Water Resources Management and Development in Cambodia

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ABSTRACT

The Kingdom of Cambodia is generally considered to be a "water-wealthy" country, positioned as it is in the lower Mekong River basin. Its gross water resources rank third in Southeast Asia, in terms of its water availability of nearly 50,000 m^3 per person per year. With a long dry season and periods of drought in the rainy season, many Cambodians face water shortages, with serious consequences for food production and domestic water supply.

At present, Cambodia has a relatively small population compared with its area, and an undeveloped economy. Therefore, there is relatively little competition for water, except that the informal or unintended use of waterways for waste disposal significantly reduces their usefulness for other purposes, largely during the dry season. However, future population growth, growing demands for improved water supply and sanitation, urbanisation, and agricultural and industrial development will place increasing stress on water resources, as well as aquatic ecosystems and fisheries.

This paper describes the topics related to the advanced water resources management in the kingdom of Cambodia. This includes a short overview of water resources and also focus on the Management and development of water resources. In this paper also presents the water vision for Cambodia, arrangement for river basin management, water issues such as :issue on water use, environment issues, institution issues, water quality issues, issues related to the flood and others harmful situation, and the role of civil society and community participation in the water resources management.

1. Introduction

The Kingdom of Cambodia is a downstream riparian country in the Mekong River basin. Of the estimated 475 billion m^3/year that flows from Cambodia towards the sea, perhaps 400 billion m^3/year flows from the upstream countries. The remainder is generated within Cambodia's borders, or in the headwaters of tributaries that reach the Mekong within Cambodia. Hence, water quantity, water quality, and sediment load in the Mekong River as it flows through Cambodia are strongly controlled by conditions in the upstream catchments. Water flows and levels in the lower Mekong delta, upstream of Cambodia's southern border with Vietnam, can be influenced also by downstream conditions, as a result of backwater effects associated, for example, with drainage or flood control works.

About 86% of Cambodia's land area is included within the Mekong River basin. This area includes the most densely populated and highly developed part of the country, along the floodplain of the Mekong, Bassac, and Tonle Sap system. The 14% of the country that drains directly to the Gulf of Thailand is lightly populated and predominantly forest covered. Water resources are almost wholly undeveloped, and the principal resource management issues in this area relate to forest and wildlife management and conservation.
A number of sub-basins in Cambodia's part of the Mekong River basin are large enough to be managed as distinct entities, if necessary. These include the Prek Thnaot, Pursat and Battambang River basins. The whole Tonle Sap basin also is large enough, in principal, to be worth managing as a unit. However, its hydrology is very strongly linked with the Mekong River, because of its "reversing flow regime", so that management of the Tonle Sap separately from the Mekong system would present unique challenges.

2. Natural Conditions

2-1 Geography

Cambodia is located in Southeast Asia between latitudes 10^0 and 15^0 North and longitudes 102^0 and 105^0 east. It has an area of 181.035 km2, and bordered by Lao PDR in the North, Thailand in the Southwest.

The central plains, which form 75% of the land area, are between 10 to 30 m above sea level.

The main feature of the central plain is the Tonle Sap lake, which is the largest permanent freshwater lake in south east Asia, It covers an area varying between 2500km2 during the dry season with an average depth of less than 2m and more than 13000km2 at the end of the wet season with maximum depth of 8-10m.

2-2 Climate

The climate in Cambodia is tropical, dominated by two main monsoons: the South – West monsoon and the north –East monsoon**.**

The South- West monsoon presents the rainy season that last from mid- may until the end of October. Almost 80% of the annual rainfall occurs from May to October. A short dry interval of 1-2 weeks is normally experienced between June and July, due to a high, anti-cyclone circulation.

2-3 Rainfall

The rainy season starts in Cambodia in mid-may and last until end of October. But, as already mentioned, at some stations, particularly those in the coastal region, it rains almost every month. The mean annual rainfall varies from 1100mm near the great lake, to more than 4000mm along the coastal area, west of the Cardamom mountain range.In the northern region, the mean annual rainfall varies from 1100 to 1800mm, with higher rainfall along the Mekong basin river and the Dangrek range mountain. Rainfall is getting lower towards the great lake.In the northeastern region, the rainfall is more intense, ranging from 1800 mm near the Mekong River, to 2500 mm towards the central high land of Vietnam.

2-4 Temperature

The variation of the mean annual temperature over Cambodia is very small, grading among 26.6^0c in the North, at Stung Treng and Siem Reap, and 27^0 c at Phnom Penh.

