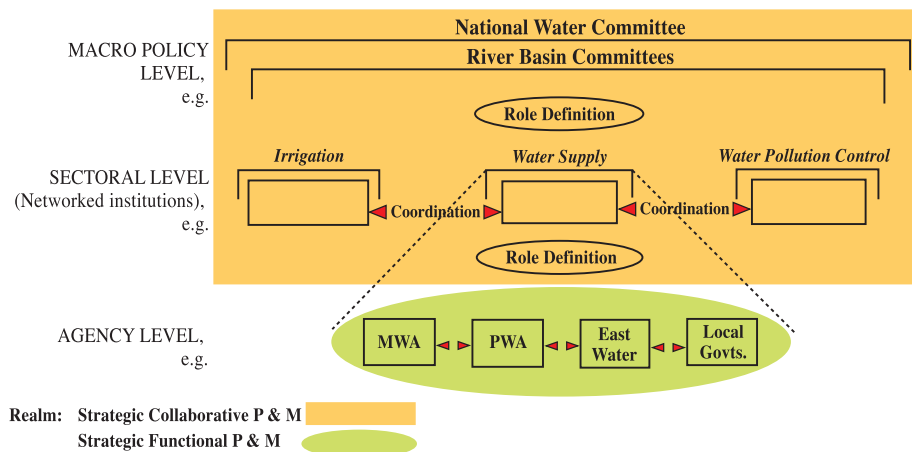
- (i) Increased demand for, and acceptance of, civil society and private sector involvement in public sector decision-making related to allocation of public resources, modes of public service delivery, management of natural resources such as water, etc. This is not to be confused with old fashioned public participation in which the public was invited to “input into” or “comment on” initiatives essentially designed by professional bureaucrats and their immediate community, e.g., consultants. This old fashioned form of involvement was characterized by public hearings, civic forums, etc. The new involvement of civil society and the private sector is based on stakeholders and interest groups being directly involved in governance, including identification and design of initiatives.
- (ii) Increased demand for transparency, accountability, and cost-effective performance on behalf of public sector institutions. That is, agencies involved in the delivery of public services are expected to deliver as promised, using scarce resources effectively and prudently.

Societal trend (i) has driven the development of *Strategic Collaborative Planning* while trend (ii) has driven the development of the *strategic functional* model. These two emerging strategic models, derived from the traditional public sector strategic planning approach, constitute the focus of this paper.

3.2 Objectives

The objectives of the paper are to: (i) briefly describe these emergent models, (ii) describe guidelines pertaining to their use, and (iii) discuss uses of these models under varying conditions to provide readers with a basis to assess their relevance to water resources planning in different countries in the Asian and Pacific region. Where possible, references have been made to methodologically oriented papers to provide further information to readers wishing to implement the approaches described. In addition, the Glossary (an appendix to this paper) provides more detail on methodology.

Figure 6. Nested strategic planning: Water resources



3.3 A Nested approach

A prime premise of this paper is that the *Strategic Collaborative Planning* and *Strategic Functional* models to be presented are not alternative approaches or mutually exclusive. Rather, both need to be applied in water resources management and planning – they operate at different scales and are nested. See Figure 6. The collaborative model is needed to identify new or changed roles for line agencies (existing or to be created), and develop strategies that involve and require networked approaches, i.e., transcend individual line agencies. Furthermore, the collaborative model takes a wide perspective and thus is able to better yield results that expound

and explain external forces affecting water resources. The collaborative approach supports development of clear, effective strategies because the planning process is not confined by the narrow mandates (often artificially drawn) of individual agencies. Importantly, collaborative planning strategies may focus on realizing cooperation among line agencies. That is, an important output of a Strategic Collaborative Planning process may be development and implementation of a *strategy of cooperation* among water agencies based on *real politik* considerations.

However, once institutions have been assigned missions through the strategic collaborative planning process, they need to be accountable, hence the importance of the one institution (single agency) scale *strategic functional* model. This nested approach is particularly important in the field of water resources planning and management because in virtually all countries of the Asian and Pacific region it involves a large number of agencies and actors. For example, in Thailand, at least 39 agencies are directly involved in water resources management.⁸ However, it is important to understand that the roles of individual institutions within the larger networked system should not be, or perceived to be, static. Network dynamics, and changing external and internal circumstances will, and should, result in roles of individual agencies changing. For example, successful agencies are likely to take on more responsibility within the network, while less successful ones, may lose power and influence. Changes in the external context will make some agencies more important, while others will become less so; some agencies will become redundant. New agencies may need to be created. This situation means that SPM needs to be an ongoing continuous process, both at the collaborative multi-agency and single-agency accountability scales.

Given the above, the collaborative model is most appropriate at the national policy and sectoral levels described above while the accountability model is most appropriate at the single agency scale. At the sub-national level, both models are appropriate under different institutional circumstances, an issue discussed subsequently.

⁸ For more details on the structure of water resources planning in Asian and Pacific nations, see: Webster, D., and Ti, Le-Huu, *An Overview of Regional Experiences and Recent Development in Strategic Planning of Water Resources*, Bangkok: ESCAP, United Nations, 2000.

METHODOLOGY

4. STRATEGIC COLLABORATIVE PLANNING

4.1 What is strategic collaborative planning?

Collaborative planning is based on two key premises.⁹ One, it assumes that intelligence and know how are widely distributed throughout society, even in technical areas such as water resources management, e.g., in specialized technical government agencies, universities, NGOs, the private sector (e.g., engineering firms), users, and in local government. Secondly, it assumes that government does not have a monopoly on governance. Even activities such as regional planning should not necessarily be a government monopoly. For example, in many areas of the United States, including Silicon Valley, the world's leading technology cluster, regional planning is undertaken by a collaborative, non-governmental body, which includes local government. Because such an approach includes many stakeholders, it makes governance more sophisticated and mediation-based. Groups can work out issues, then put forward legislation to the relevant constitutionally mandated authority, e.g., local government councils or the State legislature. In essence, much of government's work is done for it, yet the outcome is often more responsive to the needs of constituents. In many democratic legislative bodies, lobbyists are so powerful as to prevent change.

⁹ Collaborative Planning is based on the principle that developmental intelligence and knowledge is widely distributed in a variety of institutions throughout society ("distributed intelligence"). Accordingly, one agency can not and should not do planning in isolation. Collaborative Planning involves representatives of key interests (stakeholders, e.g., labour unions, local governments, private corporations, community groups) involved in a developmental issue negotiating (through trade-offs, cooperation, mediation of conflict, etc.) a course of action (plan). Once the key interests (through their representatives) agree on a course of action, the political/bureaucratic process is likely to quickly approve/implement public sector components of the action building on the outcome that has been negotiated among key stakeholders. Collaborative planning is based on the assumption that it is a sheer impossibility to control all actors (agencies) through a single plan; therefore, collaborative planning processes need to be simultaneously underway focusing on leading issues facing the society, such as water resources management.

For an overview of the collaborative planning model, see: Booher, D., and Innis, J., "Metropolitan Development as a Complex System: A New Approach to Sustainability", *Economic Development Quarterly*, 13 (2): pp. 141-156.

Collaborative planning processes enable constituencies to be formed and gather momentum, accordingly strategies, policies, instruments, and other measures, usually enjoy much stronger support by the time that they reach the legally mandated body, reducing the probability that vested interests will stop the proposed initiative. Collaborative planning is especially valuable in planning for complex systems where multiple policy objectives exist. Many water systems exhibit exactly these characteristics, e.g., watershed planning and management.

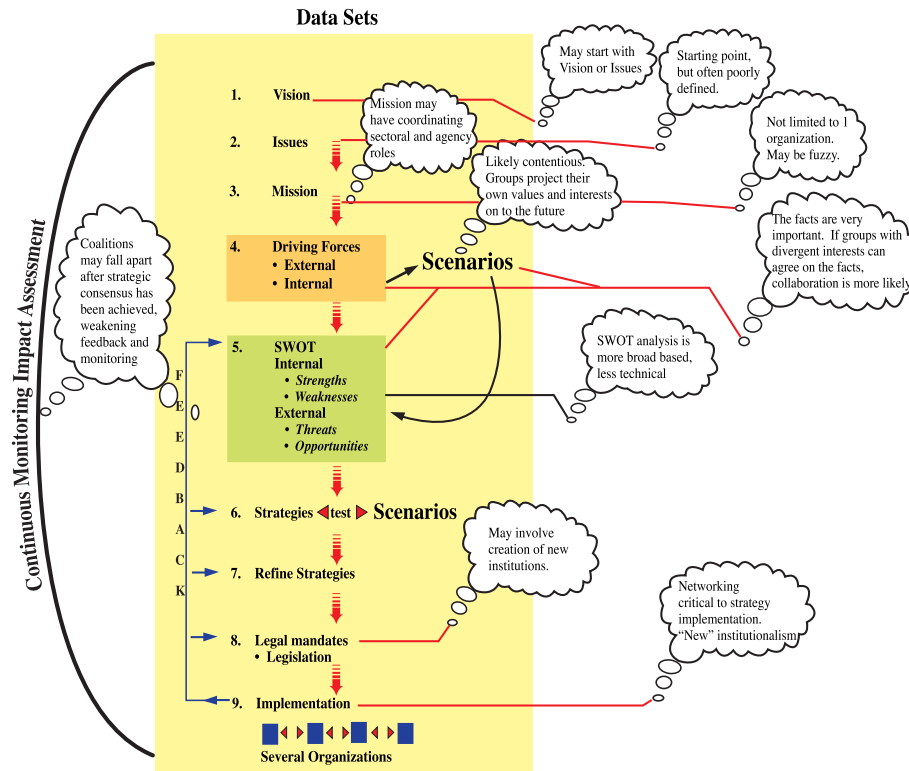
However, not all countries in the Asian and Pacific region are ready for, or want, processes in which government does not play the lead role. Fortunately, *Strategic Collaborative Planning* can be used much more conventionally. For example, a national planning agency or an umbrella water resources planning agency can instigate a collaborative planning process. However, to be collaborative it must involve stakeholders outside the government, must involve all relevant agencies, and must view water resources management from a perspective that transcends any given water agency, no matter how powerful or dominant it may be within the jurisdiction in question.

Figure 7 describes the *strategic collaborative planning* model. Some of the key ways in which it varies from the standard strategic planning model are:

- (i) The *strategic collaborative planning* model may come into play because of a major societal issue; thus it is an issue (or set of issues) that drives the process not a mission statement associated with a single institution.¹⁰ Sometimes the process is the result of a failure of traditional government processes to deal with an issue because of disagreements among agencies. For example, disputes regarding water access between urban and rural areas or among countries in regions such as the Mekong basin could generate the issue environment to set off this type of process. In some cases, even issue identification will be fuzzy, i.e., people or institutions will be unsatisfied about a situation, but the issue is not clearly articulated.

¹⁰ An issue is a failure to meet social or economic expectations. The severity of an issue is determined by, and changes, according to social values.

Figure 7. Strategic collaborative planning model



Alternatively, it may come into play as a result of a visioning process in a country, in which water resources are deemed to play a key role in realizing an envisioned future, but change is needed in terms of performance delivered by the water resources management agencies.

The *strategic collaborative model* may come into play because of a lack of coordination among agencies in taking action. There may be a Vision in place for water resources management, and even implicit agreement among the agencies that the Vision should be realized. However, lack of institutional coordination is hindering implementation. In this case, the Mission of the *strategic collaboration process* may focus on how to effectively realize coordinated implementation of the Vision.

- (ii) Because *strategic collaborative planning* often starts with issue(s), often ill defined, it quickly involves many institutions and a wide range of interest groups and stakeholders.¹¹ In this sense it is strategic planning at a more macro scale than the standard strategic planning model or the *strategic functional model* described below. This more macro level of strategic planning may occur at the national level or the sub-national area level, but is characterized by involvement of many institutions.
- (iii) In *strategic collaborative planning* the information base becomes extremely important precisely because of the wide range of interests involved. Although it is difficult for individuals and institutions to change their positions, and even more difficult for them to change their values, if they can agree on the validity of an information base, it is far more likely that deals can be struck using the *strategic collaborative* approach. The information base includes *driving forces* (internal and external), and *scenarios* (illustrating the range of possible futures affecting the issue area).

Defining the internal environment for SWOT (*strengths – weaknesses – opportunities – threats*) analysis is difficult because a wide range of institutions may offer resources of significant importance in tackling the issue at hand – in fact complex issues usually require coordinated action by a *networked* set of institutions. (Of course, many of the failures and shortcomings in improving complex systems such as water resource systems in Asian and Pacific countries, and elsewhere, can be attributed to the failure of a coordinated strategic response by key agencies and actors.) Thus the internal environment analysis (SWOT) needs to begin with an inventory of resources at hand (across a number of institutions) that could potentially assist in addressing the issue. Then, the *strengths and weaknesses* of

¹¹ For an informed discussion of techniques to involve stakeholders and interest groups in strategic planning processes, see: Priscoli, J.D., *Participation, River Basin organizations and Flood Management*, Bangkok: United Nations, ESCAP, 2001.

these potential institutional resources need to be analyzed. Because a wide range of institutions will need to be included in such an analysis, the analysis of internal strengths-weaknesses will obviously be in less depth than in the case of the *strategic functional model* described below which focuses on one institution.

Developing scenarios to provide context for *strategic collaborative planning* in the field of water resources planning and management is difficult.¹² Because the future is less well known than the past and present (the information base for driving forces), and different interest groups will perceive and want to portray the future differently, developing scenarios will be challenging. Professional facilitators/mediation experts may need to be involved to facilitate agreement in potentially controversial areas such as scenario construction.

- (iv) Once a strategy has been agreed upon, unlike the case of the *strategic functional model* in which the institution involved usually already has a legal (constitutional) mandate, the strategy will need to be legitimized. Often this requires legislation or a political mandate. However, if diverse groups have worked out difficult compromises and agreed on a strategy this can be, relatively, the easy part. In effect, the strategic collaborative process will have done the “dirty work” for the politicians, a situation that they often like.

