

Food Security and Development in the Lower Mekong River Basin and the Need For Regional Cooperation: A Challenge for the Mekong River Commission

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1. Introduction

Development partners largely agree that poverty reduction strategy plans should be the basis for development assistance programs. Most often, strategies aim at country-driven poverty reduction. But this approach, while very useful in many countries, may not take sufficiently into consideration cross-boundary impacts of development measures in regions where several countries share a river basin and heavily depend on its associated resources, economically and socially. What one country might consider development that eventually contributes to poverty reduction may in fact translate in a neighboring country into irreversible ecological harm and, as a consequence, into increased poverty.

Although poverty is closely related to and measurable through income and the degree of fulfillment of basic human needs, such as food security, it is also fundamentally linked to the ability to participate in the decisions that affect one's life. The improvement of governance structures by increasing transparency and cooperation in decision-making processes is crucial for making informed decisions at all levels of stakeholders.

This paper addresses the question of how the Mekong River Commission (MRC), through regional cooperation among its four member governments (Cambodia, the Lao People's Democratic Republic [PDR], Thailand, and Viet Nam) can contribute to poverty reduction through food security in the Lower Mekong Basin. The Mekong River Basin's capacity to produce the range of services required of it, including food, forest production, clean water, biodiversity, and perhaps climate, depends upon the maintenance of its ecological integrity. This in turn depends upon cooperation among the riparian states and between sectors to ensure balanced resource use to the benefit of each state. Cooperation should not be limited to a regional intracountry level, but must be expanded to include all stakeholders of the Lower Mekong Basin. Such expanded cooperation will give rise to the opportunity to make and influence informed decisions.

a The Mekong River, the Lower Mekong Basin, and issues of food security

The Golden Triangle, where the borders of Myanmar, Lao PDR, and Thailand meet, is the beginning of the Lower Mekong Basin (LMB), which includes the riparian countries of

Cambodia, Lao PDR, Thailand, and Viet Nam. The Mekong River has a total length of approximately 4,400 kilometers. It ranks 12th in the world in terms of length, 21st in terms of catchment, and 8th in terms of discharge.

The last two decades have witnessed rapid economic development in the lower basin countries. This has been fuelled by wide-ranging reform processes following the end of civil strife and ideological barriers within and among the LMB states. The opening of the riparian economies to trade with and investment by other countries has been particularly important in the rapid, dynamic economic development processes experienced in Cambodia, Lao PDR, and Viet Nam. Economic development has been concentrated in urban areas and at least some of the urban population have experienced substantial increases in their standard of living over a short period of time.

Seventy-five percent of the population living in the LMB earns its living from agriculture and fishing. Balanced and efficient land and water use is thus essential to long-term food security. The Mekong River Basin is one of the world's most significant food sources, particularly for the growing urban population of the Greater Mekong Subregion. It provides the staple diet for perhaps 300 million people (ADB, 1999) and can, with care, produce much more as demand increases.

The inland capture fisheries production in the LMB forms, together with rice, the basis for the food security of the rural population. Fish is the single most important source of animal protein for this population, and a very important source of income as well.

While the importance of rice for food security in the LMB is well understood, the role of fish in the overall food security of the population is not always acknowledged, either in terms of its contribution to overall food production or its essential contribution to the diet of rural people who produce most of their own food. The common property nature of the fishery sector resource base is generating increasing conflicts inside the sector among the different actors, as well as threats from other economic sectors using the same resource basis. For the economically and socially most vulnerable strata of the society—the poor—access to common property resources constitutes a last safety net in subsistence conditions.

b. The role of the Mekong River Commission in food security and poverty reduction

MRC's origins go back to 1957, when the Committee for Coordination of the Lower Mekong Basin was established. Over the period 1978 to 1995, it was known as the Interim Mekong Committee. In 1995, an agreement between Cambodia, Lao PDR, Thailand, and Viet Nam established the MRC. Under the 1995 Agreement, MRC's role is to coordinate and promote "cooperation in all fields of sustainable development, utilization, management and conservation of the water and related resources of the Basin."

