

RECORD OF DISCUSSIONS

FOR

THE PROJECT ON POWER SYSTEM MASTER PLAN 2040

AGREED UPON BETWEEN

THE ROYAL GOVERNMENT OF BHUTAN

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

August 16, 2017



Based on the Minutes of Meetings on the Detailed Planning Survey for the Project on Power System Master Plan 2040 (hereinafter referred to as "the Project") signed on April 27, 2017 between Department of Hydropower and Power Systems (hereinafter referred to as "DHPS"), Ministry of Economic Affairs (hereinafter referred to as "MoEA"), Royal Government of Bhutan (hereinafter referred to as "RGoB") (hereinafter referred to as "Counterpart") and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), (collectively hereinafter referred to as the "Parties") JICA held a series of discussions with the Counterpart and relevant organizations to develop a detailed plan of the Project.

The purpose of this record of discussions (hereinafter referred to as "the R/D") is to establish a mutual agreement for its implementation by Parties and to agree on the detailed plan of the Project as described in the following and the Annexes, which will be implemented within the framework of the Note Verbales exchanged on December 13, 2016 between the Government of Japan and RGoB.

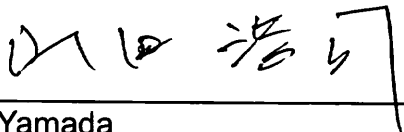
The Counterpart will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project is sustained during and after the implementation period in order to contribute toward social and economic development of the Kingdom of Bhutan.

The Parties also agreed that the Project will be implemented in accordance with the JICA's "Basic Principles for Technical Cooperation" published in 2016 (hereinafter referred to as "the BP"), unless other arrangements are agreed in the R/D.

The R/D is delivered at Thimphu as of the day and year first above written. The R/D may be amended by a minutes of meetings between Parties. The Minutes of Meetings will be signed by authorized persons of each side who may be different from the signers of the R/D.

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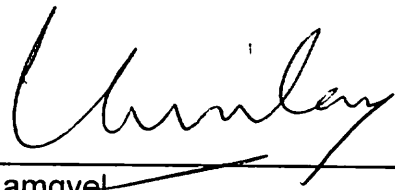
JAPAN INTERNATIONAL
COOPERATION AGENCY



Koji Yamada
Chief Representative
JICA Bhutan Office

For

ROYAL GOVERNMENT OF BHUTAN



Thinley Namgyel
Secretary
Gross National Happiness
Commission
Royal Government of Bhutan



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Sonam P. Wangdi
Director General
Department of Hydropower & Power
Systems
Ministry of Economic Affairs
Royal Government of Bhutan

- Annex 1 Main Points Discussed
- Annex 2 Project Description
- Annex 3 Implementation Structure
- Annex 4 List of Proposed Members of Joint Coordinating Committee
- Annex 5 Draft Framework of Terms of Reference for Environmental and Social Considerations on the Project

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MAIN POINTS DISCUSSED

1. Endorsement of the Proposed Master Plan and its Approval Procedure

The Parties agreed that the Master Plan to be developed and proposed under the Project will be:

- 1) firstly, presented to the Joint Coordinating Committee (hereinafter referred to as "JCC") for its endorsement, and
- 2) secondly, presented to the RGoB for its review and approval.

DHPS shall take all the necessary measures to obtain the endorsement of the Master Plan.

2. Joint Coordinating Committee (JCC)

The Parties agreed to set up the JCC as provided under Annex 4, and DHPS will be the main counterpart agency to JICA for the Project implementation. Other relevant agencies including Bhutan Power Corporation Ltd. (hereinafter referred to as "BPC"), Druk Green Power Corporation Ltd. (hereinafter referred to as "DGPC") and Bhutan Electricity Authority (hereinafter referred to as "BEA") will be involved in Master Plan formulation.

3. Environmental and Social Considerations

With regard to the Section 10.1 of the BP, the Project takes appropriate and necessary environmental and social considerations. JICA has the "JICA Guidelines for Environmental and Social Considerations (April 2010)" (hereinafter referred to as "the Guidelines"), and the necessary procedures are taken in accordance with the Guidelines. The following two points are important for the Project.

1) Strategic Environmental Assessment

As the Project is a master plan study, a Strategic Environmental Assessment (hereinafter referred to as "SEA") is required for the Project according to the Guidelines. The relevant Bhutanese laws and guidelines should also be applied. The Project will be disclosed to stakeholders in order to reflect their opinions.

