

**Environmental and Social Considerations in Detailed Planning Survey  
(Technical Cooperation for Developing Planning)**

DATE: 15 September 2017

**1. Full title of the Project**

Project on Power System Master Plan 2040 in Bhutan (hereinafter referred to as “the Project”)

**2. Type of the Project**

Formulation of a master plan

**3. Categorization and Its Reason**

A large-scale project in sensitive sector(s) is categorized as a “Category A project” under the JICA Guidelines for Environmental and Social Considerations (April 2010). 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”.

**4. Agency or Institution Responsible for the Implementation of the Project**

Department of Hydropower and Power Systems (DHPS), Ministry of Economic Affairs, the Royal Government of Bhutan

**5. Outline of the Project**

(1) Expected Goals which will be attained after implementing the Proposed Plan

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

(2) Outputs

The output of the Project includes that:

- The Power System Master Plan 2040 is formulated.
- Government officers are trained during the course of formulating the Power System Master Plan 2040.

## 6. Description of the Project Site

### (1) Target Area

The Project covers the entire land area of Bhutan (Figure 1).



Source: Maps of the World: <http://www.mapsofworld.com/bhutan/>

**Figure 1: Map of Bhutan**

### (2) Description of the Environments

#### (2)-1 Natural Environment

##### 1) Physical environment<sup>1</sup>

Bhutan is a landlocked country of which area is 38,394 km<sup>2</sup>. It borders with China (north) and India (east, west and south). Its terrain is rugged, and the altitude is from 160 m to 7,000 m. There are four (4) main rivers namely Drangme Chu, Puna Tsang Chu, Wang Chu and Mo Chu, and they flows into Brahmaputra River in India. Glaciers in the northern Bhutan consist of about 10 % of the land area and are important water source of the country.

In Bhutan, there are three climate zones (alpine, temperate, subtropical) and dominated by monsoons. Each zone has distinctive vegetations.

##### 2) Ecosystems and species

<sup>1</sup> The Information in this section is from “Statistical Yearbook of Bhutan 2016 (National Statistics Bureau, Royal Government of Bhutan)” unless otherwise noted.

Bhutan is in Eastern Himalaya of which biodiversity is high. Regarding its ecosystems, 70.46% of the land is covered with forests, and their status is reported to be good. There are also many species because of its diversified habitats<sup>2</sup>.

The direct threats to the ecosystems are land use change, forest fire, over logging, firewood collection, over grazing, illegal forest use, poaching, unsustainable agriculture practices, pollution, alien species and human-wildlife conflict. The indirect threats are considered to be climate change, population increase and poverty. Because of these threats, the extinction of species is also a concern in Bhutan<sup>3</sup>.

Conservation International, international nature conservation NGO, identifies Bhutan as part of “Himalaya”<sup>4</sup>, which is one of the “Biodiversity Hotspots” in the world. It means that it is necessary to urgently take appropriate actions to conserve its ecosystems and species.

The cumulative impact on aquatic biodiversity by hydropower development is cited as one of the impacts to be noted in the report “Managing Environmental and Social Impacts of Hydropower Impacts in Bhutan (2016)” prepared by the World Bank and the Royal Government of Bhutan.

In transmission and distribution plan, it is necessary to pay attention to electrocution and collision death of birds and bats<sup>5</sup>. There is not a report on electrocution and collision death of bats. Regarding collision death of birds, collision deaths of White-bellied Heron *Ardea insignis* at Puna Tsang Chhu are reported (Royal Society for Protection of Nature and WWF Bhutan<sup>6</sup>).

### 3) Conservation measures

51.44%<sup>7</sup> of its land is covered with protected areas. The protected area network consists of National Parks (5 sites), Wildlife Sanctuaries (4 sites), Strict Nature Reserve (1 site), Biological Corridors and a recreational park. In the Strict Nature Reserve, there is no permanent residential area and all activities but research works are prohibited. In other protected areas, there are Core Zones, Buffer Zones and Multiple-use Zones. Local people live in the Multiple-use Zones. Core Zone is fully protected, and in which human related activities are not permitted, except for regulated research and

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<sup>2</sup> The Fifth National Report to the Convention of Biological Diversity Secretariat (National Environment Commission, Royal Government of Bhutan)

<sup>3</sup> <https://www.cbd.int/countries/profile/default.shtml?country=bt#facts>

<sup>4</sup> [http://www.conservation.org/global/japan/priority\\_areas/hotspots/asia-pacific/Pages/Himalaya.aspx](http://www.conservation.org/global/japan/priority_areas/hotspots/asia-pacific/Pages/Himalaya.aspx)

<sup>5</sup> Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution (International Finance Corporation, 2007)

<sup>6</sup> Interviews were conducted in on 13 April 2017.

<sup>7</sup> National Biodiversity Strategies and Action Plan (2014)

monitoring programs.

Bhutan is a member state of the Convention Concerning the Protection of the World Cultural and Natural Heritage, but there are no World Natural Heritage Sites. The following four (4) sites are submitted on the Tentative List of the Convention<sup>8</sup>: Royal Manas National Park, Jigme Dorji National Park, Bumdeling Wildlife Sanctuary and Sakteng Wildlife Sanctuary. There are three (3) Ramsar sites<sup>9</sup>: Bumdeling, Gangtey-Phobji and Khotokha.

BirdLife International, international nature conservation NGO, identifies internationally important habitats as Important Bird and Biodiversity Areas (IBAs) and promotes their conservation with local government and NGOs. There are 23 IBAs and only eight (8) of them are under protection of the government<sup>10</sup>.

## (2)-2 Social Environment

### 1) Political system

The political system of Bhutan is the constitutional monarchy which has a bicameral legislative system and 10 ministries. Regional administration in Bhutan is carried out mainly in 20 Dzongkhags, and 205 Gewogs are established under the Dzongkhags.

### 2) Population

The projected population of 2017 is 788,389<sup>11</sup>.

### 3) Industries

Agriculture is the main industry, and the population engaged in agriculture is 58%. Industrial sectors such as the manufacturing industry play only a relatively small role in the economy until recently. The Cottage industry plays an important role in Bhutan where good wood resources and appropriate agricultural conditions are in place. Bhutan's mining industry is relatively undeveloped, and most mining activities are limited to relatively small businesses<sup>12</sup>. Inland water fishery has not developed because of fast flowing rivers and religious reason, and the aquaculture fishery in the south is mainly conducted<sup>13</sup>.