MRC's focus is on three priority areas, each of which follows directly from the 1995 Agreement: (i) developing rules for the cooperative use of water; (ii) facilitating cooperative sustainable

development of water and related resources through basin development planning; and (iii) environmental management and monitoring of the basin's natural resources.

Activities in these three fields are aimed at creating the policy and institutional conditions that will secure maintenance of the ecological integrity of the Mekong River Basin, in order to reduce poverty through sustainable development for this and future generations. MRC produces data and analysis useful for basin planning purposes that has the unique benefit of representing the collective views of the riparian states. Each country and its associated development agencies can use this indicative information as a basis for decision making. This is particularly significant for the issue of water use in agriculture and power generation, fisheries, forestry, and navigation.

2. Aspects of Poverty and Food Security in the Lower Mekong Basin

a The dimension of poverty in the region

The people in Cambodia and Lao PDR are among the poorest in the world: their income is low, the availability of food is low, and they are suffering from important health problems, due to lack of hygiene and access to safe water and health care. In the northeastern part of Thailand and the provinces of Viet Nam that are part of the basin, many people suffer from severe poverty. Poverty is closely related to access to cultivable land and appropriate amounts of water, as well as to fish.

Throughout the basin, small farms are the main feature, many of which sustain their farmers at close to or below subsistence level. Many farms produce a per capita income below US\$100 per year. Farmers are forced to seek off-farm employment elsewhere. Many are at the mercy of rice traders and are caught in a poverty trap in which they are in debt to private moneylenders to whom they have to sell their rice at harvest time at very low prices. Other farmers, for example, those in the Delta outside the problematic saline or acidic areas, generate a significant rice surplus. This situation has led to a rather skewed pattern of income distribution.

There are great discrepancies between countries and within countries. Gross domestic product per capita in three out of the four MRC member countries is among the lowest in Asia, at US\$290 for Cambodia, US\$324 for Viet Nam, US\$365 for Lao PDR and US\$2,540 for Thailand (World Bank, 1999).¹ The North-east region of Thailand is much poorer than the rest of the country. In 1996, 18 million people living in the Thai part of the LMB had an average income of US\$731 (World Bank, 1999).

Such figures, however, do not fully reflect the socioeconomic reality in the region. In fact, most people in rural areas produce a major part of their food by themselves. They achieve a balanced diet through their own rice production, fish catch, and gathering of common property resources, rather than through buying a basket of food.

¹ Figures in baht converted into US dollars at 37 baht per dollar.

Many people in Cambodia and Lao PDR do not have access to safe drinking water or proper sanitation facilities. Estimates of the percentage of the total population without a safe water supply vary between 70 percent and 80 percent for Cambodia and between 50 percent and 60 percent for Lao PDR (UNDP, 1999).

Flooding adds to the multiple aspects of poverty in the region. Large areas in the LMB are seasonal wetlands with an important function for biodiversity, fisheries, and soil fertility—and thus for food supply. But floods also aggravate poverty problems. Extreme floods, such as those in Viet Nam in 1999 and in Cambodia in 2000, destroy fields planted with crops. In those events, relief efforts were partly in vain, due to the poor quality of commercial seeds for replanting. The standing crops in 20 per cent of Cambodia's rice fields (400,000 hectares [ha]) were washed away in 2000 (*Cambodian Daily*, 2001). Furthermore, the flooding led to destruction of agricultural land, thereby affecting agricultural productivity. Floods also have an adverse impact on the countries' efforts to build up their human resources (see for instance the Cambodian government's report on the destruction of schools in 2000).

These losses have not been big on a macroeconomic scale in Cambodia (given the low normal yields²), but the impact on income, food consumption, and means of production is significant. This impact is felt hardest among the poorer sections of the population, those who are producing for their own subsistence and who are too vulnerable to cushion external shocks.

b. Rice production

Rice is the principle crop and staple food of the people in the LMB, which has achieved a remarkable increase in rice production over the last decade in line with the rest of Southeast Asia. This has contributed to the generation of a sizeable net surplus from the Basin as a whole, although the Lao PDR still has a significant deficit in its mountain areas. The Mekong River Delta annually generates about 40 percent of the total rice production in Viet Nam.