Draft framework of terms of reference for the environmental and social considerations of the Project is shown in Annex 5. The draft includes the SEA procedures.

2) Category A project

A large-scale project in sensitive sector(s) is categorized as a "Category A project" under the Guidelines. The Project is categorized a Category A project because it is a large-scale project in a sensitive sector "Hydropower,

dams, and reservoirs” and possibly in “Power transmission and distribution lines involving large-scale involuntary resettlement, large-scale logging, or submarine electrical cables”.

JICA shall pay special attentions to all aspects of natural and social environments, and to make maximum efforts to avoid, minimize and mitigate adverse impacts induced by the implementation of the Project. JICA is, therefore, required to conduct comprehensive environmental and social study for the Project.

The Project will be scrutinized and commented by the JICA Advisory Committee of Environmental and Social Considerations in two stages- submission of draft scoping and draft final report.

4. Cost Sharing

Regarding the cost sharing for the Project including stakeholders meetings of the SEA, the Parties agreed on the following points.

- 1) The Bhutanese side shall meet the expenses, if necessary, the processing fee payable to National Environment Commission for Strategic Environment Assessment; and,
- 2) The Bhutanese side shall bear the local cost for the stakeholders for the meetings under the Project. However, Bhutanese side requested JICA to provide the necessary assistance for the in-country training/workshop costs.

5. Undertakings of DHPS and RGoB

DHPS and RGoB will take necessary measures to:

- (1) provide security-related information as well as measures to ensure the safety of members of the JICA Experts and missions; and,
- (2) permit the JICA Experts and members of the JICA missions to enter, leave and sojourn in the Kingdom of Bhutan for the duration of their assignments therein and exempt them from foreign registration requirements and consular fees.

PROJECT DESCRIPTION

(1) Outcome

Based on the Power System Master Plan 2040, the prioritized projects will be taken up for implementation.

(2) Output

The Power System Master Plan 2040 is formulated.

(3) Activities

The Project will carry out the following seven (7) tasks jointly by Bhutanese side and the JICA Experts.

Task 1: Review of the Current Situation and Future Prospect

Task 2: Formulation of Hydropower Development Plan

Task 3: Improvement of Transmission System Development Plan

Task 4: Economic and Financial Analysis

Task 5: Environmental and Social Considerations

Task 6: Formulation of Power System Master Plan 2040

Task 7: Capacity Development for Future Power System Master Plan

Task 1: Review of the Current Situation and Future Prospect

- 1) Review of the socio-economic situations
- 2) Review of the recent power sector development
- 3) Review of the related policies, guidelines, regulations and reports
- 4) Review of the power market and its future prospects for both domestic and exports, including prevailing cross-border electricity trade guidelines and regulations
- 5) Review of other donors' cooperation
- 6) Review of the existing demand forecast and future prospect both domestic and export demand
- 7) Review of the present status of power system development plan

Task 2: Formulation of Hydropower Development Plan

- 1) Assessment and analysis of the hydro-met data
- 2) Reassessment of total hydropower potential
- 3) Assessment of geology of potential sites
- 4) Assessment of climate change impacts on hydropower
- 5) Develop a Hydro Power Potential Data Base
- 6) Ranking of projects applying Multi Criteria Analysis (MCA)
- 7) Site reconnaissance to the selected projects
- 8) Draft a long-term optimal Hydropower Development Plan toward the year 2040

Task 3: Improvement of Transmission System Development Plan

- 1) Examination of the appropriate software for power system analysis
- 2) Undertake power system simulation including export system
- 3) Site reconnaissance for power evacuation from the selected projects
- 4) Assessment and application of new designs and technologies
- 5) Formulation of the transmission system development plan up to 2040

Task 4: Economic and Financial Analysis

- 1) Estimate the investment costs of generation facilities
- 2) Estimate the investment costs of transmission/substation facilities
- 3) Conduct economic and financial analysis
- 4) Assessment of macro-economic Impacts

Task 5: Environmental and Social Considerations

- 1) Review of the legal and regulatory frameworks for the environmental and social considerations.
 - 2) Undertake SEA.
- *Detailed activities for environmental and social considerations are described in the annex 5.

Task 6: Formulation of Power System Master Plan 2040

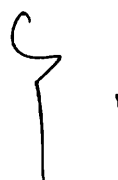
- 1) Integration of Task 1 to Task 5 to formulate PSMP 2040.

