

# Country Report: Cambodia

## WATER RESOURCES MANAGEMENT IN CAMBODIA<sup>1</sup>

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### 1- GENERAL INTRODUCTION OF KINGDOM OF CAMBODIA

#### 1-1. Geography

Cambodian lay out in the South East Asia and it is bordered Thailand in the West, by Laos and Thailand in the North, by Vietnam in the East, By Gulf of Thailand in the South.

Geographically, Cambodia can be divided by the Mekong river and Tonle Sap river with the "Great Lake" being part there of Phnom Penh sits in the West of the confluence of the above two rivers from there. The low Mekong and Bassac, are a branch of the Mekong river flows to its lower delta in Vietnam and finally to the South China Sea. More over, the capital of this country is Phnom Penh. The total area of the country is 181,035 km<sup>2</sup>, consisting of 20 provinces, four (4) municipalities and 182 districts.

#### 1-2. Population

In 2000 the population was estimated to be about 12.00 million according to the Ministry of Planning. This figure indicates that approximately 80% of Cambodian population is farmer and ethnically the population consists of about 90% are Khmer, 5% each of Chinese and Vietnamese and number of hill tribes (Cham and Burmese).

The natural rate of growth of the population calculated from the results of the census work out at 2.4% per year and population density of 66 persons per square kilometer.

The country's economy grew at an average annual rate of 5.9% in the period 1991- 1995, and reached 6.5%. Growth slowed down between 1997 and 1998, due to political instability. Although the economy stalled during those years, the GDP per capita increased from US\$ 200 in 1993 to US\$ 240 in 1998, which is still one of the lowest in the world (ADB) country Assistance Plan 2000- 2002, December 1999).

#### 1-3. Climate

##### 1-3.1. Temperature

The climate in Cambodia is tropical monsoon. There are two distinct seasons: dry season and rainy season. The dry season starts from November to April, and the rainy season starts from May to October. Average temperature is around 25°C with maximum about 40°C in April, and the coldest month is January, temperature is around 21°C with maximum about 31°C.

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**Table 1. 1 temperature (°C) of some provinces in Cambodia**

N°	Provinces and Town	April			The highest for the year	January			The lowest for the year
		Mean		The lowest		Mean		The highest	
		Max	Min			Max	Min		
1.	Battambang	35.9	24.3	19.8	41.0	30.1	19.9	34.8	10.4
2.	Siem Reap	34.7	24.3	18.0	40.3	29.9	19.5	34.2	9.5
3.	Stoeng Treng	35.0	25.0	20.0	41.4	29.5	19.0	34.0	9.5
4.	Pursat	35.1	24.5	19.8	39.5	29.6	21.0	32.8	14.6
5.	Kompong Cham	34.9	24.9	20.6	39.3	29.8	21.2	34.8	13.4
6.	Phnom Penh	35.0	24.7	17.9	40.5	30.0	21.8	34.8	13.3
7.	Svay Rieng	35.5	24.7	21.6	38.4	31.1	21.7	34.5	12.2
8.	Kampot	32.7	24.6	19.0	37.2	30.4	22.5	33.2	14.7
9.	Kampong Som	31.8	25.5	20.7	35.5	30.6	25.7	32.7	15.0

**1-3.2. Rainfall**

The distribution of precipitation varies of the country. Average annual rainfall in Cambodia varies from 1,500 mm or less in the central plain, 1,500 to 2,500 mm in the surrounding mountains. Over most of South West coastal region, average annual rainfall in excess of 3,000 mm. The East of the Mekong River is generally between 1,800 mm and 3,000 mm. The lower Mekong valley and basin of the Tonle Sap Lake is relatively drier with rainfall averaging between 1,200 mm and 1,500 mm. Precipitation also varies widely from year to year. From the latter part of July, there many are periods without significant precipitation for ten to fifteen days or more, referred to as the "short dry season "(farmer tend to delay planning on this account to minimize the risk of damage to the rice seedlings). The monthly variation of rainfall at Phnom Penh shows that the peak of the rainy season takes place in September, and the rainfall duration the wet season (from May to October) amount to 83% of the rainfall. In the dry season, rainfall is scarcely observed especially from December to March.