The overall benefits from rice production are unevenly distributed. A case in point is Cambodia, which was mentioned in a recent World Food Program study as one of the four Asian countries in which hunger was worst (*International Herald Tribune*, 2001).

Table 26.1. Fish Production in the Lower Mekong Basin

Fish Production	Volume	Market Value
Capture Fisheries	>1,000,000 tons	>US\$750-800 million
Aquaculture	200,000 tons	US\$150-200 million
Total	1.2 million tons	US\$1,000,000,000

Source: MRC (2000).

² Rice paddy yields in Cambodia amounted to 1.55 tons per ha in 1990-98, compared to 2.23 tons in Thailand, 2.53 tons in Lao PDR, 2.55 tons in Viet Nam, and 4.34 tons in Indonesia (Royal Government of Cambodia, 1999).

c. Fish

Because of the complications of assessing the total production,³ only tentative estimates of catch and aquaculture yields are available:

With the Basin's population now estimated at 60 million people, these data imply an average fish consumption in the LMB of not less than 20 kilograms (kg) per capita per year. This is on the upper edge of what is consumed in most industrialized "fish-eating" countries. Still, this figure is considered preliminary and likely to be well below the final, correct one: the average figure for the whole Basin is likely to fall on the high side of 29 kg when full MRC survey data become available.

The fish harvest is also strongly seasonal. From late November to late March-early April, when the biggest catches are taken, fish is abundant and the price of fresh fish is low. The price rises during the following months. Traditional fish products with a shelf life of 6–9 months, therefore, play a very important role in food security. An important fraction of the

Table 26.2. Food Security

Per capita fish consumption	
Average	>20 kg
Tonle Sap (flood plain):	71 kg
Luang Prabang (highland):	29 kg
Traditional products:	Approximately 10–14 kg

Source: MRC (2000).

small fish caught when migrating out of the flood plains at the beginning of the dry season is dried or salted or converted into some of the traditional fermented products. The per capita consumption of these products lies in the range of 10–14 kg per year in much of the Mekong Basin. These products are responsible for a considerable part of the animal protein intake during the rainy season.

These traditional products have, however, a much broader importance in the diet. They are an invaluable source of calcium and an important source of vitamin A and other micronutrients. This is an area which requires considerably more research, and, when confirmed for the specific traditional products, may indicate the importance of supporting the production and consumption of traditional fish products in Southeast Asia.

³ Collection and analysis of catch and effort data is an impossible task in a strongly seasonal small-scale fishery in flood plains and rice fields, etc., with hundreds of different types of gear. Moreover the exclusive registration of the more visible large-scale fisheries will clearly target only a fraction of the real production. When food security for the people is considered, however, it becomes crucial to obtain more complete and reliable data, which can form the basis for national and regional planning and for the development of appropriate fisheries management systems.

3. Future Prospects: Population Growth, Water Quality, and Development Based on Water-Related Resources

a. Population growth and pollution

Compared to overpopulated river valleys elsewhere in the world, the Mekong River Basin belongs to one of the few areas where population pressure has not been overly strong. However, the basin population has been growing comparatively rapidly. At the current rate of 2 percent per year, the population of the Basin will increase from 73 million at present to approximately 120 million by the year 2025, with an equivalent increase in the demand for food and clean water. Presently, 84 percent of this basin-wide population lives in the LMB.

Even if the population grows at the most optimistic low rate, the population in the LMB will reach an alarming level in the next decades. The population pressure will certainly in itself have negative impacts on the sufficiency of clean water and food. The increase in the demand for energy will most likely mean construction of new dams and the conversion of more forests into agricultural land. Agricultural production will have to be intensified. These and other activities will lead to a considerable pressure on ecosystems.