Task 7: Capacity Development for Future Power System Master Plan

- 1) Undertake training needs assessment
- 2) Create the contents of capacity development program
- 3) Implementation of capacity development program for power system planning

(4) Duration

The duration of the Project is 24 months, and the commencement date is to be recognized from the first arrival of JICA Experts in Bhutan.



Tentative Schedule of the Project

Cumulative Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Site Survey/Visit						▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				
Stakeholder Meetings	▲					▲						▲									▲			
Inception Report / Workshop*	▲																							
Quarterly Progress Report			▲			▲			▲						▲			▲			▲			
Interim Report/ Workshop*												▲												
Draft Final Report / Workshop**																					▲			
Final Report																								▲

* The Report to be presented to participants from relevant stakeholders

**The Report to be presented to participants at the National level

(5) Reports

JICA will prepare and submit the following reports to DHPS in English.

- 1) 10 copies of Inception Report at the commencement of the first work period in Bhutan
- 2) 10 copies of Quarterly Progress Report, every three (3) months after the commencement of the Project except the time of the Interim report and the Final Report
- 3) 10 copies of Interim Report, twelve (12) months after the commencement of the Project.
- 4) 10 copies of Draft Final Report, twenty (20) months after the commencement of the Project.
- 5) 30 copies of Final Report within one (1) month after the receipt of the comments on the Draft Final Report.

(6) Input

1) Input by JICA

(a) Dispatch of JICA Experts

(b) Training in Japan

(c) Equipment

- Necessary equipment, including vehicle(s), for the Project

Input other than indicated above will be determined through mutual consultations between JICA and DHPS during the implementation of the Project as necessary.

IMPLEMENTATION STRUCTURE

The roles and assignments of relevant organizations are as follows:

(1) The Bhutanese side

(a) Project Director

Chief Engineer, Hydropower Development Division (hereinafter referred to as "HDD"), DHPS, will be responsible for overall supervision and implementation of the Project

(b) Project Manager

Executive Engineer, HDD, DHPS will be responsible for day to day management and execution of the Project

(c) Project Counterparts

DHPS will be the main counterpart agency to JICA for the Project implementation. DHPS may, if necessary, coordinate and organize the working teams comprising of representatives from related agencies for formulating master plan.

(2) JICA Experts

JICA will send JICA Experts for the implementation of the Project. The JICA Experts may cover the following fields of expertise and the JICA Experts will give necessary technical guidance, advices and recommendations on any matters pertaining to the implementation of the Project.

- Hydropower Planning
- Geology
- Civil Design & Cost Estimation
- E&M Design
- Power System Planning
- Finance and Economics
- Environmental and Social

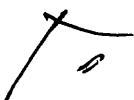
(3) Joint Coordinating Committee (JCC)

A JCC chaired by Director General, DHPS will be established in order to facilitate inter-organizational coordinating and will be responsible for steering and monitoring the Project. JCC will be held whenever deems it necessary, but at least twice a year. A list of proposed members of the JCC is shown in Annex 4.

**List of Proposed Members of Joint Coordinating Committee for
the Project**

1. Composition

- (1) Director General, DHPS
- (2) Representative from GNHC
- (3) Representative from DGPC
- (4) Representative from BPC
- (5) Representatives from JICA Bhutan/ Head Quarters
- (6) Division Heads, DHPS
- (7) JICA Experts
- (8) Project Manager as a member secretary



Framework of the Terms of reference (TOR) for Strategic Environmental Assessment (Draft)

The document describes a framework of the terms of reference for a Strategic Environment Assessment for the Project, and the contents of the document are tentative and subject to change. The details of the Strategic Environment Assessment will be discussed at the beginning of the Project.

(1) Rationale

The Project formulates a Power System Master Plan 2040 of Bhutan. It is required to conduct a Strategic Environmental Assessment (SEA) as the Environmental and Social Considerations for the Project under the following Bhutanese laws, regulation and JICA Guidelines.

- National Environment Protection Act (2007);
- Environment Assessment Act (2000);
- Regulation on Strategic Environmental Assessment (2001), and,
- JICA Guidelines for Environmental and Social Considerations (2010).

The National Guidelines for Strategic Environmental Assessment is being drafted by NEC, and is planned to be finalized by the end of 2017. The Project may use this Guidelines in addition to the above laws, regulations and JICA Guidelines.

The Project will be disclosed to stakeholders in order to seek and reflect their views and comments during the course of the implementation of the SEA.

