



WATER QUALITY MONITORING NETWORK ACTIVITY IN THE KINGDOM OF CAMBODIA

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

CONTENTS

1. Introduction
2. Aquatic Environment
3. Legislation
4. Institutional Frameworks
5. Constraints and
6. Conclusion

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

1. Introduction

- ☞ Cambodia has an area of 181,035 km² :
 - Area approximately 5/6 is land and 1/6 is coast.
 - 86% of the country area is the Mekong catchment.
 - The country extends from east to west 580 km and from north to south 450 km.
 - Tremendous of natural resources and biological diversities.
- ☞ Two seasons in Cambodia include (i) dry season from Nov. to April; and (ii) rainy season: May to Oct.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

1. Introduction (cont.)

- ☞ Cambodia has many water sources, especially, the Mekong River and Tonle Sap Great Lake.
- ☞ All water resources and other tremendous natural assets provide Cambodia more opportunities to develop their socio-economy through various sector as follows:
 - agriculture including irrigation, fisheries and aquaculture; forestry and its sub-products;
 - industry;
 - transport;
 - mining;
 - tourism;
 - urbanization; etc.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

1. Introduction (cont.)

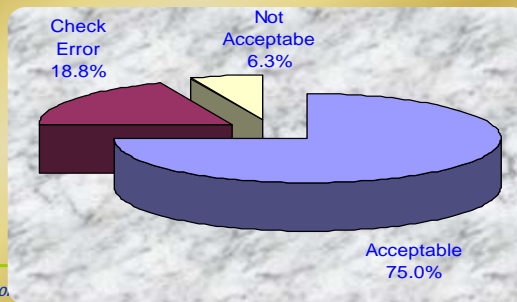
- ☞ These development might be posed local, national, and international issues, unless the environmental sound management was considered and regularly applied in consistent with the development processes.

2. Aquatic Environment

- ☞ Aquatic environment, especially, water quality is generally in a good condition (MoE and MoWRM).
- ☞ However, some parts of water quality are being threatened by human activities (in dry season).
- ☞ Those polluted parts are considered/recognized where high dense of population and related activities, for example, along the Mekong River and its main tributaries, including the Tonle Sap Great Lake.
- ☞ The human activities cause water quality degradation indicating in the summarized flow chart below.

PT Sample in October 2007

Study	Acceptable	Check Error	Not Acceptable	% Acceptable
Jun.07	12	3	1	93.75
Oct.06	10	0	4	71.43



Dialogue on

3- Water Quality Assessment, 2007

Method:

- Following by document from RTAG, 2006 three main WQI was accepted
- Six indicators were assign a value as bellows:

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

WQIs for the Protection of Aquatic Life

No.	Name	Symbol	Unit	Threshold values	Weight factor
1	pH value	pH		6.0 - 8.5	2
2	Conductivity	EC	mS/m	< 70	2
3	Ammonia	NH ₃ -N	mg/L	0.1	2
4	Dissolved oxygen	DO	mg/L	> 5	2
5	Nitrite & Nitrate	NO ₂₋₃ -N	mg/L	<0.7	1
6	Total Phosphorous	Total-P	mg/L	<0.13	1

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

► Classes for WQIal

Ranking	Name	Described
10 - 9	High	all uses are protected with a virtual absence of threat or impairment no uses ever interrupted
<8 - 9	Good	all uses protected with only a minor degree of threat or impairment no uses ever interrupted
<8 - 7	Moderate	most uses protected but a few threatened or impaired a single use may be temporarily interrupted
<7	Poor	most uses threatened or impaired several uses may be temporarily interrupted conditions usually depart from natural or desirable levels

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

► Classes for WQIhi

Ranking	Human Impact Evaluation
9 - 10	Not Impacted
< 8 - 9	Slightly Impacted
< 7- 8	Impacted
< 7	Severely Impacted

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

Conclusion on WQ data assessment, 2007

River	WQIai	WQIhi	WQIag
Mekong	High Quality	Impact	Good
Basac	Good to High	Severely Impacted	Good
Tonle Sap	Good	Severely Impacted	Good
Tonle Sap Lake	Good	Severely Impacted	Good

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

3. Legislation (cont.)

- ☞ Beside the existing of environmental legal instruments as provided in the above structure, Cambodia still has related statutes, for example, Sub-Decree on Standards and Management of Agricultural Material, Oct. 1998.
- ☞ Water Law
- ☞ Pending legislations:
 - Proposed related statutes of Water Law