Currently, only about 16 percent of the basin's population live in urban areas. However, urban population growth is expected to increase rapidly in the coming decades, fueled by both heavy migration from rural areas and population growth. Of particular importance are the rates of urban growth of Cambodia and the Lao PDR, as the largest cities of these countries are located within the basin area.

In the main cities, there are water supply and storm drainage systems. In Cambodia, Lao PDR and (arguably) Viet Nam, however, these systems require great investments for rehabilitation (ADB, 2000b; MRC-UNEP, 1997).⁴ In small towns and rural areas no such systems exist; people take their water directly from the river and discharge untreated sewage into it. Only in Thailand do the majority of people have access to safe drinking water and sanitation on a relatively large scale.

With population increasing, much more investment is required to provide safe drinking water (using ground and surface water). Untreated sewage has to be prevented from polluting the surface water bodies. The water quality of the Mekong is already deteriorating significantly and rapidly in major urban centers.

The growth of the still underdeveloped industrial sector in the Mekong River Basin will also contribute its share to the pollution of the water resources. Foreign direct investment is already increasing in several parts of the Basin, and industrial development in general is likely to increase considerably in the longer run. This will significantly raise employment and income opportunities and thereby make an important contribution to poverty reduction. However, it is also likely to increase pressure on the Mekong ecosystem, which could, in particular, affect the fish re-

⁴ ADB is providing substantial funding for these activities.

sources. In this respect, it is worth noting that the Lao PDR and Cambodia, the two least developed countries in the LMB, lie almost entirely within the Basin.

b. Prospects in socioeconomic and ecological development

i. Hydropower

Population growth and industrialization need electrical energy. The energy demand in the Basin is projected to rise rapidly, faster than the population increase. Estimates of the hydropower potential of the LMB vary, depending on the feasibility criteria applied. Hydropower development may lead to increases in income and employment in the industrial sector, rural electrification, education, sanitation and water supply, irrigation possibilities, and regulation of water flow. But it also may generate negative impacts such as the decline of fish resources, possibly an increase of water-borne diseases, reduced food production due to water logging, and the displacement and loss of cultural identity of indigenous people, who are generally among the poorest in the region.

ii. Irrigated agriculture

The World Water Forum conference in The Hague in March 2000 estimated that food demand from the Mekong River Basin will increase by between 20 percent and 50 percent by 2030, accompanied by an increase in water demand. With a view to the resource base, a substantial increase in agricultural production is possible.

Despite the primacy of rice in the agricultural sector in the area, the LMB has a relatively low “irrigation ratio” compared with the rest of Asia. A rough estimate would place the ratio of the LMB irrigated area to its total cultivated area at a mere 7–10 percent, whereas the ratio for the whole of Asia would be around 45 percent. Cropping intensities in the dry season are generally low. However, in certain areas, good prospects exist for seed crops, vegetables, and fish and shrimp ponds.

A large potential for increasing production exists in irrigated agriculture, mainly through an expansion of the irrigated area (in Cambodia and Lao PDR) and through increasing the amount of water for irrigation (in Cambodia, Lao PDR, and Thailand). This, however, may affect the Delta (Viet Nam), which is vulnerable to reduced dry season mainstream flow, accompanied by increased salinity intrusion from the sea.

Potential positive impacts of agricultural development include increased food production and consumption, income, and employment. Reservoirs for irrigation can also create new opportunities for fish production. These can range from harvesting indigenous fish and stocking nonindigenous species to cage culture and integrated farming systems. Agriculture, forestry, and fisheries provide the foundation for economic development in a broader sense.

Potential negative impacts include ecosystem damage, competition by an increased population for limited natural resources (affecting fish resources through conversion of wetlands

into agricultural land, deforestation leading to flooding, etc.), the diversion of water by irrigated agriculture, and depletion of soil quality. Inefficient water use by farmers in irrigation projects can result in large flows of tail-water into receiving waters, usually containing large amounts of pesticides. These tail-water overflows can coincide with low flows in receiving waters, resulting in threats to fish stocks in rivers and estuaries. In a recent survey of rivers, reservoirs, and wetlands in LMB, all fish sampled had pesticide residues in their flesh. Such pesticide pollution may especially occur with fish raised in paddy fields, which can create a severe hazard, both to the fish stocks and to the consumer. Integrated pest management is a feasible solution to the problem.