Maximum rainfall is in September- October, but as the lower Mekong is under South- East monsoon regime.

**1-3.3. Humidity**

Cambodia is experience high relative humidity with mean annual relative humidity values ranging from of 69% at Kampong Cham to 78% at Kampong Som ville. The country rarely experiences relative below 80% throughout the dry season and below 90% in the rainy season.

N°	Provinces and Municipalities	March mean			Absolute min for the year	October mean		
		Max	Min	General		Max	Min	General
1.	Battambang	91	38	69	13	93	63	84
2.	Siem Reap	95	46	73	21	98	65	87
3.	Stoeng Treng	84	39	63	15	96	62	86
4.	Pursat	92	45	70	23	98	65	86
5.	Kompong Cham	87	44	69	19	93	63	84
6.	Phnom Penh	89	43	67	17	98	65	85
7.	Svay Rieng	95	43	72	17	97	65	86
8.	Kampot	91	58	73	20	96	65	84
9.	Kampong Som	89	62	78	32	94	75	86

**1-3.4. Wind speed**

Table 1.3 Wind speed (m/s)

N°	Provinces and Town	Mean Max. of the year	Max. of the month		Mean % of days with wind for the year	Max. of days with wind for month	
			M/sec	Month		%	Month
1.	Battambang	9.6	15.5	June	46	63	June
2.	Siem Reap	7.2	9.5	June	29	35	February
3.	Stoeng Treng	--	--	--	--	--	--
4.	Pursat	7.7	10.5	June	37	51	April
5.	Kompong Cham	10.2	16.0	September	73	82	February
6.	Phnom Penh	11.0	21.0	June	81	92	March
7.	Svay Rieng	10.0	14.5	January	79	85	March
8.	Kampot	9.4	10.0	August	75	86	November
9.	Kampong Som	10.4	13.5	December	65	77	July

## 2- WATER RESOURCES POLICY

### 2-1 Policy

A Law on Water Resources Management is presently (in late 2000) in draft form. It will establish in Law number of key policies for the water sector, including:

- All water resources are owned by the State and are managed by the Government in accordance with the provisions of this Law and the Regulations made there under (Article 3).
- Water resources plans shall be formulated by basin, sub-basin or aquifer, and shall be coordinated by a national plan. Water resources plans shall be aimed at balancing water availability with present and foreseeable demands, including measures for the protection of water against pollution (Article 7).
- Everyone has the right to use water resources freely for drinking, washing, bathing and other domestic purposes, the watering of domestic animals and buffaloes, fishing and the irrigation of gardens and orchards in amount not exceeding that necessary to satisfy the individual and family needs of the user (Article 8).
- The use of water is subject to the payment of water use fees .... (Article 17).
- The discharge, disposal or deposit of polluting substances .. shall be subject to a wastewater discharge license ..... (Article 21).
- Without prejudice to the principle of Cambodian sovereignty, Cambodia has the right to use, develop and manage international river basins on her territory within her reasonable and equitable share, consistent with national environment and development policies and with the obligations stemming from the international agreements to which Cambodia is a party (Article 40).

There is not yet a National Water Policy (separate from the provisions of the Draft Law) or strategy for the water sector as a whole. There is sub-sectoral policies/ policy outlines and/ or strategies (some in draft) or urban sanitation, urban water supply, sustainable irrigation systems, irrigation, rural water supply and sanitation. Their provisions are comprehensive, drawing on international thinking on such matters as autonomy/ accountability of service providers, tariff structures for cost recovery, beneficiary participation in planning and operation technology, etc. In many cases, the provisions are still untested under Cambodian conditions, and pilot implementation of the policies/ strategies is proposed.

Sub-decree N° 58 defines the function of MoWRAM to include defining "the policies and strategic development of water resources .... at the level of national and international consistent is carried out by the ministries responsible; a variety of instruments allocate responsibilities among MoWRAM and other ministries.