The strategy may result in an existing institution being given a new mandate. Or, in some cases, it may result in a new institution being formed. (Proliferation of institutions can create inefficiencies, new institutions should be created only in unique circumstances.) Implementation of the strategy is likely to involve giving changed mandates to several institutions in a *network*, often including non-governmental

¹² For a discussion of scenario preparation in the field of water resources, see: APEC Center for Technology Foresight, *Water Supply and Management in the APEC Region*, Bangkok: APEC Center for Technology Foresight, 1998. (In particular, see section on, “The Future for Water Supply and Mangement: Scenario-based Futures”.)

organizations (of course, the extent to which their cooperation can be legally mandated is limited, but they can be brought into play through moral suasion, funding, etc.). Because of the increased importance of *network-based* approaches to addressing issues, network coordination becomes a priority. One school of thought argues against formalized network coordination, arguing that such networks should be *self-organizing*. This is a position often associated with the United States, for example the collaborative strategic regional planning process in Silicon Valley. Another school of thought, more associated with Asian and Pacific countries, is that the network should be guided.¹³ This occurs through umbrella organizations such as (i) a Ministry of Environment/Natural Resources, (ii) a National Development Agency, such as the Economic Planning Unit (EPU) in Malaysia or the National Economic Development Administration (NEDA) in the Philippines, or by (iii) a National Development Council type of apparatus (such as mandated in Thailand's new constitution¹⁴) which would involve key stakeholders (including economic groups) in guiding policy. Guided networks perform best when clear incentives to cooperation are put in place.

- (v) Because the *strategic collaborative* approach involves a wide range of stakeholders and interest groups, the sustainability of feedback and monitoring becomes an issue, especially if the collaborative organization was outside the public sector. (In cases where an umbrella agency exists with responsibility for water resources planning, it is often the best agency to guide collaborative strategic planning of water resources.) Often the collaborators become less active once they put in place a strategy (or especially if they fail to do so). However, this is not always the case, frequently the

¹³ For discussion of the guided Asian model, see: UNESCAP, *Strategic Environmental Planning*, New York: United Nations, 1999. (In particular, see Section II, "National Experiences on Strategic Environmental Planning".)

¹⁴ In Thailand, this new apparatus is termed the, "National Social and Economic Development Council"; its membership is constituted from a variety of defined interest groups, e.g., environment, labour.

collaborative group does stay together. In cases where the collaboration was organized outside the public sector, the collaborators may even constitute an office, hire staff, etc., paid for by contributions from collaborators, by a Foundation or NGO, or by the public sector. If the collaborative group does disintegrate or become less effective, it is especially incumbent on the official umbrella agency (if one exists) to monitor the performance of the overall strategy, because it will involve more than one institution.

4.2 Implementing strategic collaborative planning

As noted, this process is often kicked off by pressing issues or the existence of a change-oriented vision in which water resources play a key role. The hard part is to bring the key interest groups together, e.g., in the case of watershed planning, technical agencies, farmers, livestock herders, community groups, local governments, etc., to catalyze the process. If the process involves a sub-national issue, e.g., water allocation in a watershed, different groups will be involved than in the case of a national issue, e.g., dealing with tensions over national water pricing. Yet another set of interest groups will be involved in addressing international issues, e.g. water allocation among countries. Normally, in the national and sub-national cases, a government agency (such as an umbrella planning agency for water resources, the environment ministry, or the national developmental planning agency) a NGO, or an interest group, e.g., a leading Environmental Research group, will need to champion the process. In the international case, an international body such as the Mekong River Commission would normally trigger the strategic collaborative planning process.

Once the process has been constituted, it will need funds, although volunteers can contribute, if there is sufficient motivation. Funding is primarily needed for the hard analysis, i.e., identifying and assessing Driving Forces; and undertaking SWOT and Scenario analysis. To do the technical work, a Technical Working Group (TWG) needs to be formed. However, a wider Stakeholder Group (SG), but still of a manageable size, needs to exist to interact regularly with the technical working group. Key interest groups need to be represented as part of the Stakeholder Group, but its membership should preferably be limited to about 20 persons. It is virtually impossible to make progress in a collaborative process if large numbers of

people are involved, because compromises can not usually be negotiated in public (your constituency will accuse you of “backing down”). Large groups usually produce “watered down”, “lowest common denominator”, and politically non-offensive outcomes. The victims are the consumers of the service, e.g., water users. However, large scale meetings are useful during issues identification and when subjecting findings from technical analysis processes to public scrutiny, i.e., Drivers, SWOT, and Scenarios analysis interim outputs. Representatives of different groups involved in strategy formulation based on small group dynamics have an obligation to constantly interact with their constituency during the entire process, and bring feedback from their constituency to the small groups (TWG and SG). (Effective dynamics for such processes are readily understood, an outcome of a century of negotiations, e.g., labour – management negotiations.)¹⁵

Once an overall strategy has been agreed upon, it important that the collaborative group act as a unified front. Unity will dramatically increase the chances that the strategy will be legitimized by the relevant level of government, and will greatly increase the chances of the strategy being implemented, especially, as is often the case, if it involves a large number of networked institutions.

It is ideal if the collaborative group can sustain itself. The fruits of strategic planning are in the implementation, i.e., in management, not in formulating a strategy. By remaining active, the collaborative group can monitor the strategy and provide feedback. If such monitoring is formally undertaken by an official body, and a civil society collaborative group is involved, the latter can work with the official monitoring agency, either by supporting its activities, or by playing a “watch dog” or “second opinion” role.

¹⁵ Jerome D. Priscoli (2001), *Participation, River Basin Organizations and Flood Management*, Background paper prepared for Regional Cooperation in Flood Control and Management in Asia and the Pacific Phase II: Workshop on Strengthening Capacity in Participatory Planning and Management for Flood Mitigation and Preparedness in Large River Basins, organized by ESCAP, Bangkok, November 2001.

4.3 Guidelines to undertake strategic collaborative planning

The following guidelines follow the steps indicated in Figure 7.

4.3.1 Vision

A Vision is a statement that describes a desired future state. It is oriented to a given time period, usually about twenty years. A Vision for watershed planning might be built around a theme of achievement of sustainable water use in all of a country's watersheds by 2025. The problem with visions is that they often tend to be utopian rather than realistic, and are often so vague as to be of little value in guiding the collaborative strategic planning process. However, if well done, a Vision can be useful in orienting stakeholders (looking and pulling in one direction) in developing a strategy, particularly at the stage of Mission formulation.

How can realistic and useful Visions be formulated? In terms of water resources management, the Vision needs to key off the national development vision (even better, be developed as a component of the national development vision) – to a considerable and increasing extent water is a key factor supporting (and sometimes constraining) national development. A Water Resources Vision formulated in isolation from an overall national vision that incorporates social, economic, and environmental dimensions reflecting national developmental aspirations is likely to be of little value. Many Asian and Pacific countries such as Malaysia and Thailand have developed long-term Visions that can be used to orient the Water Resources Vision.

In formulating the Water Resources Vision, key stakeholders need to be convened. Priority (parameter defining) data needs to be circulated to all involved stakeholders, e.g., information on current and forecast water balances by sub-region, future economic structure, international water agreements in place and expected to be ratified, etc. The danger is that in trying to have all stakeholders "on side", the Vision will be too general to be useful, thus expecting 100 per cent consensus is likely to be unrealistic.

The Vision that is produced should be short (less than 4 paragraphs), clear, and oriented toward a specific time frame. Sometimes quality graphics can make a Vision clearer. Once formulated, the Vision should be widely disseminated.

Box 2. National Water Vision**(a) Australia:**

The vision for Australian water resources reflects a change in Australian values from an emphasis on exploitation of the resource to a stewardship ethic in water resources management.

(b) Malaysia:

In support of Vision 2020 (towards achieving developed nation status), Malaysia will conserve and manage its water resources to ensure adequate and safe water for all (including recognizing the environment as a key water user).

(c) Philippines:

By the year 2025, water resources in the Philippines are being used efficiently, allocated equitably and managed sustainably with provisions for water-related disasters.

(d) Thailand:

By the year 2025, Thailand will have sufficient water of good quality for all users through an efficient management, organizational and legal system that would ensure equitable and sustainable utilization of its water resources with due consideration on the quality of life and the participation of all stakeholders.

(e) Viet Nam:

The Vietnamese Water Vision is the integrated and sustainable use of water resources, the effective prevention and mitigation of harms caused by water for a better future on water, life and the environment.

4.3.2 Issues

Identification of Issues is critical to formulating a collaboratively based strategy for water resources management. It may be wise to identify Issues concurrent with development of a Vision. An Issue is a failure to meet expectations. However, expectations need to be identified in the context of the nation's resources. For example, the fact that Bangkok is not fully serviced with sewerage (in fact less than 20 per cent of the city is serviced by sewerage networks) is probably not an issue; the fact that existing wastewater treatment plants are not operating is.

Issue identification involves convening representative stakeholders in the water community, as per Vision formulation. However, it is important that stakeholders be truly representative of significant groups and that they be accountable to those whom they represent, feeding back information to their membership.¹⁶ Other types of information are important in identifying Issues, in particular: (a) content analysis of the media – what problems pertaining to the water sector are being reported, (b) analysis of internet sites hosting discussion of water issues, (c) official referenda/voting (and results) on water related issues, (d) political debate regarding water issues, and (e) expert opinion (domestic/international) regarding the water resources and management situation in the country in question.

In formulating an Issues statement, it is important that issues be grouped. Normally, an Issues statement should be “boiled down” to no more than 10 major national water issues. Of course, at the sub-national level, different, more immediate issues will be identified, but sub-national strategic collaborative processes should be undertaken separately, albeit within the framework of the national water strategy.

4.3.3 Mission

Formulation of a Mission statement is critical in *Collaborative Strategic Planning*. At this level, it will normally have two components, (a) a substantive one, e.g., to ensure access to water for all economic activities based on certain principles of water pricing and to ensure minimum national levels of water quality and (b) a process one, which may be as simple (at least on paper) as achieving coordinated planning and management of a nation’s water resources.

The Mission statement needs to be formulated by a smaller group than that which formulates the Vision Statement and identifies Issues. Also, more technical information is needed, even though a Mission does not detail means to achieve it, to ensure that the Mission is realistic. Formulation of the Mission statement should involve a small group that includes representatives of government bodies responsible for water management, experts (e.g., university faculty), and voluntary organizations.

¹⁶ Much has been written on stakeholder involvement in planning and management processes. For example, see: ESCAP, *Guidelines for Stakeholders Participation in Strategic Environmental Management*, New York: United Nations, 2001.

A Mission statement should not be more than one paragraph long. The shorter the better, in that it should be posted widely throughout the country to constantly orient the population to the nation's water sector mission.

Most importantly, a group of persons (or institutions) needs to be charged with responsibility for accomplishing the Mission.

4.3.4 *Driving forces*

Identifying Driving Forces is critical to effective water management. Identification of Driving Forces is a technical task. Therefore, from this point on in the Strategic Collaborative Planning process it is important that a Technical Working Group (TWG) be in place. This group should be small, no more than 10 people, but include experts on various water sectors, e.g., irrigation, water supply, waste water treatment, water pollution; and experts on planning, forecasting, anticipation, and foresight (all experts should have expertise in both one or more substantive and planning skill areas to minimize the size of the group). However, to keep the technocrats in check, the TWG should interact at regular intervals with the wider group (the Stakeholder Group) that formulated the Mission statement.

In undertaking Driving Forces analysis it is important that the internal and external environments be identified. This has always been a stumbling block in applying strategic planning techniques to the public sector and is especially difficult when the spectrum of water resource sectors is being assessed. Basically, the internal environment consists of all agencies responsible for water resources management and planning in a country and the biological (e.g., watersheds), physical (e.g., water supply networks), and human (e.g., fisher communities) systems for which they have responsibility. The external environment is everything outside that system, including international forces affecting the internal environment.

There is much technical literature on Driving Forces analysis, which will not be repeated here. However, there is a consensus that Driving Forces should be generically organized by types of forces:

- (a) Cyclical forces, e.g., annual flood cycles, business cycles
- (b) Trends, e.g., climate warming, deforestation in watersheds, population growth

- (c) Random, but predictable, events, e.g., earthquakes, changes in a major river's course
- (d) Benchmark events, e.g., signing of an important convention, such as China's joining the WTO, a country ratifying the Ramsar convention
- (e) Surprises, e.g., damming of a river (without consultation) by an upstream country, coup d'état, terrorist attacks¹⁷

Information to undertake driving forces analysis can be obtained from the popular media, professional and academic literature, insurance companies (who have a vested interest in assessing risk and future events accurately), professional futurists, historical data, e.g., water flows over a long period of time, etc. But obtaining such information is only the first

Box 3. Driving forces	
Demographic forces Population Urbanization Migration	Economic forces Globalization Changes in Mix of Economic Output Industrialization
Social forces Lifestyles Cultural preferences Poverty	Technological forces Water use technologies Water distribution efficiency Development of practical renewable energy sources No water pollution
Environmental forces Over exploitation of water resources Contamination of water resources Degradation of aquatic ecosystems Climatic changes	Governance forces Institutional reforms Legal reforms Stakeholder participation Introduction of demand management Decentralization
Derived from: Malaysian Water Sector, by Salmah Zakaria, Director of Corporate Development Division, Department of Irrigation and Drainage, Malaysia, presented at ESCAP Regional Workshop, December 2001.	

¹⁷ For a discussion of the importance of anticipating surprises in strategic planning, see: The Economist, "Scenario Planning: The Next Big Surprise: Wanted: A New Way of Planning for the Future", *The Economist*, October 13, 2001, pg. 60.

step. Useful Driving Forces analysis needs to identify which driving forces are truly important in shaping water resources outcomes and how the strength and nature of these forces will change. For example, China's joining the WTO will greatly change China's agricultural sector (e.g., crop mixes, areas farmed, farming systems) with profound implications for rural water use – most of them positive.

As with Issues analysis, it is imperative that Driving Forces be condensed (grouped) into a reasonable number of forces (no more than 12 internal, and 12 external forces) so that Scenarios can be developed and the strategy formulation exercise can be effectively informed.