2-5 Humidity

The mean annual humidity over Cambodia varies in a narrow range among 76% at Phnom Penh, to about 80% at Sihanouk ville and Kampot. The mean seasonal variation of humidity at Phnom Penh is from 66% to 85%, with the minimum of 17%.

2.6 Evaporation

The observation on evaporation in Cambodia is mostly made with the Piche evaporimeter and, to a limited extends, with the evaporation pan. The annual observation made by Piche evaporimeter, baries from 1020 mm to 1470 mm. At Phnom Penh (Pochentong) is the mean annual evaporation 1348mm.

The Mekong Committee had introduced the class an evaporation pan in 1960, but only limited data is available.

2.7 Land

Cambodia is bordered by Thailand in the West, by Laos and Thailand in the north, by Viet Nam in the east and by the Gulf of Thailand in the south. Geographically, Cambodia can be divided into two regions, that is, the Mekong river basin and Tonle Sap Plains, which are the main paddy production areas of Cambodia, and the periphery of the river basin and the mountainous areas on three sides of the country.

A total of area of the country is 181,035 km^2, consisting of 20 provinces, four municipalities divided into and 172 districts. Some 67% (12.1 million ha) of the country is classified as forested area. The cultivable area is estimated at 21% (3.78 million ha) of the country according to Land Sat survey, however un-cleared mines restrict expansion of some cultivated areas. The total paddy area 2.25 million ha in 1996/97, occupying 91.2% of the total cultivated area.

2.8 Socio-Economy

The Cambodian economy is still constrained by the effects of the destruction of social infrastructure, production systems and social services, which occurred during the Pol Pot Regime. Current per capita GDP of 292 US$ is considered as one of the lowest in the world. The Social economic survey of Cambodia prepared by Ministry of Planning reports that 38% of households or 30% of people are living on income lower than poverty line. Poverty alleviation therefore, is one of the most important targets in the First Socio-economic Development (1996-2000). The GDP growth rate has once depressed in 1994; however, it was restored to 7.6% in 1995.

Balance of trade shows a deficit over these years and it has been increasing along with increase of imports.

The agricultural sector is the mainstay of the Cambodian economy, contributing 80% of income to employed persons, 45% of GDP and exports. Despite its contribution to the natural economy, average monthly household income of about 52 US Dollars per family in rural areas is lower than that of urban areas and it is reported that about 90% of households in the rural areas lives on incomes lower than poverty line. The agricultural sector is predominated by subsistence farming, in particular paddy production under rainfed condition. Cambodia produced 2.2 million tons of paddy in 1994, with about 200,000 tons deficit. Compared to 1994, about 230,000 tons of surplus paddy was produced in 1995. Paddy production, however, is still highly dependent on rainfed farming characterized by low yield and low input of fertilizers.

2.9 Population

The current population of Cambodia is estimated at 12.5 million, which has been growing at annual average of 2.4% with population density of 51 persons per km^2. Population is divided into 85.4% in rural areas, 7.7% in urban areas and 6.9% in Phnom Penh, respectively, in 1995. It is notable that there is sex imbalance, 52.2% are female and 47.8% male, and high proportion of young generation because of two decades of conflict.

3. Vision for Water Resources

The **Vision for Water resources** in Cambodia is:

- Access for all to safe, adequate, and affordable drinking water, hygiene, and sanitation
- Freedom for all from the threat of loss of life and livelihood as a result of floods and droughts
- Sufficient water where it is needed, to provide for food security and industrial activity
- A water environment that is unpolluted, and supports healthy fisheries and aquatic ecosystems

4 Arrangements for river basin management in Cambodia

At present, management of Cambodia's water resources is the responsibility of national and provincial government. The Ministry of Water Resources and Meteorology (MOWRAM) oversees the Nation's water resources, with operational matters managed by the Provincial Departments of Water Resources and Meteorology (PDWRAM). The Royal Government is committed to devolving as many functions and responsibilities as possible to sub-national levels, and Provincial, district, and commune government progressively is being strengthened. In addition, there is a parallel, semi-independent structure to oversee rural development, that consists of Provincial, Commune and Village Development Committees. The Provincial Development Committee in each province is chaired by the Provincial Governor, and the provincial government agencies such as the PDWRAM provide technical and other support.

