



MSME 2/BEE PROJECT STATEMENT OF WORK

Name: TBD
Position: Socio-Economic Hydrology Valuation Consultant
Task Order Name: Micro Small and Medium Enterprise 2/Business Enabling Environment
Contract Number: EEM-I-00-07-00009-00, Order No. 04
Period of Performance: TBD
Level of Effort: Up to 90 days

Socio-Economic Hydrological Assessment of the Prey Lang Forest Landscape

Background

The Cambodia MSME Project supports improved management and conservation of forest ecosystems. The Project also facilitates relationships in agricultural value chains and in piped water supply that depend on reliable supplies of save water. The Project seeks to explore the linkages between forestry conservation and improved, sustainable supplies of water for agriculture, industry and household use.

While Cambodia still retains considerable forest cover, many of its existing resources are open to exploitation with few incentives for sustainable management or conservation of assets. The value of the many goods that forests supply, such as ecological functions including water supply, soil protection and carbon sequestration, and other non-timber forest products that often generate employment and income for local communities in and near forested areas have rarely been evaluated and understood.

The importance of ecosystem functions in regulating spring discharge and stream flow, the sequestration of carbon and maintaining biological services such as plant pollination cannot be overstated. Wider recognition and evaluation of these important ecosystem services creates opportunities to promote better stewardship of forests and enhance the benefits that people can derive from the sustainable management of the forest assets. By also taking a larger landscape perspective, ecosystem services derived from forests can be linked to other areas of critical economic importance, such as hydro-electric and irrigation dams, important agriculture areas and fisheries, and downstream water supplies for industry and urban communities.

Whether the goal is to derive immediate and sustained economic benefits (wealth) from the forest, preserve the assets for future generations (endowment), or ensure continuity of cultural

values (non-economic values), the outcomes are the same: a healthy, functioning forest that provides goods and services to people, provided they maintain the ecosystem.

In several locations, the MSME Project works with value chains that support improved management and conservation of forest ecosystems. There exists an opportunity to extend this work to show the upstream and downstream linkages between forest ecosystems and other value chains of importance to Cambodia's economic growth and health of the Cambodian people. The Project proposes to use one area – the Prey Lang forest landscape, an evergreen dry forest located in central Cambodia (covering all or part of Kampong Thom, Preah Vihear, Stung Treng and Kratie Provinces) – to demonstrate the economic opportunities and trade-offs between current plans to allow mining and commercial agriculture concessions compared with the long term values to Cambodia of keeping this remaining forest intact and protected, yet providing economic value in many forms. This analysis will help interested policy makers evaluate options that support the long-term economic development of Cambodia. This study will also complement the evaluation of the Prey Lang forest landscape's biological value, which is part of the REDD activities that are already being considered by the Royal Government of Cambodia.

Objectives of the Study

The objective of this study is to assess the socio-economic and hydrologic value of the Prey Lang forest landscape in light of different economic development options available to the Royal Government of Cambodia. The study will employ a landscape perspective in its analysis to not only look at the economic tradeoffs of different land uses for the immediate area occupied by the forest, but also to assess the downstream economic, health and social impacts of different land uses.

Building on a prior assessment conducted under the auspices of the East West Management Institute, this assessment will conduct a more complete hydrologic and socio-economic assessment and valuation of existing and potential services and products from the Prey Lang forest landscape, and analyze more closely the economic values of different uses for the Prey Lang lands under three different scenarios:

- Business as usual – eventual and rapid conversion of the forest through logging, mining, and land clearing for industrial plantations;
- Conservation of the forest in its current state; and
- Sustainable land use management that involves local communities and economic enterprises in partnership with the national government to manage the remaining forest assets in a sustainable manner and possibly increase areas under management in future years, which is a stated objective of the Royal Government of Cambodia.

The assessment will look at each scenario from the perspective of impact on local and downstream communities, water resources and local and downstream economic interests – such as agriculture, fisheries and municipal water supplies.

Tasks

This assessment encompasses four principal tasks described below. The Consultant(s) will coordinate closely with key Cambodian government agencies in designing and implementing this study. Key agencies include The Ministry of Environment, Ministry of Water Resources and Meteorology and Forestry Administration, among others. The MSME Project will undertake to provide logistical support for this coordination by organizing workshops, briefing sessions and participation of government representatives in some aspects of the field work, in cooperation with the consultant and based on the designed workplan of the consultant.

1. **Reach agreement with USAID and the Royal Government of Cambodia on the area to be covered by the study.** The boundaries of the Prey Lang landscape are open for wide interpretation. The forest and its remnants spans parts of four provinces – Preah Vihear, Kampong Thom, Kratie and Stueng Traeng. The previous USAID-financed study only focused on six districts within these provinces. The consultant will use recent satellite imagery and information that exists on communities that depend on resources derived from the Prey Lang landscape to recommend to the MSME Project team the area to be encompassed by the study. The MSME Project team, in consultation with representatives of USAID and the Royal Government of Cambodia, will review the consultant’s recommendations and agree on the area to be included in the assessment.
2. **Collect and review existing data and information on this area.** The consultant will build on the information already collected by various organizations including EWMI from the ARUNA Technologies Ltd report, Conservation International, World Wildlife Fund, the International Water Management Institute, UNESCO, Mekong River Commission, the Royal Government of Cambodia and others, for the agreed upon study area and downstream and adjacent areas that receive water from the Prey Lang landscape. Consultant will collect information on the following:
 - a. Bio-physical conditions. This will including past and current land cover, past and current land use, slopes, soil types, historical rainfall information on duration and surface runoff (note: it is assumed that pre-1975 historic rainfall records may be available from the Royal Government of Cambodia);
 - b. Water quality information. Using information available through different groups, and by limited sampling and analysis using local laboratories, the consultant will gather information on waters flowing from or through the Prey Lang landscape to assess the quality and potential impacts on downstream users.
 - c. Current population estimates. Update estimates of the current population living in the study area based on the most recent census information;
 - d. Existing and proposed infrastructure. Consultant will update existing and planned infrastructure such as roads, irrigation networks, planned hydro dams industrial and urban development, and agricultural development that depend on or will impact water flows and use, and make estimates of their requirements and potential impacts (i.e., land flooded by planned dams);
 - e. Land Use Changes. Consultant will update estimates of land use changes for the past ten years for the study area; particularly focusing on changes in forest cover (i.e., conversion to agriculture), and changes in the type of agriculture being

