

## **Water Environmental Management in Cambodia**

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### **Abstract**

The Kingdom of Cambodia is located in the Southeast Asia region. The geographic features and tremendous natural resources of the country provide more opportunities to develop the Cambodian socio-economy. Besides natural resources, the Royal Government designated the agricultural sector is the backbone of the socio-economic development, meanwhile more than 85% of people are farmers who live depending on farming nutrition. Sectoral development of industry, tourism, transportation, hydro-power, trade, etc., are also determined crucial sectors for the potential national development.

Indeed, above captioned sectoral development have been mentioned in the National Strategic Development Plan (2006-2010) based on the milestones of Cambodian Millennium Development Goals and the Government Rectangular Strategy. Water, forestry, fisheries and other cultural resources are recognized and determined as major sources to develop the nations. Significantly, these kinds of developments require necessarily to abide by the environmental norms/standards in order to ensuring sustainable conditions of green environment, including water and its natural resources. It means that the concept of protection and conservation of water environment should be taken into accounted and applied in parallel with the development process. Vice versa, water environment and its related resources might by deteriorated or tended to decline by unsound environmentally development, that means to destroy ourselves, our benefits, including our next generations.

Understanding the invaluable usefulness of water environment and its potential national development, the Royal Government of Cambodia has taken action aiming to protect and conserve it by other possibly activities. These include: (i) environmental related legislations and their application; (ii) capacity building and institutional strengthening; (iii) environmental monitoring and rehabilitation; (iv) public awareness raising; (v) application of international conventions/agreements; and (vi) international cooperation in the field of environmental protection and sustainable development.

The Ministry of Environment was provided major mandates by the Royal Government of Cambodia in 1993 to maintain and protect water environment throughout the country in line with socio-economic development in a sustainable manner, under a closed collaboration with key stakeholders.

Within the implementing process, the Ministry of Environment still confronts with many constraints that firmly require to improve them. The capacity building, institutional strengthening, technological transfer, key stakeholder participation, the cooperation among concerned ministries/institutions, international organizations, NGOs, and with other countries in the region — all these are key elements aiming at minimizing and phasing out the above captioned constraints, as well as to achieve to key concept of Clean air, Clean water and Clean land.

## **Background**

Abundant water sources such as the Mekong River, Tonle Sap River, Bassac River, Tonle Sap Lake, their tributaries, and related resources, are recognized to be presented in Cambodia, especially, some major endangered/nearly extinct species. The tremendous amount of water approximately 300 billion cubic meters of the Mekong River are annually discharged into Cambodian territory and 20,000 million cubic meters of groundwater are exist in this country (MRC, 1998). These water sources provide immense benefits for socio-economic development, as Cambodian proverb says "Water is life". From very long times ago up to now, water and its tremendous resources, actually, play much important tools for development of various sectors such as: agriculture, fisheries, industry, tourism, navigation, hydropower, transport, etc. Therefore, the Royal Government of Cambodia addressed that water and related resources are the crucial catalyzed to poverty alleviation.

Avoiding negative impacts to the environment and public health by any development programmes and activities, the implementation of environmental norms/standards is absolutely required by the environmental law and related statutes in order to ensuring sustainable and/or richness conditions of water and its natural resources. It means that the maintenance and protection water environment and its related resources should be considered and implemented in parallel with the development concept.

## **Current Issues toward Water Environmental Degradation**

Pollution concerns to water environment were addressed in many documents and reports remain different issues. There are still gaps in our understanding of the integrated wastewater management and treatment engineering, our ability to estimate the cost of repairing the damage we have done to it, and our knowledge of the cost of failing to take appropriate action to abate its degradation. Up to now, it is still less possible to assess the state of national water environmental pollution and its management, and the Royal Government of Cambodia, is now taking much attention to deal with pollution problems we already know exist.

## **Water Environmental Deterioration from Industrial Sector**

Industrial pollution sources are currently recognized as dying and washing factories, factories are consumed chemicals or chemical compounds, tanning factories, etc. Some of them have possessed on-site wastewater treatment<sup>1</sup>, and the rests discharge their effluents into receiving sources (both surface water and sewage system) with less quality<sup>2</sup>. Some treated effluents are sometimes exceeded the effluent standard may be resulted from irregular follow up the treatment process or careless in maintenance/follow up the treatment process. With this regard, few cases of fine have been done to abide by the Law on Environmental Protection and Natural Resources Management, and its related statutes.