4.3.5 Scenarios

It is obviously impossible to predict the future. However, to strategically plan water resources it is important to know the *range* of possible futures. Furthermore, scenarios are needed to undertake Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis described below. In water resources strategic planning, the scenarios should focus on aspects of future national and international development that would directly affect the internal environment, i.e., the water sectors. For example, political ideology very much affects the issue of water pricing, especially for rural agricultural consumers. Thus one scenario might postulate a populist government in power, elected by rural voters, that would make introduction of water use charges for irrigation virtually impossible, but might champion recognition of water rights for farmers. At the other end of the continuum, a scenario might postulate a highly market oriented government is in power, with its political base in urban areas, that would make full cost recovery for water provision more probable.

Scenarios are essentially stories about the future. Developing credible scenarios requires considerable skill. Fortunately, there are many excellent books and guides available on their formulation.¹⁸ The same team

¹⁸ A brief, but excellent guide to scenario preparation is: Tegar, G., *Technology Foresight: Philosophy and Principles*, Bangkok: APEC Center for Technology Foresight (Monograph, See section entitled, *Scenario Procedure*, pp. 7-12).

For examples of scenarios applied to the development of a nation, see: Ogilvy, J., Schwartz, P., and Flower, J., *China's Futures: Scenarios for the World's Fastest Growing Economy, Ecology, and Society*, San Francisco: Jossey-Bass Publishers, 2000.

Box 4. 2025 – Malaysian water scenario

- Water sector management: efficient, integrated
- Efficiency of water use in all sub-sectors
- Policies and legislation: effective
- Strong institutions: management plans, databases and DSS models
- Eco-friendly farming and industries
- Water shortage is no longer an issue
- Most flooding problems have been mitigated

that produces the Driving Forces analysis should develop the scenarios. Even more important than in the case of Driving Forces analysis, the wider group (the Stakeholder Group) that formulated the Mission Statement should be involved in development of the Scenarios at regular intervals.

According to Tegart, tests of a good scenario are: (a) it is plausible to a critical mass of experts and/or decision makers, (b) it is internally consistent, (c) it is relevant to the topic or issue of interest (in this case, planning and management of water resources), (d) it is challenging, containing some elements of surprise or novelty in directions where the organisation(s)' vision needs to be stretched, (e) it is linked to participants' mental maps, and (f) it should not be novel in every respect.

4.3.6 *SWOT analysis*

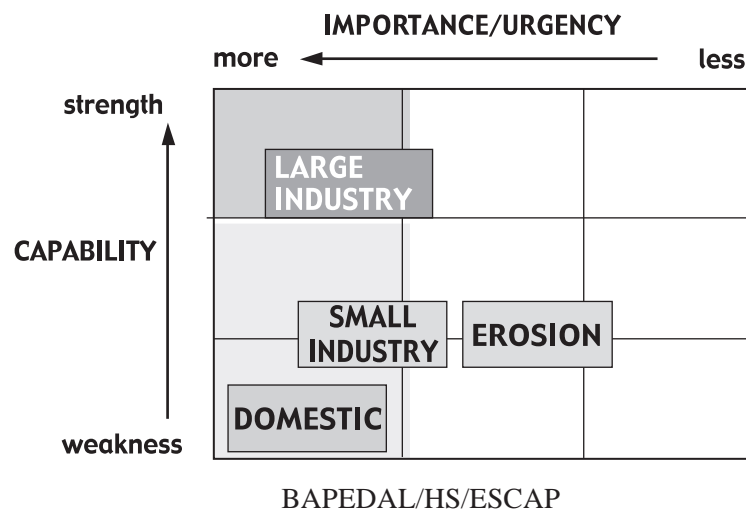
SWOT analysis is where the Mission, Driving Forces, and Scenario come together to create the information base needed to formulate Strategies.

SWOT analysis can be sub-divided into two main components: SW (Strengths – Weaknesses) and OT (Opportunities – Threats).

SW analysis focuses on the internal environment, and institutions in particular. As noted earlier, because *Strategic Collaborative Planning* involves a large number of institutions, SW assessment can not be done in nearly the same detail as for Strategic Functional planning and management, discussed below, which focuses on one institution. If funds are available, this aspect of the collaborative planning process can often be enhanced by engaging professional organizational analysts who can apply techniques to rapidly identify strengths and weaknesses within organizations. Such outside

Figure 8. Analysis of the PROKASIH (Clean River Programme) in Indonesia

PRIORITIZING/FOCUSING



Source: Hendra Setiawan, *Environmental Impact Management Agency, Indonesia*, presented at the Regional Workshop to finalize the Guidelines on Strategic Planning and Management of Water Resources, Bangkok, December 2001.

experts should report back to both the TWG and the larger Stakeholder Group. It is important to recognize, in undertaking SW analysis, that strengths and weaknesses are not objective qualities. What is a strength under one set of conditions (Scenario, Driving Forces) may be a weakness under another set. For example, if a water agency is oriented toward regulatory-administrative approaches to water pollution management and political change results in market-based instruments becoming the norm, what was one a strength (legal and policing functions) may become a weakness and what was once a weakness (expertise in economics) may become a strength. Similarly, if hardware approaches, e.g., building dams, give way to software approaches, e.g., demand management, the value of different institutional attributes will necessarily change. Given the foregoing, in undertaking SW analysis, it is important that institutional characteristics be evaluated against future scenarios and driving forces to see how institutions would stand up under different conditions. An analogy would

be the testing of airplane designs in a wind tunnel to see how they stand up under different conditions. However, this is best done after OT analysis is done, because OT analysis can often help analysts better define the future.

OT analysis focuses on assessing the external environment for both threats and opportunities. This analysis should be undertaken by the Technical Working Group. To a significant degree, Driving Forces analysis will provide the data base for OT analysis. However, additional information should be collected, as needed, as new possible threats and opportunities are identified. The wider Stakeholder Group should be involved regularly in the process. Often this wider group can play an important role in identifying opportunities or threats that have been missed by the smaller Technical Working Group. The TWG can then follow up technically to determine the importance of threats and opportunities identified by the wider group, and how they may play out.

Global warming could represent a threat in terms of increased drought, etc., and obviously calls for appropriate responses. On the other hand, the potential to sign a trade agreement that enables a country to cultivate fewer hectares in water intensive crops or sign a bilateral treaty which would ensure less fluctuation in water levels of an important navigable river would represent opportunities. Obviously in formulating the Strategy, the emphasis should be on identifying means to maximize opportunities and minimize threats.

4.3.7 Identifying and refining strategies

The next step is actually identifying appropriate strategies. *Strategic Collaborative Planning* is likely to focus on the *roles* to be played by different institutions (at both the sectoral and agency levels) and the strengthening of network dynamics, i.e., how institutions can more effectively interact to add value, ensure that there are no gaps in service delivery, minimize duplication, and enhance synergy.

Strategy formulation needs to be undertaken within resource parameters, i.e., the financial, human, and technical resources that are likely to be available. Of course, all resources are elastic (more so in the medium and longer term than short term) depending on performance of the overall national system, and performance within the water resources field as a whole, and in water sectors. Nevertheless, it is important to identify order of

magnitude resource availability before formulating strategies, so that the strategies put forward are realistic.

Strategy formulation is not creating wish lists of project or programmes. Rather, it involves identifying no more than 10 strategic thrusts that will work through interventions or incentive frameworks focused on points (fulcra) of high leverage. Once these thrusts have been identified, appropriate institutional responsibilities can be assigned. Strategy formulation involves maximizing opportunities and minimizing threats as noted earlier. Often systems modeling and information from analogous situations elsewhere can assist strategy formulation, as can best practices data banks.

Refining the strategy involves two components: (a) the technical, and (b) feedback from stakeholders. The former involves applying traditional tools of analysis such as cost-benefit analysis, economic analysis, financial feasibility assessment, environmental and social impact assessment, etc., to key thrusts that have been tentatively identified. The latter involves distribution of the strategy to the larger group of stakeholders, to obtain their feedback. This process should not seek to make everyone happy, i.e., achieve consensus. Such an approach would guarantee a sub-optimal Strategy; it is mathematically impossible to achieve change without make some groups worse off (at least relatively).¹⁹ However, by exposing the draft strategy to a wider group it will identify logical inconsistencies and identify thrusts that are clearly unacceptable to large segments of the population. (A strategy must be acceptable and reasonable – technical optimality is a utopian goal.) Furthermore, constructive feedback will enable fine tuning of strategic thrusts.

4.3.8 *Legal mandates in implementation*

Once the Strategy has been developed and accepted by the Government in power, legislation will need to be prepared to alter the mandates of institutions, as necessary, to implement the Strategy. (To a significant extent, it may be possible to effect changes in institutional roles through administrative guidelines rather than legislation.) In some cases, new institutions will need to be created although this should be an action of last resort to avoid proliferation of bureaucracy. In other cases,

¹⁹ Based on the work of Kenneth Arrow of Stanford University, for which he won the Nobel prize in Economics.

institutions which clearly perform a role unneeded, or inconsistent with the Strategy, will need to be shut down. The Strategy should clearly define roles of institutions, essentially defining their Missions, but legal implementation will depend on the Government in power.

It is easier to prescribe institutional roles and mandates than institutional cooperation and empowerment of networks. Devising means to do the latter will be one of the major challenges facing those involved in implementing the *Strategic Collaborative Planning* process. Although there are no easy answers, prescribing regular committee meetings involving the actors is unlikely to accomplish the coordination objective. More important is putting in place incentive structures (which can be defined through the *Strategic Collaborative Planning* Process) which reward cooperation. For example, cooperation essential to implementation of the strategy could result in larger fiscal transfers to the cooperating agencies involved (whether national or sub-national) from the national government. Committee meetings create an illusion of cooperation; rewarding cooperation ensures that it occurs.

4.3.9 Monitoring and impact assessment

Very important in *Strategic Collaborative Planning* is specification of monitoring and impact assessment systems. Basically, monitoring should be done by the agencies themselves, but be subject to quality control by high-level agencies (e.g., the national planning agency, the office of the Budget). However, since strategies at this level are likely to emphasize inter-agency cooperation, there will be a need to monitor such performance at a level higher than the line agencies themselves, e.g., by a national planning agency or where an umbrella water resources agency exists, e.g., the National Water Resources Committee in Thailand, by such an agency. Monitoring involves creation of indicators that need to be aligned to the strategy. This is not an easy task and requires considerable effort and resources.²⁰

²⁰ For detail on the design of such a system, see: Dearden, P., *Natural Resources and Environment: Implementing the Ninth Five Year Plan*, Bangkok: Asian Development Bank/NESDB, 2001.

A key source describing current best practice in the formulation of environmental indicators, including for water resources is: Smeets, E. and Weterings, R., *Environmental Indicators: Typology and Overview*, Copenhagen: European Environment Agency, 2000 (Technical Report 25).

5. THE STRATEGIC FUNCTIONAL MODEL

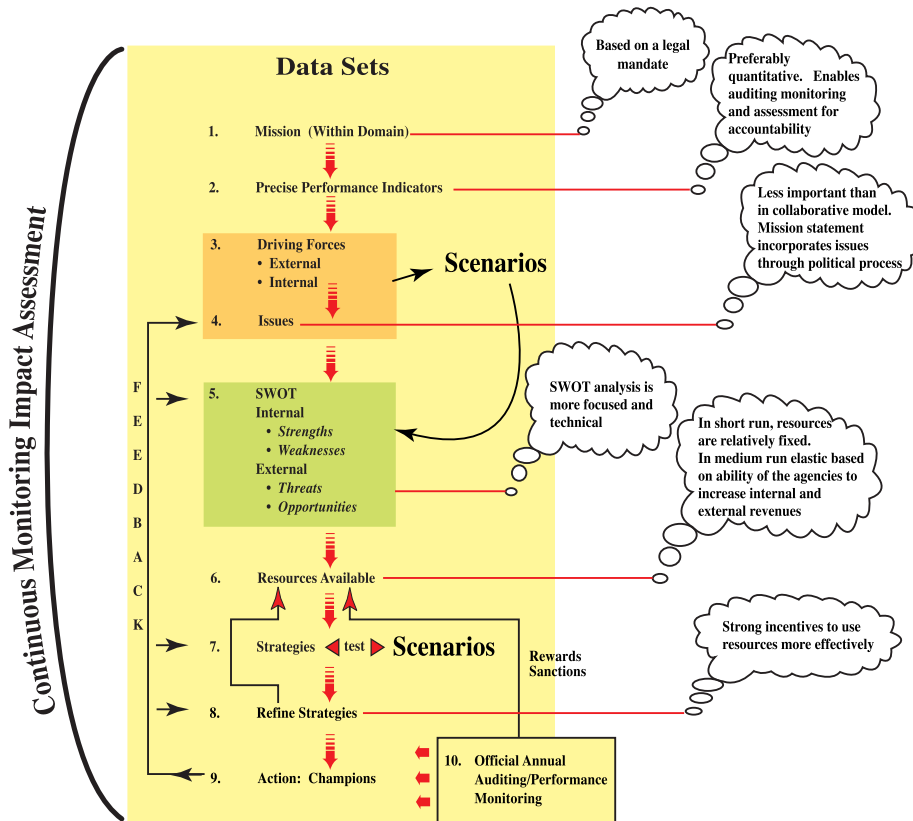
5.1 What is strategic functional planning and management?

Strategic planning lends itself to increased accountability of government agencies for a variety of reasons. Firstly, each agency is required to develop a Mission statement that is essentially a commitment or promise in regard to future performance. It is for this reason that many traditional bureaucrats do not like strategic planning – Mission statements clearly describe the purpose of their institution, holding the civil servants accountable. Secondly, strategic planning focuses on a limited number of actions (high leverage activities that will make a big difference). This reduces “noise”, making it is easier to monitor outcomes, the relationship between spending and outcomes/results, etc., when resources are focused on a limited number of actions for which there are clear performance expectations.