iii. Forest, wetland, and coastal ecosystems

The forest, wetland, and coastal ecosystems in the Mekong River Basin are being continuously degraded—additional victims of growing population pressure. Cambodia probably has still the most diversified and preserved forest/wetland ecosystems in the Basin. The Lao PDR is one of the richest countries in the region in terms of biodiversity, due to a relatively intact large area of forest resources. Yet many areas are threatened by development. Biodiversity degradation in Thailand has already proceeded to a stage where only limited areas of species richness exist within the Mekong River Basin. The Mekong Delta in Viet Nam is fully affected by human intervention (conversion of mangrove forests to shrimp farms and wet rice cultivation, drainage works, etc.).

c. Inland fisheries: A complex issue

Close to 1,300 different species of fish (Rainboth, 1996; Rainboth personal communication, 1999) have now been identified in the LMB. Approximately 120 species are estimated as being commercially important and are found at marketplaces in the Basin.

The variety of ecosystems encompassing rivers, lakes, flood plains, and estuaries supports a high diversity of fish species. The changes between dry and rainy seasons and the periodic flooding of the land create the high fish production, and force the fish to migrate. In particular, the flooded forests are important as feeding areas and shelter for fish. When the water recedes at the end of the rainy season, the fish migrate back to the main stream where—if not caught—they survive until the next flooding. It is the flood plains that provide the high productivity, while the main river and the permanent water bodies create the habitats where the fish can survive from one season to the next. Furthermore, each year some of the species have to travel great distances to reach their spawning grounds (see Figure 26.1).

With the expected population growth in the LMB, additional fish production of approximately 1 million tons is needed by 2025 in order to ensure food security at a consumption level of approximately 30 kg of fish per capita per year. The capture fishery is considered already utilized at its maximum possible level, and there are only limited possibilities for expanding it in reservoirs and other artificial water bodies. It is more than likely that the

Figure 26.1. Example of Fish Migration In The Region
The Arrows indicate migrations of the Trey Riel (*Henicorhynchus* spp).



Source: Mekong River Commission.

development of other economic sectors may lead to some decline in the overall fish production in the LMB in the future.

With strong population growth in the Mekong Basin and a natural capture fishery that can hardly be expanded, aquaculture has an important role to play in food security as a whole. It is the most important source for the increase in fish production that is required to cope with the increase in population.

There is a tradition for inland aquaculture in the Mekong Basin. In an overall perspective, aquaculture production still plays a limited role, with a total production at present estimated at 200,000 tons. The traditional separation of aquaculture and capture fisheries as two almost independent production systems is not feasible in an area like the Mekong Basin. On the one hand, some high-value wild fish are captured (usually as fry and fingerlings) and stocked for on-growing on aquaculture farms, while low-value species are captured and fed to predatory fishes being cultured in cages. On the other hand, escapees from aquaculture activities frequently reach the natural habitats in high numbers, when exceptional floods surpass the dikes around ponds or accidents cause breakage of fish cages.

An increase from the present approximately 200,000 tons per year to 1.2 million tons in 2025 would require an annual growth in the sector of approximately 8–10 percent per year. This is hardly likely to be achieved. To the contrary, there are some significant developments in the LMB that actually form a threat to fisheries.

The most important threat to the fish resources themselves comes from habitat destruction.⁵ Fish habitats are changed and destroyed by other sectors, e.g., when the flood forests, which form important shelters and spawning grounds for fish, are cut down and wetlands are drained in order to allow for increased rice production. The net economic result may be negative.

A second important threat is constraints on fish migration. A dam on the main stream could in its worst case scenario cause the collapse of the resource system around the flood plains in central Cambodia and the Mekong Delta of Viet Nam. The fish migrations are vital to these resource systems. The systems would probably recover only slowly and partially from constructions that might cut off large spawning habitats (and then only if given a chance).