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<sup>8</sup> UNESCO: <http://whc.unesco.org/en/statesparties/BT/>

<sup>9</sup> Ramsar Convention: <http://www.ramsar.org/sites/default/files/documents/library/sitelist.pdf>

<sup>10</sup> Important Bird Areas in Asia: Key sites for conservation (BirdLife International, 2004)

<sup>11</sup> National Statistical Bureau: <http://www.nsb.gov.bt/main/main.php>

<sup>12</sup> Bhutan Statistical Yearbook 2016

<sup>13</sup> A series of interviews was conducted with Department of Hydropower and Power Systems in April 2017.

#### 4) Religion

Bhutan is a Buddhism country and many people still also believe in traditional animism<sup>14</sup>. 75.3% of its population is Lamaistic Buddhist, 22.1% is Indian- and Nepalese-influenced Hinduism and 2.6% is others<sup>15</sup>.

#### 5) Ethnic groups and languages<sup>16</sup>

There are three (3) big ethnic groups in Bhutan, namely Tshanglas, Ngalops and Lhotshampa. Other groups such as Bumthaps, Khengpas, Kurtoeps, Brokpas, Bramis, and Doyas Monpas are also present. 18 languages are recognized in the country and some of them are considered to be on the brink of extinction.

#### 6) Cultural Heritages

There are no World Cultural Heritage Sites, but the following four (4) sites are submitted on the Tentative List of the Convention<sup>17</sup>: Ancient Ruin of Drukgyel Dzong, Dzongs (the centre of temporal and religious authorities: Punakha Dzong, Wangdue Phodrang Dzong, Paro Dzong, Trongsa Dzong and Dagana Dzong), Sacred Sites associated with Phajo Drugom Zhigpo and his descendants and Tamzhing Monastery.

#### 7) Poverty<sup>18</sup>

Gross National Happiness (GNH) is the development philosophy in Bhutan. There are four pillars of GNH; to balance the socioeconomic activities, to protect the natural environment, to protect the traditional culture, and to carry out appropriate governance. During the 11th Five-Year Plan (2013 - 2018), programs to deal with ideas that respond to anti-poverty measures have been conducted under the four pillars of GNH.

The poverty rate in Bhutan decreases from 31.7% in 2003 to 12% in 2012. The government has achieved its goal of the Tenth 5-Year Plan (to reduce the poverty rate to 15%). The reasons are considered to be improvement of infrastructure such as roads, electricity, telecommunication, water supply in rural areas, and implementation of specific poverty alleviation programmes.

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<sup>14</sup> Tourism Council of Bhutan (in Japanese):

[http://www.travel-to-bhutan.jp/about\\_bhutan/%E7%A4%BE%E4%BC%9A%E3%81%A8%E5%AE%97%E6%95%99](http://www.travel-to-bhutan.jp/about_bhutan/%E7%A4%BE%E4%BC%9A%E3%81%A8%E5%AE%97%E6%95%99)

<sup>15</sup> The World Factbook – Bhutan : <https://www.cia.gov/library/publications/the-world-factbook/geos/bt.html>

<sup>16</sup> Tourism Council of Bhutan (in Japanese):

[http://www.travel-to-bhutan.jp/about\\_bhutan/%E7%A4%BE%E4%BC%9A%E3%81%A8%E5%AE%97%E6%95%99](http://www.travel-to-bhutan.jp/about_bhutan/%E7%A4%BE%E4%BC%9A%E3%81%A8%E5%AE%97%E6%95%99)

<sup>17</sup> UNESCO: <http://whc.unesco.org/en/statesparties/BT/>

<sup>18</sup> ELEVENTH FIVE YEAL PLAN 2013-2018

The analysis shows that the poverty is a rural phenomenon, those employed in agriculture are poorer, poverty is less acute in households with educated heads, and poor families also tend to have a bigger family size.

The poverty rates of Dagana, Lhuentse, Pemagatshel, Samdrup Jongkhar, Samtse and Zhemgang Dzongkhags are more than the national average (12%), and the rate of Lhuentse is 31.9% which is the worst of the country. However, the poverty rate and the GNH Index need to be carefully compared. For example, the poverty rate of Lhuentse is the worst in the country but its GNH Index is 0.773 which is categorized as “High category” by the 2015 GNH Survey. Although the Multi-dimensional Poverty Index of Gasa is the worst, its poverty rate is low and the GNH Index is very high.

#### 8) Infectious diseases

The infection rate of HIV/AIDS in Bhutan is low. 380 cases are reported by June in 2014 and the prevalence is 0.15% of the total population<sup>19</sup>. But, the number of patients in 2000 was 38, and the rapid increase of the number is the concern of the government.

Regarding Tuberculosis (TB), it is necessary to pay attention to the situation because 975 cases are reported and 39 patients die in 2015<sup>20</sup>. It is also a concern that patients with Multi Drug Resistant TB and TB/HIV may increase in the future<sup>21</sup>.

## 7. Legal framework of the Environmental and Social Considerations in Bhutan

### (1) Relevant Laws

The Constitution states that Buddhism is the spiritual heritage of Bhutan in Article 3 and preserving, protecting and promoting the cultural heritage of the country in Article 4. In its Article 5, it states protecting, conserving the natural resources of Bhutan, and preventing all forms of ecological degradation. It also states in Article 5 that a minimum of 60% of total land shall be maintained under forest cover for all time, and that the Parliament may, by law, declare any part of the country to a protected area.

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<sup>19</sup> <http://www.unct.org.bt/mdgsinbhutan/>

<sup>20</sup> Statistical Yearbook of Bhutan 2016 (National Statistical Bureau)

<sup>21</sup> ELEVENTH FIVE YEAL PLAN 2013-2018

Based on the National Environment Strategy (1998), National Environment Protection Act, an umbrella act for all environmental legislations, was enacted in 2007. National Environment Commission (NEC) deals with the environmental issues in Bhutan.

Environment Assessment Act was enacted in 2000 to regulate environmental impact assessment (EIA) in all development projects in Bhutan. There are rules and regulations and guidelines related to EIA and Strategic Environmental Assessment (SEA) as follows:

- Regulation on Environmental Clearance of Projects (2016)
- List of Activities that the Competent Authorities shall Screen and Issue Environmental Clearance and List of Activities not requiring Environmental Clearance (2016)
- Regulation on Strategic Environmental Assessment (2001)
- Environmental Assessment General Guidelines (2012) and other guidelines for seven (7) sectors
- National Guidelines for Strategic Environmental Assessment in Bhutan (Draft): It is planned to be finalized in December 2017.

