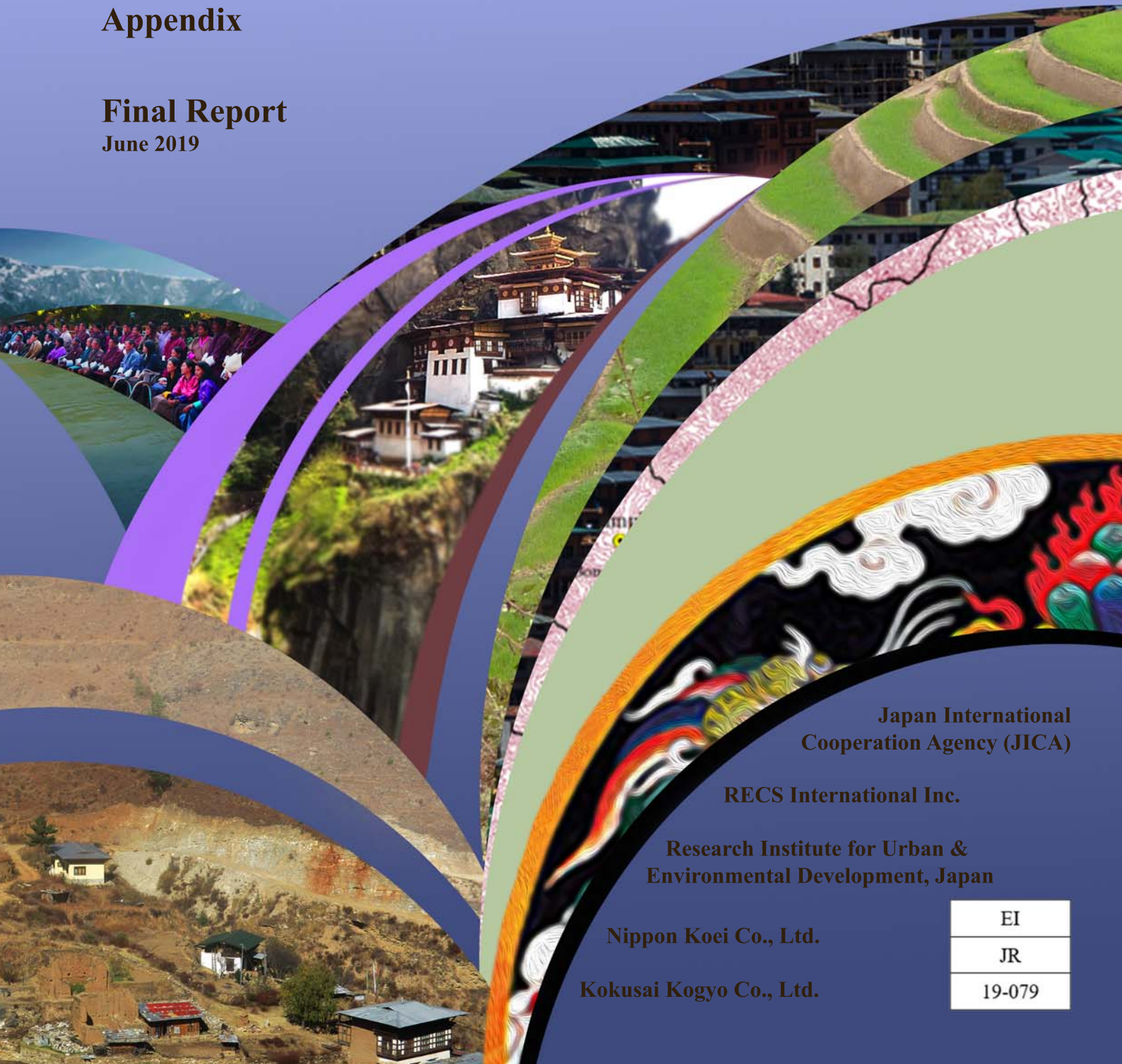




# The Project for Formulation of Comprehensive Development Plan for Bhutan 2030

## Volume IV Appendix

**Final Report**  
June 2019



Japan International  
Cooperation Agency (JICA)

RECS International Inc.

Research Institute for Urban &  
Environmental Development, Japan

Nippon Koei Co., Ltd.

Kokusai Kogyo Co., Ltd.

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**Ministry of Works and Human Settlement  
(MoWHS)**



**Japan International Cooperation Agency  
(JICA)**

**The Project for  
Formulation of Comprehensive Development Plan  
for  
Bhutan 2030**

**Final Report**

**Volume IV  
Appendix**

**June 2019**

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**Appendix 1**

**Terms of Reference (TOR)**  
**for**  
**Strategic Environmental Assessment (SEA)**  
**for**  
**the Project for Formulation of Comprehensive**  
**Development Plan for Bhutan 2030**



**Terms of Reference (TOR)**  
**for**  
**Strategic Environmental Assessment (SEA)**  
**for**  
**the Project for Formulation of Comprehensive Development Plan for Bhutan 2030**

**1. Introduction**

The principle of national policy in Bhutan is well-balanced development and prosperity between urban and rural. However, Bhutan faces increasing rural-urban migration, mainly from east to west. This rural-urban migration is deemed as a contributory factor to the problems faced by rural areas. Some of these problems include labour shortages leading to fallow agricultural land and socio-cultural break-up. Further, this influx of population heading to the main cities, such as Thimphu, is linked to rising unemployment.

One of the causes of domestic migration is estimated to be the gap in the level of feeling happiness between urban and rural areas. According to the result of the third Gross National Happiness (GNH) survey conducted in 2015, the GNH Index in urban areas was estimated to be 0.811, compared to 0.731 in rural areas. In addition, according to the Poverty Analysis 2012, the poverty rate for urban areas is predicted to be 1.8%, compared to 16.7% in rural areas.

With a view to addressing the issue of rural-urban migration and promoting regionally balanced development, the Royal Government of Bhutan (RGoB) is planning to initiate sectorial interventions, such as the development of special economic zones, industrial estates, hydropower projects, tourism, farming and agro-based industries. In this context, the RGoB requested the Government of Japan to implement “The Project for Formulation of Comprehensive Development Plan for Bhutan 2030” (hereafter known as “the Project”), with the aim to promote a comprehensive and coordinated approach to development.

In response to the request from the RGoB, the Japan International Cooperation Agency (JICA), the official agency for official development assistance, decided to undertake the Project starting with a mission being dispatched to carry out a detailed planning survey. The JICA mission and the Gross National Happiness Committee (GNHC) signed a Record of Discussions (RD) with witness by the Ministry of Works and Human Settlement (MoWHS) in respect to conducting the Project on 18 August 2016. Based on the RD, the Project has commenced in January 2017 by dispatching a mission consisting of experts covering necessary expertise for formulating the Comprehensive Development Plan.

In the meantime, the Environmental Assessment Act (2000) and the National Environmental Act (2007) represent the legal basis for environmental and social considerations in Bhutan. In turn, the Regulation on SEA (2001) was enacted to specify the implementation of an SEA. Detailed procedures were presented in the National Guidelines (Draft) for the SEA (SEA Guidelines) in 2016. In the process of formulating the Comprehensive Development Plan, SEA will be undertaken with participation of various levels of stakeholders to be affected by the implementation of it.

The SEA process of this Project and its methodology will basically follow the procedures set out in the SEA Guidelines. At the same time, however, the SEA will also be conducted

considering the provisions in the JICA Guidelines for Environmental and Social Considerations (JICA Guidelines) stipulated in 2010.

## **2. Objectives and Benefits of SEA**

SEA is a vital to guide and support the development plan and decision-making for its formulation by identifying and assessing critical environmental and social issues. The objectives and benefits of the application of SEA in the Project are as follows:

- To make the formulation process more effective in terms of better decision-making for evaluation of the development plan,
- To avoid and/or minimize significant negative impacts and to enhance positive impacts by the implementation of the development plan,
- To create a good opportunity for the Project Proponent and other stakeholders to experience SEA process and understand its effectiveness for the development plan and decision making,
- To evaluate the development alternatives from a wide range of viewpoints including physical, natural, social, economic, cultural and health aspects, and the concept of GNH, and so on, and
- To avoid unnecessary revision of the project components and activities in the following implementation stage of the development plan and the cost for it by applying SEA at the planning stage.

## **3. Outline of the Project**

The Project for Formulation of Comprehensive Development Plan for Bhutan 2030 (“The Project”) has commenced in January 2017. The Proponent (Lead Agency) of the Project is Department of Human Settlement (DHS), Ministry of Works and Human Settlement (MoWHS). Outline of the Project is as follows:

### **(1) Objectives of the Project**

- To formulate a Comprehensive National Development Plan (CNDP) for Bhutan,
- To promote well-balanced development in urban and rural areas across the entire country through the implementation of the CNDP for maximizing the level of GNH.

### **(2) Outputs of the Project**

- The CNDP for Bhutan for 2030,
- The recommendation for the institutional framework to implement the CNDP.

### **(3) Significance of the Project**

- The first attempt to formulate the Comprehensive National Development Plan,
- Challenge to pursue a development model suitable for balanced development contributing to the level of GNH.

### **(4) Study Area of the Project**

- The national territory of Bhutan with a land area of 38,394 km<sup>2</sup>.

