

## TERMS OF REFERENCE

### FORMULATION OF AN INTEGRATED RIVER BASIN MANAGEMENT AND DEVELOPMENT MASTER PLAN FOR CEBU RIVER BASIN

#### I. RATIONALE

The Philippines is endowed with abundant water resources, but is currently confronted with difficulties in meeting its water needs. Water as scarce resource now in "quite crisis" is caused by increase of competition of its use and aggravated by other factors such as the increase of population and economic growth which greatly affects the current water supply and demand.

Sustainable social and economic developments in the country increasingly depend on the availability of water of good quality, especially in the heavily urbanized and industrialized areas like Cebu Province. Problems related to shortage of water and pollution of water sources have clearly become manifest in a number of ways. The rapid industrialization and high population growth and density in the area, together with the fragility of small island ecosystem, have contributed to the problems.

In line with the operationalization of the River Basin Control Office under DENR through E.O. 510, has adopted the Integrated River Basin Management approach to address the burgeoning problems on water sector. The RBCO thru its mandates aims to harmonize and rationalize all government existing and planned river basin programs/projects to ensure the sustainable water to the entire country and also to mitigate flooding. The effective land and water resources governance and management is the key to further ensure continuous availability of good quality of water to all existing and future water uses and users.

Though, there have been numerous intervention in most of the major river basins, there have not been a significant impact on sustainable water resources management because of the lack of coordinated effort among the government players from planning to program implementation and monitoring and the lack of stakeholder's participation in the formulation and decision making in managing the river basin resources.

The Cebu Province and its river basins/watersheds is characterized with varying degrees of degradation. It suffers from severe soil erosion and deforestation, erratic streamflow, diminishing groundwater resource, salt water intrusion, flooding and declining land productivity as well as water pollution. This situations limit the capacity of Cebu River Basins to perform entirely its tasks in maintaining a wholesome environment, conserving water and achieving water security.

There are many initiatives in the past wherein several plans and programs had been developed and implemented for the management of water resources in the Island Cebu; however, the problem of sustainability of funding and lack of concerted effort and sectoral approach in dealing with the problem is still observed.

Paradigm shift is needed in combating the environmental and institutional problem besetting the Cebu River Basin. Hence an Integrated and Ecosystem approach to river basin

management in consonance with the approved Integrated River Basin Management and Development Master Plan (IRBMDMP) must be instituted.

For this reason, the River Basin Control Office of the DENR will conduct the consolidation and harmonization of all the existing programs/plans into an Integrated Master Plan for the River Basin/watersheds in the whole island of Cebu to serve as blue print for the future development in the area.

The development of Integrated Cebu River Basin Management and Development Master Plan that will address not only the problem on water resources management but also poverty, inequality and loss of livelihood due to perennial flooding.

### Issues and description of Cebu River Basin/Cebu Province

The island of Province of Cebu is located in the geographic center of the Philippine Archipelago. It has a land area of about 500,000 ha, elongated in shape, 250 kilometers long and at its widest center area, about 50 kilometers across. It is thinly outstretched island and has bulge at the middle where its main watersheds are found. The three (3) major catchments of Mananga, Kotkot and Lusaran river system that should serve Metro Cebu consisting of Cebu City and 3 other component cities and six large municipalities at the eastern seaboard are including the Mactan Island are in serious degraded condition. These three (3) major catchments/watersheds with a total area of 29,000 hectares have annual average rainfall of 1.7 meters over the area can have a potential storage capacity according to hydrologist sufficient to meet the needs of Metro Cebu. However, environmental and ecological protection, conservation and rehabilitation should be managed properly and effectively. Its topography is such that about 64% of its land has a slope of 18%-30% and 12% with a slope of 30%-50%. Cebu is one of the most severely deforested and eroded islands in the the Philippines now with forest cover of barely 0.8% on its total area. (Cebu Uniting for Sustainable Water Foundation, CUSWF)



### Population and Water Supply in Central Cebu

With an estimated population of about 1.2 Million, 720,000 in Cebu City alone (CUSWF Report) Metro Cebu's water supply is already in a state of a "quiet crisis." Quiet is to demonstrate the paradoxical low awareness and lack of concern about the situation among the people in general.

The Central Cebu is identified as the island's primary growth area of approximately 2800 square kilometers. Majority of the population lives along the central east coast of the island. The Metro Cebu water supply has traditionally mainly relied on groundwater extracted from the coastal aquifer, but there is consensus that present extraction rates are not sustainable and further salt water upcoming and horizontal intrusion near the shorelines

ambushes. In addition the groundwater quality in the coastal plain is affected by the recharge of domestic and industrial waste, seepage from septic tanks and leaching from unprotected (solid waste) dump sites.