Cambodia is a signatory to the Agreement on the cooperation for the sustainable development of the Mekong River Basin, which inter alia established the Mekong River Commission (MRC). Article 1 establishes areas of cooperation as "all fields of sustainable development, utilization, management and conservation of the water and related resources of the Mekong River Basin, including, but not limited to irrigation, hydropower, navigation, flood control, fisheries, timber floating, recreation and tourism, in a manner to optimize the multiple- use and natural benefits of all riparian and to minimize the harmful effects that result from natural occurrences and man-made activities ". Other articles define specific policies, relating inter alia to water utilization, maintenance of minimum flows, navigation, and inter-basin diversions.

## **2-2 Goals and Priorities**

The policies and strategies referred to in 2.1 include numerous statements of goals, but they are general in scope, and do not provide specific, quantitative targets. The Government's Socio- economic requirements and proposals refer to investment plans for the water sector, but not in terms of explicitly stated goals, not even in terms of quantifiable indicators like access to safe water. (Available figures for such indicators are highly variable, which suggests that quantifiable targets may be of limited value until national monitoring capacity is enhanced). The major exception is with respect to irrigated area; the national target is to increase area of irrigated cropland from 16% to 20% of the total by 2003. The various sub-sectoral policies indicate a large number of measures that would be required of implementation, although in general terms that would need considerable more specificity to be actionable.

The draft Law on Water Resources Management does not explicitly set priorities for water. Except that Article 8 defines "free water uses "not subject to a license as "drinking, washing, bathing and other domestic purposes, the watering of domestic animals and buffaloes, fishing and the irrigation of gardens and orchards..." . Other uses (which are not specified) are grouped together in Article 9 as "Water uses subject to license ". Therefore, implicitly receiving equal priority. Similarly, the Agreement on the cooperation for the sustainable development of the Mekong River basin identifies a large number of water uses, but does not design priorities to them. There has been title need to formally establish an order of priority for access to water, because at present there is limited competition among water users, even during the dry season. In practice, though, the use of water bodies for waste disposal takes priority over all other uses. This is not a conscious policy, but at present the uncontrolled disposal of human, animal and other wastes causes widespread contamination of drinking water supplies. It is implicit in Article 8 of the Law on Environmental Protection and Natural Resources Management that such degradation is undesirable, and that ecological and other amenity value of water should be sustained.

## **3- INSTITUTIONAL BASE**

### **3-1. Political System**

Cambodia is a constitutional monarchy, with a progressive constitution adopted in 1993. The country is emerging from three decades of civil war and instability, which came to an end with the final demise of the Khmer Rouge senior leadership in March 1999. A democratically elected coalition government comprises, since the last elections in July 1998. Cambodia has been a member of the United Nations since December 1998, and was admitted to ASEAN in April 1999, the Royal Government in presently strongly centralized, with local authorities directly appointed and supervised by central government, under a budget administered by the Ministry of Economy and Finance. The Government is working to devote ministerial functions, budget responsibilities, and decision-making to provincial authorities and communes, and Provincial governors (responsible to Minister of the Interior) already have a significant level of authority at that level. A central component of the process of devolution has been the creation and training of Development Committees at

village, commune and provincial level, principally in the context of development assistance projects under SEILA, CARERE, PRASAC, and other interventions.

To reverse the effects of their decades of social disorder, the basic framework for good governance and the rule of law is being developed, with extensive assistance from international organizations. There are at present major gaps in the legal framework relating to governance, administration, investment, and property rights, and there is high level of public mistrust of the law and the civil and military authorities. Recent of the political and governmental do evaluations circumstances of international in Cambodia.

Organizations identify many areas in which action is required, to provide all citizens equal access to the law and to basic human rights. Nevertheless, rapid progress is being made; for example, civil, criminal and commercial codes have been prepared, a Labor Law was enacted in 1997, and key legislation relating to water resources, land and forestry are being considered.