Figure 9 describes the *Strategic Functional* model. Some of the key characteristics that distinguish it from the standard public sector strategic planning model are:

- (i) The internal environment (the organizational agent) is very clear. It is almost invariably one agency. Defining the internal environment (the agent) is often one of the most difficult problems in applying strategic planning approaches (which were developed by industrial and military users) to public sector planning and management, but not in this case.
- (ii) The Mission statement is usually constrained, often necessarily, because it is proscribed by legislation or administrative guidelines. It may be a product of the collaborative process described above.
- (iii) The Mission statement must be translated directly into measurable expectations (outcomes, possibly impacts), preferably quantitative. Otherwise, performance can not be held accountable.
- (iv) To a certain degree explicit issue identification is less important, in the sense that the Mission, reflecting a legal

Figure 9. Strategic functional planning model



mandate, or defined through official administrative guidelines, should to a considerable extent, at least in a democratic society, reflect societal issues.

- (v) Strategic options (the range or latitude of action) in the *Strategic Functional* model are more limited by the fact that resources and range of functions are more clearly bounded than in the case of the *Strategic Collaborative model*, especially in the short run. However, it is a mistake to assume that resources (or functions) are fixed. For example, an irrigation district can generate more revenues (within legal mandates) through user fees, an urban water distributor can generate more net revenue by reducing leakage, etc.

- (vi) The *Strategic Functional* model requires that outcomes/results be measured and that the indicators used to measure outcomes align with the performance expectations derived from the Mission statement.
- (vii) Sanctions need to be in place. If there are no costs or benefits from meeting (or not meeting) Mission expectations, there is little incentive to do so. Sanctions can range from the punitive, e.g., dismissing management associated with severe under performance to the positive, e.g., awarding the agency in question with a larger mandate and an increased set of resources to accomplish it. There is no such thing as accountability without sanctions.

5.2 Implementing strategic functional planning and management

In terms of methodology, the Strategic Functional Model is closer to the standard strategic model than is the Strategic Collaborative approach described earlier. Nevertheless, there are important differences.

As has been noted, this model flows from a strong and precise Mission statement. Performance expectations need to be derived from the Mission statement. They should be quantitative to the greatest extent possible, but if qualitative, they still need to be put forward in a systematic manner. Normally, performance expectations should be developed for both the short term (aligned with the fiscal/budget year) and the medium term (3-5 years). Depending on the subject matter, there may be value in quantifying longer-term expectations, e.g., 10 years. This is especially the case in the natural resource/environmental area, including water resources management, as contrasted with areas such as economic performance where change is often faster. To clean up a river or reforest a watershed takes time.

Although this model is not Issues driven, Issues should still be discussed and analyzed within the framework set by the Mission statement. In dealing with issues, it is important that stakeholder and interest groups be involved – but the focus should be on those groups that are directly pertinent (decision makers, users of the agency's services, those directly impacted by its actions) to the mandate of the Mission statement.

In undertaking SWOT analysis, the internal environment of the organization is very important. If an institution is going to succeed in delivering its Mission, it is important that internal strengths-weaknesses analysis be very seriously undertaken. Although to a considerable extent, in the short-run, internal organizational strengths are given and that will strongly influence the scope and parameters of the Strategy, in the longer-run resources are much more elastic. Internal strengths-weaknesses analysis will provide important information on how the institution should be changed (re-engineered, re-oriented) internally. Of course, important feedback loops are involved. Resources limit what strategies are possible, but as strategies are refined and implemented, institutional resource needs will change, and internal institutional change will often be needed.

In terms of monitoring and assessing performance, this should be done internally by the organization in question. However, for the accountability model to be meaningful, external monitoring of its performance against the Mission statement (and derived performance expectations) will also be necessary, for reasons of checks and balances. This will require serious auditing of inputs, outputs, developmental outcomes, and to the extent possible, developmental impacts. Identifying indicators to measure outputs and outcomes requires careful thought. There should not be too many, it will confuse accountability, but those chosen need to be powerful in terms of measuring performance. External monitoring and assessment should involve stakeholders and interest groups outside the organization, particularly user groups. Such groups can act effectively as “watch dogs”, assisting the formal auditing/monitoring agency in enforcing accountability. For example, many official monitoring/regulatory agencies have internet sites that enable stakeholder groups to input information (feedback) concerning performance against the Mission statement. In other cases, phone numbers are provided to users to report on agency performance. If a user group has mass membership this type of monitoring can be very effective. For example, in the United States the International Air Travellers Association (IATA), a mass membership group, constantly monitors the performance of the US Federal Aviation Administration (FAA) against its Mission statement. In Hong Kong, China, public facilities have colourful posters posted in high traffic areas illustrating and describing the services that can be expected on a day-to-day basis, and expectations regarding the condition of the facility. The public is invited to report (by telephone, internet) any deviations from these expectations

associated with the agency's mission statement. In the Municipality of Phitsanulok (a city of 100,000 in Northern Thailand), the Municipality requests citizens to report deviations in performance from its Mission statement on its website. A constant challenge facing those responsible for overseeing monitoring processes is to minimize distortions caused by the sanctions – rewards system. That is, the more important monitoring information becomes in allocating resources, the greater will be the incentive for agencies to bias monitoring data to indicate performance better than is actually the case.

5.3 Guidelines to undertake strategic functional planning and management

The following guidelines parallel the steps outlined in Figure 9 pertaining to implementation of *Strategic Functional Planning*. Since most of these steps were discussed in the previous section on, *Guidelines to Undertake Strategic Collaborative Planning*, the following section is limited to discussing differences in strategic planning activities (steps) associated with Strategic Functional Planning/Management relative to the Strategic Collaborative approach describe earlier, and discussing steps not part of the collaborative approach.

5.3.1 Mission statement

In the case of the Strategic Functional Model, the Mission statement pertains to a single institution, either a sectoral agency operating nationally or locally, or an area-based agency. As such, it should be developed by the agency itself, in conjunction with key users of its services, plus those directly impacted by its activities. However, the Mission statement should be constructed within the parameters defined through the *Strategic Collaborative Planning* process described above.

The Mission statement should be succinct, even more so than in the case of collaborative planning and be posted prominently where ever the agency operates.

Specific individuals in the agency should be given responsibility to effect, and be held responsible for, implementation of the Mission. (Why would civil servant agree to take on such a role? Because success in

implementing a Mission can lead to community and agency recognition and rapid promotion within the agency.) Within the agency, a technical working group (TWG) needs to be formed to undertake the following steps. As in the case of the collaborative planning approach, the TWG would regularly interact with a wider Stakeholder Group.

5.3.2 Formulation of precise performance indicators

As noted above, precise performance indicators need to be established to operationalize accountability based strategic planning. Much has been written on this topic.²¹ In the water sector, the DPSIR framework is the international norm. (DPSIR stands for Drivers, Pressures, State, Impact, and Responses.)²² Consistent with strategic planning philosophy, such a framework facilitates taking action on drivers (within the internal environment), i.e., causes of problems rather than symptoms. As such, performance indicators would measure impacts of interventions on outcomes, but also on drivers closely causally correlated with mission attainment.

Indicators should be realistically implementable, i.e., data should be available on a timely basis (ideally in real time) to formulate and maintain them, and they should be powerful, i.e., changes in the indicator(s) should be closely correlated with Mission performance. In results based budgeting systems, input indicators are also required, i.e., it is necessary to relate resources utilized to achieve a Mission to the outcome(s) realized. It is the relationship between inputs and outcomes/results that determines whether expected performance has been achieved.

5.3.3 Driving forces

In the *Strategic Functional Model*, Driving Forces analysis closely reflects that undertaken in the case of the collaborative model. However, since the scope of activity will be narrower, the range of drivers may be less so that emphasis can be placed on drivers more associated with the function in question and technical analysis can go deeper. For example, if the agency in question is an urban water supply agency, emphasis would be

²¹ U.S. Government CD-ROM. Also see: Melaville, A., *A Guide to Selecting Results and Indicators*, Washington: The Finance Project, 1997. Specific to the water sector, see, Dearden, P., 2001.

²² The DPSIR framework is described in Smeets, E. (2000).

placed on changes in economic activity and demographic structure, rather than changes in agricultural policy change.

In the case of the *Strategic Functional Model*, the internal environment will be the institution itself and the water systems, and related social systems, for which it has direct responsibility.

**Box 5. Success indicators, after eight years
of PROKASIH, Indonesia**

Processes

- Commitment of Decision Makers
 - The President: “PROKASIH AWARD”
 - Minister of Home Affair
 - Vice-Governor
- Provincial Team-work
 - Report to Vice-Governors
 - Governmental bodies
 - Universities
 - Community major groups
- Regular meetings
- Compliance Momentum

Outputs

- Regulations and guidelines
- Proper trained officials
- River basin work plan
- National government bodies support
- Compliance database – Disclosed
- Public critics

Outcomes

- Industrial wastewater treatment
- Comply to effluent standard
- Industrial pollution load reduction
- Self compliance

Source: Hendra Setiawan, Environmental Impact Management Agency, Indonesia, presented at the Regional Workshop to finalize the Guidelines on Strategic Planning and Management of Water Resources, Bangkok, December 2001.

5.3.4 Scenarios

Scenarios may play a less important role at the accountability level. In effect, the Missions assigned to individual agencies should reflect future conditions as defined using the collaborative approach. However, more bounded scenarios should be produced that focus more on the institution's role. For example, if the agency in question is responsible for water supply in a large city, it should develop scenarios (or use scenarios developed elsewhere – perhaps by the city's government) pertaining to future development trajectories of the city in question, and its water supply source areas.

5.3.5 SWOT

SWOT analysis again parallels the guidelines noted for Strategic Collaborative Planning. Because only one institution is being subject to SW assessment, it can be done in much more detail than is the case for Strategic Collaborative Planning. Such work is very important as it lays the foundation for institutional changes that will make Mission fulfillment possible.

In undertaking the OT analysis, it must be remembered that other water sectors form part of the external environment.

5.3.6 Resources available

As noted under Indicators (ii above) accountability based strategic planning requires that Mission achievement be related back to a set of resources. Thus it is important that resources available be clearly defined before strategizing. However, an iterative process should then take place that relates the strategy to resources. A good strategy is likely to attract more resources.

5.3.7 Identifying and refining strategies

At the Strategic Functional level, strategies will obviously fall within the mandate of the institution in question. As such they are likely to be technical in nature but should involve new more productive means of achieving the Mission. In other words, the strategy formulation stance should be *proactive and entrepreneurial* rather than passive and bureaucratic.

New ways of achieving Missions can often be identified through studying international experience and best practices, holding retreats at which it is “safe” for staff or outsiders to put forward radically different means of achieving the Mission, offering prizes for innovative ideas that work, etc.

As was the case in *Strategic Collaborative Planning*, stakeholders should be involved in review of the strategy. These stakeholders should be the decision-makers and those directly using or affected by the services of the institution in question. Because the single institution level is much more bounded, technical analysis will play a larger role in refining strategies, e.g., financial feasibility analysis, economic analysis, technology appropriateness assessment, and environmental impact assessment.

5.3.8 *Auditing and performance monitoring*

Key to this model is auditing and performance monitoring. Although the agency should do its own performance monitoring, a higher level body, e.g., the Bureau of the Budget in conjunction with the National Planning Agency or Umbrella Water Resources Committee should ensure quality control. Essential to the model working is making all results of auditing and performance monitoring public, e.g., on the internet, in annual reports, in the media, etc. And, as has been stressed, the model will only work if good performance is rewarded and unexplained poor performance sanctioned or punished.

APPLICATIONS UNDER VARYING CONDITIONS

6. MODEL VARIANCE

The foregoing nested paradigm of strategic planning and management in the water resources field needs to be varied under differing conditions. Some of these differing conditions are discussed below:

6.1 National versus area scales

There is a strong movement in the Asian and Pacific region toward emphasizing area-based approaches in water resources planning, e.g., river basins, water sheds, agro-ecological zones. Sometimes an implementing agency (authority) is created at the sub-national level, but in other cases, committees are formed that attempt to coordinate national and local agencies (particularly local governments) involved in water resources (or natural resources) management operating within the area in question.

Area based strategic planning makes considerable sense. If one agency is involved, the Strategic Functional Model would be more appropriate, whereas if many actors are involved, the Strategic Collaborative Model is more appropriate. However, if many nationally based agencies are involved, they will also need to factor in their area-based activities into their strategic functional plans. (In other words, sub-national strategic plans and national strategic plans need to be consistent at the agency level.) It is important that national agencies build the spatial dimension into their Missions and Strategies. For example, because water resource conditions vary so widely among regions in most countries, national agency monitoring needs to be disaggregated spatially. The spatial disaggregation should obviously correspond with official water or natural resource planning areas.

6.2 Differing underlying drivers

Leadership is always important in strategic planning. However, in some cases, leadership can instigate the process with legal mandates not existing, or playing a lesser role, even if in place. For example, at the national level in Malaysia, leadership plays an important role in strategic planning processes. Other systems, such as Japan may be more

Box 6. Application of SPM in the region: priority elements, components, and issues of SPM**At the national level:**

- 1. Most important element:** (i) A clear Vision based on shared concerns, (ii) All elements of SPM should incorporate technical, social, financial, and environmental considerations.
- 2. Most important driving forces:** (i) Increasing food requirements, (ii) Demand for additional land for irrigation and flood protection, (iii) Increasing (and competing) demands for water for agriculture, household, and industrial uses.
- 3. Most important issues:** (i) Need for policy reforms, (ii) Need for institutional reform at the organizational level, (iii) Need for appropriate mechanisms to prevent/resolve conflicts/differences, (iv) Need for increased public participation.

At the sectoral level:

- 1. Most important element:** (i) A clear Vision based on shared concerns, (ii) All elements of SPM should incorporate technical, social, financial, and environmental considerations.
- 2. Most important driving forces:** (i) Increasing food requirements, (ii) Demand for additional land for irrigation and flood protection, (iii) Increasing (and competing) demands for water for agriculture, household, and industrial uses.
- 3. Most important issues:** (i) Need for policy reforms, (ii) Need for institutional reform at the organizational level, (iii) Need for appropriate mechanisms to prevent/resolve conflicts/differences, (iv) Need for increased public participation.