The Project is categorized as "A" project under the JICA Guidelines for Environmental and Social Considerations (2010), and, therefore, the Project is required to pay special attention to all aspects of natural and social environments and to take appropriate actions to avoid, minimize and mitigate the adverse impacts induced by implementation of the Project.

(2) Description of the SEA

1) Objectives

The objectives are;

- (a) to integrate the Four Pillars of the Gross National Happiness into the Master Plan;
- (b) to facilitate the concept of sustainability being reflected;
- (c) to avoid, mitigate and minimize adverse environmental impacts and/or cumulative environmental impacts, and to enhance positive impacts; and,
- (d) to strengthen and support implementation of environmental and social considerations (e.g. implementation of Environmental Impact Assessment) at project implementation stage.

2) Study areas of the SEA
Entire Bhutan

- 3) Methodology and the steps of the implementation of the SEA
- Consistent and clear environmental objectives of the Project are decided based on the Four Pillars of the Gross National Happiness.
 - Terms of Reference (TOR) of the SEA is drafted and submitted to the National Environment Commission (NEC). Discussions with NEC are held and the TOR is finalized. The SEA is conducted according to the approved TOR.
 - Baseline surveys (including contents of relevant laws and regulations in Bhutan, and baseline data on relevant physical, biological and socio-economic conditions, such as land use, natural environment and a presence of vulnerable communities) are conducted on the environmental and social conditions of the Study area. Secondary data are utilized for the surveys.
 - Scoping (choosing alternatives for analysis, a range of significant and potentially significant impacts, and study methods when deciding policies, plans or programs) of the Project is conducted and the scoping report is submitted to NEC.
 - Based on the results of the scoping, social and environmental surveys are conducted to collect more information.
 - As specified under the Task 2 of annex 2, potential hydropower development sites are evaluated applying Multi Criteria Analysis (MCA) and discussed at Stakeholders Meetings (SHMs) in the steps indicated in Figure 1. The contents of the MCA including criteria are well examined based on the results of the scoping and the surveys, and, if necessary, criteria and others may be modified. Different alternative scenarios are also examined and discussed.

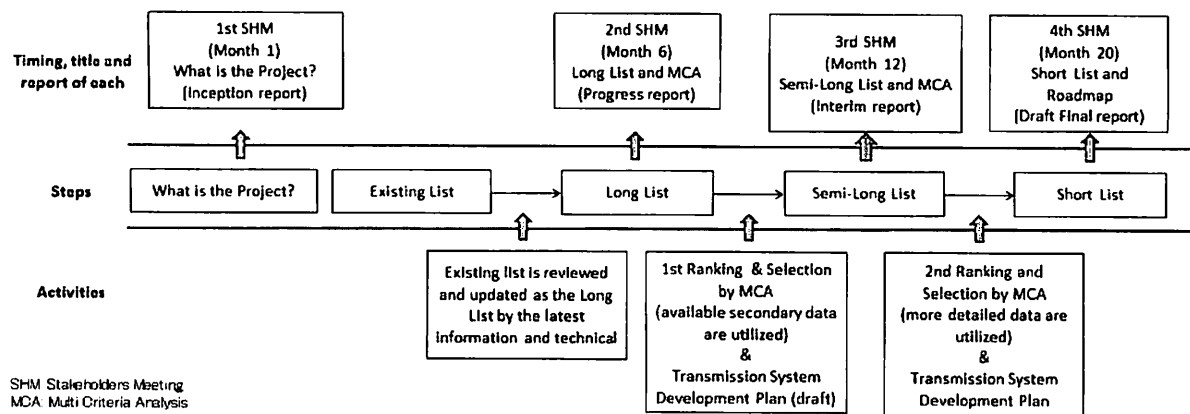


Figure 1 Tentative steps for ranking and selection of hydropower development sites

SHM: Stakeholders Meeting, MCA: Multi Criteria Analysis

- Views and comments from stakeholders are collected and reflected to the Project in the process of developing the lists.
The stakeholders of the Project are tentatively identified as government

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agencies, NGOs, private companies and representatives from Dzongkhags. Four Stakeholders Meetings (SHMs) are held in Thimphu to discuss the contents of the Project. The timings of SHMs are indicated in Figure 1. Exact members of the stakeholders are to be determined by "Stakeholders Analysis" at the stage of drafting the TOR.

All sites listed in the Semi-Long List are visited by the counterparts and the JICA Experts, and representatives of Dzongkhags and Gewogs are interviewed. Their comments are examined and reflected to the Project.

- (h) Monitoring system and method are discussed and established.

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