### **(5) Contents of the Comprehensive National Development Plan**

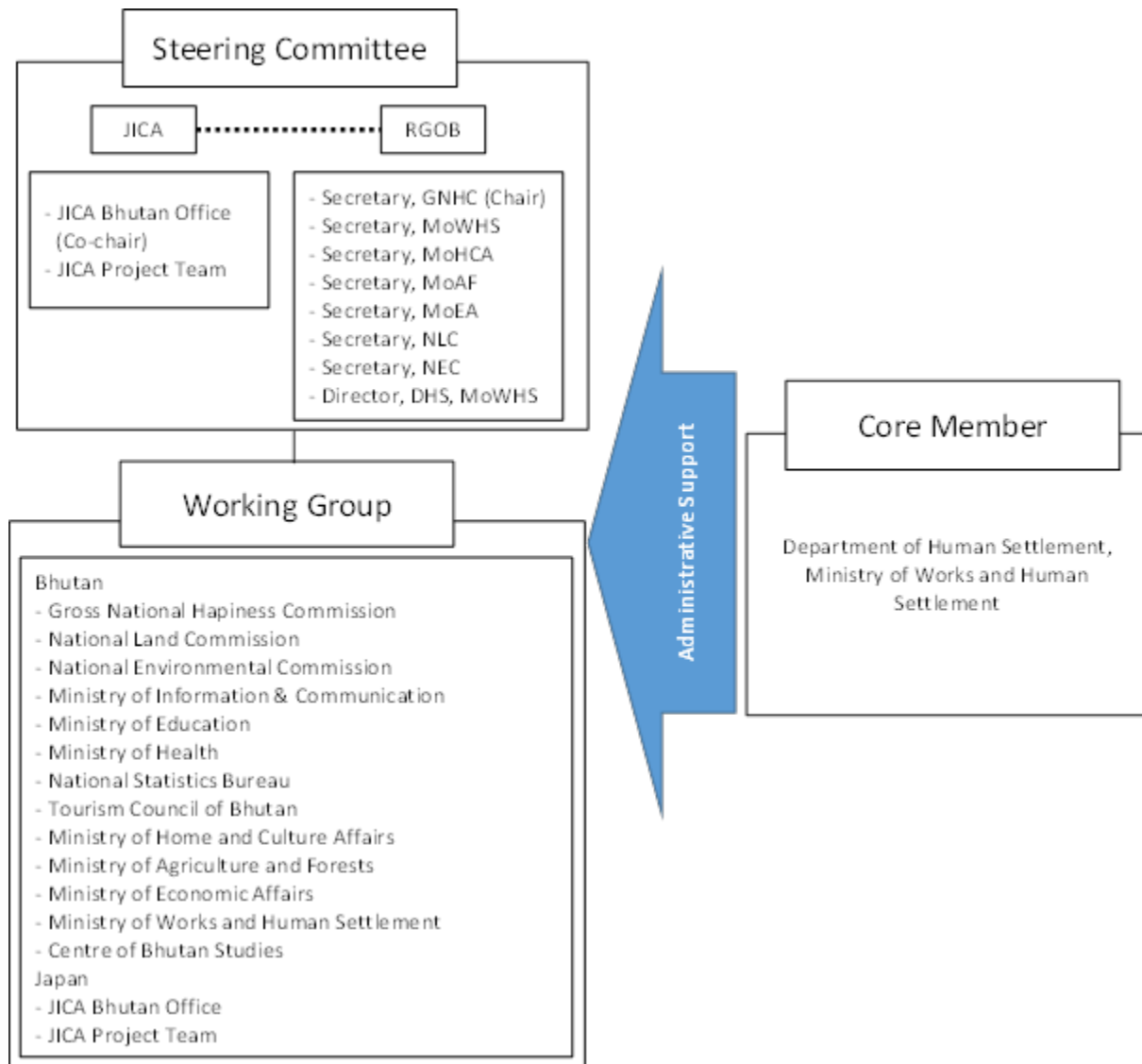
- a. Examination and analysis of existing conditions and development issues,
- b. Strategic environmental assessment,
- c. Development vision,
- d. Development objectives,
- e. Development strategy and development scenario,
- f. Socio-economic framework,
- g. National spatial structure,
- h. Land use plan,
- i. Specification of basic physical and social infrastructure services for cities, towns and main villages,
- j. General guidance for priority sectors including rural development and depopulation countermeasures, industrial development, and transport, and
- k. Recommendations on implementation of comprehensive national development plan.

(6) Period of the Project

The Project period is from January 2017 until December 2018 (Two years).

(7) Organization Chart of the Project





**Figure 1 Organization Chart of the Project**

#### **4. Scope of SEA**

SEA process for the Project will be incorporated into the formulation process of CNDP. Major tasks in the SEA process includes, but not limited to, the following:

(1) Preparatory Works and Scoping for SEA

- a. Establishment of a formation to implement SEA, including SEA Team, SEA Management Team and Task Force,
- b. Scoping and development of SEA Terms of Reference (TOR),
- c. Stakeholder analysis and participation strategy,
- d. Data collection and organization of information on environmental and social considerations.

(2) Assessment of Development Plan

- a. Assessment of the development alternatives including ‘no action,’

- b. Environmental assessment for the selected alternatives (the best development plan).

(3) Stakeholder Participation

(4) Reporting and Review

In this regard, SEA Guidelines stipulates ‘Screening’ as the first step of SEA process. In case of the Project, however, it is not necessary to follow this step because it has been already determined that SEA is carried out in the Project.

## **5. Methodology**

Methodology of each work item listed in the previous section 4 is described in detail:

### **(1) Preparatory Works and Scoping for SEA**

#### **a. Establishment of a Formation to Implement SEA**

The SEA Guidelines stipulate that SEA Team, comprised of core experts with environmental/social knowledges and skills, should be established within the Proponent of the development plan.

In case of this Project, a project organization to facilitate discussion, resolve the issues and grant an approval has been already established as shown in Figure 1 above. A new formation of an implementing team might cause additional time consuming procedures. In case of this Project, therefore, the following organizations with functions are proposed:

- DHS, as a Project Proponent including JICA Project Team: To function as a SEA Team to cover all aspects of the SEA and coordination with all the stakeholders. In this regard, Core Members will function as SEA Management Team to manage all the process of SEA. Technical aspects of SEA will be covered by JICA Project Team joined by DHS staffs aiming at capacity building,
- Working Group consisting of representatives from relevant government agencies: To play a role of SEA Task Force of the Project in order to discuss the analysis and study results of the SEA Team and resolve the issues and problems raised in the SEA process,
- Steering Committee: to finally confirm and grant an approval for the analysis results of SEA and SEA reports.

#### **b. Scoping and Development of SEA Terms of Reference (TOR)**

One of the most important works in the preparatory stage of SEA is scoping of SEA and a development of SEA TOR. Scoping is being done in parallel. This draft TOR is the very result of the preparation work. Based on the draft TOR, discussion among the Working Group members is to be made for improving it for finalization.

#### **c. Stakeholder analysis and participation strategy**

The SEA Guidelines also stipulates that identification of stakeholders should be done through stakeholder analysis using a comprehensive mapping, covering:

- Primary stakeholders: those ultimately likely to be affected, either positively or negatively by the PPPs,
- Secondary stakeholders: those persons or organizations who are indirectly affected by the PPPs,

- Key stakeholders: (who can also belong to the first two groups) – those persons or organizations that have significant influence upon or importance related to the PPPs, or play key roles within organizations.

However, the boundary of the primary stakeholders and secondary stakeholders are not always clear. In this TOR, therefore, stakeholder identification is to be carried out without specifying them as ‘primary’ or ‘secondary.’

In the meantime, stakeholder analysis was preliminarily undertaken in the previous stage, i.e. detailed planning survey of this Project last year, having identified the following stakeholders.

- Related ministries
- Representatives of local governments, and related planning officials
- Academic sector
- Public institution and private sector,
- NGOs / Civil Society Organizations, etc.

Following these preliminary information, the details of the stakeholders will be examined and clarified during the SEA process.

#### **d. Data Collection and Organization of Information on Environmental and Social Considerations**

Collection of data and information on environmental baseline and social issues is aimed at clarifying the current status of environment and social settings, which will be affected positively or negatively by the implementation of the development plan. Baseline data will be the basis for not only the identification of impact but also the formulation of development alternative itself since they can provide vital input on planning conditions and necessary considerations to the environmental and social aspects. Baseline data can also be the basis for trend analysis of fluctuation in the future by gathering them for a certain period of time.

Target area to be covered for the data collection is the whole territory of Bhutan because the project shall cover the whole nation. The neighbouring areas of India will also be examined in a regional context as necessary. Source of the data and information will include, but not limited to, published and unpublished, official and unofficial sources, existing EIA/EA reports and ongoing works and so on.

The range of the collection of data and information, namely, the range of environmental and social considerations for the Project is listed in the following. It should be noted this range of data collection might be subject to change during the SEA process when necessary.

##### **Environmental Baseline Data:**

- Land: Geography and climate, topography and geology, land cover/ land use, land acquisition / purchase from the third parties, earth-related disaster, mining and quarrying, and mineral resource development, issues on grazing and forest fire, etc.
- Water: Water resource and water use, water quality/ water pollution of water bodies and drinking water, soil and sediment contamination, river water regime and flood including GLOF, etc.
- Air: Air quality/ air pollution, Offensive odor, noise pollution and vibration, etc.

- Biodiversity/ Ecology/ Forest: Flora and fauna, biodiversity, ecology, wetlands/ marshes, protected areas, forest cover, forest conservation and utilization, forest offences and poaching, pests and diseases outbreak, human wildlife conflicts, etc.
- Waste Management: Municipal solid waste management, sewage management, medical waste management, industrial waste and E-waste, etc.
- Climate Change: Green gas emission, global warming and climate change, impacts of climate change, etc.
- Socio-economic Aspects: demography, involuntary resettlement and land acquisition, issues and urbanization/migration and informal settlers, poverty, ethnic minority and indigenous people, socio-economy and employment, industries and energy, social infrastructure and services, tourism, social institutions/ local decision-making institutions, misdistribution of benefit and damages, local conflicts of interest, gender/ vulnerable groups / rights of children, religion and spirituality, etc.
- Culture and Tradition: Culture and heritage sites, traditional architecture, landscape and aesthetics, etc.
- Health and Sanitation: Health service and infrastructure, mortality and morbidity, sanitation and water borne diseases, infectious disease including HIV/AIDS, etc.