practiced (from subsistence to more commercial or industrial production). Consultant will also update information on land concessions already issued or planned and the types of land use changes these will bring if fully implemented.

- f. Current economic activities. Consultant will collect information on the current economic activities taking place within the study area – including the number of people employed, and annual economic income generated. Consultant will also gather economic information on agriculture and fisheries that are tied to waters flowing from or through the Prey Lang forest and make estimates of the value of these economic activities in terms of annual income and jobs generated.
3. **Analysis of hydrological functions.** Building on information already available, estimate the contribution of the Prey Lang landscape to water availability in areas supplied by rivers and springs that originate in or flow through the Prey Lang landscape, and especially the Steung Sen River. The analysis will use a ten-year time horizon to:
- a. Estimate the water contribution of each water source under the three different scenarios to the Mekong and Tonle Sap rivers and to important downstream agriculture and fisheries production areas. Consultant will need to develop estimates of changes in water flows in both wet and dry seasons under each scenario, and estimate the potential impact on downstream water uses.
 - b. Estimate the current and expected sediment loads under each scenario from the different water sources using recognized methods that factor in land cover, crop type, tillage type, slope, soils and rainfall information. Where large scale economic infrastructure already exists or is being planned, analyze the impacts of the different sedimentation estimates on the economic life or maintenance costs of the infrastructure.
 - c. Estimate the water pollution in addition to sedimentation that will be generated under each scenario, and its potential impact on downstream economic activities or health and wellbeing of Cambodian people.
 - d. Estimate the impact of each scenario on the survival of species and areas of ecologic and economic importance such as the river dolphins and their importance to tourism.
4. **Assessment of economic and social tradeoffs from the different scenarios.** Under each scenario, consultant will assess the potential economic and social impact of each proposed scenario within a ten-year time horizon. These assessments will be used to estimate the economic tradeoffs between the different scenarios in terms of economic benefits/costs and social benefits/costs.
- a. Business as usual scenario.
 - Consultant will estimate the economic benefits to be derived from large scale timber extraction, mining and land conversion to industrial plantations in terms of value and number of jobs that will be generated. Benefits will factor in estimates of increased or decreased land productivity due to forest clearing.
 - Consultant will estimate the economic and social costs from large scale timber extraction, mining and land conversion on the immediate area, and the impact

- of sedimentation and pollution on downstream infrastructure, agriculture and fisheries productivity and on water supplies for cities and industries.
 - Consultant will estimate the economic costs of social dislocation caused by wide scale land use conversion under existing and announced concessions.
- b. Conservation of the forest in its current state.
 - Consultant will estimate the socio-economic benefits in terms of income and jobs derived from existing land uses in the buffer and core zones of the Prey Lang landscape, and the value of continuing current water flows and sedimentation levels on downstream infrastructure, agriculture, fisheries and water supplies for urban and industrial uses.
 - Consultant will estimate the economic costs of current land uses in the buffer and core zones, and the estimated costs of investment required by the government and local communities to protect and manage the forestlands in their current state.
- c. Sustainable land use management.
 - Consultant will estimate the economic benefits in terms of income and jobs that can be derived from more sustainable land use management that involves protecting the core zone, and improved management of the buffer zone by both communities and corporations. Economic estimates will also assess the value of sustainable uses on downstream impacts on infrastructure, agriculture, fisheries and water supplies for urban and industrial use.
 - Consultant will estimate the economic costs of more sustainable land use in terms of investments required by industries to reduce pollution and improve operations to minimize the impact on the environment, soils and water within the Prey Lang landscape. Also, make estimates of any social dislocation that might occur to achieve more sustainable land use management.

Using the above analyses, summarize the hydrologic, economic and social benefits and costs of each scenario. This comparative analysis will be used to spur a dialog with donors and national government policy makers on investment strategies for the development of the Prey Lang landscape.

Schedule

The assessment should be completed in a period of no more than 90 days.

Deliverables

A detailed report that: (1) defines the area of the study; (2) summarizes the information gathered above; (3) analyses of the hydrologic value and impacts of each proposed scenario on water flows from or through the Prey Lang landscape, and (4) analysis of the economic and social value and costs for different economic activities under each scenario.

Reporting

The Consultant(s) will report to Mr. Curtis Hundley, Chief of Party of the USAID Cambodia MSME Project.

Qualifications

1. The lead consultant or team leader must have the following qualifications:
 - a. Advanced degree – at least a Master’s of Science degree – in relevant field of study such as forestry, hydrology, watershed management, agriculture development or environmental sciences;
 - b. At least 10 years experience leading teams in the conduct of watershed analyses and/or developing environmental and social impact assessments for land conversion schemes in tropical areas.
 - c. Relevant experience in Cambodia or Indochina is preferred, given the type and level of information that will need to be collected from Cambodian and regional institutions.
 - d. The consultant should have demonstrated experience and capacity to undertake rigorous analyses of anticipated impact of changing land use and climate change, and be very familiar with use of GIS, land use mapping and modeling.