### 3-2. National/ Federal and Sub-national Institution

Organizations	Responsibilities
List of principal water-related agencies Cambodia National Mekong Committee (CNMC).	Advise the Cambodia representative to the MRC Council on all matters relating to activities with in the Mekong River basin that could affect Cambodia interests. Review proposal prepared by RGC agencies in the light of the Mekong Agreement. Liaise between MRC and RGC agencies.
Ministry of Water Resources and Meteorology (MoWRAM).	Responsibilities defined by RGC Sub-degree on 30 June 1999 include (in abbreviated form): Define policies relating to and strategic development of water resources. Research and investigations of water resources Prepare plans for water resources development and conservation. Manage direct and indirect water resources use, and mitigate water-related disasters. Draft water law and monitor its implementation. Gather and manage hydro-meteorological data and information. Provide technical advice. Administer international collaboration, including that within the Mekong River basin.
Ministry of Industry, Mines and Energy (MIME).	Water-related responsibilities include : Water supply provision to provincial towns. Administration of single-purpose schemes involving hydropower.
Ministry of Rural Development (MRD).	Water-related responsibilities include : Water supply, sanitation and land drainage in rural areas.
Ministry of Public Works and Transportation (MPWT).	Water-related responsibilities include : Sanitation and Land drainage in Phnom Penh and provincial towns. Water transport.
Phnom Penh Water Supply Authority (PPWSA) and Municipality of Phnom Penh	Water-related responsibilities include : Water supply in Phnom Penh.

(under the Minister of the Interior). Ministry of Environment (MoE)	Water resources in the Phnom Penh region. The MoE has a mandate to protect Cambodia's natural resources and environment from degradation. Its legal mandate includes water in the list of media for which is responsible. The Natural Environmental Action Plan includes six focal areas, one of which is fisheries and floodplain agriculture in the Tonle Sap region; otherwise, water receives limited mention.
Ministry of Agriculture, Forestry and Fisheries (MAFF).	MAFF is engaged in development of policies and strategies for agriculture, forestry and fisheries that have significant implications for the management of the water resources required for irrigation and capture fisheries/aquaculture. MAFF responsibilities for forestry also have relevance to catchments condition, hydrological regime and water quality issue.
Ministry of Economic and Finance (MEF)	MEF is responsible for compiling the RGC's. Socio-economic Development Program and Public Investment Program. To the extent that water-related investments are proposed in a number of different components of the programs, MEF has the role of harmonizing proposals, and matching them against RGC investment priorities.

### 3-3. Inter-agency Coordination

In the water sector, the principal vehicles for inter-agency coordination are (a) the Cambodian CNMC, and (b) the process of preparing the Royal Government's Socio-economic Development Requirement and Proposals, the Socio-economic Development Plan, and the Public Investment Program, assembled by the MEF. In practice, it appears that there is very limited interagency coordination at national level, either in planning or operational matters. Arrangements for exchanging information also are rather hierarchical and controlled, so that may staff may not have easy access to information from other agencies that would assist them in their own duties. As a result, ministries and their constituent departments (even within a single ministry) may often act largely in isolation from others, even where their responsibilities are closely related. On the other hand, because the corps of senior, skilled administrators is small, there is an extensive informal network of contacts, and these assist in information exchange and gathering.

At provincial level, operational activity is focused through Provincial governors (who are responsible to the Minister of the Interior). Provincial departments receive their budget allocations from their parent ministries, and in principle receive technical support from and report to them. However, in practice, linkages to national parent ministries appear to be weaker than within the provinces. Coordination among ministry/ department staff at provincial level may be stronger than at national level, because of more immediate oversight by governors. Coordination is particularly strong in the context of project implementation at Provincial and local level, e.g. of project like PRASAC.

With the high level of International Organization (IOs) and NGOs in Cambodia's water sector, Coordination with government agencies is a major issue. The Government has expressed dissatisfaction with the extent to which many NGOs and IOs operate quasi-independently, and outside the framework of the SEDP and PIP. However, much NGO/ IO activity is administered through Provincial-level agencies, so that national-level officials may

not be well informed or involve as they need/ would like to be. a consequence of weak inter-agency coordination is that NGO/ IO interventions also are frequently not well coordinated (despite the existence of three NGO umbrella agencies and six sector committees). An example in the water sector is the seemingly weak coordination between the national strategy for agriculture developed by MOWRAM and several of the IOs that administer their assistance through MOWRAM.

#### **3-4. Community, NGO, and Other Stakeholder Participation**

Rural development, coordinated and planned by the MRD in the context of SEILA, CARERE, PRASAC and other programs, increasingly has been implemented through rural development committees at provincial, commune and village levels. The PRDC and CRDA are appointed to engage with the local civil authorities, but the VDC are democratically elected. This provides the foundation of a participatory, community (rather than private sector) approach to rural development, including rural water supply and community irrigation. The SEILA program in particular has been a significant element in building the RGC's strategy to pass as much responsibilities as possible to the community.