#### **International Treaties and Accords:**

- Designation in the international treaty/convention such as, World Heritage (Cultural, Natural), Wetlands designated by the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), etc.

#### **Legislation, and National Level Plans, Politics and Strategies:**

- Legal framework on environmental and social considerations.
- National Level Plans, Politics and Strategies.

### **(2) Assessment of Development Plan**

#### **a. Assessment of Development Alternatives including ‘No Action’**

Environmental assessment process will be applied for the development plans to be produced during the Project, for identifying likely impacts due to the implementation of the plan. The assessment in this SEA process will be undertaken for each of the development alternatives, including ‘no action.’

#### **Description of Development Alternatives:**

The outline of the development alternatives to be produced in the Project will be described as shown in Table 1 below. In the SEA process, the development alternatives will be described in the each viewpoint itemized in the columns of ‘items’ and ‘contents.’ These ‘items’ and ‘contents’ correspond to SEA objectives and indicators (refer to the following section), respectively, from the viewpoint of SEA process.

**Table 1 Outline of Development Alternatives (Tentative)**

Item		Content (example)
Nine (9) Domains GNH	Psychological Wellbeing	<ul style="list-style-type: none"> <li>• Crime rate and public safety</li> </ul>
	Health	<ul style="list-style-type: none"> <li>• Birth and death rate with natural population growth rate</li> </ul>
	Time Use	<ul style="list-style-type: none"> <li>• Lifestyle</li> </ul>
	Education	<ul style="list-style-type: none"> <li>• Human resource development</li> </ul>
	Cultural Diversity	<ul style="list-style-type: none"> <li>• Traditional culture, ethnicities and heritage</li> </ul>
	Good Governance	<ul style="list-style-type: none"> <li>• Role of central government, local government and community</li> <li>• Social turmoil and security</li> </ul>
	Community Vitality	<ul style="list-style-type: none"> <li>• Social participation and existence of communities in urban and rural</li> </ul>
	Ecological Diversity	Natural environment
		<ul style="list-style-type: none"> <li>• Forested area, precious species, hydrology and topography,</li> <li>• Conservation of forested area, protected area and ecosystem</li> </ul>
		Environmental destruction
Socio-economic development	Living standard	Disaster prevention
		<ul style="list-style-type: none"> <li>• Risk of disaster</li> </ul>
		Social disparity
	Public services	<ul style="list-style-type: none"> <li>• Disparity between regions/Dzongkhags, gender, income classes, ethnics and age groups</li> </ul>
		<ul style="list-style-type: none"> <li>• Infrastructure, medical, education, etc.</li> </ul>
		<ul style="list-style-type: none"> <li>• Risk of disaster</li> </ul>
	Population projection and economic projection	<ul style="list-style-type: none"> <li>• Population size and population structure</li> <li>• Scale of economy and industrial structure</li> </ul>
	Agriculture	<ul style="list-style-type: none"> <li>• Role of agriculture, manufacturing and tourism in national development</li> <li>• Existence of farming village</li> <li>• Economic diversity and resilience</li> </ul>
	Manufacturing	
	Tourism and service	
Regional context		<ul style="list-style-type: none"> <li>• Superiority of Bhutan in the regional context including India and Bangladesh</li> </ul>
Spatial structure		<ul style="list-style-type: none"> <li>• Axis of national territory, core, land use and transport system</li> </ul>
Development approach		<ul style="list-style-type: none"> <li>• Short, medium and long terms</li> </ul>
Preliminary GNH Index		<ul style="list-style-type: none"> <li>• GNH Index in urban and rural areas</li> </ul>

### **SEA Objectives and Indicators:**

In the assessment process, SEA objectives and indicators will be set out as SEA Guidelines stipulates. SEA objectives and indicators are, in other words, environmental components to be affected and the parameters for evaluation of the impacts, respectively.

In this Project, SEA objectives and indicators will be set out from the wide range of environmental and social aspects which are shown in the previous section, meaning that the likely impacts will be evaluated from the viewpoints of the SEA objectives and indicators set out. In addition, SEA objectives and indicators will also be set out from the following aspects, which characterize Bhutan as a unique country in the world.

- Nine (9) domains highlighted in the GNH (psychological wellbeing, health, time use, education, cultural diversity, good governance, community vitality, ecological diversity and living standard)

- Correction of social disparity (those between rural and urban areas, the gender gaps, gaps among age group, and gaps among income classes,
- Technical aspects and necessary cost of the development alternatives,
- Compliance with the philosophy of “Middle Path” addressed in the National Environmental Strategy for Bhutan (1998)

The details of these SEA objectives and indicators will be examined and organized through the collection of environmental baseline data and information to be gathered in the early stage of the SEA process as well as the discussions in the SEA process.

#### **Assessment Method of Impacts:**

The expert judgement will be applied for impact assessment by combining with other analytical tools such as checklist, spatial analysis, trends analysis, and modelling (statistical analysis). Analytical tools to be adopted will depend on the environmental objectives/components. Modeling method (statistical analysis) will be applied for evaluating the level of GNH as a result of the implementation of the development plan.

Impact description will be done in rather qualitative manner since this assessment is to be applied for a plan but not for a project. Quantitative projection, therefore, is not always applicable but it can only be applied to limited issues.

The scope of the impacts to be examined shall cover the environmental and social settings listed in Table 3 including the categories of land, water, air, biodiversity/ecology/forest, waste management, climate change, socio-economic aspects, culture and tradition, and health and sanitation. The assessment will also clarify the nature of the likely impacts by clarifying positive or negative, direct or indirect, if cumulative ones as well as reversible or irreversible.

#### **Elaboration of the Alternatives for Best Development Plan:**

The development alternatives will be initially proposed by the JICA Project Team. They will also be modified and/or created from Bhutan side through discussion in the Working Group. SEA objectives and indicators also can be modified/ added by Bhutan side. These elaborated development alternatives will be presented and discussed in the 1<sup>st</sup> stakeholder meeting as described in the following section. Through these processes, the most preferred alternative will be adopted as a best development plan. Thus, the process to select the best development plan is not a simple linear direction but complex, iterative and rather robust until reaching to the consensus for the best development plan. Thus, SEA eventually will contribute to appropriate decision-making process for the formulation of the development plan.

#### **b. Environmental Assessment for the Selected Alternative (the Best Development Plan)**

Environmental assessment will be applied for the selected alternative, i.e. the best development plan. In the environmental assessment, impact description and evaluation will be undertaken in the same manner as those for the development alternative. The mitigation measures for the negative impacts and enhancement measures for positive impacts will also be addressed in the environmental assessment as Strategic Environmental Management Plan (SEMP). These analysis results of the impact assessment conducted by SEA Team will be discussed in the Working Group and presented in the 2<sup>nd</sup> stakeholder meeting as mentioned in the following section.



### **(3) Stakeholder Participation**

#### **a. Manner of Stakeholder Participation**

SEA is an effective planning tool for creation of development alternatives and selection of the best development plan. Among the methods of stakeholder participation, namely, providing information or reviews, engaging in workshops, meetings, focus sessions, interviews, dialogues, etc. (SEA Guidelines) stakeholder meeting combined with workshop will be adopted in this Project.

#### **b. Implementation of Stakeholder Meeting (SHM)**

Two (2) stages of stakeholder meetings will be held as shown in Table 2 by the initiation of SEA Team composed of JICA Project Team and DHS staffs supported by relevant local government officials.

The first stakeholder meeting will be held in the three areas, i.e. west, central and east area. Each consultation will constitute a two-day session. After providing an explanation of each development alternative including potential environmental and social impacts in the first day, time for small group discussions will be facilitated, while each group will deliver presentations the next day about discussion results in each group and share information. Before any discussions, explanations based on the quantitative analysis will be conducted to facilitate participants' understandings.

The second stakeholder meeting will be held in Thimphu to explain and discuss regarding the development vision and a national land use plan. In the meeting, potential environmental and social impacts and mitigation measures for the chosen alternative will also be discussed among participants through group discussion.

**Table 2 Overview of the Stakeholder Meetings (Tentative)**

	<b>Frist Meeting</b>	<b>Second Meeting</b>
Purpose	Explanation and discussion about 1) the significance of the participation in the SEA and 2) the development alternatives	Explanation and discussion regarding the development vision and a national land use plan
Venue	Three places (west, central and east) <ul style="list-style-type: none"> <li>• West: eight Dzongkhags,</li> <li>• Central: six Dzongkhags,</li> <li>• East: six Dzongkhags,</li> <li>• Total: 20 Dzongkhags,</li> </ul>	Thimphu
Length	Two days in each location	One day
Contents	Small group workshop-style meetings will be implemented to effectively collect peoples' opinions <ul style="list-style-type: none"> <li>• Explanation of the SEA and the significance of people participation</li> <li>• Explanation of the SEA implementation method, including evaluation indicators and methods</li> <li>• Explanation of the proposed development alternatives including potential impacts</li> <li>• Discussion and suggestions about alternatives and evaluation methods (workshop)</li> </ul>	Group discussions will be held in each area to increase levels of understanding <ul style="list-style-type: none"> <li>• Introduction of opinions as suggested in the first stakeholder meeting</li> <li>• Explanation of comparison results regarding the alternatives</li> <li>• Environmental effect evaluation and environmental mitigation proposal about the chosen alternative</li> <li>• Group discussions by areas</li> </ul>
Participants	<ul style="list-style-type: none"> <li>• Related ministries</li> <li>• Representatives of Dzongkhags, Thromdes and Gewogs, and related planning officials</li> <li>• Academic sector</li> <li>• Public institution and private sector,</li> <li>• NGOs / Civil Society Organizations (CSOs), etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Related ministries</li> <li>• Representatives of Dzongkhags, Thromdes and Gewogs, and related planning officials</li> <li>• Academic sector</li> <li>• Public institution and private sector,</li> <li>• NGOs / Civil Society Organizations (CSOs), etc.</li> </ul>
Number of participants	Six persons for each administrative area; in total, 60 to 80 persons in each location	100-150 persons
Language	Local language (Dzongka)	Dzongka/English

#### **(4) Reporting and Review**

The following reports will be produced during the process of SEA.