4. Institutional Frameworks

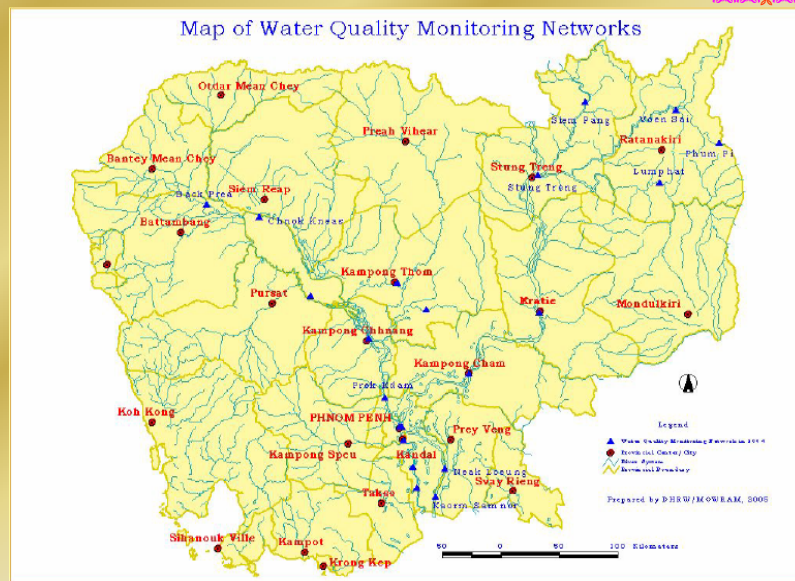
- ☞ The main responsible institutions toward water quality management comprise MoE and MoWRM.
- ☞ Responsibilities and activities of both above ministries are separately mentioned as below.

4. Institutional Frameworks (cont.)

- ☞ MOWRAM also responsible for water quality monitoring as authorized by the Royal Government.
- ☞ Under the support of MRC, MOWRAM particularly implements the WQMN that is a main programme of MRC aiming at protection and maintenance water sources in country.

4. Institutional Frameworks (cont.)

- ☞ Historically, the programme has commenced since 1993 under the MRC support:
 - 5 stations were operated in 1993;
 - 6 stations were operated in 1995; and
 - So far, there are 11 stations are being operated.
- ☞ Under the guidance of MRC, 19 parameters are being analyzed for assessing the current and future water quality of the Mekong River and its tributaries.



Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

4. Institutional Frameworks (cont.)

- ☞ Water samplings are being taken by the MOWRAM has two procedures as follows:
 - Sampling at existing stations is a burden of LAB staff; and
 - Sampling of a primary network will be carried out by Provincial/Municipal Dept. and afterward the water samples will be sent to the MOWRAM's LAB in Phnom Penh Municipality.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

4. Institutional Frameworks (cont.)

- ☞ MOWRAM has started to carry out the QA Programme since May 2004, of which some tasks are being prepared:
 - Quality Manual;
 - Analytical Method; and
 - Sampling Procedure.
- ☞ Additional tasks including:
 - Maintain of equipment: example Spectrophotometer, Balance, Pipettes and Burette... etc.
 - Preparing of control solution: pH, Conductivity, Chloride, NO₃-N, NH₄-N..etc.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

5. Constraints

- ☞ Many constraints are being confronted by the both main institutions (MoE and MOWRAM) include as follows:
 - Lack of particular national strategic plan to mitigate and eliminate various activities, which threatened to aquatic environmental decline.
 - Inadequacy of expertise staff, especially, in the field of waste management and their treatment engineering.
 - Some treated effluents occasionally exceed the National Effluent Standard due to inappropriate management.
 - Inadequacy of supporting tools like particular legal tools, budget and analytical facilities.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

5. Constraints

- Local and international net working, for instance, data and information dissemination and exchange is limited.
- No central wastewater treatment plant, except onsite treatment system in some pollution sources.
- The implementing environmental legal tools is weakly.
- The participation of educational institutes, NGOs, etc., has not widely occurred yet.
- Public awareness towards the context of aquatic environmental quality management is limited.
- Insufficiency of related dissemination key tools like films, books, mass media, and so on.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

6. Conclusion

- ☞ To promote these constraints, Cambodia, especially, the MoE, MOWRAM and inter-ministries and line-agencies step-by-step will effort as possible for capacity building and institutional strengthening, including public awareness promotion for all stakeholders.
- ☞ To promote and strengthen the cooperation and mutual understanding among riparian countries and countries in the region/world.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

6. Conclusion (cont.2)

- ☞ Cambodia, of course, still requires assistance from any donors and other international organizations like:
 - Financial support for expanding monitoring activities and educational programme throughout main cities and urban areas.
 - Promoting the official capacity dealing with the water quality analysis and assessment.
 - Technological transfer and LAB/concerned staffs' capacity strengthening.
 - Experience exchange and closed cooperation among GMS countries, and especially, with adjacent countries.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

6. Conclusion (cont.3)

- ☞ The future requirement for water quality assessment including:
 - Increasing analyzing any necessary water quality parameters such as nutrients (eutrophication) including chlorophyll-a, pesticides, some heavy metals, etc.
 - If possible there should be analyzed fish and some aquatic species.

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008

THANKS FOR YOUR ATTENTION

Dialogue on the Water Environmental Governance in Cambodia, 25-26 September 2008