In rural mountainous areas, water availability is generally insufficient, due to the physical characteristics of the area. In the absence of public water supply system, a considerable part of rural population does not have access to safe water sources.

**Water Resources and Watershed Degradation**

The focal causes of this threatening water crisis are the degradation of the major watersheds of Central Cebu, mostly overlooked as vital linked to Metro and Central Cebu's groundwater storage. Lacking appreciation for this essential role of watersheds and political will to implement existing regulations, improper developments are still allowed to ravage the environment and ecosystem in these water resource areas.

Over pumping on coastal aquifer allow seawater intrusion to move about 4 km inland in certain places in Cebu had been happening for the past 30 years. Further the destruction of natural recharges areas by infrastructure constructions and other human developments altering natural contours and filling up wet lands contribute to water resources depletion.

**II. INTRODUCTION**

The River Basin Control Office (RCBO) is created through the Executive Order No. 510 on March 05, 2006. This is the coordinating body which is mandated to: 1) Rationalize the various existing River Basin Projects; 2) Develop a National Master Plan for Flood Control by integrating the various existing River Basin Projects and developing additional plan components as needed; 3) Rationalize and prioritize reforestation in watersheds; 4) Develop a Master Plan on Integrated River Basin Management and Development; 5) Act as water body that shall coordinate all government projects within the river basins; and 6) Implement water-related projects such as river rehabilitation, lake management, and other water resources management and development.

One of the plans and directions of RCBO for the years 2007-2010 is to develop an integrated river basin master plan for various river basins which includes the Cagayan River Basin.

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### **III. PROJECT OBJECTIVES**

The objective of this project is to formulate an Integrated River Basin Management and Development Plan for Cebu Province which will address concerns on: 1. Water resources management; 2. Watershed Management and Restoration; 3. Creation of institutional framework and physical structure for management; 4. Flood Control and Hazard Management; 5. Watershed and River Management; 6. Coastal Resources Management; 7. Community participation which will promote a more sustainable management of the basin.

### **IV. CONSULTANT QUALIFICATION REQUIREMENTS**

- Non-government organization/association or company or corporation duly registered with the Securities and Exchange Commission (SEC) and the Department of Trade and Industry (DTI).
- Locally based with vast experience in river basin and watershed management/master plan formulation.
- With adequate basic resources (i.e. logistics/materials etc) to be supported by audited financial statements or statements of assets and liabilities.
- Not blacklisted on the previous projects of DENR and other agencies (both government and private)
- Satisfactory performance rating from the previous similar and related projects.
- Must be eligible in accordance with the Government Procurement Act-Republic Act 9184

### **V. EXPERTISE REQUIRED**

The consultants required for the study are (i) an integrated river basin management specialist cum team leader (12 person-months), (ii) a sociologist (5 person-months), (iii) a watershed management specialist (5 person-months), (iv) an economist (4 person-months), (v) an environment specialist (5 person-months), (vi) a institutional development specialist (4 person-months), (vii) a hydrologist (4 person-months), (viii) a hydraulic structure engineer (4 person-months), (ix) an irrigation engineer (3 person-months), and (x) a database and geographical information systems specialist (6 person-months).

### **VI. SCOPE OF WORK OF CONSULTING SERVICES**

The consultants will formulate a master plan for River Basin in Cebu Province to test the sound investment decisions in the sustainable management of water resources in Cebu Province. The terms of reference for consulting services will include the following tasks:

#### **A. Review of Water Policy and Basin Development Strategy (Phase I)**

- (i) Review and assess the guiding policy principles for the river basin development and management at national, sector, and project levels that have been enunciated and adopted by experts, international organizations and governments in the Philippines (i.e. World Bank: Bicol River Basin and Watershed Mgt. Project; Japan Bank for International Cooperation: Study on Watershed Management and Flood Warning System of the Agusan River Basin)