- Scoping Report
- Interim SEA Report
- Draft SEA Report
- SEA Final report

All these reports will be described in English.

##### **a. Scoping Report**

Scoping Report, aiming to clarify the scope of SEA, is to be produced at the beginning stage of SEA process in parallel with the preparation of TOR. Main contents of the Scoping Report are as follows:

- Initial results of data collection and literature review.
- Initial results of the analysis of legal framework.
- Initial identification results of key environmental and socio-economic issues.
- Results of stakeholder consultation.

#### **b Interim SEA Report**

Interim SEA Report will be produced after the process of assessment for the development alternatives including ‘no action’ and the results of 1<sup>st</sup> stakeholder meeting. The main contents of the report are as follows:

- Description of development alternatives
- Results of assessment for the alternatives (comparative evaluation of alternatives)
- Results of 1<sup>st</sup> stakeholder meeting (discussion raised in the workshop and meeting)

#### **c. Draft SEA Report**

Draft SEA Report will be produced after the process of the environmental assessment for the selected alternatives, i.e. best development plan. The main contents of the report are as follows:

- Description of the selected alternatives (best development plan),
- Results of assessment for the selected alternatives,
- Results of 2<sup>nd</sup> stakeholder meeting (discussions raised in the meeting)

The Draft SEA Report will be subject to a series of review by various levels of stakeholders as follows:

- Administrative review by the CM, WG and SC,
- Review by relevant stakeholders who participated in the SHM,
- Public review

Detailed process for review of draft SEA report will be determined through consultation / coordination with the Core Members and Working Group.

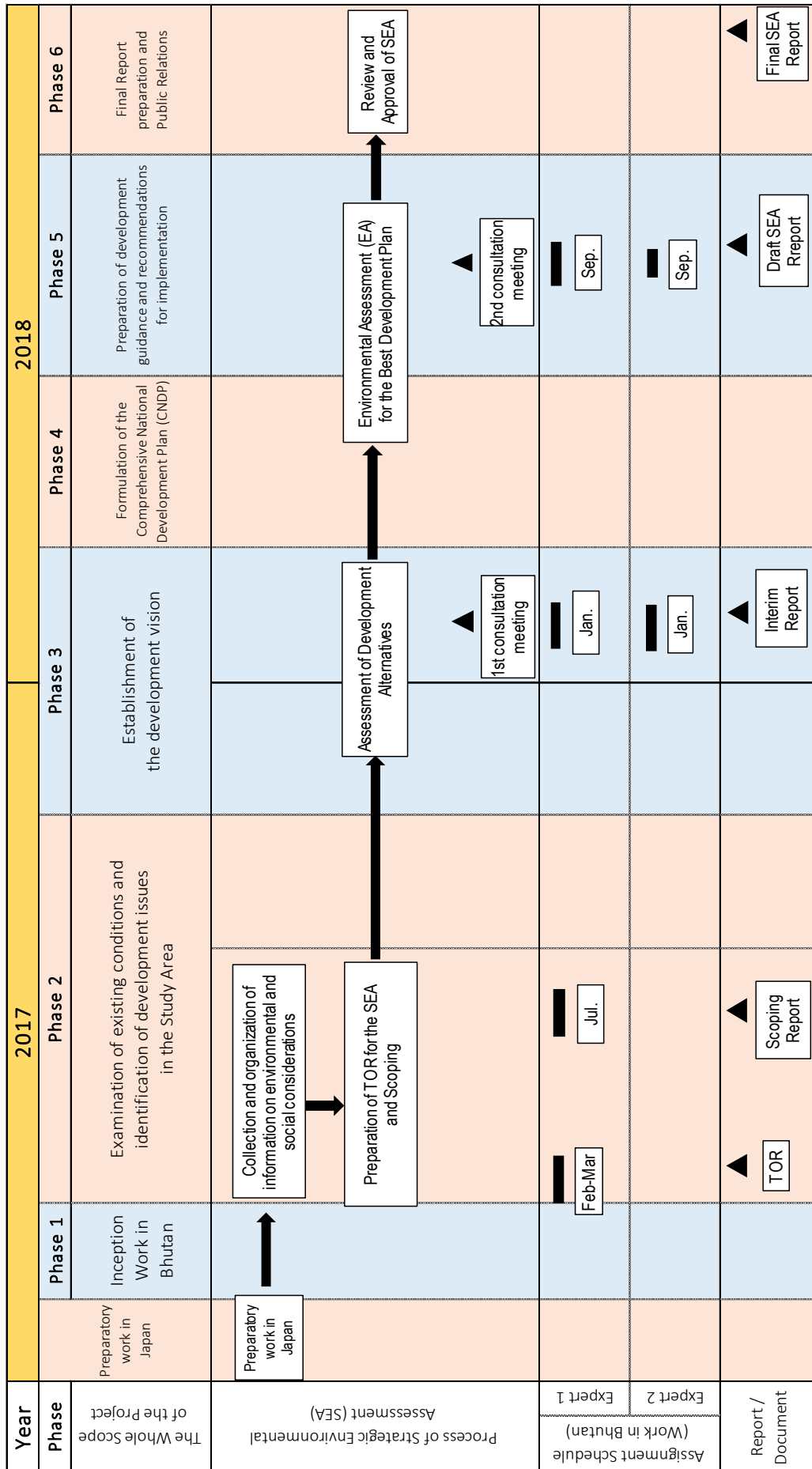
#### **d. Final SEA Report**

Based on the various comments through the review of the various levels of stakeholders mentioned above, the Draft SEA Report will be revised and improved for Final SEA Report. The Final SEA Report will be discussed in the Steering Committee of this Project and will be finally submitted to GNH Commission.

### **6. Work Schedule**

Work Schedule of the SEA process is shown in Figure 3. SEA Process will be undertaken incorporated in the whole activities in the Project for the Formulation of the Comprehensive Development Plan for Bhutan 2030. It will take two years and continue until December 2018 for the period of two years.

Figure 2 Work Schedule of Strategic Environmental Assessment (SEA) for the Project





**Appendix 2**

**Scoping Report for**

**Undertaking a Strategic Environmental Assessment (SEA)**

**for**

**the Project for Formulation of Comprehensive**

**Development Plan for Bhutan 2030**





**Scoping Report**  
**for**  
**Undertaking a Strategic Environmental Assessment (SEA)**  
**for**  
**the Project for Formulation of Comprehensive Development Plan for**  
**Bhutan 2030**

October 2017

Prepared by SEA Team  
Consisting of JICA Project Team (JPT)  
and Core Members of Department of Human Settlement (DHS), MoWHS

**Scoping Report  
for  
Undertaking a Strategic Environmental Assessment (SEA)  
for  
the Project for Formulation of Comprehensive Development Plan for Bhutan 2030**

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## **Abbreviation**

ADB	Asian Development Bank
BLCA	Bhutan Land Cover Assessment
BLSS	Bhutan Living Standard Survey
BSER	Bhutan State of the Environment Report
CBS&GNH	Centre for Bhutan Studies & GNH Research
CBD	Convention of Biological Diversity
CF	Community Forest
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNDP	Comprehensive National Development Plan
CO <sub>2</sub>	Carbon Dioxide
CSO	Civil Society Organization
CM	Core Member
CMD	Compliance Monitoring Division
DGPC	Druk Green Power Corporation
DHS	Department of Human Settlement
DOFPS	Department of Forests and Park Services
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FMU	Forest Management Unit
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GLOF	Glacial Lake Outburst Flood
GNH	Gross National Happiness
GNHC	Gross National Happiness Commission
GRF	Government Reserved Forest
IPCC	Inter-governmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
LAS	Invasive Alien Species
LCMP	Land Cover Assessment Project
MCM	Million Cubic Meter
MoAF	Ministry of Agriculture and Forests
MoEA	Ministry of Economic Affairs
MoIC	Ministry of Information and Communications
MoWHS	Ministry of Works and Human Settlement
MoHCA	Ministry of Home & Cultural Affairs
MoEA	Ministry of Economic Affairs
MoLHR	Ministry of Labour and Human Resources
NBC	National Biodiversity Centre
NEC	National Environment Commission
NECS	National Environment Commission Secretariat
NGO	Non-Governmental Organisation
NHS	National Health Survey
NIIT	National Institute for Information and Technology
NIWRM	National Integrated Water Resources Management

NLC	National Land Commission
NSB	National Statistical Bureau
NTNU	Norwegian University of Science and Technology
PC	Personal Computer
PM10	Suspended Particulate Matter
PPP	Policies, Plans and Programmes
RCDC	Royal Center for Disease Control
RECP	Regulation for the Environmental Clearance of Projects
RGoB	Royal Government of Bhutan
RNR	Renewable National Resources
RSTA	Road Safety and Transport Authority
SC	Steering Committee
SEA	Strategic Environmental Assessment
SEMP	Strategic Environmental Management Plan
SESMP	Strategic Environmental and Social Management Plan
SHM	Stakeholder Meeting
SNC	Second National Communication
SYB	Statistical Year Book
TMT	Thermo Mechanical Treated
TOR	Terms of Reference
TSP	Thimphu Structure Plan
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USD	U.S. dollar
UWICE	Ugyen Wangchuck Institute of Environment and Conservation
WCD	Wildlife Conservation Division
WG	Working Group
WHO	World Health Organization
WWF	World Wildlife Fund



## **1. Introduction**

The principle of national policy in Bhutan is well-balanced development and prosperity between urban and rural. However, Bhutan faces increasing rural-urban migration, mainly from east to west. This rural-urban migration is deemed as a contributory factor to the problems faced by rural areas. Some of these problems include labour shortages leading to fallow agricultural land and socio-cultural break-up. Further, this influx of population heading to the main cities, such as Thimphu, is linked to rising unemployment.