Cultural heritages are essential components of Bhutan, and Department of Culture, Ministry of Home and Cultural Affairs, conserves the cultural heritages including intangible cultural heritages and promotes the conservation of them. Cultural Heritage Act has been drafted<sup>22</sup>. The act (draft) identifies and establishes Movable Cultural Properties, Intangible Cultural Heritages and Cultural Sites, and recognizes conserves the entire country as Cultural Landscape.

The natural resources and biodiversity are the other important components of the country. There are following policies and acts to promote their conservation. Department of Forests and Park Services, Ministry of Agriculture and Forests, is in charge of issues related to biodiversity conservation.

- National Biodiversity Strategies and Action Plan (2014)
- Biodiversity Act of Bhutan (2003)
- National Forest Policy (2010)
- Forest and Nature Conservation Act of Bhutan (1995, revised in 2006)
- Forest and Nature Conservation Rules of Bhutan (2006)

Climate Change Division of NEC is in charge of climate change issues. The estimated sequestration capacity of the forests in 2000 is 6.3MtCO<sub>2</sub>eq<sup>23</sup>, while the total emission in the same year is 1.6 MtCO<sub>2</sub>eq. It means that Bhutan is a net sink for greenhouse gases. However, emissions from sectors

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<sup>22</sup> The interview with Department of Culture, Ministry of Home and Cultural Affairs, on 7 April 2017.

<sup>23</sup> MtCO<sub>2</sub>eq means “equivalent to one million tons of CO<sub>2</sub>”.

such as industrial processes and transport are showing a rapidly increasing trend. Bhutan is highly vulnerable to adverse impacts of climate change due to the fragile mountainous ecosystems and economic structure. It is therefore important for Bhutan to take appropriate mitigation and adaptation measures<sup>24</sup>. Paris Agreement under United Nations Framework Convention on Climate Change is planned to be ratified in May 2017.

Table 1 shows other related laws to the environmental considerations in Bhutan.

**Table 1: Related laws of the environmental considerations in Bhutan**

No.	Name	Relevant authority
1	Waste Prevention and Management Act	Ministry of Works and Human Settlement
2	Waste Prevention and Management Regulation	Ministry of Works and Human Settlement
3	Child Care and Protect Act	National Commission on Women and Children
4	Child Adoption Act	National Commission on Women and Children
5	Domestic Violence Prevention Act	National Commission on Women and Children
6	Disaster Management Act	Ministry of Home and Cultural Affairs
7	Labour and Employment Act	Ministry of Labour and Human Resources

Sources: Detailed Planning Survey Team

Table 2 shows the relevant international conventions of which Bhutan is a member state.

**Table 2: Relevant international conventions**

No.	Name
1	Convention on Wetlands of International Importance especially as Waterfowl Habitat
2	Convention Concerning the Protection of the World Cultural and Natural Heritage
3	Convention on International Trade in Endangered Species of Wild Fauna and Flora
4	Convention on Biological Diversity
5	United Nations Framework Convention on Climate Change
6	Convention on the Elimination of All Forms of Discrimination against Women
7	Convention on Rights of the Child
8	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

Sources: From the website of each convention.

## (2) Environmental Impact Assessment

### 1) National Environment Commission

National Environment Commission (NEC) was established under National Environment Protection Act (2002) as the highest decision-making body on all matters relating to the environment and its management. One of its roles is to mainstream the environment into planning processes, and

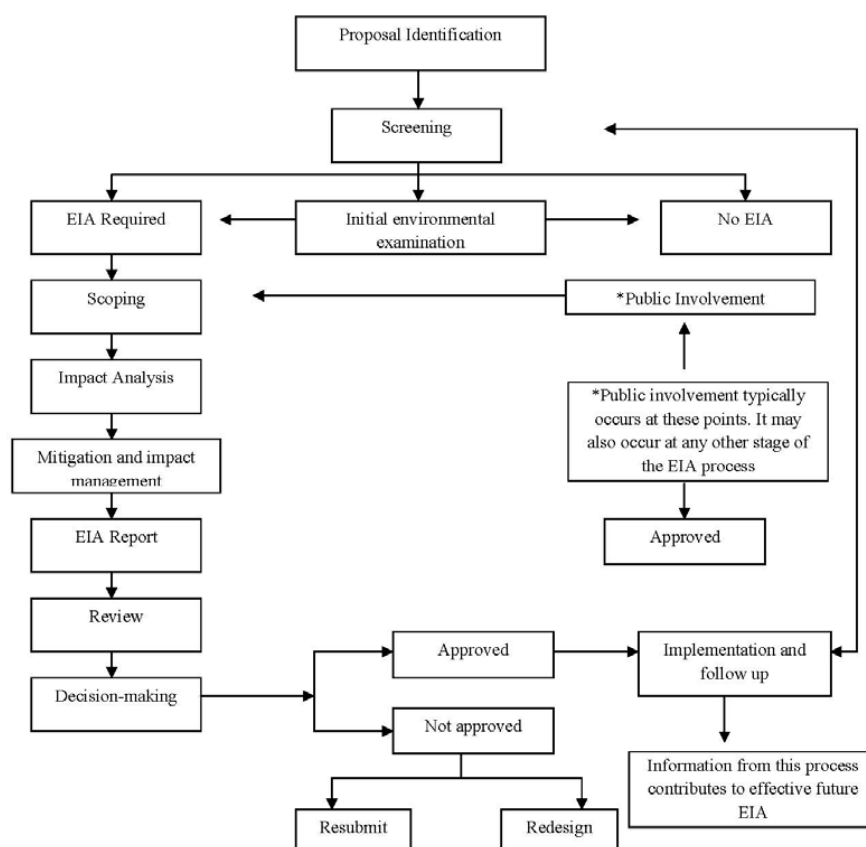
<sup>24</sup> Intended Nationally Determined Contribution (2015) submitted to the 21<sup>st</sup> Conference of parties for United Nations Framework Convention on Climate Change : UNFCCC



Environment Assessment Act (2000) and Environmental Impact Assessment (EIA) are the important tools to implement the role.