Pollution from urban areas and industrial development may destroy important habitats, and is also feared as a barrier to migration, like a dam: the fish will not be able to pass the part of the river where it occurs. Failure to address the pollution problems attendant on urban development may cause irreparable damage to the ecosystems in the main stream and in Tonle Sap. This issue requires the highest attention.

Further, the increase in rice production, using higher-yielding strains that require more fertilizer and pesticides, may eliminate the traditional extra outcome of fish, frogs, and other animals for food and income from the fields. This is rarely considered during the planning of this kind of development. Once again, the net economic result may in some cases be negative, especially for the poorer sections of the population.

Flood prevention, in contrast with prudent flood management, will have a negative effect on fish production, since it hampers the free movement of fish. The same applies to a

⁵ Over fishing is often mentioned as a potential threat, and it is certainly so in some local areas and for some vulnerable species like the giant Mekong fish species and other large species, which reproduce at a relatively advanced age. However, for the Basin as a whole, this appears to be of relatively minor importance compared to habitat destruction.

measurable reduction of the peak flood brought about as an accumulated effect of reservoirs constructed upstream.

Thus, the fisheries sector is likely to face severe complications in the near future. Nevertheless, there seem to be few other sources of animal protein that can be developed within a reasonable time span to replace fish in the diet of the rural population.

4. A Catchment Management Approach to Ensure Balanced Resource Use

a The rationale of the catchment management approach

The previous chapter has sketched some of the interrelationships between the environment, human economic activities, and the Mekong Basin's hydrology. All of these together should be taken into account while striving for food security to accompany continued population growth.

One of the methods MRC applies to take these parameters into consideration is the so called catchment management approach. With this approach, the Mekong River Basin is divided into a number of subdivisions, each consisting of an individual catchment area. A catchment is defined as a geographical unit in which all flows of water (precipitation, evaporation, run-off water, ground water, and river streams) affect the catchment's main water body, which, in MRC's case, is a tributary of the Mekong River.

The catchment management approach was introduced in MRC's fisheries program and is an integral part of the Agriculture, Irrigation and Forestry Program (2001–2005). It also forms the methodological backbone of the three MRC core programs that are about to start: the Water Utilization Program (WUP), the formulation of the Basin Development Plan, and the Environment Program.

The catchment management approach aims at optimizing the use of the resources of the catchment for the local community, the particular nation, and the LMB as a whole. It involves consideration of all sectors and aspects, such as agriculture, forestry, fisheries, the environment, local services, and socioeconomic and cultural characteristics of the local communities. In addition, it also looks at the interlinkages between all these aspects. It recognizes that

- The local communities in a catchment area are often a cause of environmental stress, but may be suffering from the results of irrational planning.
- Social and economic pressure faced by small communities is often taken out on the environment, mainly through unsustainable farming practices.
- Where the exploitation of resources is causing environmental problems, there is often a solution that may minimize the damage and even benefit the rural community in a way that simple compensation would not.
- Planning for natural resources management undertaken without participation from

potentially affected communities will be susceptible to misunderstandings and difficulties in implementation.

Furthermore, it works on the premise that local activities, from the upper catchment to the bottom valley, impact on a fragile landscape, and may eventually impact on the river basin as a whole. Under this approach, all relevant developments are studied on a smaller scale, while taking into account the overall picture of transboundary issues. The impact of pollution from various sources, silting, dam construction, urban and industrial areas, etc., are all included.

The implementation of a natural resources management and development strategy will require broad cooperation among different local authorities sharing the same watershed, in some cases even across national borders. Talking about natural resources management is talking about provincial, national, and regional cross-sectoral economic planning, involving various government offices as well as the people concerned. This also potentially involves local development cooperation at field and district level, where important decisions are made and the natural resources management is actually taking place.

b. The catchment approach in the fisheries program

For fisheries, a catchment-based management planning system involves, among other things, the determination of important habitats and migration routes. The aquaculture potential

“There is vast potential for developing the natural resources of the Mekong Basin.”

may be determined in close relationship to the size, type, and role of the wild fish species in food security and their need for habitats. This may be followed by the drafting of a policy for the use of

indigenous and exotic fish species in fish culture as well as a catchment-based fish health management plan. The role of existing reservoir fisheries may have to be defined, not only for each water body, but also as an integral part of the resource system in the catchment; thus, plans for, and potential impacts of, further dams, weirs, or other major economic activities related to the water may be assessed more easily. In brief, a catchment-based research and management plan may bring the natural resources and their importance for food security into the overall national and regional planning processes.