One of the causes of domestic migration is estimated to be the gap in the level of feeling happiness between urban and rural areas. According to the result of the third Gross National Happiness (GNH) survey conducted in 2015, the GNH Index in urban areas was estimated to be 0.811, compared to 0.731 in rural areas. In addition, according to the Poverty Analysis 2012, the poverty rate for urban areas is predicted to be 1.8%, compared to 16.7% in rural areas.

With a view to addressing the issue of rural-urban migration and promoting regionally balanced development, the Royal Government of Bhutan (RGoB) is planning to initiate sectorial interventions, such as the development of special economic zones, industrial estates, hydropower projects, tourism, farming and agro-based industries. In this context, the RGoB requested the Government of Japan to implement “The Project for Formulation of Comprehensive Development Plan for Bhutan 2030” (hereafter known as “the Project”), with the aim to promote a comprehensive and coordinated approach to development.

In response to the request from the RGoB, the Japan International Cooperation Agency (JICA), the official agency for official development assistance, decided to undertake the Project starting with a mission being dispatched to carry out a detailed planning survey. The JICA mission and the Gross National Happiness Committee (GNHC) signed a Record of Discussions (RD) with witness by the Ministry of Works and Human Settlement (MoWHS) in respect to conducting the Project on 18 August 2016. Based on the RD, the Project has commenced in January 2017 by dispatching a mission consisting of experts covering necessary expertise for formulating the Comprehensive Development Plan.

In the meantime, the Environmental Assessment Act (2000) and the National Environmental Act (2007) represent the legal basis for environmental and social considerations in Bhutan. In turn, the Regulation on SEA (2001) was enacted to specify the implementation of an SEA. Detailed procedures were presented in the National Guidelines (Draft) for the SEA (SEA Guidelines) in 2016. In the process of formulating the Comprehensive Development Plan, SEA will be undertaken with participation of various levels of stakeholders to be affected by the implementation of it.

The SEA process of this Project and its methodology will basically follow the procedures set out in the SEA Guidelines. At the same time, however, the SEA will also be conducted considering the provisions in the JICA Guidelines for Environmental and Social Considerations (JICA Guidelines) stipulated in 2010.

## **2. Objectives and Benefits of SEA**

SEA is a vital to guide and support the development plan and decision-making for its formulation by identifying and assessing critical environmental and social issues. The objectives and benefits of the application of SEA in the Project are as follows:

### **Technical Objectives and Benefits:**

- To make the formulation process more effective in terms of better decision-making for evaluation of the development plan,
- To avoid and/or minimize significant negative impacts and to enhance positive impacts by the implementation of the development plan,
- To evaluate the development alternatives from a wide range of viewpoints including physical, natural, social, economic, cultural and health aspects, and the concept of GNH, and so on, and
- To avoid unnecessary revision of the project components and activities in the following implementation stage of the development plan and the cost for it by applying SEA at the planning stage.

### **Capacity Building Objectives and Benefits:**

- To create a good opportunity for the Project Proponent and other stakeholders to experience SEA process and understand its effectiveness for the development plan and decision making.

In Bhutan, there have been two demonstration applications of strategic environmental assessment (SEA) conducted by the NEC, GNHC and NLC, which were completed in 2010 as follows:

- (1) Prospective Strategic Assessment of Damdum Industrial Estate (Samtse Dzonghag) (GNHC/NEC/NLC 2010)
- (2) Prospective Strategic Assessment of Proposed Hydropower Projects on Basin-2 (Watershed of the Punatsangchu River) (GNHC/NEC/NLC 2010).

In addition, the third SEA for the Road Sector Master Plan was initiated in 2016 and is currently under evaluation stage by NEC. Furthermore, the fourth SEA was initiated in the same year and is being applied for Thimphu Structure Plan, which is scheduled to be completed within this year.

This SEA for the Comprehensive Development Plan for Bhutan 2030 is the fifth one, which is unique in terms of targeting for a nationwide development plan including wide range of components such as national spatial structure (zoning), land use plan, and general guidance for priority sectors. Under such circumstances, it is believed that this SEA can contribute to the capacity building in undertaking SEA for the Project Proponent and other stakeholders in Bhutan.

### **3. Formulation of CNDP**

The Project for Formulation of Comprehensive Development Plan for Bhutan 2030 (“The Project”) has commenced in January 2017. The Proponent (Lead Agency) of the Project is Department of Human Settlement (DHS), Ministry of Works and Human Settlement (MoWHS). Outline of the Project is as follows:

#### **(1) Objectives of the Project**

- To formulate a Comprehensive National Development Plan (CNDP) for Bhutan,

- To promote well-balanced development in urban and rural areas across the entire country through the implementation of the CNDP for maximizing the level of GNH.

(2) Outputs of the Project

- The CNDP for Bhutan for 2030,
- The recommendation for the institutional framework to implement the CNDP.

(3) Significance of the Project

- The first attempt to formulate the Comprehensive National Development Plan,
- Challenge to pursue a development model suitable for balanced development contributing to the level of GNH.

(4) Study Area of the Project

- The national territory of Bhutan with a land area of 38,394 km<sup>2</sup>.

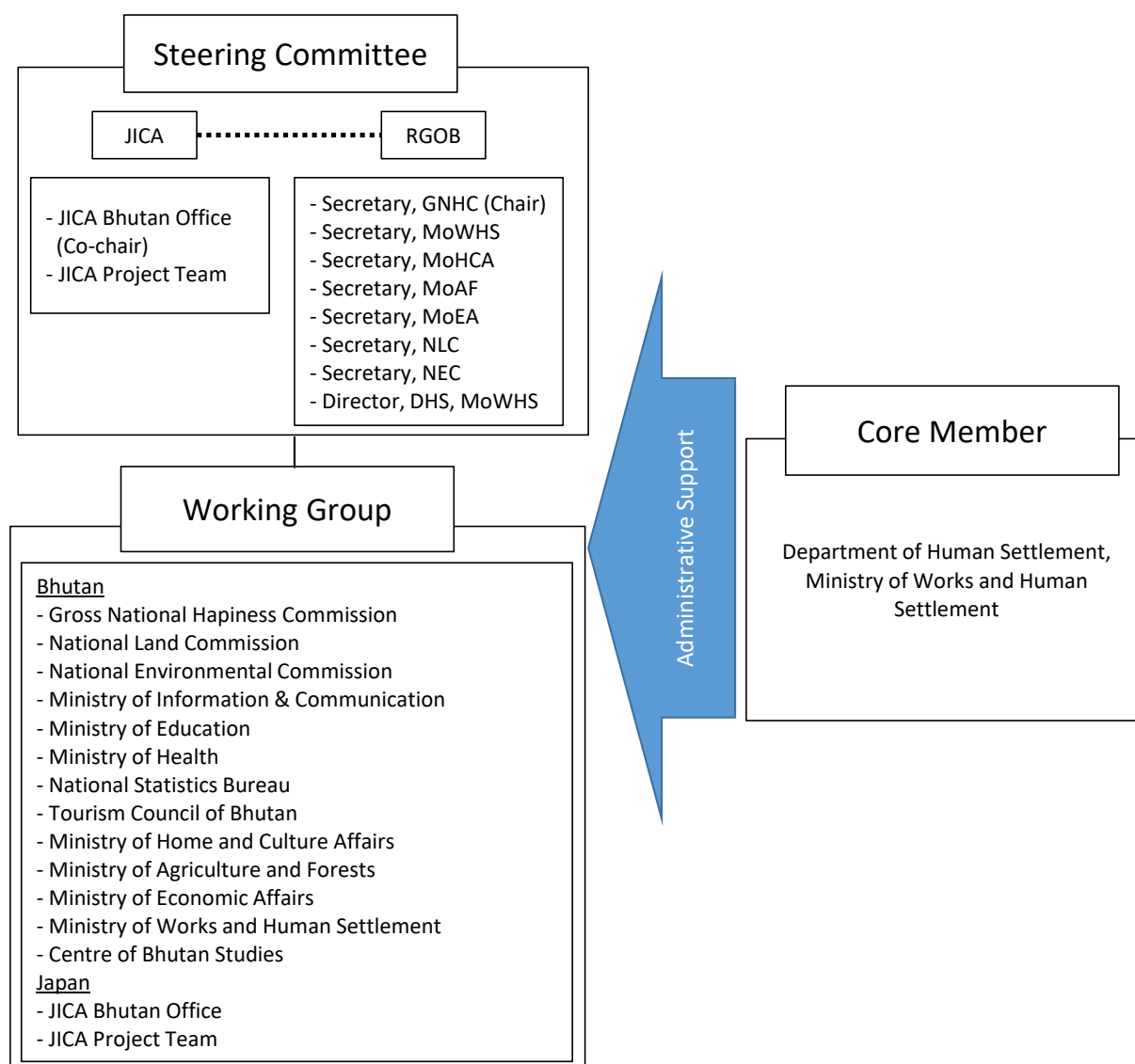
(5) Contents of the Comprehensive National Development Plan

- a. Examination and analysis of existing conditions and development issues,
- b. Strategic environmental assessment,
- c. Development vision,
- d. Development objectives,
- e. Development strategy and development scenario,
- f. Socio-economic framework,
- g. National spatial structure,
- h. Land use plan,
- i. Specification of basic physical and social infrastructure services for cities, towns and main villages,
- j. General guidance for priority sectors including rural development and depopulation countermeasures, industrial development, and transport, and
- k. Recommendations on implementation of comprehensive national development plan.