At the organizational level:

- 1. Increased information requested on SPM: Priorities:** (i) Methodological variants of SPM (collaborative, accountability, etc.), outlining key steps, (ii) Country cases illustrating application of SPM, (iii) Additional information on identification of shared Visions, (iv) Comparison of SPM approaches with conventional (rational, comprehensive, linear planning) approaches.
- 2. Increased information requested on SPM: Other items noted:** (i) Definition of SPM terms; including preparation of a Glossary, (ii) Relevance of SPM variants to differing government and administrative structures, (iii) Applicability of SPM to environmental, sanitation, and land issues.

Source: Results of the Working Groups at ESCAP's Regional Workshop to Finalize the SPM Guidelines, Bangkok, December 2001.

Box 7. Actions to combat vulnerability of the Pacific island countries to climate change

Key message 1: There is a need for capacity development to enhance the application of climate information to cope with climate variability and change.

Actions required:

1. Develop and enhance the application of climate information and to strengthen links between meteorological and hydrological services by: (i) working with existing climate information services in the region, (ii) formalizing efforts to build climate information and forecasting capacity, (iii) ongoing development of analysis, forecasting and application tools, and (iv) including participation by end users (e.g. water providers, hazard managers, health officials, agriculture and public).
2. Develop rainfall and drought prediction schemes for Pacific island countries by: (i) adaptation of existing models to Pacific island countries, and (ii) future development of drought monitoring and prediction methods.
3. Enable regional support to develop water applications of Climate Information and Prediction through: (i) training, (ii) applied research, and (iii) technology transfer.

Key message 2: Change the paradigm for dealing with Island Vulnerability from disaster response to hazard assessment and risk management, particularly in Integrated Water Resource Management.

Actions required:

1. Implement actions to strengthen national capacity to use hazard assessment and risk management using CHARM and other vulnerability assessment and risk management tools.
2. Provide high-level briefings for political leaders from the region on the value of CHARM as a tool for planning and decision-making.
3. Implement a programme of climate analysis for regional countries that can assess the risk of climate-related extreme event, particularly droughts and floods, and tropical cyclones.
4. Develop and/or implement minimum standards for conducting island risk and vulnerability assessments and development of drought mitigation and response plans.
5. Build on the climate analysis and forecasting capacity provided by Fiji Met Service, the Pacific ENSO Applications Center, the Australia Bureau of Meteorology, and the National Institute for Water and Atmospheric Research to develop risk reduction strategies through the use of climate forecasting in conjunction with risk management.

Source: adapted from the Regional Action Programme of Sigatoka Regional Consultation Workshop, organized by SOPAC and ADB, Sigatoka, August 2002.

bureaucratically based, but the role of leaders still remains important.²³ In other cases, civil society or the private sector may take the lead in producing strategic plans, e.g., the Philippines, inviting the public sector to participate. For example, conservation authorities (responsible for watersheds) in some nations have been the product of civil society initiative.

Since multi-agency cooperation involves motivating a large number of agencies to pull in the same direction, based on a single Mission, often embedded in a Vision, charismatic leadership can play a substantial role.

In societies, such as the Philippines, where Voluntary Organizations play an important role in society, they can play a defining role in a Mission being realized. However, normally, the Voluntary sector is very fragmented and different agencies in the sector operate very differently, thus consistency and coverage in implementation can be a problem. (Sometimes VOs pull in different directions, even when a strategy is in place.) As a result, it is usually difficult for Civil Society, especially at the national level, to champion a Mission.

6.3 Under varying political/bureaucratic systems

Asian and Pacific region societies vary widely in the extent to which the concepts presented in this paper can be applied. For example, the *Strategic Collaborative Planning* model which depends significantly on horizontal cooperation may be difficult to implement in societies characterized by strong vertical integration (where each national agency is essentially a separate “silo” or fiefdom). Or, it may be difficult to implement the collaborative approach in societies where stakeholder participation in planning processes is still limited, i.e., where voluntary organizations are discouraged. Thus the approaches presented will need to be modified to fit political/bureaucratic differences among Asian and Pacific region nations.

Although the concept of accountability seems straight forward, there are many societies in which individual (or even work unit) accountability within the bureaucracy is a somewhat threatening concept. Introduction of

²³ For a discussion of the importance of leadership in strategic management, see: Wells, D., *Strategic Management For Senior Leaders: A Handbook for Implementation*, Washington: US Department of the Navy Total Quality Leadership Office, 1996 (TQLO Publication 96-03).

Box 8. Initiation and implementation of SPM

At the national level:

Priority 1: (1) *Political and decision makers:* willingness, commitment, (2) *Implementation mechanisms:* coordination, integrated into budgeting plans, strong auditing, monitoring and evaluation and role assignments, (3) *Capacity building:* training, HRD, accumulation of experiences: success or failures

Priority 2: (1) *Legal basis for SPM:* frameworks, enforcement, structured mediation mechanisms

At the sectoral level:

3.1 To trigger SPM

Priority 1: (1) base on initiatives developed through important benchmark events such as WWF (3rd WWF, March 2003), Agenda 21, etc. (2) training and awareness programmes

Priority 2: (1) political will

Other: (1) identify and give authority to a central coordinating body, (2) identify champions, (3) integrate SPM requirements into policy directives

3.2 To maintain momentum of SPM

Priority 1: (1) ensure accountability and provide incentives, (2) ensure cyclical/periodic review/reporting

Priority 2: (1) carry out the SPM process at national level, (2) build consensus among knowledge base, (3) implement identified tasks, (4) include local perception

3.3 Other remarks

Priority 1: (1) publicize successful case studies, (2) be sufficiently flexible to incorporate necessary changes over time

Priority 2: (1) include financial auditing, (2) provide legal support to the process

At the organizational level:

Priority 1: (1) provide “incentives” for the decision makers and key water stakeholders to be proactive (such as political promotion, funds/budget), (2) monitor performance indicators and accessible information, (3) enhance public demand and appreciation

Priority 2: (1) promote awareness through educational systems and public campaigns, (2) to provide incentive/promotion

Other: (1) to identify champions, (2) to initiate at political platform, (3) to discipline offending, (4) to narrow the knowledge gap and enhance understanding of the future vision of the SPM process, (5) to pay special attention to great difficulties affecting a paradigm shift from traditional approach, (6) to persuade by using a clear vision and goals

Source: Results of the Working Groups at ESCAP’s Regional Workshop to Finalize the SPM Guidelines, Bangkok, December 2001.

the *Strategic Functional Model* may require considerable awareness-building, describing its advantages to the general public, before it can be introduced in the bureaucracy. Bureaucrats will also need to understand that they stand to benefit from more accountability, e.g., through increased merit based pay.

6.4 Under varying socio-economic-environmental conditions

Levels of development may affect the degree to which the approach put forward is applicable. In very poor countries, problems in the immediate future are often so overwhelming, e.g., how do we supply the city with enough water tomorrow, that taking a longer run, or cross-agency view, of water resources planning and management may seem like an unaffordable luxury. Also, resources (technical, financial, human) may not be available to develop indicator systems; existing data and information sources, e.g., those needed to undertake Driving Forces analysis, may be inadequate. In such cases it may be appropriate to introduce strategic planning approaches asymmetrically, e.g., starting with certain water sectors, certain sub-national areas, or even individual agencies, that display more capacity and/or commitment.

In some countries, environmental conditions, e.g., long-term water shortages may be so pressing that although a strategic planning approach is very much needed because of the seriousness of the situation, virtually all attention will be on the short-run and the immediate. In such cases, international assistance to introduce strategic approaches to improve problem diagnosis and identification of the most appropriate policy responses to address such “overwhelming” and chronic problems, may be justified. For example, this was the case in the formulation of the Flood Action Plan in Bangladesh.

6.5 Under centralized versus decentralized governance systems

Virtually every nation in the Asian and Pacific region is either decentralizing (fiscal, administrative, political), e.g., Cambodia, Thailand, Indonesia, or is already significantly decentralized, e.g., China. Under decentralized conditions, the situation becomes more complex in terms of introducing strategic planning because so many authorities with increased resources to act will be involved in the water resources sector at the local level. This makes *Strategic Collaborative planning* increasingly more

important at the sub-national scale. At the same, time Strategic Functional is very important at the level of local institutions. Although decentralization is designed to improve governance (by bringing government closer to the population, more closely linking revenue collection and expenditures, improving transparency, etc.), too often locally based management of water resources (and other public functions) is inefficient, low capacity, and in some cases, corrupt. Thus the accountability principles put forward apply equally, if not more so, to decentralized local agencies.

7. MONITORING OUTCOMES OF STRATEGIC PLANNING IN WATER MANAGEMENT: USING INDICATORS EFFECTIVELY²⁴

7.1 Context

7.1.1 Rationale

As the future becomes more difficult to predict, and change is faster, there is decreased emphasis on detailed plans. The emphasis is now on visions, missions, objectives, targets, strategically oriented intervention and *monitoring results and outcomes*. Complementing decreased detail in plans themselves, is greater reliance on monitoring of outcomes. This means increased resources are being allocated to designing and maintaining indicator systems rather than plan making per se. Some jurisdictions such as Japan; Hong Kong, China; and China have developed real time monitoring systems of environmental conditions, e.g., slope stability, water quality, air pollution. However, most monitoring systems are based on secondary and survey data. The trend is toward more continuous monitoring rather than monitoring at widely spaced intervals (e.g., mid-term plan reviews).

7.1.2 Benefits

Monitoring is beneficial because it:²⁵

- (i) provides a structured approach for focusing on strategies, objectives, and performance indicators
- (ii) in the case of system status indicators, improves foresight and anticipation; improves ability to detect change, enables rapid change of course corrections

²⁴ Prepared by Mr Douglas Webster and Ms Larissa Muller of Asia Pacific Research Center of Stanford University, United States of America in consultation with Ti Le-Huu, Water Resources Section, ESCAP.

²⁵ Nathan Associates Inc. *Implementing The Ninth Plan: Medium Term Recovery Strategy Project. Final Report.* NESDB & ADB, Thailand: August 2002, and Department of Defense, Federal Quality Institute, Human Technology, Inc., Jarrett-Thor International, Management Systems International, *Module 4: Developing Performance Indicators and Measurement System*, Workshop on Planning and Measurement sponsored by the Federal Quality Institute and the Office of Personnel Management, July 1997.

- (iii) analysis of monitoring data facilitates identification of both optimal and less-effective practices
- (iv) assists in prioritizing the allocation of programme resources and assists in budget preparation
- (v) provides means of articulating programme resource requirements and justification in competitive bureaucratic, political, and economic environments
- (vi) provides a mechanism for reporting programme performance to upper management
- (vii) informs debate within the country on policy choices available at any given time, facilitating the involvement of civil society in the planning process.

There are basically *two* types of monitoring. One measures changes in the *status of a system* or sub-system which an organization or several organizations have responsibility, e.g., a watershed. Indicators used in this type of monitoring are known as *status indicators*. The second measures the *performance* of a policy intervention, programme, project, function, or process for which a specific organization (or organizations) has responsibility in converting inputs into outcomes or results. Indicators used in this type of monitoring are known as *performance indicators*. *Performance indicators* are signs that point to success or failure in performance and answer the question “how will we know when we have been successful?”.²⁶

7.1.3 Scope of systems monitored

In the case of water resources management, the scope of systems monitored, both in terms of *status* and *performance* monitoring, can vary widely, ranging from narrowly technical systems, such as pollutant levels in a river, to wide ranging monitoring involving ecological and socio-economic indicators in a major watershed. The extent of the monitoring in the case of *performance monitoring systems* will relate directly to the objectives of the intervention, which in turn, will be based on a legal mandate.

²⁶ Department of Defense, Federal Quality Institute, Human Technology, Inc., Jarrett-Thor International, Management Systems International. *Module 4: Developing Performance Indicators and Measurement Systems*. (Exhibit 4-1), Workshop on Planning and Measurement sponsored by the Federal Quality Institute and the Office of Personnel Management, July 1997.

In terms of *system status monitoring*, the system may be wider than policy mandates of agencies involved. In some cases, it is necessary to monitor problematic conditions for which an agency may not yet have responsibility to address the situation.

7.2 Indicators for monitoring

Monitoring systems are based on a set of indicators. Indicators are measurements that quantifies and simplifies information in a way that facilitates understanding of environmental dynamics and organization performance by both decision-makers and the public. It should allow assessment of the direction and strength of change.²⁷

7.2.1 Types of indicators

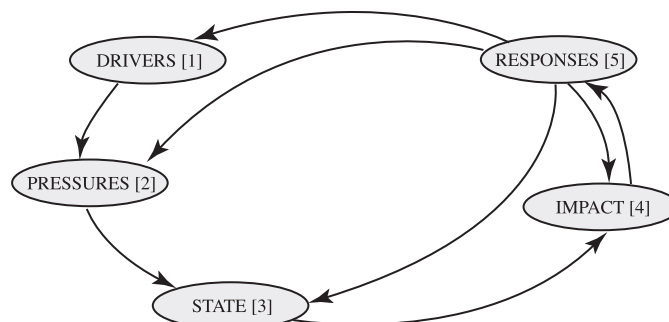
There are two types of indicators, corresponding to the two types of monitoring noted above.

a. System status indicators

The best status monitoring systems for water resources management are based on cause and effect frameworks. OECD's Drivers-Pressures-State-Impact-Response (DPSIR) framework is the most widespread framework for classifying environmental indicators for use in status monitoring. This framework has been adopted by all EU countries, United States, Canada, Australia, Japan and many developing countries, e.g., Malaysia. This cause and effect framework is based on five sub-types of indicators (see Figure 10), namely:

- (i) *Driving forces indicators*: Describe social, demographic and economic forces and corresponding changes in lifestyles, consumption and production patterns (e.g., increased travel and leisure).
- (ii) *Pressure indicators*: Describe pressures on environment related to the drivers, (e.g., emissions of pollutants, use of land for roads, water withdrawals, deforestation, fisheries catch, etc.)

²⁷ Nathan Associates Inc. *Implementing the Ninth Plan: Medium Term Recovery Strategy Project. Final Report.* NESDB & ADB, Thailand: August 2002 (pp. 148-164).