## 2) Process of EIA

Figure 2 shows the flow of EIA process.



Source: Environmental Assessment General Guidelines (2012)

**Figure 2: Flowchart of EIA process**

## (2) Strategic Environmental Assessment

### 1) Legislation

Legislation regarding the implementation of SEA is Environment Assessment Act (2000) and Regulation on Strategic Environmental Assessment (2001). National Guidelines for Strategic Environmental Assessment in Bhutan is being drafted and is planned to be finalized in December 2017.

### 2) Proposed process of SEA

The National Guidelines (Draft) summarizes the process which consists of six (6) stages (Table 3). After the SEA is implemented, it is necessary to submit it to NEC with an Environment Statement

and be approved.

**Table 3: Proposed process of SEA**

<b>STAGE 1: SCREENING</b>
<ul style="list-style-type: none"> <li>The proponent screens its proposed Policy, Programme and Plan (PPP) to determine if it is likely to have significant environmental and social impacts. The proponent may convene an expert group to help with screening and/or seek advice from NEC Secretariat (NECS).</li> <li>Where such impacts are deemed likely, the proponent must undertake an SEA and proceeds to Stage 2.</li> <li>Where no such impacts are deemed likely, the proponent should indicate this in its PPP proposal before submitting to the GNHC for further screening prior to submission to Cabinet.</li> </ul>
<b>STAGE 2: PREPARATORY STEPS AND SCOPING</b>
<p><b>Preparatory steps</b></p> <ul style="list-style-type: none"> <li>Proponent to establish SEA management team/mechanism.</li> <li>Developing SEA Terms of Reference. <ul style="list-style-type: none"> <li>Setting overall objectives, requirements, products, and initial stakeholder analysis</li> <li>Identifying key issues to be addressed (to be refined during scoping)</li> <li>Constituting the SEA team (in-house staff or engaging expert consultants)</li> </ul> </li> <li>Appoint team of experts to undertake SEA.</li> <li>Start clarifying goals, objectives decision criteria (e.g. for selected preferred alternative) and who should be involved (other agencies, stakeholders, etc.) (this continued during scoping).</li> </ul> <p><b>Scoping</b> (some elements may be done in parallel):</p> <ul style="list-style-type: none"> <li>Stakeholder analysis and prepare participation strategy.</li> <li>Stakeholder workshop – to explain the SEA (reason and process), scope key issues, identify SEA objectives.</li> <li>Identify key sources of data and information.</li> <li>Initiate collection of baseline data and new research/field studies (where required).</li> <li>Identify alternatives (to PPP or to possible PPP components).</li> <li>Preparation of scoping report and subjection to public comment.</li> <li>Review of scoping report by the PPP proponent.</li> </ul>
<b>STAGE 3: ASSESSMENT</b>
<p>Assessment should be carried out in two stages:</p> <ol style="list-style-type: none"> <li><b>Assessment of alternatives</b> to PPP or its components (leading to <i>interim SEA report</i>– circulated to stakeholders for comment, The proponent should then select a preferred alternative and provide an explanation of how the findings of the assessment of alternatives assessment and consultations were taken into account in the preferred option.</li> <li><b>Assessment of preferred alternative</b>– more focused and detailed - (leading to <i>SEA report</i> including identification of the detailed mitigation needed to avoid the significant effects.</li> </ol> <p>Both steps should involve:</p> <ul style="list-style-type: none"> <li>Continued analysis of available baseline data and new data from research/field studies.</li> <li>Continued stakeholder engagement.</li> <li>Identification of environment and social impacts (positive and negative; direct, indirect, cumulative).</li> <li>Identification of options for enhancing positive impacts and avoiding /minimizing /mitigating negative impacts.</li> </ul>
<b>STAGE 4: REPORTS AND REVIEW</b>
<p><b>Draft reports</b></p> <ul style="list-style-type: none"> <li>Preparation of <i>Interim SEA report</i> (during Stage 3).</li> <li>Preparation of <i>first draft SEA report</i> (with non-technical executive summary) and <i>ancillary reports</i> (e.g. reports on special studies),</li> <li>In some circumstances, a stand-alone <i>Strategic Environmental and Social Management Plan</i> (SESMP) may be warranted.</li> </ul>

<p><b><u>Internal review</u></b></p> <ul style="list-style-type: none"> <li>• <i>Administrative review</i> of first draft reports by proponent (ensure compliance with basic requirements).</li> <li>• <i>Technical review</i> of first draft reports by proponent.</li> </ul> <p><b><u>Scrutiny workshop</u></b></p> <ul style="list-style-type: none"> <li>• Draft SEA report (and draft SESMP where required) presented at a workshop involving the proponent and NECS - to agreed SEA recommendations for adoption in the PPP.</li> </ul> <p><b><u>Revision</u></b></p> <ul style="list-style-type: none"> <li>• Revision and preparation of <i>second draft SEA</i> report (and SESMP report where required).</li> </ul> <p><b><u>Stakeholder/public comments</u></b></p> <ul style="list-style-type: none"> <li>• Provision of second draft reports to key stakeholders for comment and feedback.</li> <li>• Issuance of a <i>notice</i> regarding the second draft SEA and SESMP in a newspaper with a nationwide circulation (e.g. Kuensel) (indicating where they can be accessed within a stated time limit for public review and comment).</li> <li>• Workshop for stakeholders to discuss and comment on reports – convened by PPP proponent.</li> </ul> <p><b><u>Finalise SEA report</u></b></p> <ul style="list-style-type: none"> <li>• Preparation of final version of SEA report (and SESMP where required).</li> </ul> <p><b><u>Regulatory review</u></b></p> <ul style="list-style-type: none"> <li>• NECS will review the final SEA documents. To assist it, the NECS may: <ul style="list-style-type: none"> <li>○ constitute a Technical Advisory Committee (TAC) to review and provide independent technical comments on the SEA (and SESMP where required).</li> <li>○ set up an Independent Expert Commission to review SEAs having transboundary impacts (would require agreement/collaboration with other affected country). (Note: such SEAs would need to be undertaken in collaboration with appropriate agencies in the other affected country, and the review mechanism agreed at the outset).</li> </ul> </li> </ul>
<p><b>STAGE 5: DECISION-MAKING ON SEA</b></p> <ul style="list-style-type: none"> <li>• NECS will make the final decision on the adequacy/acceptability of SEA report (and SESMP where required) by issuing an approval with conditions (if necessary).</li> </ul> <p><b><u>Finalising the PPP</u></b></p> <ul style="list-style-type: none"> <li>• The proponent will incorporate the findings and recommendations of the SEA (and SESMP where required) in the PPP.</li> <li>• To comply with the SEA Regulation 2002, the proponent will prepare an <i>Environmental Statement</i> (ES) - elements are specified in the Regulation - drawing from the SEA report.</li> <li>• The ES will be included in the draft of the PPP proposal to be submitted to the GNHC for screening prior to submission to Cabinet [<i>this may change when the regulation is revised</i>].</li> </ul>
<p><b>STAGE 6: MONITORING AND EVALUATION OF PPP</b></p> <ul style="list-style-type: none"> <li>• The PPP proponent is responsible for monitoring and evaluation of the implementation of the PPP, guided by the monitoring recommendations in the SEA report (or by the SESMP where prepared).</li> <li>• NECS shall oversee the monitoring and evaluation process by the PPP proponent.</li> </ul>