(6) Period of the Project

The Project period is from January 2017 until December 2018 (Two years).

(7) Organization Chart of the Project



**Figure 1 Organization Chart of the Project**

#### **4. Legal Requirements for SEA**

The SEA for the Project is required to conduct with full regard to the following legislation, national development philosophy and plans.

##### **(1) The Constitution of the Kingdom of Bhutan (2008)**

Article 5 of the Constitution reflects Bhutan's commitment to sustainable development and recognition of environmental conservation as one of the four pillars for enhancing GNH. It states as follows:

1. Every Bhutanese is a trustee of the Kingdom's natural resources and environment for the benefit of the present and future generations and it is the fundamental duty of every citizen to contribute to the protection of the natural environment, conservation of the rich biodiversity of Bhutan and prevention of all forms of ecological degradation including noise, visual and physical pollution through the adoption and support of environment friendly practices and policies.
2. The Royal Government shall: (a) Protect, conserve and improve the pristine environment and safeguard the biodiversity of the country; (b) Prevent pollution and ecological degradation; (c) Secure ecologically balanced sustainable development while promoting justifiable economic and social development; and (d) Ensure a safe and healthy environment.
3. The Government shall ensure that, in order to conserve the country's natural resources and to prevent degradation of the ecosystem, a minimum of sixty percent of Bhutan's total land shall be maintained under forest cover for all time.
4. Parliament may enact environmental legislation to ensure sustainable use of natural resources and maintain intergenerational equity and reaffirm the sovereign rights of the State over its own biological resources.
5. Parliament may, by law, declare any part of the country to be a National Park, Wildlife Reserve, Nature Reserve, Protected Forest, Biosphere Reserve, Critical Watershed and such other categories meriting protection

SEA is a tool designed to improve environmental, socio-economic and sustainability outcomes of the development process, and so is well-aligned with, and could play a key role in achieving, these objectives.

##### **(2) Compliance Requirement with National Development Philosophy of Gross National Happiness:**

The SEA as well as the Project for Formulation of Comprehensive Development Plan for Bhutan 2030 itself is required to be conducted with full regard to Bhutan's development philosophy of Gross National Happiness (GNH) as shown in the following:

Gross National Happiness (GNH) defines quality of life in more holistic and psychological terms than Gross National Product. The term coined by His Majesty King Jigme Singye Wangchuck serves as a unifying philosophy for development planning and management. While conventional development models stress economic growth as the ultimate objective, the concept of GNH is based on the premise that true development of human society takes place when material, spiritual and emotional well-being occur side by side to complement

and reinforce each other.

In the sphere of public policy, the GNH philosophy is to operate on the following four main pillars:

- Equitable socio-economic development, ensuring equity between individuals and communities as well as regions to promote social harmony, stability and unity and to contribute to development of a just and compassionate society.
- Conservation of the environment, ensuring development pursuits are within the limits of environmental sustainability and are carried out without impairing the biological productivity and diversity of the natural environment.
- Preservation and promotion of culture, instilling appreciation of the cultural heritage and preserving spiritual and emotional values that contribute to happiness and cushion the people from the negative impacts of modernization.
- Promotion of good governance, developing the country's institutions, human resources and systems of governance and enlarging opportunities for people at all levels to fully participate and effectively make development choices that are true to the circumstances and needs of their families, communities and the nation as a whole.

To take forward the philosophy of GNH, Bhutan has designed its vision document Bhutan 2020, providing development goals, objectives and priorities with a twenty-year perspective and outlining key principles to guide the development process (NEC 2008).

In order to foster measurement of a holistic range of GNH values, a domain-based framework has been adopted by the Centre for Bhutan Studies & GNH Research (CBS). The framework contains nine (9) constituent domains of GNH as briefly explained below:

**Psychological wellbeing:** This domain attempts to understand how people experience the quality of their lives. It includes reflective cognitive evaluations such as life satisfaction, and affective reactions to life events such as positive and negative emotions. It also covers spirituality.

**Health:** This domain comprises of conditions of the human body and mind and thereby attempts to characterize health by including both physical and mental states. A healthy quality of life allows us to get through our daily activities without undue fatigue for physical stress.

**Time use:** This domain attempts to analyse the nature of time spent on work, non-work and sleep, and highlights the importance of maintaining a harmonious work-life balance.

**Education:** Besides incorporating formal and informal education, this domain also tries to assess different types of knowledge, values and skills, which are mostly acquired informally.

**Cultural diversity and resilience:** The culture domain looks at the diversity and strength of cultural traditions including festivals, norms, and the creative arts.

**Community vitality:** This domain attempts to focus on the strengths and weaknesses of relationships and interactions within communities. This domain gathers information on social cohesion among family members and neighbours, and on practices like volunteering.

**Good Governance:** The domain of good governance evaluates how people perceive various governmental functions in terms of their efficiency, honesty and quality. Indicators help to

evaluate the level of participation in government decisions at the local level and the presence of various rights and freedom.

**Ecological diversity and resilience:** This domain encompasses indicators that measure people's own evaluations of the environmental conditions of their neighbourhood and assess eco-friendly behavior patterns. It also covers hazards such as forest fires and earthquakes.

**Living standards.** This domain refers to the level of material comfort as measured by income, conditions of financial security, housing and asset ownership.

### **(3) Five-Year Plans**

The First Five-Year Plan was formulated to guide the national economic development in 1961. It was fully funded by India and its planning period was from 1961 to 1966. A decade later, the Planning Commission was established to make planning more effective at the time when the Third Five-Year Plan (1971-1976) was formulated. After the organizational reforms including establishment of Policy and Planning Department in the ministries and change of the Planning Commission to the Ministry of Planning, the Gross National Happiness Commission became responsible for the Five-Year Plans in 2007.

The 11th Five-Year Plan (2013-2018) is the latest Five-Year Plan and focuses on the self-reliance and inclusive development. The Government of Bhutan recognizes the urgent need to pursue the self-reliance objective that transforms the national economy to a more diversified economy that creates productive employment opportunity, ensure a broader tax base and provides an enabling environment for private sector development. This is the preparedness to the circumstance that foraging partners phases out the development assistance from Bhutan as the national economy is improved.

The inclusive development aims at reducing poverty and inequality by enhancing the standard of living and the quality of life. Although the poverty was significantly improved by intensive investment by the government, disparities still existed between regions and gender. The 11th Five-Year Plan focuses on resolving these disparities using the investment installed in the past. Plus, the 11th Five-Year Plan ensures Green strategies to adopt the rigorous environmental standards in the economic development.

### **(4) Bhutan 2020**

Since the First Five-Year Plan was formulated in 1961, the Royal Government of Bhutan has completed successfully seven Five-Year Plans until 1996. The socioeconomic changed during implementation of the Five-Year Plans. Visioning is a means of determining the future in the long term and periodic reviews and preparation of long term plans are complementary activities in this direction. The Planning Commission (currently reformed to the Gross National Happiness Commission) prepared a vision document of which perspective extended to 2020 beyond the planning period of the Five-Year Plan in 1999.

Bhutan 2020 is the vision document that envisions peace, prosperity and happiness of the country which the Five-Year Plan must be in line with. Bhutan 2020 reviewed the past performance, development issues, challenges in the future with overarching goal and guiding principles, envisioned status of Bhutan in 2020 and over centuries.

The overarching goal is to ensure the future independence, security and sovereignty. The guiding principles comprise six subjects. Identity must be secured by respecting to cultural

imperative. Unity and harmony of the society is the second principle. Stability by the firm monarchy is the third. Self-reliance is the fourth. Sustainability encompassing social, financial, economic, cultural and environmental aspects is critically important as the fifth. Flexibility to adapt to change without causing problems is consistent with concept of Middle Path as the sixth. Performing the guiding principles, Bhutan 2020 envisages the state imagery with nation embracing the benefits of modernization without negative effects, self-confident and self-reliant people, economy with new and clean industries based on our rich biodiversity, intact environment and decentralized institution with dynamic private sector's activity.

### **(5) Strategy for Gross National Happiness**

After adaption of the First Five-Year Plan in 1961, socioeconomic situation has been improved due to large efforts made by the government. In response to the modernization of the country, Bhutan started facing with new social problems as the developed and developing countries have experienced. The rural-urban migration started as the people left the rural and remote areas, although the government has installed a lot of investments to improve the quality of life in the rural and remote areas. The younger generation enjoyed the education in a good service and obtained the high education certificates. They could not find the job opportunity though they are not interested in working in agriculture. This is a complicated dilemma of the country. In such circumstances, the Gross National Happiness Commission formulated the Strategy for Gross National Happiness in 2008 to develop the long-term framework for 20 years until 2028. The Strategy aimed to be the guideline for the Tenth Five-Year Plan (2008-2013). The Strategy has not been approved, but it is recognized as the most important reference by national and local government officials.