- (ii) Collect all relevant statistical data relating to climatic, hydrological, geographic, hydro-geological, environmental, and socio-economic conditions in the river basin for the last ten (10) years to formulate a master plan.
- (iii) Identify existing water control structures and those users in the basin, and assess current working conditions.
- (iv) Assimilate the Integrated River Basin Management and Development Master/Framework Plan and relevant documents for the preparation and adoption of a comprehensive policy on river basin development and management in the Philippines.
- (v) Review existing information and studies on water sector in the Philippines from a quantitative and qualitative perspective.
- (vi) Review the experience of international and bilateral organizations such as JBIC, the World Bank, and the ADB in the water sector in the Philippines. At a broad level, assimilate the lessons learned to build on past work and enhance the developmental impact.
- (vii) Review and assess the existing Regional Development Plan, Basin Development Plan, Provincial and Municipal Development Plan and Identify conflicts of interests among LGUs and/or the basin Communities, if any
- (viii) Assess the role of the existing River Basin Organization (i.e. Bicol River Basin-Project Management Office (BRB-PMO); and the Laguna Lake Development Authority), and its current issues. Analyze the issues on sustainability of the established inactive organizations (i.e. Agno River Basin ~~Commision~~; Cagayan River Basin Commision and the Bicol River Basin Commision). Assess the necessity of the establishment of the River Basin Organization for the Cagayan River Basin, including the matrix stating merits and demerits for the establishment of RBO.
- (ix) Study international and locally recognized best practices for the watershed management activities (i.e. Moreton Bay in Australia; and Chesapeak Bay in USA) by communities, NGOs, and business communities, and analyze whether these practices are applicable to the Philippines, especially in Cebu Province River Basin.
- (x) Study international and locally recognized best practices for the resources transfer mechanisms from people living in the downstream flood-prone area to people living in the upstream watershed area, and analyze whether these practices are applicable to the Philippines, especially in the Cebu River Basin.
- (xi) Identify the all stakeholders who are now or who in the future may be involved in the development and management of the water sector in the basin and analyze their background, history, concepts, interest, and approach to the water sector. Analyze their roles rights, responsibilities, motivations and aspirations. Examine and evaluate policies for stakeholder participation; the absorptive capacity of different stakeholder groups including

nongovernmental organizations, gender issues; experience in participatory water resources management, and mechanism for client groups' participation (including women) in planning, implementation, and management in the sector, in the basin.

- (xii) Conduct consultation meetings with stakeholders, communities, civil societies, and business communities in the basin, focusing how to solve the current problems in the water sector through community participation.
- (xiii) Undertaken a social analysis for the river basin to identify (i) groups who will benefit from and/or use the proposed works, (ii) groups who may be adversely affected by the works, (iii) indigenous people, (iv) gender concerns, and (v) other major stakeholders<sup>5</sup>. Each social analysis will describe the needs, demands, and absorptive capacity of the groups, and will consider the need to compensate those likely to be adversely affected. Socioeconomic data, including current urban and rural population levels and migration trends, growth predictions, presence of minority peoples, land use and tenure, employment, gender issues, division of labor, and productivity and family incomes will be derived from secondary sources supplemented by interviews and rapid rural appraisals. Particular attention will be given to discerning differences in the extent and severity of poverty among beneficiaries and the population as a whole.
- (xiv) Conduct discussions with relevant institutions at the Central and provincial levels, including the Department of Agriculture, National Irrigation Administration; Department of Environment and Natural Resources, National Water Resources Board, Department of Public Works and Highway, Department of Energy/National Power Corporation, National Commission on Indigenous People, the office of the President, and NGO's and business communities to assess current administrative arrangement, policies, and strategies for the water sector.
- (xv) Describe how water and its delivery are priced. Review current water pricing in view of the principles of cost recovery and equity, including issues such as water price subsidies and indirect pricing or taxation methods, and water license fees. Review the methodology used to price water, and the availability of data necessary to establish an opportunity cost or shadow price of water.
- (xvi) Assess the effectiveness of existing policies, laws, decrees, regulations, and circulars pertaining to the water sector that govern allocation of available water resources; water rights and water pricing, project identification and implementation; funding mechanisms; water infrastructure management; catchment management; environmental protection; environment sanitation; and public health. Identify shortcomings in these instruments.
- (xvii) Consolidate existing Geographic Information System (GIS) data for the Cebu river basin and adopt the new River Basin Integrated Information Management System (RBIIMS).

- (xviii) Formulate development strategy for Cebu River Basin which will be applicable for the next fifteen (15) year, considering population growth, economic development in the basin, water availability and resources development, and environmental conservation activities based on the consultation made with river basin stakeholders.

### **Deliverables**

- A comprehensive report of the findings from the studies describe in each of the items above;
- Proceedings on the consultation/discussion with multi-stakeholders as stated on item xii and xiv;
- Cebu River Basin Management and Development Strategy.

### **B. Formulation of Master Plan (Phase II)**

- (i) Describe current natural and socio-economic condition and these trends in the river basin, highlighting current problems and in the water sector.
- (ii) Describe surface and ground water resources development and use in the basin. Assess existing water rights including customary water right (water taped by indigenous people without official registration for long time) in the basin including tributaries. Explain how water has been allocated between different consumptive and non consumptive uses, and provide an assessment of the basis for such allocations and priorities. Evaluate past and present development of single and multipurpose water supply and control infrastructure. Assess past and present programs in water supply and disposal for human consumption and industrial purposes, and identify trends. Assess past and present programs in irrigation and drainage. Evaluate the impact of in-stream uses on the environment, particularly those related to hydropower generation.
- (iii) Assess the physical resources base in the basin, including surface water availability, groundwater availability, and water quality. Identify sensitive ecosystem, and comment on how issues of water quality affect these ecosystems.
- (iv) Review and update the existing water balance study including mathematical model in the basin.
- (v) Assess current land use, land title/ownership and forest concessions in the basin and identify the trend of land use and appropriate land use in the basin for next fifteen (15) years.



