

Brief Terms of Reference for the

Preparation of River Basin Plans and Hydropower Development Master Plans and Strategic Environmental and Social Assessment

Introduction

The World Bank has provided funds to support the preparation of integrated river basin development plans covering all significant river basins in Nepal. The Irrigation and Water Resources Management Project (IWRMP) under its Component-C “Institutional and Policy Support for Improved Water Management” aims to strengthen the relevant institutions, namely the Water and Energy Commission Secretariat (WECS) and Department of Irrigation (DOI) to provide more effective and streamlined water resources management services at the national level. Similarly, Power Sector Reform and Sustainable Hydropower Development Project (PSRSHDP) under its Component B “Studies and Preparation for Policy Recommendations and Sector Reform” aims to support the preparation of river basin planning with Integrated Water Resources Management (IWRM) approach for selected river basins and preparation of a Hydropower Generation Master Plan including capacity building of WECS. In addition, PSRSHDP under its Component C “Capacity Building for Safeguard Management and Hydropower Development” also proposes to conduct Strategic Environmental and Social Assessment (SESA) of River basin plans and Hydropower Development Master Plans. This approach is intended to provide the legal, technical, managerial and institutional mechanisms to enable implementation of the activities identified by the Water Resources Strategy 2002, and National Water Plan 2005 in line with IWRM principles and taking into account climatic and socio-economic uncertainties.

The Department of Irrigation (DOI) is preparing irrigation master plan under the Asian Development Bank (ADB) funded Water Resources Project Preparatory Facility (WRPPF) in coordination with the preparation of the river basin plans. While WECS has overall authority for river basin planning, it is essential that river basin plans to be prepared under this study explicitly takes into account all the uses of water in different sectors such as hydropower, irrigation, drinking water, environmental flow, etc. The river basin planning should consider the optimal use of waters in different sectors and hydropower planning should determine the optimal capacities and types of hydropower plants in a basin. Accounting the influence of climatic and socio-economic uncertainties and balancing the interests of diverse stakeholder groups in river basin planning and management will require a modern approach to decision making under uncertainty (DMU). In this context WECS intends to prepare River Basin Plans through IWRM, Hydropower Development Master Plans and conduct Strategic Environmental and Social Assessment (SESA) of these plans covering almost all river basins of Nepal.

Objective of the Study

The study has set the following objectives:

- i. To prepare river basin plans through integrated water resources management principles for all rivers of Nepal (except Bagmati River Basin) considering all aspects of water uses;
- ii. To prepare hydropower development master plans by mainly updating/upgrading and re-optimizing existing hydropower development master plans for all the major river basins of Nepal;
- iii. To concurrently undertake an integrated Strategic Environmental and Social Assessment (SESA) of the river basin and hydropower development master plans; and
- iv. To develop the capacity within WECS to carry out integrated water resources development and management planning at basin level to meet local, regional and national needs utilizing appropriate knowledge and information management systems, analytical and modeling tools, and planning methodologies.

Scope of the services

The study area of the river basin plans covers all the river basins of Nepal except Bagmati river basin, as study of the basin is being carried out by WECS under ADB assistance. The aim of preparing basin plans is the sustainable development and management of water resources of each river basin with maximum economic, social, and environmental benefits with due consideration of environmental values and climatic & socio-economic factors. The brief scope of services in river basin plans shall include, but not limited to, the followings:

- Baseline context, mapping and analysis of the basins, which include mainly physical environment, biological environment, socio-economic environment, policy and legal framework, institutional set ups and political economy of river basin planning;
- Stakeholder analysis and engagement, which include mainly relevant national and sub-national agencies such as ministries, departments, etc., relevant civil societies, social and environmental organizations and NGOs/INGOs, relevant private sector partners and stakeholders, farmer groups, fishermen/women, local community groups;
- Development of Decision Support System (DSS) for river basin planning, which includes mainly knowledge base for each basin based on systematic collection, evaluation and analysis of baseline information on existing conditions in the basin, relevant information on institutional and social factors that can influence water resources use and management;
- Preparation of plans, models, and scenarios of the future conditions of the basins, which include assessment of current land use, community forests, wildlife reserves and national parks, maps of existing road networks, preparation of current water balance for all major rivers and tributaries at every confluence point with other rivers using a physically based distributed hydrologic model, determination of significance of climate change and the appropriateness of various DMU analytical methods to incorporate it appropriately into the water-energy intervention assessments;
- Formulation of basin plans considering optimum allocation of water to all users including irrigation, hydropower, domestic and industrial water supply and agriculture uses;

The study area for the preparation of the hydropower master plans covers all major rivers and their tributaries of Nepal. The aim of preparing hydropower master plan is to update and upgrade the available hydropower development master plans of various river basins of Nepal in order to optimize the benefits from the emerging domestic as well as export power markets. The brief scope of the services shall include, but not limited to:

- Review of available hydropower studies, plans and existing situation of Nepal Power System, which include National Water Resources Development Plan Study for Koshi River Water Resources Development (1983-1985), Upper Karnali and Mahakali River Basin Study (1991-93), Gandaki Basin Power Study (1978), Medium Hydropower Study Project (1996-97), Small Hydropower Development Plan (1993), Nationwide Master Plan Study on Storage-type Hydroelectric Power Development in Nepal (2014);
- Site reconnaissance of potential hydropower sites, updating/upgrading of data and information relevant to prospective hydropower projects The Consultant shall have to carry out limited amount of confirmatory drilling works, in case new dam sites are proposed.
- Reassessment and optimization of installed capacities of hydropower projects, which include assessment and/or reassessment of the installed capacities and configuring and/or reconfiguring (in terms of RoR, PPRoR and Storage) of the potential hydropower projects based on domestic power demand, multi-use of water, cost benefit analysis, export power market, etc. in different scenarios; and
- Prioritization and recommendation on sequencing of hydropower development within various basins;

The study area of SESA also covers all river basins of the country. SESA aims to ensure the integration of environmental and social dimensions into the river basin and hydropower master plans from their inception to the post evaluation. The brief scope of services under SESA shall include, but not limited to, the:

- Collection of baseline data and information related to the environmental and social dimensions of each river basin/sub-basin, which include human dimensions, water resources and climate change, existing land tenure system in the basin, traditional land use and water rights of indigenous people, land acquisition practices, forest, biodiversity and ecosystems, agricultural practices, cultural system and tourism;
- Stakeholder analysis and engagement, which include consultative process from identifying stakeholder representatives and consultations with them in the field and elsewhere;
- SESA analyses for alternative scenarios, which include analyses and determination/prediction/quantification of the direct, induced and cumulative environmental and social positive and negative impacts and costs of each of the proposed water allocation and management planning scenarios, for each river basin;
- Guiding framework and recommendations for environmental and social impact assessment, which include recommendations for carrying out assessment of individual project level Environmental and Social Impacts (ESIA), Resettlement Planning Instruments, and Social Assessments to further assess and specify project-level impacts and required mitigations, guidance on quantifying downstream flow releases from hydropower plants, defining areas of influence and approaches for catchment management schemes;

The capacity development assessment of this study aims to develop the capacity within WECS to carry out integrated water resources development and management planning at basin level utilizing appropriate knowledge bases and information management systems, analytical and modeling tools, and planning methodologies. The capacity development shall also include the promotion of knowledge exchanges and peer learning in different countries to support the growth and sustainability of transformational hydropower development in Nepal.

Duration of the assignment

The duration of the assignment shall be 36 months.