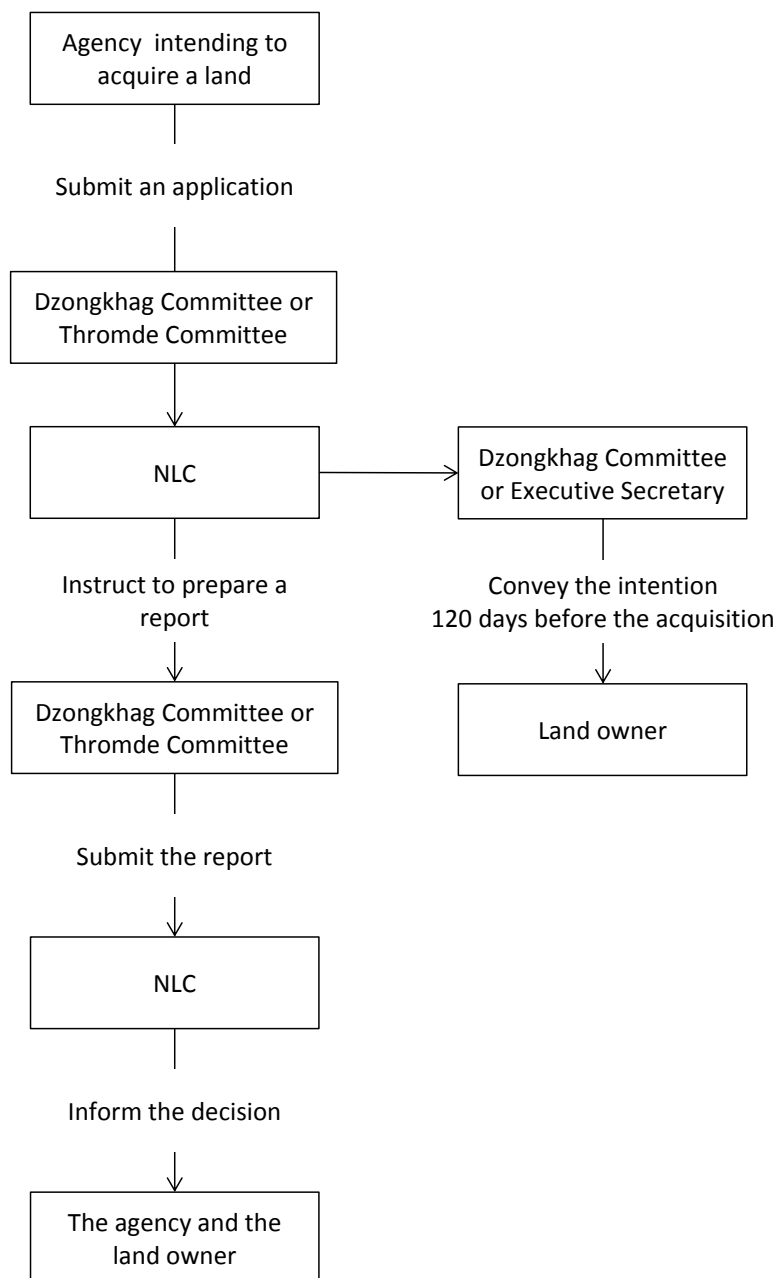
Source: National Guidelines for Strategic Environmental Assessment in Bhutan (Draft)

#### (4) Land Acquisition

Land acquisition for public project is conducted based on Land Act (2007) and Land Rules and Regulations (2007). National Land Commission is in charge of its implementation. Although there is no legislation related to involuntary resettlement, various acts and regulations such as Environmental Assessment Act (2002) require public consultations in their implementation. The purchase cost of

the land applies the official price (Land Compensation Rates 2017) set by Property Assessment and Valuation Agency.

Figure 3 shows the flow of land acquisition. Compensation is made to land owners before land acquisition.



Source: Land Rules and Regulations (2007)

**Figure 3: Flowchart of land acquisition**

(5) Other clearances

According to the “Application for Environmental Clearance: Guideline for Hydropower Project, 2004 (NEC)”, the No Objection Certificates (i.e. clearances) shown in Table 4 are necessary for obtaining Environmental Clearance for hydropower project but in some cases they are not necessary.

**Table 4: Checklist for No Objection Certificates (Clearances)**

Agency/ concerned people to issue NOC	Reason
Dzongkhag / City Corporation	Administrative Approval from Dzongkhag
Department of Forest	Should the project damage or acquire <i>Tsamdo</i>
Department of Forest	Should the project damage or acquire <i>Sokshing</i>
Department of Culture	Should the project be located within 50m of a cultural or religious site
Nature Conservation Division	Within boundary of a Protected Area
Municipal Authority	Within 50m of a public park
Private owner	Within 50m of a human dwelling
Private property owners	Should the project need to acquire private property
Department of Health	Within 50m of hospital
Department of Education	Within 50m of school
Department of Energy	Should the project require the relocation of power transmission line
Bhutan Telecom Authority	Should the project require the relocation of telephone lines
Department of Roads	Should the project require access from highways and feeder roads

Source: Application for Environmental Clearance: Guideline for Hydropower (2004)

In addition, NEC publishes a checklist on the website on what are necessary for Environmental Clearance procedures (Table 5).