Nowadays, no river basin organisations have been established in other river basins outside the Mekong system, or in sub-catchments of the Mekong basin. However, the draft Law on Water Resources Management make provision for water resources to be managed on a river basin basis, where it is considered necessary. The draft Article 5 states that "the MOWRAM may declare any basin, sub-basin or aquifer as Water Law Implementation Area when within that basin, sub-basin, groundwater or aquifer there are likely to be conflicts among water users, problems of water pollution or watershed degradation.".
Furthermore also in the draft National Water Resources Policy, which just recently adopted by the Royal Government of Cambodia (16 February 2004) had mentioned policies related to river basin management and stakeholder participation in the river basin management such as:

1. *To promote the study, monitoring, evaluation, and preparation of short-, medium-, and long-term development plans for river basins. River basin plans will take account of modifications to river flows and aquifer levels, to ensure that utilisation of water resources at present and in the future is sustainable.*
2. *To focus management effort on priority watersheds and aquifers, including those that are under serious threat from human activity, and on competition for water before it becomes a major threat to the socio-economic development and environmental sustainability.*

3. *To promote and facilitate knowledge about, and participation by line agencies, stakeholders and beneficiaries in, the preparation of river basin development and management plans*.
4. *To promote collaboration among RGC institutions, private investors, stakeholders, and beneficiaries, in activities and programmes related to investment in and the management, exploitation, protection, and development of water resources, in order to ensure efficiency and sustainability*.
5. *To promote and facilitate the participation of private investors, stakeholders, beneficiaries, NGOs, and International Organisations, especially women, the landless, and other disadvantaged people, in planning and management of water resources.*

At present, however, water resources are not managed in this way. Up to now, competition among alternative users has not been great, and there has been little development of water resources in the upper catchments, so that water has not been under obvious stress. Most water use is by small irrigation systems in the lower catchments of the Central Plains, and water management has been on a system-by-system basis. However, there is growing competition among irrigators, as individuals take water by pumping directly from watercourses and irrigation systems abstract water in larger quantities to service whole communities of farmers. The levels of use, and therefore the severity of competition and the effect on residual flows, are unmeasured at present. However, they are likely to be placing more stress on water and aquatic resources than has been recognised.

Competition for water can be expected to increase as the Nation's economy develops, subject to the availability of capital funds. The principal competing uses of water are likely to be hydropower, irrigation, and residual (instream) flow requirements needed to maintain the Tonle Sap ecosystem and fishery. Other uses of water – small boat navigation, village and town water supply, bathing and washing, etc. – are all significant in the Tonle Sap/Mekong system and many of its sub-basins. Water resources planning and management increasingly will need to consider the river basin perspective, to ensure that water is used to achieve the greatest net economic and social benefit, while sustaining environmental requirements. Some loans and grants to the Royal Government already promote a river basin and/or IWRM approach to water resources development and management. An example is the Northwest Irrigation Sector Project, funded by the Asian Development Bank.

5 Cambodia in the Mekong River basin context

Cambodia is a signatory to the *Agreement on the cooperation for the sustainable development of the Mekong River basin*, which established the Mekong River Commission (MRC) in 1995. Cambodia did not participate in the work of the MRC's predecessor for many years, due to internal conflict, but rejoined in 1995. Cambodia's participation is administered through the Cambodia National Mekong Committee.

Cambodia benefits considerably from the MRC programmes. Perhaps the principal area of benefit is flood management. Data and forecasts provided through the international monitoring and forecasting system are essential to the MOWRAM's capacity to provide the National Disaster Management Committee with useful forecasts. Cambodia participates in and benefits from other MRC programmes, notably the Water Utilisation Programme (WUP, which develops water use rules to guide international sharing of the resource), river works and navigation, and the Environment Programme (environmental monitoring and management). Training and capacity building are essential elements of the MRC's programmes, which are of great value to the RGC's staff.

As a downstream riparian state, Cambodia is particularly concerned about the impacts of water resource development and management in upstream countries. A key function of the MRC is to address these impacts; the WUP is the principal programme in this area. Relationships between downstream and upstream riparian states in the Mekong basin are not always smooth, and Cambodia has experienced negative impacts from deliberate (dam construction) and unintended (land use change) manipulation of water resources in the upper catchment. The situation is made worse by the fact that the two most upstream riparian states are not members of the MRC.