The Population and Housing Census counted urban population at 196,111 persons or equivalent to 31% to the total population of 872,758 persons in 2005. The Strategy estimated that the urban population will be increased to 605,696 persons or 69% to the total population of 872,758 persons in 2028. To encounter the rapid urbanization, the Strategy suggests strengthening the capital city area of Thimphu as a key driver of national economic growth and designate nine urban development areas at the strategical places, aiming at the balanced development. The urban development areas consist of Economic Hubs (Bumthang, Monggar and Kanglung) and Growth Centres (Gelephu, Paro, Phuentsholing, Punakha/Wangdue, Samdrupjongkhar and Samtse). The Economic Hubs are located along the proposed southern East-West national highway. The Growth Centres are located the East-West national highway in the latitudinal central region.

The improvement of transport network is targeted at the primary national highway comprising two East West National Highways and five North South National Highways plus the secondary national highway that interconnect Dzongkhag headquarter. The Strategy also recommends the southern East West National Highway to be part of the Asian Highway 48. Air transport will be reinforced by opening the all weather international airport in Gelephu and two domestic airstrips in Bartsham and Bumthang in east of Bhutan. The international logistics will be improved by enhanced accesses to Haldia port in West Bengal and Jawarharlal Nehru Port in Mumbai.

### **(6) National Environmental Protection Act (2007)**



The National Environmental Protection Act provides a definition of SEA. Although the Act does not discuss the role of SEA, it sets out parameters that are important and useful for the conduct of it.

The Act requires that all other Acts and regulations governing the use of land, water, forests, minerals and other natural resources shall be consistent with its provisions, and repeals all existing laws relating to environment, which are inconsistent with the Act (although it does not specify these).

The Act gives all Bhutanese a fundamental right to a safe and healthy environment with equal and corresponding duty to protect and promote the environmental wellbeing of the country. In line with the Government's Middle Path Strategy, the Act states that economic development and environmental conservation shall receive equal priority.

### **(7) Environmental Assessment Act (2000)**

Clause 1 of the Act states that this Act establishes procedures for the assessment of the potential effects of strategic policies, plans or programmes (implying both SEA) and projects (implying EIA) on the environment, and for the determination of policies and measures to reduce potential adverse effects and promote environmental benefits."

The Act stipulates the requirements for conducting environmental assessments and obtaining environmental clearances for development projects.

- "The issuance of an environmental clearance shall be a prerequisite to the issuance of a development consent" (Clause 8)
- "A project of the Royal Government that does not require a development consent may commence only after receiving an environmental clearance from the Secretariat [NECS] (Clause 9)
- "Any person who seeks to carry out a project that requires a development consent shall include in the application to the competent authority a description of the potential environmental effects of the project" (Clause 11)
- "If the Secretariat [NECS] cannot, on the basis of the information provided by the applicant, identify the potential environmental effects of the project, or if the information provided is not sufficient to demonstrate that the project satisfies the terms in Article 18, the competent authority shall ask the applicant to prepare environmental assessment documents according to terms of reference approved by the Secretariat" (Clause 15).

The Act is supported by various documents intended to guide its implementation:

- Regulations, e.g.:
  - Regulation for the Environmental Clearance of Projects (2016),
  - Regulation on SEA 2002 (see the following section).
- A General Guideline of Environmental Assessment (2012);

### **(8) Regulation on Strategic Environmental Assessment (2002)**

The Regulation on was also introduced with several specific purposes as below:

- Ensure that environmental concerns are fully taken into account by all government agencies when formulating, renewing, modifying or implementing any policy, plan or programme;
- Ensure that the cumulative and large scale environmental effects are taken into consideration while formulating, renewing, modifying or implementing any policy, plan or programme;
- Complement project-specific environmental reviews as per the Regulation for the Environmental Clearance of Projects (RECP) and to encourage early identification of environmental objectives and impacts of all government proposals at appropriate planning levels;
- Promote the design of environmentally sustainable proposals that encourage the use of renewable resources and clean technologies and practices;
- Promote and encourage the development of comprehensive natural resource and land use plans at the local, district and national levels; and

Article 5 of Bhutan’s SEA Regulation states “Any agency that formulates, renews, modifies or implements any policy, plan or programme including Five-Year Plans which may have a significant effect on the environment, shall perform a Strategic Environmental Assessment in accordance with this regulation, before the proposal is adopted or submitted to the Royal Government of Bhutan.”

The information included in the SEA shall be in such detail as may reasonably be required for the purpose of assessing the significant direct and indirect effects of implementing the PPP on humans, fauna, flora, soil, water, air, climate, landscape, material assets and cultural heritage.

The Regulation is supported by the National Guidelines for Strategic Environmental Assessment (SEA) in Bhutan (2016), which stipulates the SEA process as shown in the table below:

**Table 1 Summary of Stages in the SEA Process**

<p><b>STAGE 1: SCREENING</b></p> <ul style="list-style-type: none"> <li>• The proponent screens its proposed 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 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 by the proponent, the proponent should consult with the NECS.</li> <li>• If it is concluded that no significant impacts are 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>
<p><b>STAGE 2: PREPARATORY STEPS AND SCOPING</b></p> <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 (TOR).</li> </ul> <p><b>Scoping</b> (some elements may be done in parallel):</p> <ul style="list-style-type: none"> <li>• Identify key sources of data and information;</li> <li>• Stakeholder analysis and prepare participation strategy;</li> <li>• Stakeholder consultations and workshop – to explain the SEA (reason and process), identify baseline data and PPPs held by consultees, to enable consultees to assist in scoping key issue and identifying SEA objectives;</li> <li>• Review of other PPPs, document aims, objectives and key themes of relevance to PPP being assessed;</li> <li>• Identify key environmental and socio-economic issues that the PPP should take into consideration;</li> <li>• Based on key themes and issues, develop draft SEA objectives, targets and indicators to provide a framework for assessment and monitoring of the PPP;</li> <li>• Start identifying potential alternatives (to PPP or to possible PPP components);</li> <li>• Preparation of scoping report and circulation/disclosure for stakeholder and public comment; subjection to public comment;</li> <li>• Update of scoping report in response to comments.</li> </ul>
<p><b>STAGE 3: ASSESSMENT</b></p> <p>Assessment should be carried out in three stages:</p> <ol style="list-style-type: none"> <li>a) <b>Confirmation of alternatives</b> to PPP or its components to be assessed;</li> <li>b) <b>Assessment of alternatives</b> to PPP or its components (leading to <b>interim SEA report</b> – 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>c) <b>Assessment of preferred alternative</b> – more focused and detailed - (leading to <b>SEA report</b> including identification of the detailed mitigation needed to avoid the significant effects.</li> </ol> <p>Assessment should involve:</p>

- Continued analysis of available baseline data and new data from research/field studies;
- Continued stakeholder engagement;
- Identification of environment and social impacts (positive and negative; direct, indirect, cumulative);
- Identification of options for enhancing positive impacts and avoiding/minimizing/mitigating negative impacts.

#### **STAGE 4: REPORTS AND REVIEW**

##### **Draft reports:**

- Preparation of *Interim SEA report* (during Stage 3);
- Preparation of *first draft SEA report* (with non-technical executive summary) and *ancillary reports* (eg. reports on special studies).

##### **Internal review:**

- *Administrative review* of first draft reports by proponent (ensure compliance with basic requirements);
- *Technical review* of first draft reports by proponent.

##### **Scrutiny workshop:**

- Draft SEA report presented at a workshop involving the proponent and NECS - to agree SEA recommendations for adoption in the PPP.

##### **Revision:**

- Revision and preparation of *second draft SEA* report (and SESMP report where required).

##### **Stakeholder/public comments:**

- Provision of second draft reports to key stakeholders for comment and feedback;
- Issuance of a *notice* regarding the second draft SEA and SESMP in a newspaper with a nationwide circulation (eg Kuensel) (indicating where they can be accessed within a stated time limit for public review and comment);
- Workshop for stakeholders to discuss and comment on reports – convened by PPP proponent.

##### **Finalise SEA report:**

- Preparation of final version of SEA report (and SESMP where required) and a draft Environmental Statement (ES) (a concise summary of the SEA – contents are specified in the SEA Regulation 2002).

##### **Regulatory review:**

- NECS will review the final SEA documents and draft ES.

#### **STAGE 5: DECISION-MAKING ON SEA**

- 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), and on the draft ES.

##### **Finalising the PPP:**

- The proponent will incorporate the findings and recommendations of the SEA (and SESMP where required) in the PPP;
- To comply with the SEA Regulation 2002, the proponent will finalise an *Environmental Statement* (ES) and include this in the PPP or provide it as a separate report;

- The PPP (with the ES if a separate document) should be submitted to the GNHC for screening prior to submission to Cabinet.

#### **STAGE 6: MONITORING AND EVALUATION OF PPP**

- 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);
- NECS shall oversee the monitoring and evaluation process by the PPP proponent.

Source: National Guidelines for Strategic Environmental Assessment (SEA) in Bhutan (2016)

## **5. Scope of SEA**

### **5.1 Boundary of SEA**

The target area of the Project covers the national territory of Bhutan with a land area of 38,394 km<sup>2</sup>. To analyze the conditions of Bhutan in a regional context, the Project will also examine the socioeconomic interaction between Bhutan and neighbouring areas of India. The boundary of SEA of the Project is “the national territory of Bhutan including neighbouring areas of India.”