**Table 5: Checklist for processing Environmental Clearance and Renewal**

	New Application for EC	Renewal of EC
1	Application routed through Competent Authority	Application with a copy of Environmental Clearance
2	Duly filled IEE form	Forwarding letter from the concerned Competent Authority
3	Dzongkhag or Thromde Administrative Approval based on location	Compliance report
4	Forestry Clearance if the activity passes through State Forest Land	If all the above information is completed, the concern officer to do the following: a. Collect application fee; and b. Register and acknowledge the application.
5	Public Consultation documents containing the records of the discussion verified and authenticated by the local authority	
6	Water abstraction permits from concerned local authority, if there is any water abstraction activity	
7	If all the above information is completed, the concern officer to do the following: a. Collect application fee; and b. Register and acknowledge the application.	

Source: Checklist for processing Environmental Clearance and Renewal (NEC)

Regarding the clearances related to project, after having sufficient consultation with the competent authority, it is necessary to confirm the content of each clearance and obtain necessary clearances from related organizations.

#### **8. Provisional Scoping**

A provisional scoping is conducted for the Project. The results are shown in Table 6 (hydropower development) and Table 7 (transmission lines development).

**Table 6: Provisional Scoping of the Project (hydropower development)**

Cate- gory	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
Pollution Control	1	Air quality	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Air pollution caused by heavy machines and vehicles is expected.</li> <li>➤ Air pollution by dust around roads and other places is expected.</li> </ul> <p>[Operation and monitoring stage (O&amp;M stage)]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	2	Water quality	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Water pollution by oil and others from heavy machines and vehicles is expected.</li> <li>➤ Water pollution by surplus soil from underground facility construction sites containing minerals is expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	3	Wastes	B-	B-	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Wastes from construction sites are expected.</li> <li>➤ It may be necessary to find soil dumping sites.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ Wastes from power station and other facilities are expected.</li> </ul>
	4	Soil contamination	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Soil contamination by oil and others from heavy machines and vehicles is expected.</li> </ul>

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Category	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					<ul style="list-style-type: none"> <li>➤ Soil contamination by surplus soil from underground facility construction sites containing minerals from is expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	5	Noise and vibration	B-	B-	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Noise and vibration from heavy machines and vehicles are expected.</li> <li>➤ Noise and vibration during road works are expected.</li> <li>➤ Noise from blasting are expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ Noise from substations is expected.</li> </ul>
	6	Subsidence	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Ground subsidence may happen because of underground facility construction.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	7	Odor	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Odor from wastes and sewage from construction sites are expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	8	Sediment	B-	B-	[Construction Stage]



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Category	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					<ul style="list-style-type: none"> <li>➤ Sediments of rivers are affected because of weir or dam construction.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ Sediments of rivers are affected by the operation of hydropower plants.</li> </ul>
Natural Environment	9	Protected areas	A-	A-	[Construction stage] <ul style="list-style-type: none"> <li>➤ Activities in buffer zone of protected area are expected.</li> <li>➤ If there are protected areas downstream of the river, impacts on them are expected because of change of river flow.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ If there are protected areas downstream of the river, impacts on them are expected because of change of river flow and sediments.</li> <li>➤ Although impacts are expected to be small, maintenance activities may give impacts to protected area if the project is located close to protected area.</li> </ul>
	10	Ecosystem	A-	A-	[Construction stage] <ul style="list-style-type: none"> <li>➤ Impacts on terrestrial ecosystems outside protected areas are expected.</li> <li>➤ Impacts on aquatic ecosystem of rivers are expected.</li> <li>➤ Impacts on terrestrial and aquatic ecosystems downstream of rivers are expected.</li> <li>➤ Alien species for protection of slopes may give impacts on domestic species.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ Impacts on terrestrial ecosystems outside protected areas are expected.</li> </ul>

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Category	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					<ul style="list-style-type: none"> <li>➤ Impacts on aquatic ecosystem of rivers are expected.</li> <li>➤ Impacts on terrestrial and aquatic ecosystems downstream of rivers are expected because of change of river flow and sediments.</li> </ul>
	11	Hydrology	A-	A-	Impacts caused by change of river flow and sediments are expected.
	12	Topography and geology	B-	B-	[Construction stage] <ul style="list-style-type: none"> <li>➤ Construction works in mountainous areas may cause soil erosions and slope failures.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ Some access roads may be prone to soil erosions and slope failures.</li> <li>➤ Earthquake caused by reservoir may be expected.</li> </ul>
Social Environment	13	Involuntary resettlement	B-	D	[Planning stage] <ul style="list-style-type: none"> <li>➤ Involuntary resettlement may occur.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	14	Poor people	C	C	No particular negative impact by the Project is expected, and some positive impacts may occur. However impacts will be evaluated again when the content of the Project is determined.
	15	Indigenous or ethnic minority	D	D	Various languages and traditional culture exist in Bhutan, and the constitution respects their languages and cultures and preserves them. Therefore no particular negative impact by the Project is expected

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Category	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
	16	Local economies, such as employment, livelihood	B+	B-	<p>[Construction stage]</p> <ul style="list-style-type: none"> <li>➤ Employment by the Project is expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ Unemployment may become an issue after the completion of construction.</li> </ul>
	17	Land use and utilization of local resources	B-	C	<p>[Planning stage]</p> <ul style="list-style-type: none"> <li>➤ Land use and utilization of local resources may change.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ Negative impacts and positive impacts are expected because of change of land use and utilization of local resources. However impacts will be evaluated again when the content of the Project is determined.</li> </ul>
	18	Water usage	C	C	Although the impacts caused by the change water flow in rivers are expected, details of water use are unknown. Impacts will be evaluated again when the content of the Project is determined.
	19	Existing social infrastructures and services	B-	C	<p>[Construction stage]</p> <ul style="list-style-type: none"> <li>➤ Impacts by new construction works such as construction site and new access roads are expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No particular negative impact by the Project is expected, and some positive impacts such as road renovation may occur. However impacts will be evaluated again when the</li> </ul>

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Cate -gory	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					content of the Project is determined.
	20	Social institutions such as social infrastructure and local decision-making institutions	C	C	No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	21	Misdistribution of benefits and damages	B-	C	<p>[Planning stage]</p> <ul style="list-style-type: none"> <li>➤ If involuntary resettlement is necessary, misdistribution of benefits and damages may occur.</li> <li>➤ There is a possibility that not only economic damages and benefits but also impacts on traditional lives of local people may occur.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.</li> </ul>
	22	Local conflicts of interest	B-	C	<p>[Planning stage]</p> <ul style="list-style-type: none"> <li>➤ If involuntary resettlement is necessary, misdistribution of benefits and damages may occur.</li> </ul>