## **Other sources of Water Environmental Deterioration**

Besides the industrial sector as mentioned above, many sources are also recognized to cause water environmental deterioration, these include:

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<sup>1</sup> It complied with the environmentally sound technology

<sup>2</sup> It has a very simple treatment basin without respond to the National Standard and/or It does not has a treatment basin

Wastewater and sewage discharges without treatment from various pollution sources such as enterprises, hospitals, residential areas, ports, vehicle/engine workshops, etc.

The disposal of liquid and solid wastes, especially human excrement into water source from anarchic/squatter settlement, floating houses, floating restaurants/business areas.

The runoff of agro-chemicals from agricultural areas into receiving waters. On the other hand, land clearing for agricultural purpose can also lead to large quantities of silt entering stream channels and contribute to high sediments in river.

Mining activities at the western and northeastern parts of the country, especially, gold mining, which used toxic chemicals as catalysis — that is a severe concern of water contamination<sup>3</sup> and loss of aquatic life at local level. However, there is insufficient document or information to publicly disseminate.

Solid and liquid wastes discharge from slaughterhouses, poultry, piggery farms, and the like.

Soil erosion from watershed at upstream and local watershed.

Fresh and marine aquaculture practices respond to domestic and external market demands, especially shrimp farming at provinces and cities along the coastal areas.

Fish catching devices by using of tree branches, tires or other poisonous substances, for example, toxic chemicals, Calcium Carbide (CaC<sub>2</sub>).

Waterway transportation was recognized a potential source of water quality emergency in Cambodia, especially, fuel-oil transportation with inadequate safety facilities and less attention from concerned institutions too. Another major concerned is a case of floating oil stations/selling are located in dense-floating communities, including workshops<sup>4</sup> in Tonle Sap Lake. What will be happened when these stations were either leaked or gotten fire?

Transboundary water pollution resulted from various development activities at upstream riparian countries.

## **Water Environmental Policies and Management Activities**

### ***Existing Legislation***

Historically, within the 1990s the Royal Government of Cambodia has approved the Law on Environmental Protection and Natural Resources Management and other four related Sub-degrees, namely, (1) Sub-Degree on Water Pollution Control; (2) Sub-Degree on Solid Waste Management; (3) Sub-Degree on EIA Process; and (4) Sub-Degree on Air Pollution and Noise Disturbance Control. Remarkably, the effluent standard for discharging at specific areas, water quality standard in public water areas for biodiversity conservation and for public health protection were also adopted. Recently, the Law on Water Resources Management has approved by the National Assembly, of which more strongly contribute the maintenance and

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<sup>3</sup> *Turbidity and chemical pollutants*

<sup>4</sup> *Workshop has a function to fix boats and other machines*

protection of water environment to abide by sustainable, reasonable and equitable use of water and its resources.

Besides above key legal instruments, Cambodia also has some major relevant policies, strategies, regulations and standard, and all these were enter into forces such as:

Policy Framework – Rural Water Supply and Sanitation (Feb. 27, 2001) focuses on the services of rural water supply and sanitation without any harmful to the environment and public health, based on sustained financially, socially and institutionally, technically, and environmentally.

National Policy on Water Supply and Sanitation (Feb. 07, 2003) focuses on selecting the options of sanitation technologies that contribute to protect and conserve water and its resources.

National Water Resource Policy for the Kingdom of Cambodia (16 Jan. 2004) aims to: (i) protect, manage and use water resources with effective, equitable and sustainable manner; (ii) solve the water problem in collaboration with related institutions; (iii) develop and carry out the national strategy and policy towards water resource management; (iv) direct stakeholders for developing, managing and utilizing the water resources; and (v) achieve the national policy on poverty reduction and sustainable national economy development.

Drinking Water Standard (2004) aims at identifying acceptable parameters in drinking water samples must be met the standard in order to ensure a good quality as living demands.

Policy Framework – Rural Water Supply and Sanitation Sector (27 February 2001) focuses on the services of rural water supply and sanitation without any harmful to the environment and public health, based on sustained financially, socially and institutionally, technically, and environmentally.

So far Cambodia is taking attention to apply the National Sustainable Development Plan (NSDP, 2006-2010) – the major roadmap of the Government to develop the nation as well as to alleviate people poverty. Within the environmental context, the NSDP highlighted the goals in preservation, conservation and sustainable use of all natural resources including biodiversity of the country, and water resources, are not only to conserve the unique natural heritages but also to enhance environmental sustainability and to contribute to sustainable economic growth, poverty reduction and improvements in the lives of rural communities. Furthermore, natural areas are and would be actively promoted as attractive low-impact 'eco-tourist destinations' bringing in further benefits to the local communities. Therefore, water environment is the main part for paying attention.