Figure 10. The DPSIR indicator's framework

Source: NESDB & Nathan Associates Inc., *Implementing the Ninth Plan: Medium Term Recovery Strategy Project*, Bangkok: NESDB/ADB, August 2002.

- (iii) *State indicators:* Describe the quantity and quality of physical phenomenon (e.g., BOD, heavy metal concentrations)
- (iv) *Impact indicators:* Measure how changes in the state of the environment result in socio-economic impacts, e.g., impacts on crop productivity, value of fisheries output, water availability, flooding
- (v) *Response indicators:* Measure the effectiveness of attempts to prevent, compensate, ameliorate or adapt environmental changes. For example, the number of cars with pollution control, or houses with water efficient utilities, recycling amounts.

b. Performance indicators

Performance monitoring and evaluation is oriented around the accomplishment of actions that transform inputs into outputs, and outcomes (sometimes called results). This performance oriented framework is based on four sub-types of indicators, namely:²⁸

²⁸ The following material draws heavily on: Department of Defense, Federal Quality Institute, Human Technology, Inc., Jarrett-Thor International, Management Systems International, *Module 4: Developing Performance Indicators and Measurement System*, Workshop on Planning and Measurement sponsored by the Federal Quality Institute and the Office of Personnel Management, July 1997.

- (i) *Input indicators:* Describe the resources used in producing an output or outcome. They are usually expressed as amounts of money or employee time.
- (ii) *Process indicators:* Describes the quality and functional effectiveness of activities and tasks that add value to inputs to create outputs and outcomes. Quality may refer to the total cycle time of the process, to time between key steps of the process, or to the amount of rework (to correct mis-steps) within the process.
- (iii) *Output indicators:* Measure the products and services provided by a programme or process. For example, the number of hectares reforested in a watershed. If a quality indicator is used, it might be the number of hectares reforested to schedule (on time).
- (iv) *Outcome indicators:* Measures the results of a programme activity compared to its intended purpose. It is often useful to distinguish *intermediate outcomes* from *end outcomes* when end outcomes can not be determined for two or more years into the future.
 - (a) *End outcome indicators:* Measure the desired and ultimate results that are hoped to be achieved by the programme activities. These results are directly related to the agency's missions, e.g., clean water.
 - (b) *Intermediate outcome indicators:* Measure outcomes that are expected to lead to the ends desired, but are not themselves "ends". In many programmes, a progression or sequence of outcomes usually occurs. See Box 9.

At the agency level, the focus should be primarily on outcome indicators. Developing indicators to measure outcomes is particularly challenging because readily available indicators are generally aimed at input and output reporting. Developing outcome indicators frequently requires stepping outside the routine information collection associated with the programme.

Box 9. Intermediate outcomes

The following is an example of a progression or series of intermediate outcomes for an environmental protection programme aimed at returning inland lakes to clean condition.

End goal:

To return the waters of inland lakes to clean condition

Intermediate outcomes (in order of sequence):

- (i) Passage of state laws: number of national, provincial or local laws passed to reduce untreated waste
- (ii) Establishing technical assistance programmes: Number of state, provincial or local technical assistance programmes to help businesses
- (iii) Businesses take advantage of the programmes: Number of businesses that requested and received technical assistance from the programme
- (iv) Businesses change behaviour: Amount of untreated waste released by industry
- (v) Waste material flowing into lakes is reduced: Amount of untreated waste released by a particular industry

End outcomes:

- (i) Water quality improves: Pollutant counts for water quality
- (ii) The condition of living resources in the receiving waters, such as fish and mammals improves: Condition of living resources in receiving waters
- (iii) Citizens are able to use the waters for recreation and business purposes: Number of days of unrestricted fishing

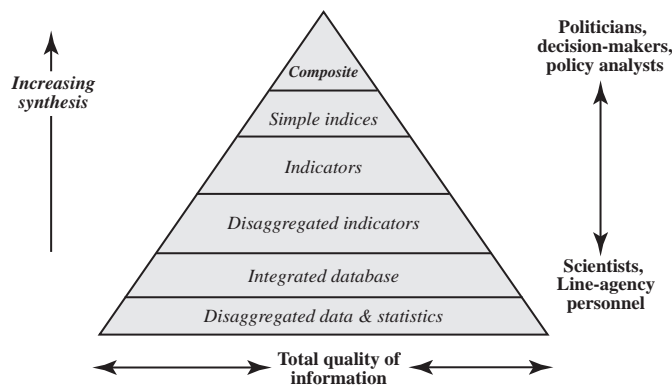
Source: *Module 4: Developing Performance Indicators and Measurement System*, Workshop on Planning and Measurement sponsored by the Federal Quality Institute and the Office of Personnel Management, July 1997.

7.2.2 Levels of aggregation: Indicators

The level to which information is aggregated to create an indicator is an important issue in designing indicator systems. This issue applies to both *status* and *performance* indicators. Different levels of aggregation are appropriate to different audiences.

In essence, the quality of information is best at the least aggregated level. However, while this information may be useful for understanding the nature of the system, it is not necessarily useful for decision-making. Often more synthesized or aggregate indicators are the most useful to decision-makers, and to less technical audiences, such as some civil society groups, politicians, and the general public. Dearden assesses levels of aggregation as follows and as described in Figure 11.

Figure 11. Relationship between data, indicators, indices and users



Source: NESDB & Nathan Associates Inc., Implementing the Ninth Plan: Medium Term Recovery Strategy Project, Bangkok: NESDB/ADB, August 2002.

Research scientists and line agencies may be involved in the routine collection of *data* on environmental systems or programme performance. Without such data meaningful indicators cannot be constructed. At a higher level of sophistication this raw data may form an *integrated database*, such as, for example, the integration of social and biophysical data as a basis for integrated watershed management planning. However, synthesis of this data into *indicators* is often the most useful to decision-makers. Indicators themselves may show greater or lesser degrees of aggregation, especially in a spatial sense. Higher levels of thematic aggregation produce indices. *Simple indices* are composed mainly of indicators that are all similar. The well-known Dow Jones industrial average, for example, combines changes in market processes for 30 blue chip stocks listed on the New York Stock Exchange. *Composite indicators* are often the most useful for

decision-makers and represent the highest level of aggregation. They are few in number and incorporate many, and often very different sub-variables. They are highly attractive because they convey a lot of information and are useful for making macro-level policy decisions.

Highly aggregated indicators, especially composite indicators present risk, Firstly, they add little to understanding as to causality. Secondly, a common pitfall in developing indicator systems is the search for a single, all-encompassing composite indicator which can accurately describe a very complex situation.²⁹ A complementary family of measures better serves to accurately depict the variety of factors that contribute to determining the health of a system or an organization. Opportunities should be sought to aggregate various lower level indicators into summary indicators, but no single indicator is likely to summarize all others.

7.3 Developing effective indicators

In terms of performance indicators, there should be not target or objective without an indicator, and no indicator without a target. Organizational goals and policy objectives only become clear when indicators are identified.

7.3.1 Characteristics of effective indicators

Effective indicators should be:

- (i) Useful
- (ii) Reflect an agency's strategic plan and be linked to policies
- (iii) Be responsibility-linked: The "process owner", programme manager or programme team who is accountable for making progress on any indicator should be clearly identified.
- (iv) Based on frameworks (DPSIR or Input-Process-Output-Outcome);

²⁹ Department of Defense, Federal Quality Institute, Human Technology, Inc., Jarrett-Thor International, Management Systems International, *Module 4: Developing Performance Indicators and Measurement System*, Workshop on Planning and Measurement sponsored by the Federal Quality Institute and the Office of Personnel Management, July 1997.

- (v) **Balanced:** does the set of indicators span all dimensions of efficiency, quality, client/stakeholder satisfaction and mission effectiveness?
- (vi) **Analytically sound:** Designed with sound scientific understanding and meet scientific criteria of validity, reliability, and accuracy. In particular is in the indicator Valid? That is, does it really capture what the agency is trying to achieve. Does change in value of the indicator reflect improvement/decline in organizational performance?
- (vii) **Based on credible data:** Often data sources have to be created
- (viii) **Simple and easy to understand**
- (ix) **Practical:** Timely information at reasonable cost (human and financial resources)
- (x) **Limited in number:** It is important to identify key performance indicators because acquiring and using information is costly. After identifying a list of potential indicators, a subset (priority indicators) should be selected that will provide the most information with the least number of indicators.
- (xi) **Consistent over time:** Do indicators permit comparison of system and organizational performance from one time period to the next?
- (xii) **Conducive to aggregation, both spatially and thematically**
- (xiii) **Transparent:** The construction of the indicator should be public
- (xiv) **Developed in close cooperation with data users and data suppliers:** both oversight and operational interests should be involved in developing and using indicators, particularly performance indicators.

In summary, developing indicators is a challenging process requiring considerable judgement. Trade-offs may be required among the desirable characteristics noted above in the interests of designing practical systems.

Developing indicators is an iterative process. Once defined they should be continually refined as the usefulness of data is revealed and the organization strengthens its ability to measure and use indicators.

7.3.2 *Quantitative versus qualitative indicators*

Quantitative measures are clearer and more motivating than qualitative measures and should be used wherever possible.³⁰ Qualitative indicators should only be used in those situations where quantitative indicators do not reflect the targets and objectives. To improve the usefulness and comparability of qualitative measures over time, technical instruments are available to assess descriptors, e.g., Likert scales (e.g., 1-5).

7.3.3 *Example: Water management indicators for Thailand's Ninth Plan*

Table 1 provides an example of the use of indicators for water management in Thailand, based on the objectives identified in Thailand's Ninth Plan (2001-2006). The approach taken was to first identify all water-related objectives and targets in the Ninth Plan. Then, indicators were identified at three levels:

- (i) *Potential indicators:* A long list of feasible indicators that relate to achieving the stated objectives. They are mostly within the purview of the (line) agencies in the water resources management area.
- (ii) *Priority Indicators:* A subset of the potential indicators that provide the most information with the least number of indicators.
- (iii) *Headline indicators:* These are the single most useful indicators for judging overall success in meeting stated objectives. There is only one headline indicator per objective.

³⁰ Department of Defense, Federal Quality Institute, Human Technology, Inc., Jarrett-Thor International, Management Systems International, *Module 4: Developing Performance Indicators and Measurement System*, Workshop on Planning and Measurement sponsored by the Federal Quality Institute and the Office of Personnel Management, July 1997.

This level is of most interest to planning and policy agencies. They are mostly *composite indices*, in that they contain information from other level indicators, and hence cannot be constructed without input from the previous levels of indicators. The example described in Table 1, lists only the priority and headline indicators.

7.4 Remarks

Indicators are essential in monitoring the state of water systems and in assessing the degree of success in achieving policy and programme objectives. Normally, two separate, but related sets of monitoring systems need to be developed and operationalized. One, to measure changes in the status of water systems, e.g., watersheds, and another to monitor the performance of policy and programmatic interventions. Managers of programmes and their staffs need to be involved in the design of performance systems, as should stakeholders living in the target areas to promote ownership and transparency. However, designing effective indicators is a technically challenging process, therefore technical expertise is essential.

In summary, as status of systems and drivers (external and internal) change ever faster, detailed planning is becoming more difficult. The information gap in terms of information needed to intervene in water systems effectively, increasingly needs to be filled by better monitoring systems built around well-thought out and effective indicators.

CONCLUSION

The water resources sector in virtually all Asian and Pacific nations is very complex involving a large number of stakeholders, interest groups, and institutions. Strategic planning approaches and techniques have much to offer in improving performance in water resources management and planning given the significant, and widely divergent, demands put on water resources.

It has been argued that strategic planning approaches need to be applied at two levels. Because water resources constitute a wide, multi-faceted system, a collaborative based approach to strategic planning is needed to understand, plan, and manage water resources from a wider perspective. In looking at water resource systems as a whole, strategic

planning should start with a Vision, based on issues, and look to solutions that are network based, that is based on incentives-driven cooperation among water-related agencies (including those outside the public sector).

However, once different agencies have been empowered legally, and their Missions more clearly defined, often through the support of strong coalitions resulting from collaborative processes, the emphasis should shift to accountability that is best encouraged and enforced at the single institution scale. Strategies are of little value unless implemented. And experience, for example in the United States where strategic functional processes are mandated by law for national agencies (and in many states),³¹ has shown that strategic Functional processes work. Agencies need to be held responsible for delivering on their commitments to Missions. Of course, many bureaucrats and politicians are not comfortable with such a concept. Merely auditing inputs, i.e., checking that moneys are spent as required by law, is unlikely to result in strategies being realized.

There is no one correct way to do strategic planning in the field of water resources planning and management. This paper, however, has attempted to put forward basic principles and guidelines applicable to strategic planning in the water resources sector in an era when accountability and collaboration are increasingly valued.

³¹ For more details on the United States legally mandated system of strategic accountability, see Webster, D., and Le-Huu, Ti (2001).