A catchment approach to fisheries management will explore the following issues:

- Registration of total production, species composition, important habitats, important migration routes, and present aquaculture or reservoir fisheries, and the need and priorities for further research;
- Determination of the present roles and development potential of aquaculture and reservoir fisheries, and development of an overall and integrated management strategy for capture fisheries and aquaculture; and
- Establishment of natural resources management systems at river basin level as well as at subcatchment and local levels, with more emphasis on the access of the poor to the limited resources.

c. The catchment approach in agriculture, irrigation, and forestry

The recently developed MRC program in this field focuses on collaborative planning (and learning) for comprehensive development in sensitive cross-border areas, or areas that are likely to have an impact on the LMB as a whole. Small communities may participate in a grant scheme to improve their livelihood. Some of the other activities⁶ included in the catchment management approach to development of these sectors are: (i) the establishment of transborder or transsubbasin local government planning committees to discuss and plan interventions in the catchment, including discussion of transboundary issues; (ii) the establishment of a capacity to monitor resource use and trade in the catchment areas; and (iii) a study of land, water, and forest use rights.

With irrigated agriculture often the single largest consumer of water, it is well understood that efficient water use must receive special attention. Therefore, this aspect has become a second pillar of the program.

5. River Basin Management: The MRC Strategy

a. River basin management

Countries sharing a river are affected by one another's decisions on how to exploit the natural resources in the basin. Cross-border cooperation in resource management is therefore essential. Moreover, authorities at provincial and district levels, who are sharing their daily work with the resource users, the small-scale farmers and fishers, must be involved. Within a sector or subsector, food security and the preservation of resources cannot be planned for in isolation. The planning must be coordinated with similar efforts of other sectors. MRC can play a key role in such cooperation.

To meet present opportunities and challenges, the MRC Secretariat was restructured in July 2000. Operational activities were reoriented from a predominantly sectoral project approach to a multisectoral and basin wide program approach. The changes aim at focusing MRC on river basin management. As evidenced at the meeting of the MRC Ministerial Council in October 2000, the four member countries stand united behind this aim, which also receives strong support from aid providers.

Three core programs provide the foundation for MRC in river basin management. Their purposes and interlinkages are as follows. The WUP is to provide MRC member states with the technical framework for managing the Mekong water, which will take the form of rules for water utilization and ecological protection, including maintenance of sufficient flows in the dry season and measures to protect water quality. The Basin Development Plan, closely linked to the WUP objectives, is to ensure coordination of development activities in the Mekong Basin, so that the balance can be kept between development of the immense Basin

⁶ The details of these activities are described in MRC (2000).

resources, on the one hand, and maintenance of water flow and ecological systems, on the other. The plan aims to identify transboundary economic development activities that balance the Basin peoples' development needs with sustainable water quality, quantity and long-term environmental integrity. The Environment Program is to provide an adequate knowledge basis for development decisions affecting the balance of the many complex, delicate, and critical ecosystems at work in the Mekong Basin, and the means to ameliorate adverse environmental effects.

b. Focus on food security

There is vast potential for developing the natural resources of the Mekong Basin, which is at the core of the MRC mandate. As this occurs, a key task in the years to come will be to ensure food security. Expanding agriculture seems to be a viable response to the expected population increase. But agricultural development has to be managed carefully to reduce negative effects on other sectors, or in geographic areas other than the ones developed, in particular, the fisheries sector. Irrespective of development in the agriculture sector, fish resources are likely to decline, when measured per capita, due to population increases and the adverse effects of development. Their significance in terms of nutritional value makes it imperative for MRC to seek to sustain the fish resources and simultaneously identify and prepare the ground for introduction of alternative sources of protein.