6 Current developments in River Basin Planning

The Royal Government of Cambodia (RGC) prepares a Socio-Economic Development Plan to guide government strategy; the second Plan, SEDP-II, has poverty reduction as its key focus. In support of this, an operational strategy is being developed in the water sector that focuses on capacity building in key ministries, as well as investment in water supply and sanitation, irrigated agriculture, and other areas.

The MOWRAM has overall responsibility for water resources management and conservation in Cambodia, but it is a very new ministry and at present has a limited number of staff with skills in IWRM. Other RGC agencies focus on particular aspects of water use (e.g. single-purpose development for hydropower in the Ministry of Industry Mines & Energy), and their skills are normally limited to the disciplines that are relevant to their primary functions. The Ministry of Environment perhaps has the most broadly-based skills relevant to IWRM, but its water-related mandate focuses on aquatic ecosystems and industrial waste disposal, rather than water resources management as a whole.

The Asian Development Bank (ADB) has actively supported Cambodia since 1993, and presently is supporting MOWRAM to build its capacity in water resources development and management, setting priorities for investment, and introducing the concept of IWRM as a means of guiding river basin and water resources development. Included in this work is the so-called Northwest Irrigation Sector Technical Assistance project (TA No. 3758-CAM). Part A is supporting development of the National Water Resources Policy, and initial capacity building in IWRM. Part B is preparing projects in selected priority river basins for water resources development, based on a river basin approach, but with a focus on irrigation. Capacity building in MOWRAM is likely to continue beyond the current Technical Assistance under the proposed investment project. It will include policy and strategy related to IWRM, initial training of key staff through courses and on-the-job exposure, and practical application in selected river basins, tentatively the Pursat, Battambang, and Mongkol Borei. All of these are likely to be subject to multiple use development of water resources, so that prior IWRM/river basin studies will provide an important basis for design.

The types of studies necessary have been mapped out under the TA No.3758-CAM, by reference to international experience. Cambodia will need to train a significant number of people, and assemble a multi-disciplinary team, to carry them out effectively. There are several investigations in other river basins at present, in addition to the Northwest Irrigation Sector Project (Table 1).

Table 1. Ongoing or recent river-basin-based investigations of water resources.

Basin	Province	Prime focus	Support	Status
Stung Chikreng	Siem Reap	Irrigation	AFD	Completed 2002
Stung Slakou	Takeo	Irrigation	JICA	Completed 2001
Stung Chinit	Kampong Thom	Irrigation	ADB/AFD	Ongoing
Stung Kbal Chhay	Kampong Som	Water supply	DANIDA	Ongoing
Stung Siem Reap	Siem Reap	RBM	MRC	Completed 2002

7 Water Issues in Cambodia

Increased water demand brought about by rapid population growth has created the need to increase food production through expansion of irrigation and industrial production to meet basic human needs. As Cambodia builds its society and economy, obstacles to the Royal Government's goals of poverty alleviation and economic development must be identified and addressed. Water is of fundamental importance in many sectors, although many people take water for granted.

In the last decade Cambodia has some problem that is related to the water Resources management. Competition and water shortages will increase as a result of highly variable rainfall and growing demand for water. Watersheds are being degraded resulting in sedimentation of reservoirs and more serious floods and droughts. Water pollution from domestic, agricultural and industrial sources is contaminating surface and ground water and affecting public health.

7.1 Water quality issues

Water pollution originates mainly in municipal and household sources and in human and animal waste, but also in illegal mining and industrial activities. As far as municipal waste is concerned, there are no treatment facilities. Cambodia has long had problems of water quality management, which are aggravated by lack of water quality data and information and insufficient capacity to monitor wastewater discharges and the quality of the receiving

bodies of water. Water pollution is likely to increase in the future, as a result of industrial, tourism and transportation development.

Water pollution also originates in non-point sources, such as the use of fertilizers and pesticides in agriculture and urban sources. There is no certainty as to origins of fertilizers and pesticides, which are mostly produced in Thailand and Viet Nam, and no standards have been set. No code of good agricultural practices exists in Cambodia

7.2 Issues relating to the use of water

Issues relating to the use of water Since water resources are abundant in Cambodia, and economic development is still limited, there is still little scope for such conflicts.

Some problems relating to the use of water are gradually emerging as regards the use of reservoirs for irrigation and fishing purposes. Furthermore, for instance, among water user within different irrigation command area and also between navigation and uses requiring the construction of hydraulic works (dam of weirs) in the rivers. This occurs in particular in the Takoe and Kandal Provinces in Cambodia.