Table: Thailand's water management indicators for the Ninth Plan

Objectives	Headline Indicator	Priority Indicators
1. To manage water resources efficiently for consumption, production and agriculture. Adjust agricultural cropping system to use less water more efficiently.	Sustainable Water Allocation Index: (i) calculation of sustainable limits of water use for each basin; (ii) targets for allocation of withdrawal amongst sectors (iii) monitoring of instrument efficacy	a) Proportion of water withdrawals (%) subject to service charge b) water efficiency by sector (based consumption levels) c) agricultural water consumption per economic output/rai d) reduction in agricultural water consumption
2. To create multi-purpose water sources through community participation, with local people sharing the expense.	Pond Value Index: (iv) market and non-market costs and benefits of pond creation (can be expressed as a benefit: cost ratio)	Percentage of target number of ponds created
3. To create guidelines for use of underground water appropriate to local conditions. Monitor land subsidence and control water extraction through zoning.	Sustainable Ground Water Allocation Index: (v) portion of water by volume being supplied on a sustainable basis, based on recharge and discharge parameters for individual aquifers	(none)
4. To collect fees for raw water use from industry, commerce and water supply. Provide incentive for people to maintain water quality and use water efficiently.	Catchment Health Index per Instrument: Monitor following catchment health indicators against application of various instruments (vi) water supply (e.g., discharge rates) (vii) water quality (BOD, etc.) (viii) riparian conditions (ix) macro invertebrate assemblage	Ratio of water price to cost of water provision
5. To improve water forecasting for floods, droughts and water provision.	Forecasting Accuracy Index: (x) proportion of floods predicted in a timely manner against total number of floods (xi) proportion of droughts predicted in a timely manner	(none)

Table: (continued)

Objectives	Headline Indicator	Priority Indicators
	against total number of droughts (xii) accuracy of water availability figures per water basin compared with actual water availability (% variance)	
6. To formulate integrated and participatory master plans at the river-basin level, with priority to critical basins.	Number (or %) of Plans Implemented: (xiii) requires setting threshold criteria to assess level of implementation (e.g., formation of operational committees, key plan actions)	Catchment Health Index (scale of 1 to 10) – see Headline Indicator for Objective 4.
7. To rehabilitate constructed community wastewater systems and operate them efficiently through local governments and cost-sharing.	Wastewater Treatment Index: (xiv) proportion of wastewater plants that are operational (xv) proportion of the waste stream that is being treated	Water Quality Index: (xvi) variance between target and measured quality of water downstream from plants

Source: Nathan Associates Inc. Chapter IV: Environment and Natural Resources, in *Implementing the Ninth Plan: Medium Term Recovery Strategy Project. Final Report*. NESDB & ADB, Thailand: August 2002 (pp. 148-164).

GLOSSARY

Accountability

1. An obligation or willingness to accept responsibility or to account for one's actions. *The American Heritage Dictionary of the English Language. Fourth Edition.*
2. Responsibility for an activity, accompanied by rewards and recognition for good performance, and adverse consequences for performance that is unreasonably poor www.orau.gov/pbm/handbook/App_A.pdf.
3. Since 1990, the concept of governmental *accountability* has taken on a new meaning. In this view, government demonstrates *accountability* when it shows its citizens: (i) what they are getting from the use of public funds in terms of products and services, (ii) how these expenditures benefit their lives or the lives of those they care about, and (iii) how efficiently and effectively the funds are used. This type of *accountability* holds government responsible not only for its actions, but also for the results of its actions. In order to demonstrate *accountability* in this way, state and local governments and federal agencies have begun developing new measurement and reporting systems. These are generally called "performance measurement systems" or sometimes "performance accountability systems". *Alliance for Redesigning Government National Academy of Public Administration Outcomes and Performance Case Studies: Strategic Planning* <http://www.alliance.napawash.org>.

Activity

Action taken to transform *Inputs* into *Outputs*, and ultimately *Outcomes* or results.

Benchmark/Benchmarking

1. A *Benchmark* is: (i) a point of reference from which measurements may be made, (ii) something that serves as a standard by which others may be measured or judged, (iii) a standardized problem or test that serves as a basis for evaluation or comparison (as of

computer system performance). More specifically, *Benchmarking* is a systematic process used to identify, understand and adapt practices to improve performance and *efficiency*. *Merriam-Webster's dictionary* http://www.human-resources.org/benchmarking_best_practice.htm (*human resources learning center*).

2. A continuous improvement process tool or technique of measuring products, services, and practices against an organization, company, or entity regarded as “Best in Business” and then improving products, services, and practices, accordingly. http://policy.nrcs.usda.gov/scripts/lpsii.dll/EDSnf/gm_340_412.htm *USDA United States Department of Agriculture Natural Resources Conservation Services (NRCS) Electronic Directives System*.
3. To measure an organization's products or services against the best existing products or services of the same type. The *Benchmark* defines the 100 per cent mark on the measurement scale. Also, the process of comparing and measuring an organization's own performance in a particular process against the performance of organizations judged to be the best in a comparable industry. http://www.orau.gov/pbm/handbook/App_A.pdf.
4. *Benchmarking* is an ongoing systematic process of measuring and comparing an organization's operations, practices, and performance against the others within and outside of the industry, including evaluating “the best” practices of other organizations. It is used within the strategic planning process to guide the management of an organization's human, social, and technical resources. *Lerner, Rolfes, Saad, & Soderlund, 1998*); *CSUN* <http://www.claedf.com/Data/Home/AboutCLAEDF/StrategicPlan/TheGlossary/M11319/B8>.
5. *Benchmarking* is the continuous search for best practices that lead to superior performance and that are beneficial in establishing performance targets and improved methods. http://www.coj.net/sterling/005_glossary.pdf *City of Jacksonville, Florida* www.coj.net.

Champion

1. The Senior Staff person who is responsible to implement and achieve a priority target. <http://www.enr.state.nc.us/files/strat.htm>.

2. A *Basin Champion* is a volunteer, who lives and works in a basin management unit, whose responsibilities are to ensure that basin-specific issues are carefully monitored and articulated, and that key players and stakeholders are kept involved in the Framework process. *Kentucky Watershed Management “We all Live in a Watershed”* (Kentucky Division of Water) http://kywatersheds.org/Direct_Guides/glossary.htm.

Collaboration

Multi-dimensional concept that involves working together cooperatively to achieve a desired outcome. Individuals and teams (work groups, units, etc.) benefit to the extent that they are able to promote cooperation, building trusting relationships, develop shared goals, and effectively solve problems. Strategies that promote collaboration: (i) Creating cooperative goals, (ii) Promoting cooperation, (iii) Seeking integrated solutions, and (iv) Fostering trusting relationships. <http://www.barton.cc.ks.us/StrategicPlan/Glossary.htm>.

Driving forces

1. Key social, economic, environmental, political, technological events, trends, cycles, and patterns that significantly shape or alter external and internal environments.
2. Elements that move the plot of a *Scenario*.

Driving Forces Analysis

Driving Forces Analysis is a technique to explain patterns of change in the external environment. If change can be explained, such analysis can play a significant role in anticipating and understanding likely future external environments. In undertaking this work, it is important to hit the right level of granularity, i.e., the analysis should focus on independent drivers (that are the basis of the analysis) and a level of detail commensurate with the *Mission* being addressed. Identifying independent drivers is especially important, e.g., technology is usually an independent driver, but technology itself may be driven by a more basic independent driver such as deregulation or support by society to science (education, research, etc.) Human intuition plays an important role in *Driving Forces Analysis*, especially in terms of explaining and anticipating outcomes from interaction among drivers. It is

important to generalize from the data. On the other hand, if independent drivers/events are amalgamated at too high a level, the structural relations identified may prove too ephemeral.

Usual steps in undertaking *Driving Forces Analysis* are as follows:

- (i) Break down the data base into events, trends, patterns, and structures.
- (ii) Specify the important events.
- (iii) Discover trends, cycles, and time behaviour we observe in the events, in support of conceptualization of variables.
- (iv) Infer patterns, based on cues implying causality identified through variable behaviour.
- (v) Develop explanations, theories, hypotheses that connect the system together through causal links. Multiple structures will result from different possible interpretations of causal patterns.
- (vi) Use the theories to project future behaviour (with multiple structures leading to multiple scenarios).

Delivery of output

An *Output* is generally considered to have been delivered when the products resulting from a *Programme* activity are made available to the intended primary users.*

Effectiveness

1. The extent to which expected accomplishments are achieved.*
2. The relationship between *Programme Inputs, Outputs and Mission Objectives*.

Efficiency

1. *Efficiency* is measured by how well *Inputs* are converted into *Outputs*.*
2. *Inputs* used per Unit of *Output*. *World Bank, Capacity Building for Decentralization in Thailand Project, 2002.*

Evaluation

A process that seeks to determine as systematically and objectively as possible the relevance, *effectiveness* and impact of an activity in the light of its *goals, objectives* and accomplishments.*

Environment

1. Circumstances and conditions that interact with and affect an organization. These can include economic, political, cultural, and physical conditions inside or outside the boundaries of the organization. *Best Practices in Customer Driven Strategic Planning, Federal Consortium Benchmarking Study Team Study Report*, James J. Cavanagh and Dolores J. Livingston, US Department of Energy, 1997.
2. The *Internal Environment* refers to circumstances and conditions within the organization; that is, those conditions that can, at least in principle, be controlled by the organization itself. The *External Environment* refers to circumstances and conditions outside the organization, as such they are not directly controllable, although certain circumstances and conditions can be influenced by the organization through policy frameworks, incentive structures, information diffusion, etc.

Expected accomplishment

A desired *outcome* involving benefits to end-users, expressed as a quantitative or qualitative standard, value or rate. Accomplishments are the direct consequence or effect of the generation of *outputs* and lead to the fulfilment of a certain *objective*.*

External factors

Events and/or conditions that are beyond the control of those responsible for an *activity* but that have an influence on the success or failure of the *activity*. They may be anticipated through *scenarios*, assumptions, *driving forces analysis*, etc., or they may be unanticipated.*

Foresight

Action in reference to the future; prudence; wise forethought. *Websters Revised Unabridged Dictionary, 1913*.

Goals

1. Broad, long-term aims that define a desired result associated with identified strategic issues. *Mobilizing for Action through Planning and Partnership (MAPP) Formulate Goals and Strategies* http://nacchowebsite.naccho.org/formulate_goals/formulate_goals_overview.asp.
2. The result that a *programme* or organization aims to accomplish. Also, a statement of attainment/achievement, which is proposed to be accomplished or attained with an implication of sustained effort and energy. http://www.orau.gov/pbm/handbook/App_A.pdf.
3. *Goals* are broad based, *mission-related* milestones that guide the unit toward achieving its *vision*. *Barton County Community College, Kansas* <http://www.barton.cc.ks.us/StrategicPlan/Glossary.htm>.
4. *Goals* are designed to drive actions and they are intended to represent the general end toward which an organizational effort is directed. *Goals* address *Critical Issues* in a general sense by stating overall policy intention that drives broad programmatic areas. A *Goal* should provide a sense of what level of performance is expected but it should not specify how the organization is to achieve the level of performance. Generally, there should be a *Goal* assigned to each *Critical Issue* or programmatic area within the organization. *Goals* link “downward” to *Objectives*. Every *Goal* should have at least one *Objective*. *Hudson Associates Consulting, Inc. Strategic Management Glossary* <http://www.hacinc.com/hacinc/DrDan/glossary/g-h.html>.

Guideline

A principle put forward to set standards or determine a course of action. http://au.riversinfo.org/library/1999/sth_syd_plan/app_C.php.

Impact

Consequences of *outputs*, generally measured in terms of developmental expectations. Synonymous with results or *outcomes*. *Impacts* can be positive or negative, anticipated, or unanticipated.

Indicator

1. Measurement that reflects the status of a system. *Indicators* reveal the direction of a system (e.g., a community, the economy, the environment, river basin), whether it is going forward or backward, increasing or decreasing, improving or deteriorating, or staying the same. *Mobilizing for Action through Planning and Partnership (MAPP) Formulate Goals and Strategies* http://nacchoweb.naccho.org/mapp_glossary.asp.
2. A measurement that quantifies and simplifies information in a way that facilitates understanding of environmental problems by both decision-makers and the public. It should allow assessment of the direction and strength of change. Nathan Associates Inc. *Implementing the Ninth Plan: Medium Term Recovery Strategy Project. Final Report.* NESDB & ADB, Thailand: August 2002 (pp. 148-164).
3. *Indicators of achievement* are used to measure whether and/or the extent to which the *objectives* and/or expected accomplishments have been achieved, as the result of policy or programmatic interventions. *Indicators* correspond either directly or indirectly to the *objective* or the expected accomplishment for which they are used to measure performance.*

Input

1. Something, like money or manpower, needed to produce a product or conduct an *activity*. The Government Performance and Results Act makes a distinction between *outcomes* (results), *outputs* (efforts/products/activities), and *inputs* (money, manpower, and other things needed to produce an output). *National Parks Conservation Association* http://www.npca.org/take_action/park_planning/expert/glossary.asp.
2. *Inputs* are personnel and other resources (financial, technical, equipment) necessary for producing *outputs* and achieving accomplishments.*
3. Value of resources used to produce an *output*. *World Bank, Capacity Building for Decentralization in Thailand Project, 2002.*

Issues

1. An *Issue* is a difficulty or problem that has a significant influence on the way the organization functions or on its ability to achieve a desired future, for which there is no agreed-on response. *Issues* can be internal or external to an organization, or both. *Nutt and Backoff 1987, p. 47.*
2. An *Issue* is assumed to be strategic if planners perceive it will involve decisions and actions related to changes in “the basic long-term goals and objectives of an [organization], and the adoption of courses of action and the allocation of resources necessary for carrying out these [changed] goals”. *Chandler 1962, p. 13.*
3. An *Issue* is a failure of a system or organization to meet community expectations.

Management

Systematic and sustained decision making and allocation of resources to achieve an agreed-upon *objective*.

Mandate

1. An authoritative command or instruction. *The American Heritage® Dictionary of the English Language: Fourth Edition, 2000.*
2. A role formally assigned to a level of government or organization through constitutional, legal, or administrative edict means.

Mission

1. The ultimate purpose of the Agency’s *programmes*. www.usaid.gov/pubs/bj2001/glossary.html
2. What an organization does. The City of Jacksonville’s Mission is: “Serving you, meeting today’s challenges, focusing on the future.” http://www.coj.net/sterling/005_glossary.pdf *City of Jacksonville, Florida www.coj.net*
3. A succinct declaration of the purpose of the organization or organizational unit. www.barton.cc.ks.us/StrategicPlan/Glossary.htm.

Mission Statement

1. A *Mission Statement* is a broad comprehensive statement of the agency's purpose. It defines what the agency is and why it exists. It also defines who the agency serves and identifies products or services that are provided. A *Mission Statement* may define a geographical location an agency operates within or an area served. The words and intent in the *Mission Statement* must be able to be translated into *goals* and strategies focused on results. www.info.state.ia.us/transitionteam/guiding.pdf.
2. A statement of the role, or purpose, by which an organization intends to serve its stakeholders. Describes what the organization does (current capabilities), who it serves (stakeholders), and what makes the organization unique (justification for existence). *Mission Statements* always exist at the top level of an organization, but may also be set for different organizational levels or components *Hudson Associates Consulting, Inc., Strategic Management Glossary* <http://www.hacinc.com/hacinc/DrDan/glossary/m-n.html>.