The EU-supported PRASAC (Program de Rehabilitation et d' Appui au Sector Agricole du Cambodge) has incorporated Water Point Committees (for domestic water supply) and Water User Associations (for irrigation systems) in its interventions in over 1,250 villages in six provinces around Phnom Penh. Similarly. Other intervention in rural water supply and sanitation. Such as the UNICEF assisted Water and Environmental Sanitation program (which during 1992- 7 benefited 0.7 million people), increasingly have incorporated a bottom- up approach starting at the village level.

In irrigated agriculture, the RGC's policy is to devote responsibility for all aspects of scheme operation to Farmer Water User Community (FWUC), with support from MoWRAM. This is in according with the Circular N° 1 on Sustainable Irrigation Policy (1999). The UNFAO intervention Special Program for Food Security, which was a pilot in seven districts during 1997- 2000, established Water User Groups/ Associations as a major component of the approach.

The RGC's expressed policy in urban sanitation is based on community participation; the policy on urban water supply also allows for community participation, principally in neighborhoods that do have existing systems.

As well as international agencies such as UNICEF, there are a large number of NGOs active in water related activities in Cambodia, principally domestic water supply sanitation and small-scale irrigation. These are commonly small-scale interventions, at the neighborhood or village level.

#### **3-5. Private Sector Participation**

Cambodia is moving rapidly along a path to a fully open market economy. In the water sector, however most activity is still under state control (with heavy support from international funding agencies). Particularly through the Department of Provincial Water Supply of MIME, the MPWT, the Phnom Penh Water Supply Authority (PPWSA, a state-owned utility company run on a commercial basis). MRD, and MoWRAM.

The RGC is committed to reducing its direct involvement in delivering water services. The intention is to yield managerial autonomy to public utilities, so that they can achieve financial independence, to privatize existing utilities, and to encourage private sector investment in new services. Thus, for example, follow-up to an Operational review of the PPWSA includes introduction of water tariff structure that enable cost recovery and also cross- subsidization of low-income residential customers, and metering of connections. Recently drafted policies on urban supply and sanitation affirm that private sector provision of these services will be favored. At present, three towns gave privatized water supplies,

using different models of privatization. The RGC has just signed an agreement with a Chinese company to rehabilitate the Kirirom Hydropower scheme, on a BOT basis.

Private sector activity in irrigation is limited principally to that based on groundwater, where individual farmers are able to install wells and pumps independently. This involves the individual farmers, well drillers, and pump supplies. It is estimated that there are several thousand such applications, and that they have been multiplying rapidly during the last two years, as word spreads.

Another means of private sector participation in water is through water vendors, who supply water in localities, particularly in Phnom Penh, where piped water is unavailable. Sale of bottled water is also a significant industry, although such water is beyond the financial reach of most Cambodia.

#### **4- LEGAL BASE**

##### **4-1. Body of Water Law and Regulations**

Briefly describe the body of water-related law and regulations, with particular reference to its comprehensiveness and clarity. A Law on WRM in Cambodia was submitted in September 2001 by Minister of Water Resources and Meteorology and reviewed and approved by the Council of Ministers, but the Draft Law has not submitted by the National Assembly (in September 2003). The draft Law includes chapters on Water Resources Inventory and Planning, Water Resources Use and Development, Groundwater, Protection of WR, Flood Control, Servitudes (rights and obligations), Incentives and penalties, and International Rivers.

##### **4-2. Property Rights and Tenure**

All natural resource, including land and water, belong to the state. Article 3 and 4 of the draft Law on WRM state that "all water resources are owned by the state "and that "the beds and banks of rivers, streams. Lakes, canals, storage tanks and reservoirs are owned by the state "Article 8 provides for "free water uses "of water for basic household needs, and other article provide for licensing of all other uses.