### ***Pending Legislation***

Draft Law on Water Supply and Sanitation of the Kingdom of Cambodia has been reviewed by the Council of Ministers. So far, this pending law is adjusting based on the comment of the Council of Ministers and will submit to the National Assembly afterward. It is significantly focused on the management of water supply at urban/rural areas well as the provision of applicable sanitation procedures to manage domestic wastewater and sewage with the environmental friendly in order to promote the people living as well as to provide usefulness to society, economy and environment.

### **The Management Procedures and Activities**

Applying the Sub-Decree on EIA Processing, the Ministry of Environment (MoE) has a crucial function to review EIA report of respective proposed investment projects<sup>5</sup>, which submitted by investors. In collaboration with concerned ministries, including the Council for the Development of Cambodia (CDC), the MoE evaluates and reports to the Royal Government whether the proposed investment project can adopt or not. To evaluate a proposed investment project, MoE officers commonly conduct field/site survey at proposed areas and do a desk-study before reporting to decision-makers. Decentralization procedure is currently applied at provincial level, e.g. the proposed investment with budget less than two million dollars is reviewed and evaluated by the Environmental Provincial Department only, and finally they report to Governor for approval.

The programme of environmental pollution control/monitor is regularly conducted by the MoE officers, these include:

Programme of surface water quality monitoring – to take monthly water samples at designated sampling points in the main water bodies for analyzing. Objectives of this programme significantly aim at identifying water quality in these water bodies for human consumption and appropriate living condition for aquatic lives.

Routine control/monitoring programme at pollution sources – to ensure the richness of water environment throughout the country without any pollution. Two programmes are being conducted: (i) 45 days – for special factories<sup>6</sup>; and (ii) 90 days – for normal factories<sup>7</sup>, including garment factories. Licensing will be provided to factory owners who treated their effluents in complying with the National effluent standard.

Educational programme of environmental quality management/protection – to develop and promote technical awareness and knowledge to environmental officers at provincial level including line institution.

### **Regional and International Cooperation**

The Cooperation for the Sustainable Development of the Mekong River Basin (MRB), 5 April 1995 that signed by the four representative governments of riparian countries such as: Cambodia, Lao PDR, Thailand and Viet Nam. The crucial concepts of this agreement aim to maintain, protect and conserve the environment and sustainable natural resources of the Mekong River and its tributaries from various development activities. Pursuant to the 1995 Agreement, the four riparian countries must to cooperate in all fields of sustainable development, utilization, management and conservation of the water and related resources of the MRB, including, but not limited to irrigation, hydro-power, navigation, flood control, fisheries, timber floating, recreation and tourism, in a manner to optimize the multiple-use and multiple benefits of all riparians and to minimize the harmful effects that might result from natural occurrences and man-made activities. Towards the maintenance and protection of healthy water environment of the Mekong River, the specific stipulations of the Agreement were addressed as follows:

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<sup>5</sup> Ref. to its classification in the Sub-Decree

<sup>6</sup> Washing-dyeing factories and factories that consume chemicals and chemical substances with their producing processes

<sup>7</sup> Factories that produce their productions without using chemical or chemical substances

Article 3: Protection of the Environment and Ecological Balance "To protect the environment, natural resources, aquatic life and conditions, and ecological balance of the MRB from pollution or other harmful effects resulting from any development plans and uses of water and related resources in the Basin."

Article 7: Prevention and Cessation of Harmful Effects "To make very effort to avoid, minimize and mitigate harmful effects that might occur to the environment, especially the water quantity and quality, the aquatic (ecosystem) conditions, and ecological balance of the river system, from the development and use of the MRB water resources or discharge of wastes and return flows. Where one or more states is notified with proper and valid evidence that it is causing substantial damage to one or more riparians from the use of and/or discharge to water of the MR, that State or States shall cease immediately the alleged cause of harm until such cause of harm is determined in accordance with Article 8."

### **Recommendation**

Within the implementing process, the Ministry of Environment still confronts with some main constraints that require to improve, these comprise such as: capacity building, institutional strengthening, applicable technological transfer, key stakeholder participation as well as the cooperation among concerned ministries/ institutions and NGOs. For achieving these cases, Cambodia still needs more technical assistance from international organizations and donors, especially, the Government of Japan through the Ministry of Environment of Japan to deal with water environmental management/protection, including the knowledge of wastewater treatment procedure. Additionally, Cambodia also requires a closed collaboration with other countries in the region to solve transboundary issues, including their networking as well.