Criteria for a Mission Statement

- ✓ Tells what the agency does
- ✓ Tells who the agency serves
- ✓ Tells how the agency provides services
- ✓ Tells why the agency exists

Monitoring

1. Measurement, over time, in changes in outputs and outcomes associated with programmatic initiatives, policy changes, or other forms of organized intervention in a system.
2. Measurement, over time, of the performance of a programme, a function or a process. The term performance covers the work of an organization (or organizations) performs in converting inputs to outputs to outcomes. Department of Defense, Federal Quality Institute, Human Technology, Inc., Jarrett-Thor International, Management Systems International. Module 4: Developing Performance Indicators and Measurement Systems. (Exhibit 4-1), Workshop on Planning and Measurement sponsored by the Federal Quality Institute and the Office of Personnel Management, July 1997.

3. Measurement, over time, of changes in the status of a system for which an organization has responsibility.

Objective

1. *Objectives* state the specific outcomes that an organization expects to accomplish within a given or stated time frame. *Objectives* should be detailed enough to provide an overall sense of what exactly is desired without outlining the specific steps necessary to achieve that end. *Objectives* are specific and measurable targets for accomplishment during the stated time frame. *Objectives* link “upward” to Goals, link “downward” to Strategies, and they also link directly to *Outcome/Effectiveness* measures. Every *Objective* should have at least one Strategy. Whenever possible, every *Objective* should be linked to an *outcome* measure. Hudson Associates Consulting, Inc. *Strategic Management Glossary* <http://www.hacinc.com/hacinc/DrDan/glossary/o-p.html>.
2. A significant development result which contributes to the achievement of an Agency *goal*. www.usaid.gov/pubs/bj2001/glossary.html.
3. A more specific statement than a *goal* which seeks to advance the intent of a *goal*. Objectives bridge the distance between *goals* which are general in nature and policies which call for a specified and distinct action to be accomplished. www.bozeman.net/planning/MstrPln/2020Text/PDF/Chapter14.pdf.
4. A concise, measurable statement of a desirable future condition for a resource or resource use which is attainable through management action. www.for.gov.bc.ca/hfp/planning/writing/page45.html.
5. A statement of the desired result to be achieved within a specified time. www.tricare.osd.mil/imtr/downloads/fy02app_fg.pdf.

Outcome

1. That which comes out of, or follows from, something else. *Websters Revised Unabridged Dictionary 1913*.
2. In planning and evaluation, the desired condition resulting from accomplishing strategies. *Outcomes* may also be undesired

(negative) or unintended (either negative or positive). www.barton.cc.ks.us/StrategicPlan/Glossary.htm.

3. The consequences, results or *impacts* associated with *outputs*.
4. Consequences/results associated with a *programme*/service. *Outcomes* focus on the ultimate “why” of providing a service. *World Bank, Capacity Building for Decentralization in Thailand Project, 2002.*

Output

1. A tangible immediate and intended product or consequence of an *activity*. Examples of *Outputs* include personnel trained, people fed, analyses prepared, vaccinations given, policies recommended, technical assistance delivered, better technologies developed, and new construction completed. www.dec.org/partners/ar/msw_docs/glossary.pdf.
2. Quantity or number of units produced. *Outputs* are activity-oriented, measurable, and usually under managerial control. *World Bank, Capacity Building for Decentralization in Thailand Project, 2002.*

Performance indicator

1. *Performance indicators* are used to observe progress and to measure actual results compared to expected results. The indicators are usually expressed in quantifiable terms, and should be objective and measurable (numeric values, percentages, scores and indices). www.usaid.gov/pubs/cp2000/cp00gloss.html.
2. A parameter useful for determining the degree to which an organization has achieved its *goals*. A quantifiable expression used to observe and track the status of a process. Also, the operational information that is indicative of the performance or condition of a facility, group of facilities, or site. http://www.orau.gov/pbm/handbook/App_A.pdf.
3. An indicator that tracks the state of a system before and after a planned intervention (policy, programme, project).

Priority

A priority is a preferential rating in the allocation of limited resources. Thus, activities with the highest priority are those that would be conducted even if total resources were significantly curtailed; activities with the lowest priority are those that would be curtailed or terminated if all anticipated resources were not available or if activities with a higher priority had to be commenced earlier or expanded.*

Programme

1. A *Programme* consists of the *activities* undertaken by a department or office.*
2. A *Programme* differs from a project in that it is not site and time specific, it is replicable under a given set of conditions.

Programme Strategy

A *Programme Strategy* is a sequence of actions to be undertaken for the purpose of achieving an *objective*.

Relevance

Relevance is the extent to which an *activity*, expected *output*, *outcome*, or strategy is pertinent or significant to achieve the related *objective*, and the extent to which the *objective* is significant to the problem addressed. Relevance is viewed in the context of the activity's design as well as in the light of actual implementation operational performance. That is, shortcomings in relevance may be the result of design deficiencies and/or management/operational deficiencies.

Scenario

1. A *Scenario* describes a likely future that sets the context for the *Mission*. Normally several *Scenarios*, illustrating a range of possible futures are produced in undertaking strategic planning. *Scenario* formulation follows from, and builds on, *Driving Forces Analysis* (described above). *Scenarios* are dynamic, containing a plot line indicating how the future external environment is evolving. *Scenarios* contain events, key actors, and reflect trends, cycles, random events, and surprise events.

2. *External Scenarios* are based on shared and agreed upon mental models of the external world. They are internally consistent and challenging descriptions of possible futures relevant to the *Mission* at hand. They are intended to be representative of the range of possible future developments and outcomes in the external environment. What happens in the *External Scenario* is essentially outside the control of the organization (the internal environment).
3. Another use of the term *Scenario*, is as a normative map to a desired future. Such *Normative or Internal Scenarios* are normative in the sense that a given identified goal is sought, one that is judged to be superior to other potentially achievable outcomes. *Normative or Internal Scenarios* are causal lines of argument, linking actions and decisions to a desired goal. (“If the organization does this, then this will happen, which will lead to that and so on, until Goal A is achieved.”) Compared with *External Scenarios*, they are often less complete, but are almost by definition internally consistent. For example, if a river basin committee sees its future as the coordinator of all natural resource agencies operating in a given environment, and intends to use that function to achieve sustainable development of the basin, utilizing a reforestation strategy, that is a *Normative Internal Scenario*. It is termed internal because the scenario is based on decisions that are under the control (at least in principle) of the organization in question.

Although *Normative Internal* scenarios can be useful as components of strategies, i.e., as paths forward, they do not replace *External Scenarios*. *External Scenarios* are highly useful, and are utilized earlier in the strategic planning process, because they are, if well constructed, value free or objective. They allow leaders, managers, and other stakeholders, to see the world through different lenses, stretching their conventional mental maps. *External Scenarios* focus on context, not the daily “playing field”.

Individuals, as well as organizations, develop *Normative or Internal Scenarios*. For example, an individual may decide that he or she will become a medical doctor, plotting a scenario to achieve that goal.

Stakeholder

1. People who have a vested interest in the outcome of the project. <http://www.isnar.cgiar.org/publications/planning-book5.htm>.
2. Individuals, groups or organizations that are affected by and/or have an interest in a particular issue. www.earthsummit2002.org/msp/book/01chap1.pdf.
3. Those individuals, groups, and parties that either affect or who are affected by the organization. *Stakeholders*, as a general rule, include all internal and external customers. *Stakeholders* are involved or consulted as a part of the strategic planning process so that their views, needs, and concerns are given consideration during development of organizational *goals, objectives* and strategies, and also to provide input related to programmatic outcome measures. *Hudson Associates Consulting, Inc., Strategic Management Glossary* <http://www.hacinc.com/hacinc/DrDan/glossary/s-t.html>.
4. An individual or group who has a vested interest in or may be affected by a project or process. <http://www.vcc.vic.gov.au/strategy>.
5. Any group or individual who is affected by or who can affect the future of an organization – customers, employees, suppliers, owners, other agencies, Congress, and critics. www.orau.gov/pbm/handbook/App_A.pdf.

Strategic planning

1. The framework which an operating unit uses to articulate the organization's priorities, to manage for results, and to tie the organization's results to the customer and beneficiary. The *Strategic Plan* is a comprehensive plan which includes the strategic objectives and a description of how it plans to deploy resources to accomplish them. www.info.usaid.gov/pubs/sourcebook/usgov/asp.html.
2. *Strategic planning* provides communities with a systematic and disciplined way of setting goals and determining how they can be accomplished, given the opportunities and threats posed by a changing economy and the community's internal strengths, weaknesses, and resources. Strategic planning is a cyclical process which requires monitoring, modifying, and periodic updating. www.natomasjournal.com/The-nature-of-the-plan.html.

3. A process for helping an organization envision what it hopes to accomplish in the future, identify and understand obstacles and opportunities that affect the organization's ability to achieve that *vision*, and set forth the plan of activities and resource use that will best enable the achievement of the *goals* and *objectives*. www.orau.gov/pbm/handbook/a6.html.
4. A plan describing what a staff hopes to achieve within the next six years. These plans, required by the Government Performance and Results Act, should include measurable results-oriented *goals* that the staff can use to prioritize work and measure progress. www.npca.org/take_action/park_planning/expert/glossary.asp.
5. Disciplined effort to produce fundamental decisions and actions that shape and guide what an organization (or other entity) is, what it does, and why it does it. Strategic planning requires broad-scale information gathering, an exploration of alternatives, and an emphasis on the future implications of present decisions. It can facilitate communication and participation, accommodate divergent interests and values, and foster orderly decision-making and successful implementation. www.dpa.ca.gov/tcid/osci/express/18a.htm.

SWOT

A mnemonic for four key questions that any company needs to think about. (i) *Strengths*: What are the organization strengths compared with its competitors?, (ii) *Weaknesses*: What are the organization's weaknesses compared with its competitors?, (iii) *Opportunities*: What are the main opportunities for the organization in its surrounding environment?, and (iv) *Threats*: What are the main threats to the organization in its surrounding environment? There are people who prefer to call its TOWS rather than *SWOT*, thereby placing emphasis on the questions about the organization's environment rather than on the questions about the organization itself. *Pocket Strategy: The Essentials of Business Strategy from A to Z*, The Economist Books, The Bath Press, 1998.

Target

1. Specific results that can be measured. Each objective may have several targets. www.enr.state.nc.us/files/strat.htm.

2. The specific and intended result to be achieved within an explicit timeframe and against which actual results are compared and assessed. In addition to final targets, interim targets also may be defined. www.usaid.gov/pubs/cp2000/cp00gloss.html.

Values

The beliefs held that guide the actions of the organization, organizational units, and individuals. www.barton.cc.ks.us/StrategicPlan/Glossary.htm.

Vision

1. A *Vision* is a passionate and compelling statement of a desired future – what we want to be. A *Vision* carries us over the barriers of the current situation. A *Vision* tells us about the character of the organization and how it ought to function. A *Vision* states the purpose of the organization in concrete terms from the perspective of the local community. What is needed to succeed in creating a *Vision*? (i) A committed core drawn from the cooperating partners. (ii) A process that engages their interests and concerns (iii) A willingness to look beyond what has been and is, to what can and should be. Southern Rural Development Center (SRDC) www.ext.msstate.edu/srdc/activities/conference/Garkovicr.ppt.
2. A short description of what the organization, organizational unit and/or individual will look, feel, and be like in the future. An image of our desired future. www.barton.cc.ks.us/StrategicPlan/Glossary.htm.
3. A *Vision* is a picture of the future you seek to create, described in the present tense, as if it were happening now. A statement of “our vision” shows where we want to go, and what we will be like when we get there. The word comes from the Latin *videre*, “to see.” This link to seeing is significant; the more richly detailed and visual the image is, the more compelling it will be. Because of its tangible and immediate quality, a *Vision* gives shape and direction

Criteria for a Vision Statement

- ✓ Descriptive of the future
- ✓ Brief
- ✓ Inspiring
- ✓ Challenging
- ✓ Believable

to the organization's future. And it helps people set goals to take the organization closer to the *Vision*. <http://www.sol-ne.org/Lexicon/vision.html>.

Vision Statement

1. A *Vision Statement* represents what the future should or can be. It provides a picture of the future as seen through the eyes of the employees, customers, and *stakeholders*. A great *Vision Statement* is one that will not only inspire and challenge, but will also be meaningful enough so every employee will be able to relate it to his/her job. www2.state.ia.us/ded/vifaqs2.asp.
2. A *Vision Statement* guides the efforts of the various task forces, which are responsible for developing, reporting, and implementing a plan of action.
3. A forward-looking ideal of where a community wants to be, related to its *goals*.

Vision and Mission

An organization's *Vision* sets out the reasons and purpose for the organization's existence and the "ideal" state that the organization aims to achieve; the *Mission* identifies major goals and performance objectives. Both the *Vision* and *Mission* are defined within the framework of the organization's philosophy, and are used as a context for development of intended strategies and criteria for evaluating emergent strategies. The *Mission* includes identification of (i) market (and other – social, political) needs the organization fulfills, (ii) business scope (i.e. products and markets) required to fulfill organization's purpose and (iii) unique competencies that distinguish the organization from competitors. The organization's philosophy consolidates its values, relationships with stakeholders, policies, culture, and management style. Hax & Majluf, 1996, p. 27; Hax & Majluf, 1991; CSUN strategic planning, April 1997; Hill & Jones, 1992), <http://www.claedf.com/Data/Home/AboutCLAEDF/StrategicPlan/TheGlossary/M11319>.

Developing a Vision Statement

Vision Statements are often crafted through teamwork. The participatory process usually needs to take place in a setting where everyone's opinion is valued and everyone feels free to be creative. Using a trained facilitator for this process can be beneficial.

* United Nations – Regulations and Rules Governing Programme Planning, the Programme Aspects of the Budget, the Monitoring of Implementation and the Methods of Evaluation; Secretary-General's bulletin: ST/SGB/2000/8, 19 April 2000.

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