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Cate -gory	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					[O&M stage] ➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	23	Cultural heritages	B-	C	[Planning stage] ➤ Traditional culture described in one of the four pillars of GNH may be affected. ➤ Impacts on movable cultural properties, intangible cultural heritages and cultural sites are expected. [O&M stage] ➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	24	Landscape	B-	B-	[Planning stage] ➤ Impacts on movable cultural properties, intangible cultural heritages and cultural sites are expected. [Construction stage] ➤ Impacts by construction works are expected. [O&M stage] ➤ Impacts by soil erosions and slope failures along access roads are expected depending on topography and geology.
	25	Gender	C	C	No particular negative impact by the Project is expected, however impacts will be evaluated

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Cate -gory	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					again when the content of the Project is determined.
	26	Children's rights	C	C	No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	27	Infectious diseases such as HIV/AIDS	B-	C	[Construction stage] ➤ Infectious diseases may be spread because of the inflow of external workers. [O&M stage] ➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	28	Labor conditions	B-	B-	[Construction stage] ➤ Accidents of workers are expected. ➤ Diseases caused by dust are expected. [O&M stage] ➤ Accidents such as a traffic accident during maintenance activities are expected.
Others	29	Accidents	B-	B-	[Construction stage] ➤ Accidents and traffic congestions by construction works are expected. ➤ Accidents to neighboring residents including electrocution are expected. ➤ Accidents such as slope failures are expected. [O&M stage] ➤ Short-circuit accidents at substations and fires accompanying short-circuit accidents

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Cate- gory	No.	Environmental Item (hydropower)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					are expected. ➤ Slope failures along access roads are expected depending on topography and geology. ➤ Accidents such as a traffic accident during maintenance activities are expected.
	30	Trans-boundary impacts / global warming	B-	A+	[Construction stage] ➤ Emissions from forest clearance are expected. ➤ Emissions from heavy machines and vehicles are expected. [O&M stage] ➤ Contribute to the reduction of carbon emissions at regional level by exporting electricity to neighboring.

A+/-: Significant positive/negative impact is expected. B+/-: Positive/negative impact is expected to some extent. C: Extent of positive/negative impact is unknown. A further examination is needed, and the impact could be clarified as the study progress. D: No impact is expected.

**Table 7: Provisional Scoping of the Project (transmission lines development)**

Cate- gory	No.	Environmental  Item (transmission lines)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
Pollution Control	1	Air quality	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Air pollution caused by heavy machines and vehicles is expected.</li> </ul> <p>[Operation and monitoring stage (O&amp;M stage)]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	2	Water quality	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Water pollution by oil and others from heavy machines and vehicles is expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	3	Wastes	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Wastes from construction sites are expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	4	Soil contamination	B-	D	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Soil contamination by oil and others from heavy machines and vehicles is expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	5	Noise and vibration	B-	B-	<p>[Construction Stage]</p> <ul style="list-style-type: none"> <li>➤ Noise and vibration from heavy machines and vehicles are expected.</li> </ul>



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Cate- gory	No.	Environmental Item (transmission lines)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					<ul style="list-style-type: none"> <li>➤ Noise and vibration during road works are expected. [O&amp;M stage]</li> <li>➤ Noise from substations is expected.</li> </ul>
	6	Subsidence	D	D	No activities which give negative impacts are planned.
	7	Odor	B-	D	[Construction Stage] <ul style="list-style-type: none"> <li>➤ Odor from wastes and sewage from construction sites are expected. [O&amp;M stage]</li> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	8	Sediment	D	D	No activities which give negative impacts are planned.
Natural Environment	9	Protected areas	B-	B-	[Construction stage] <ul style="list-style-type: none"> <li>➤ Activities in buffer zone of protected area are expected.</li> <li>➤ If transmission line crosses a biological corridor, division of the protected area is expected.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ Although impacts are expected to be small, maintenance activities may give impacts to protected area if the project is located close to protected area.</li> </ul>
	10	Ecosystem	B-	B-	[Construction stage] <ul style="list-style-type: none"> <li>➤ Impacts on terrestrial ecosystems outside protected areas are expected.</li> </ul> [O&M stage]

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Cate- gory	No.	Environmental Item (transmission lines)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					<ul style="list-style-type: none"> <li>➤ Impacts on terrestrial ecosystems outside protected areas are expected.</li> <li>➤ Although impacts are expected to be small, collisions and electrocutions of Indian Flying Fox and birds are expected.</li> </ul>
	11	Hydrology	D	D	No activities which give negative impacts are planned.
	12	Topography and geology	B-	B-	[Construction stage] <ul style="list-style-type: none"> <li>➤ Construction works in mountainous areas may cause soil erosions and slope failures.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ Some transmission tower sites and access roads are prone to soil erosions and slope failures.</li> </ul>
Social Environment	13	Involuntary resettlement	C	D	[Planning stage] <ul style="list-style-type: none"> <li>➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.</li> </ul> [O&M stage] <ul style="list-style-type: none"> <li>➤ No activities which give negative impacts are planned.</li> </ul>
	14	Poor people	C	C	No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	15	Indigenous or ethnic minority	D	D	Various languages and traditional culture exist in Bhutan, and the constitution respects their languages and cultures and preserves them. Therefore no particular negative impact by the Project is expected.

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Category	No.	Environmental Item (transmission lines)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
	16	Local economies, such as employment, livelihood	B+	C	[Construction stage] ➤ Employment by the Project is expected. [O&M stage] ➤ Unemployment may become an issue after the completion of the construction.
	17	Land use and utilization of local resources	B-	B-	[Construction stage] ➤ Cash crops such as fruit trees are cut down under transmission lines and at tower sites. [O&M stage] ➤ Restrictions are imposed under transmission lines.
	18	Water usage	D	D	No activities which give negative impacts are planned.
	19	Existing social infrastructures and services	B-	C	[Construction stage] ➤ Although impacts are expected to be small, impacts on road traffic are expected. [O&M stage] ➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	20	Social institutions such as social infrastructure and local	C	C	No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.