- (national) (local)
- (vi) Assess the efficiency and effectiveness of relevant institutions at the macro and micro levels. In particular, evaluate the appropriateness of the current planning-by-level philosophy. Identify and comment on overlaps and duplication of functions both between levels of Government and within levels. Analysis should emphasize structure, organization, management, and the role of adequate cost recovery. At a broad level, estimate available and required skills and training needs to achieve institutional objectives.
  - (vii) Describe the state of water resources and of critical portions of the natural environment that are closely related to water availability and water quality in the basin. Review major water-related public health issues. Prepare an inventory of matters related to the physical resources base and the environment, including the effects of water development on the environment. Describe the incidence and conditions associated with major water-related diseases, especially those related to water supply and sanitation.
  - (viii) Review and identify the proposed projects including non-structural component in connection with (i) watershed conservation and management, (ii) irrigation, (iii) hydropower generation, (iv) water supply for domestic and industrial use, (v) disaster mitigation, drainage and flood control, (vi) waste water management, (vii) navigation, and (viii) environmental conservation. Then prioritize the identified projects based on the selection criteria set forth.
  - (ix) Identify for each subsector the major issues facing the basin in the present, including emerging issues, and identify future trends. In particular, distinguish the constraints that now or may in the future hinder the resolution of major issues facing the water sector, and specify the opportunities that may exist to facilitate or accelerate their solution.
  - (x) Prepare a gender action plan to reflect the gender analysis of the role of women in the decision making process.
  - (xi) Ascertain the status of current major project related to the water sector in the basin. Review their appropriateness in terms of effectiveness in addressing the major issues identified previously.
  - (xii) Evaluate alternative strategies for managing water resources, including those relating to the management of supply, e. g., investment, allocation, and real-time management, and those relating to the management of demand, e.g., regulatory measures and control, pricing, incentives, finance, and markets. Develop clear economic and administrative decision criteria to allocate scarce water resources among competing subsectors in the basin.

- (xiii) Prepare public awareness plan for integrated river basin management, such as children's education program, radio broadcasting, and exchange visits.
- (xiv) Prepare natural disaster hazard map based on the data collected and after analysis of topographic and socio economic condition.
- (xv) After reviewing and assessing above data and information collected, based on the development strategy agreed at the end of phase I, formulate a fifteen year master plan for the Cebu River Basin together with the prioritized list of projects with rough cost estimate.
- (xvi) Assess the impact on the poor, living in the basin by implementation of the Master Plan.
- (xvii) Identify the constraints to implement the proposed Master Plan and propose mitigation measures

#### **Deliverables**

- Draft final report
  - All items listed in phase II must be reflected in the prepared master plan.
- Final Report: *Colm* Integrated ~~Cagayan~~ River Basin Management and Development Master Plan.

#### **C. Workshop and Reporting Requirements**

Two workshops will be organized<sup>1</sup>. The first workshop will be conducted at the end of Phase I (4 months) for comment of the Technical Working Group established by DENR-RBCO. The second workshop will be organized after the submission of draft final report to discuss the draft Master plan with stakeholders. At each workshop, the consultants will make powerpoint presentation and provide concise reports for discussion. A final report incorporating comments from the Government/DENR Technical Team, RDC, NGOs, and conference participants/other stakeholders must be submitted within one week before the contract ends.

In addition to the reporting assignments specified above, the consultants will prepare brief monthly progress notes for review by the technical working group. These notes, which should not exceed three pages, are intended to keep the Steering

<sup>1</sup> The workshops should draw together the major stakeholders in water resources decisions. These include key officials from relevant institutions involve in the strategy formulation process at the central and provincial levels, professionals associations, private sectors, NGOs, and civic organizations. All should be given an equal opportunity to voice their views and define their interests.

Committee regularly informed of progress achieved and constraints impending smooth implementation.

Ten (10) copies of the inception and midterm reports will be required in English. Approximately 10 copies of the draft final report and 10 copies of the final report in English will be submitted. Approved final report shall comprise hard copy and electronic copy, including geo-referenced maps used.

## VII. SCHEDULE

The consultancy services will have the duration of twelve (12) months.