Conflict are also recorded among the user of neighbouring wells, due to the over-extraction of ground water in some area of the country (Takoe and Prey Veng Province), where there is a remarkable wells density resulting in two wells per family in some instances. This apparently, leads to the lowering of the water table and is at the origin of the intrusion of the salts. Given the scarcity of data and information on the subject, however, there is no clear evidence of such occurrence, excerpt for some wells being exhausted.

Another water quantity issues relates to the high water losses and floods occurring because of the current status of “Pol Pot” irrigation schemes and of the schemes that area not completed yet. Poor hydraulic design and irrigation layout stemming from the Khmer Rouge regime, together with lack of financial resources for operation and maintenance, have caused a number of irrigation schemes to deteriorate. Drainage requirements also, have been overlooked, with the result that there is a potential for water logging, salinization and in general, environment degradation. There is an urgent need, therefore, to proceed to the rehabilitation of these schemes.

7.3 Issues relating to floods and other harmful situations

Flood projection works are inadequate, and there are no mean of control of those human activities that are at the origin or aggravate the effects of floods. These activities include, amongst other things, the filling of reservoirs, the construction of buildings on the banks of rivers and the shores of lakes and reservoirs, the obstruction of rivers, the cutting of trees, poor land drainage, the extraction of sand, gravel, rock and other materials from the beds and banks of water bodies.

The Mekong has experienced serious environment degradation due to deforestation. It was estimated that the forest cover in the basin declined from about 50% (1970) to about 27%(1985). This decline continues, and is due to population growth, slash-and-burn agriculture in upland area, the collection of fuel wood, logging operations, the extraction of sand, gravel, rock and other materials from the beds and banks of water bodies and the construction of structure. There is an urgent need to introduce measures to prevent the negative effects of these activities on watersheds. As far as international relations are concerned, it is felt that deforestation and watershed degradation upstream are the major source of changes in the regime of Mekong River and the main cause of sedimentation of the Tonle Sap Lake.

The inland fisheries are undergoing a process of degradation, mainly due to over fishing and the sedimentation of river and lakes. Reportedly, fish are also infected with skin disease due to the inadequate use of fertilizers and pesticides in agriculture. The declines of forests of the floodplains of Great Lake and the Tonle Sap and Mekong River as a consequence of agricultural expansion and of the demand of fuel wood are also a cause of the degradation of the fish resources. The forests serve as spawning and nursery ground for fish.

7.4 Institutional issues

Before 1999, year of creation of Ministry of Water Resources and Meteorology (MOWRAM), water management functions, data and information on water resources were scattered among various ministries and agencies. Now that functions have been centralized in the MOWRAM, data and information on water resources are still possession of deferent ministries and agencies, although efforts are ongoing at the MOWRAM to strengthen the data and information systems available and the existing institutional capacity.

To provide a solution to the issues outlined in this section, it is necessary in the first place to strengthen the capacity of MOWRAM staff, at the both national, the provincial and in the future, the district level. Therefore, capacity needs to be completely built.

7.5 Environmental issues

The principal environmental issues facing Cambodia have been considered in the *National Environmental Action Plan 1998-2002*. From a water resources perspective, the two most important issues are forest management and management of fisheries and floodplain agriculture in the Tonle Sap region. The NEAP outlines many components of plans to address these issues, and lists appropriate objectives and activities. Water resources management is not a major element of the action plans. This is rather surprising, especially in the case of the fisheries and floodplains of the Tonle Sap.

Within the Mekong system, Cambodia receives considerable support from the MRC and other External Support Agencies (ESA) such as DANIDA for investigations and management of environmental issues. The focus has been on forest, aquatic ecosystem, and fishery-related matters; an integrated approach generally has not been taken. Perhaps this is appropriate, given the nature and scale of the sectoral issues. However, an approach to resource and environmental management in a river basin context, or in terms of IWRM, would have considerable merit, given that the water cycle is the basic component of these issues.

8 The role of civil society and community participation in water resources management

Water resources management “on the ground” in Cambodia is carried out largely by civil society. Agriculture is by far the largest user of water, in terms of volume. About 85% of farmers are engaged in rain-fed (predominantly paddy rice) cultivation, which of course requires significant modification of runoff patterns. The great majority of communal irrigation systems are small ones, with rudimentary levels of management by the farmers themselves. A growing number of farmers abstract water from watercourses and aquifers, using small motor pumps. Up to now, there has been no control of such individual users.