After the downfall of the Khmer Rouge regime 1979, local authorities began allocating land and houses on a wide scale, with a maximum holding of 5 ha. Private ownership of land-use rights (not land itself) was legally reintroduced in Cambodia in 1989, when it was declared that all Cambodians could own, use, and inherit land-use rights granted by the government. The State of Cambodia Land Law, 1992, allows citizens to acquire land titling has been cumbersome, so that less than 15% of applicants have received certificates of ownership (implying, strictly, that the remainder are illegal occupants, which provides them with no protection in the face of widespread land-grabbing by more powerful people). The poorest half of the population shares less than one quarter of the cultivable land, one family in six is landless, and there is extensive land speculation and aggregation by the wealthy.

Disparities in access to agricultural land appear to be growing, due to population growth and fragmentation, forced sales to pay debt, usurpation of land by the more powerful, and deficiencies in land law enforcement. It is estimated that 15% of the total land area changed hands during 1993- 1998, with the poor as net sellers and the wealthier as net buyers. Law disputes constitute the second highest number of legal cases in Cambodia. There have been further land reforms since 1998, but disputes are still occurring as a result of insecure tenure and illegal transactions and usurpation. Further reform and improvements in administration are anticipated in the Government's Socio-economic Development Requirements and Proposals, April 2000, and the Immoveable Property Bill, Which would reform the Land Law, is awaiting debate by the National assembly.

Access to common property resources- common land and, in particular, fisheries- traditionally has contributed significantly to rural household welfare. Access is being restricted rapidly, by allocation of property rights to business people. Around Tonle Sap Lake, a few dozen businessmen now occupy most Fishing concessions, and traditional fisher folk have been displaced.

#### **4-3. Water Allocation and Conflict Resolution**

Cambodia has abundant water, so competition and conflicts rarely occur. Resolution of conflicts is provided for in the draft Law on WRM. In places where conflicts do arise between water users, community and local leaders resolve them informally.

### **5- MEKONG RIVER IN CAMBODIA**

#### **5-1. Introduction**

The Mekong flows 4,800 km from its sources in the mountains of Tibet, through Yunan province of China, Myanmar, Thailand, Laos PDR, Cambodia and Vietnam, to the China Sea. The Lower Mekong Basin has a total area of 795,000 km<sup>2</sup>, 60 million people. The average flow is 15,000 m<sup>3</sup>/s, and the total discharge 475 BCM/ y. In Cambodia, the Mekong flows for 480 km through the provinces of Stoeng Treng, Kratie, Kampong Cham, Kandal and Prey Veng. It drains 155,000 km<sup>2</sup>, or 86% of the total area of Cambodia.

#### **5-2. Mekong River for Economic development**

The Mekong River system, including the Great Lake, plays an important role in sustaining ecosystems and providing a resource base for economic development, including irrigation, fisheries, hydropower, navigation, tourism, and cross-sectoral use. For the irrigation sector, the Mekong/ Sap system could irrigate about 1.2 million ha, but so far we only irrigate about 200,000 ha. For hydropower, the Mekong offers a potential of 5,000 to 8,000 MW. In the fisheries sector, fish production is 300,000 to 400,000 t/y. If this huge water resource is managed and exploited for national development, our country will progress rapidly. Otherwise, we will always face Mekong floods that damage and destroy infrastructure, households, property, vegetation, animals, and human life.

#### **5-3. Mekong River Commission's Main Roles**

The MRC's main role is cooperation among all member countries for development, usage, management and conservation of water and related resources in the Mekong River basin. The Commission has three components:

- The Council, which has ministerial level representation from member countries, and makes policy decisions.
- The joint Committee, which consists of departmental level representatives and executes the decision of the Council.
- The Secretariat, which executes the instructions of the joint Committee.

Another important role of the MRC is to maintain a central archive of documents and information related to the development and management of water and other natural resources in the Mekong Basin. Its Water Utilization Program started in April 2000 and ending in 2006, has been supported by GEF/ WB, Finland, Japan and France with a budget of US\$ 16 million.

### **6- CONCLUSION**

- Cambodia is a country that is considered to have abundant water.
- Water Resources Policy is part of a comprehensive framework that provides a basis for the protection, management and use of freshwater, brackish water, and marine water resources.
- Water Law provides guidelines for the way in which the nation develops and manages its water resources.