In the long term, a shift to integrated, diversified agriculture with a more balanced cropping pattern throughout the year is likely to be more profitable than the present strong dependence on wet-season rice production. Plans for related infrastructure and investments in agricultural marketing development, institutional development, and support services should therefore be a prime consideration in a planning process for the whole region.

At present, two of MRC's five sector programs directly address the issue of food security. The aim of the MRC Fisheries Program is coordinated and sustainable management, use, and development of the economic and nutritional potential of inland living aquatic resources in the Mekong River Basin. The Agriculture, Irrigation and Forestry Program, which was formulated in October 2000, focuses on activities to promote the sustainability and further development of food production from the land and water resources of the Basin, where cooperation between member countries is required for success. The overall program development objective is to achieve "cooperative sustainable development and utilization of land and water resources to the benefit of the basin community, and to contribute to poverty alleviation and food security." (MRC, 2000).

c. Poverty reduction through basin development

The regional interdependence of the basin as regards development requires regional cooperation to reach decisions on development priorities. This, in turn, requires information on possible development options and their consequences, including the possibilities for compensatory measures, when needed. Through regional cooperation and through its catch-

ment management approach, MRC strives to ensure that development priorities are set in a holistic perspective, taking into account positive and negative impacts of development in various sectors, and guided by the overall objective of reducing poverty. If development options have a negative impact on poverty, compensatory measures have to be introduced to neutralize these effects, so that no one in the basin is worse off. A key prerequisite for this is knowledge and information. MRC has taken steps to become a regional knowledge center and information hub on Mekong Basin issues. Through its current programs, MRC will generate a vast amount of data and information that will be shared with all stakeholders, who are invited to participate in the planning and implementation of its programs and strategies.

MRC has accepted its responsibility as one of the key actors in promoting increased food security and facilitating the development of the countries of the Lower Mekong Basin. In order to do so, MRC crucially needs accurate and timely information to support decision making. Obtaining and providing this information and establishing the processes for sound basic development are among the cornerstones of MRC's work and the key to development that meets the social, cultural, and economic needs of the people, now and in the future.

References

- Azimi, A., W. Knowland, R.J. Carew, I. Ruzicka, and A. Zola. 1999. *Environments in transition, Cambodia, Lao PDR, Thailand, and Viet Nam*. Manila: Asian Development Bank, p. 124.
- . 2000. *Environments in transition: Cambodia, Lao PDR, Thailand, Viet Nam*. Manila: Asian Development Bank, p. 122.
- The Cambodia Daily*. 2001. Goods Made Hunger Worse, Agency Warns. January 12. p. 19.
- International Herald Tribune*. 2001. 830 Million are Hungry in the World, UN Finds, January 10.
- Jensen, J. G. 2000. Can This Really Be True? *Catch and Culture* 5 (3, March).
- MRC (Mekong River Commission). 2000a. *Agriculture, Irrigation and Forestry Program for 2001–2005: Sustainable Land and Water Use for Basin Health and People*. Phnom Penh.
- . 2000b. *MRC Program for Fisheries Management and Development: Annual Report, April 1999–March 2000*. Phnom Penh: MRC Secretariat. May.
- , and UNEP (United Nations Environmental Programme). 1997. *Mekong River Basin Diagnostic Study, Final Report*. Bangkok.
- Rainboth, W. J. 1996. *FAO species identification field guide for fishery purposes. Fishes of the Cambodian Mekong*. Rome: Food and Agriculture Organisation.
- Royal Government of Cambodia, Ministry of Planning. 1999. *Cambodia Poverty Assessment*. Phnom Penh.
- Sjorslev, J. G. (ed.). 2000. *Fisheries Survey, Luang Prabang, Lao PDR*. Vientiane.
- UNDP (United Nations Development Programme). 1999. *Human Development Report 1999*. New York: United Nations.
- World Bank, 1999. *World Development Indicators*. Washington, D.C.