Medium and large irrigation systems are managed by the PWDRAM and MOWRAM. The policy of the RGC is progressively to increase farmer participation in scheme operation and maintenance, and to transfer costs to the beneficiaries. Policies are defined in the Royal Government's *Circular on the implementation policy for sustainable irrigation system*. Farmer Water User Communities (FWUC) are being established to take responsibility for operation and maintenance of newly constructed or rehabilitated systems. About 100 FWUCs have been established; inevitably, some FWUCs are more successful than others. The level of trust and collaboration in some system areas is less than desirable, and there examples of conflict –often between upstream and downstream farmers – and even sabotage. Cambodia's recent history perhaps explains these cases. ESAs that fund investment in irrigation are actively promoting, if not requiring, farmer participation, and the MOWRAM is investing considerable effort to introduce participatory irrigation management and development (PIMD).

The other principal area of water resources development and management is water supply and sanitation. In most provincial towns and the capital city of Phnom Penh, piped water supply is the responsibility of government-owned companies; a handful of towns now have private sector water companies. Most of Cambodia's population, however, is reliant on non-piped supplies, principally hand pumps, ponds, and watercourses (streams, canals, lakes). Many facilities have been provided by NGOs or RGC agencies (Ministry of Rural Development, MOWRAM), and beneficiary participation is a normal aspect of the work. Increasingly, operation and maintenance is assigned – in principle – to the beneficiaries. Usually, they are organised as "water pump committees", within a Village Development Committee, or through the traditional system of village leadership. In practice, the community may not be able to carry out the necessary tasks, due to a lack of training, forgetfulness, or a lack of cash to buy spare parts.

Policy development, planning, and other "high level" aspects of national water resources management are carried out by the MOWRAM. Workshops, working parties, etc. commonly are used in these areas, and NGOs and ESAs normally are invited to nominate participants. A number of high-level national conferences have been held in recent years, to explore issues related to water resources management. Again, NGOs, ESAs and other stakeholders have been invited to participate. In practice, however, RGC employees predominate in all such activities.

The sub-national Development Committee structure provides a way of enhancing public participation in planning and decision-making, particularly at village level. This structure can be applied to water-related developments, as well as to the many other types of development that are dealt with. If a river basin approach is implemented in the future, a mix of government (national and sub-national) and non-governmental personnel probably would be involved in policy, planning and oversight.

9 Conclusion

In comparison with many other countries in Asia, Cambodia's river basins in general are in good condition. The upper catchment areas are still mainly forested, although forest exploitation and land clearance for agriculture have made considerable advances in recent decades. Even in the more densely populated lower catchments, in the Central Plains, agricultural land use is in most areas neither intensive nor extensive. Paddy rice is cultivated over an area of perhaps 22,000 km^2, but its impact on water resources and sedimentation is less severe than in many other countries where development is more intense and affects steeper country. Certainly, there are serious issues facing the managers of water and other natural resources in Cambodia, particularly in the Tonle Sap system and along the Mekong River. Annual flooding is a natural event that in "average" years is highly beneficial to the farmers and fisher-people that depend on the river. However, in extreme floods, such as that of the year 2000, serious loss of crops, land and property, livelihood, and even life can occur. There are concerns that extreme floods are at least partly a consequence of land use modification in the upper Mekong system, in addition perhaps to global climate change. In the Tonle Sap lake, progressive sedimentation and infilling is, again, a natural process that results from the contribution of sediment from the rivers that flow into the lake basin. However, there are concerns that rates of sedimentation have increased, again as a result of land use change. Data are scarce, but many people believe that clearance for agriculture of seasonally flooded forests around the perimeter of the lake, as well as forest clearance and agriculture in tributary river basins, have resulted in increased inflows of sediment, and also nutrients.

With the coming of peace to Cambodia, the stage has been set for such issues to be addressed effectively. Cambodia joined the group of nations that collaborate together through the MRC in 1995, the Ministry of Water Resources and Meteorology was established in 1998, and the RGC presently is finalising a National Water Resources Policy

and a Law on Water Resources Management. The Kingdom has received considerable assistance from the donors in recent years, to develop policies and strategies to deal with water-related issues. However, there are severe limits on the resources available for water resources management "on the ground", particularly in terms of trained and experienced staff. Technical assistance and technology transfer from other countries will be required for some time to come, particularly in the area of river basin management.

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