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Category	No.	Environmental Item (transmission lines)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
		decision-making institutions			
	21	Misdistribution of benefits and damages	B-	B-	[Construction stage] ➤ Cash crops such as fruit trees are cut down under transmission lines and at tower sites. [O&M stage] ➤ Restrictions are imposed under transmission lines.
	22	Local conflicts of interest	B-	B-	[Construction stage] ➤ Cash crops such as fruit trees are cut down under transmission lines and at tower sites. [O&M stage] ➤ Restrictions are imposed under transmission lines.
	23	Cultural heritages	B-	C	[Planning stage] ➤ Impacts on movable cultural properties, intangible cultural heritages and cultural sites are expected. [O&M stage] ➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	24	Landscape	B-	B-	[Planning stage] ➤ Impacts on movable cultural properties, intangible cultural heritages and cultural sites are expected.

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Category	No.	Environmental Item (transmission lines)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					<p>[Construction stage]</p> <p>➤ Impacts by construction works are expected.</p> <p>[O&amp;M stage]</p> <p>➤ Impacts by soil erosions and slope failures at tower sites and along access roads are expected depending on topography and geology.</p>
	25	Gender	C	C	No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	26	Children's rights	C	C	No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
	27	Infectious diseases such as HIV/AIDS	B-	C	<p>[Construction stage]</p> <p>➤ Infectious diseases may be spread because of the inflow of external workers.</p> <p>[O&amp;M stage]</p> <p>➤ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.</p>
	28	Labor conditions	B-	B-	<p>[Construction stage]</p> <p>➤ Accidents of workers are expected.</p> <p>[O&amp;M stage]</p> <p>➤ Accidents such as traffic accidents during maintenance activities are expected.</p>
○	29	Accidents	B-	B-	[Construction stage]

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Cate- gory	No.	Environmental Item (transmission lines)	Evaluation		Explanation of impacts
			Planning and construction stages	Operation & monitoring stage	
					<ul style="list-style-type: none"> <li>➤ Accidents and traffic congestions by construction works are expected.</li> <li>➤ Accidents to neighboring residents including electrocution are expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ Short-circuit accidents at substations and fires accompanying short-circuit accidents are expected.</li> <li>➤ Slope failures along access roads are expected depending on topography and geology.</li> <li>➤ Accidents such as traffic accidents during maintenance activities are expected.</li> </ul>
	30	Trans-boundary impacts / global warming	B-	B+	<p>[Construction stage]</p> <ul style="list-style-type: none"> <li>➤ Emissions from forest clearance are expected.</li> <li>➤ Emissions from heavy machines and vehicles are expected.</li> </ul> <p>[O&amp;M stage]</p> <ul style="list-style-type: none"> <li>➤ Positive impact is expected because of reduction of transmission line losses.</li> </ul>

A+/-: Significant positive/negative impact is expected. B+/-: Positive/negative impact is expected to some extent. C: Extent of positive/negative impact is unknown. A further examination is needed, and the impact could be clarified as the study progress. D: No impact is expected.

## **9. Alternative to the Project Activities including “Zero (without project)” Option**

Potential hydropower development sites are evaluated and selected applying Multi Criteria Analysis (MCA) and discussed at Stakeholders Meetings (SHMs) during the course of the Strategic Environmental Assessment (SEA) as described in “11. Terms of Reference for the Environmental and Social Considerations”. Different alternative scenarios are also examined and discussed in the SEA.

## **10. Result of the Consultation with the Recipient Government on the Environmental and Social Considerations including Roles and Responsibilities**

The Detailed Planning Survey Team explains to the counterparts of the Bhutan that the Project shall comply with the national laws, guidelines and the “JICA Guidelines for Environmental and Social Considerations (2010)”. Both parties agree on the compliance to ensure that appropriate considerations shall be implemented for the environmental and social impacts expected by the Project. The Team also explains that a SEA shall be conducted in the Project as part of a master plan study, and it shall involve related stakeholders.

## **11. Terms of Reference for the Environmental and Social Considerations<sup>25</sup>**

### **(1) Rationale**

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

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<sup>25</sup> It 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.

The Project is categorized as “A” project under the JICA Guidelines, 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

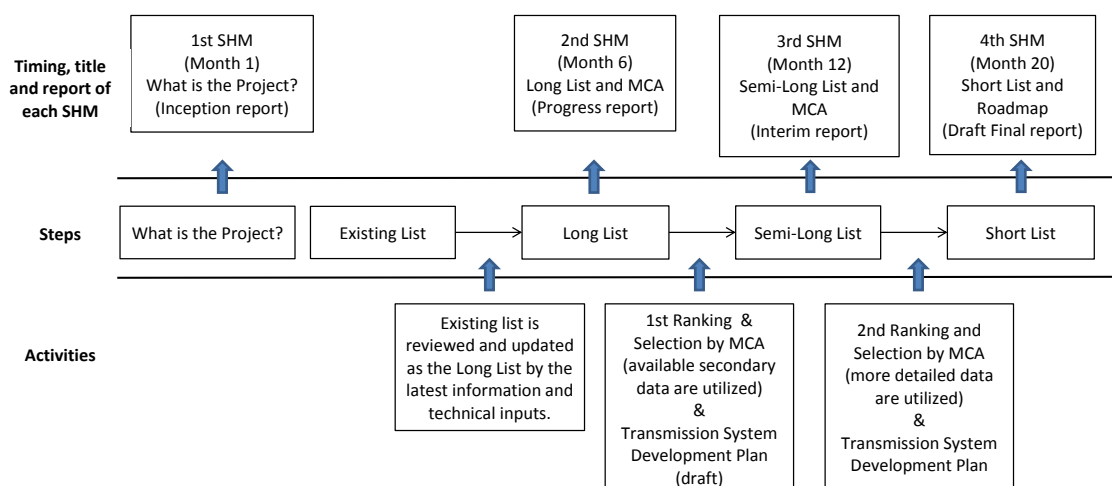
Entire Bhutan

3) Methodology and the steps of the implementation of the SEA

- (a) Consistent and clear environmental objectives of the Project are decided based on the Four Pillars of the Gross National Happiness.
- (b) 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.
- (c) 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.
- (d) 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.
- (e) Based on the results of the scoping, social and environmental surveys are conducted to collect more information.
- (f) 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 4: Tentative steps for ranking and selection of hydropower development sites**

SHM: Stakeholders Meeting, MCA: Multi Criteria Analysis

- (g) 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 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.

End of the document