### **5.2 Major Works included in SEA**

SEA process for the Project will be incorporated into the formulation process of CNDP. Major works in the SEA process includes, but not limited to, the following:

#### **(1) Preparatory Works and Scoping for SEA**

- a. Establishment of a formation to implement SEA, including SEA Team, SEA Management Team and Task Force,
- b. Scoping and development of SEA Terms of Reference (TOR),
- c. Stakeholder analysis and participation strategy,
- d. Data collection and organization of information on environmental and social considerations.

#### **(2) Assessment of Development Plan**

- a. Assessment of the development alternatives including ‘no action,’
- b. Environmental assessment for the selected alternatives (the best development plan).

#### **(3) Stakeholder Participation**

#### **(4) Reporting and Review**

In this regard, SEA Guidelines stipulates ‘Screening’ as the first step of SEA process. In case of the Project, however, it is not necessary to follow this step because it has been already determined that SEA is carried out in the Project.

## **6. Result of Preparatory Works**

### **6.1 Formation of SEA Team**

The SEA Guidelines (2016) stipulate that SEA Team, comprised of core experts with environmental/ social knowledges and skills, should be established within the Project Proponent of the development plan.

In case of this Project, a project organization to facilitate discussion, resolve the issues and grant an approval has been already established as shown in Figure 1. A new formation of an implementing team might cause a complexity and additional time consuming procedures. In case of this Project, therefore, the following organizations with functions are proposed (see Figure 2):

- DHS, as a Project Proponent including JICA Project Team: To function as a SEA Team to cover all aspects of the SEA and coordination with all the stakeholders. In this regard, Core Members will function as SEA Management Team to manage all the process of SEA. Technical aspects of SEA will be covered by JICA Project Team joined by DHS staffs aiming at capacity building,
- Working Group consisting of representatives from relevant government agencies: To play a role of SEA Task Force of the Project in order to discuss the analysis and study results of the SEA Team and resolve the issues and problems raised in the SEA process,
- Steering Committee: to finally confirm and grant an approval for the analysis results of SEA and SEA reports.

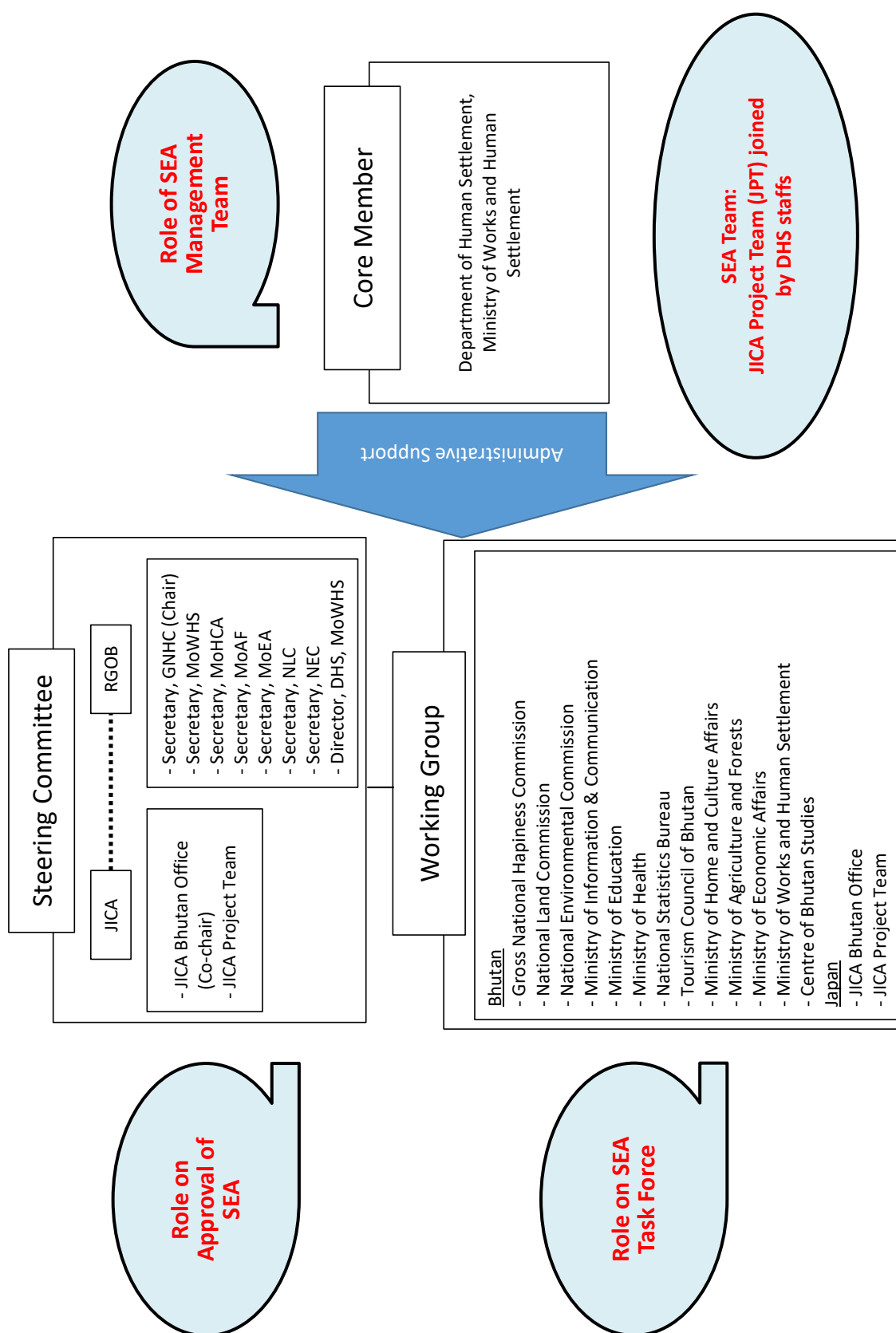


Figure 2 Organization Chart of SEA

## **6.2 SEA and Development of TOR of SEA**

One of the most important works in the preparatory stage of SEA is scoping of SEA and a development of SEA TOR.

### **(1) Requirements in Scoping**

Requirements in scoping process are described in the SEA Guidelines in Bhutan. They are more clearly specified than JICA Guidelines as follows. However, it can be interpreted there is not big differences between the two. The scoping in the SEA of this Project shall basically follow SEA Guidelines in Bhutan covering each item listed as below:

#### **SEA Guidelines in Bhutan (2016):**

- Identify key sources of data and information;
- Stakeholder analysis and prepare participation strategy;
- Stakeholder consultations and workshop – to explain the SEA, etc.;
- Review of other PPPs, document aims, objectives, etc.;
- Initiate collection of baseline data and new research/study (where required);
- Identify key environmental and socio-economic issues;
- Based on key themes and issues, develop draft SEA objectives, targets and indicators to provide a framework for assessment and monitoring;
- Start identifying potential alternatives (to PPP or to possible PPP components);
- Preparation of scoping report and circulation/disclosure for stakeholders;
- Update of scoping report in response to comments.

#### **JICA Guidelines:**

JICA Guidelines states that “Scoping” means choosing alternatives for analysis, a range of significant and potentially significant impacts, and study methods.

### **(2) TOR of SEA**

TOR (draft) of SEA (herewith Attached) to be covered by SEA Team was prepared and discussed among the Working Group members on March 24, 2017.

## **6.3 Stakeholder Analysis and Participation Strategy**

The result of preliminary stakeholder analysis was done in the JICA Study for Formulation of Comprehensive Development Plan for Bhutan 2030) in 2016. The result of preliminary stakeholder analysis was utilized for scoping the expected participants of the stakeholder meetings. In this scoping report, stakeholder analysis was further conducted to specify the stakeholders who will be directly or indirectly related to and affected by the CNDP and therefore to be expected to participate in the two stages of stakeholder meetings. The result of stakeholder analysis is as summarized below:

### **6.3.1 Stakeholder Analysis**

The SEA Guidelines also stipulates that identification of stakeholders should be done through stakeholder analysis using a comprehensive mapping, covering:



- Primary stakeholders: those ultimately likely to be affected, either positively or negatively by the PPPs,
- Secondary stakeholders: those persons or organizations who are indirectly affected by the PPPs,
- Key stakeholders: (who can also belong to the first two groups) – those persons or organizations that have significant influence upon or importance related to the PPPs, or play key roles within organizations.

However, the boundary of the primary stakeholders and secondary stakeholders are not always clear because one stakeholder will be directly affected in terms of a certain issues (impacts) but will be indirectly affected in terms of other issues. In this TOR, therefore, stakeholder identification is to be carried out without specifying them as ‘primary’ or ‘secondary.’

In the meantime, stakeholder analysis was preliminarily undertaken in the previous stage, i.e. detailed planning survey of this Project last year, having identified the following stakeholders.

- Related ministries,
- Representatives of local governments, and related planning officials,
- Academic sector,
- Public institution and private sector,
- NGOs / Civil Society Organizations, etc.

Detailed scope of stakeholder is listed in Appendix-1. These stakeholder members will be scrutinized for final participants for stakeholder meetings as described in the next section.

### **6.3.2 Stakeholder Participation Strategy**

#### **(1) Manner of Stakeholder Participation**

SEA is an effective planning tool for creation of development alternatives and selection of the best development plan. Among the methods of stakeholder participation, namely, providing information or reviews, engaging in workshops, meetings, focus sessions, interviews, dialogues, etc. (SEA Guidelines) stakeholder meeting combined with workshop will be adopted in the SEA of this Project.

#### **(2) Implementation of Stakeholder Meeting (SHM)**

Two (2) stages of stakeholder meetings will be held as shown in Table 2 by the initiation of SEA Team composed of JICA Project Team and DHS staffs supported by relevant local government officials.

The first stakeholder meeting will be held in the three areas, i.e. west, central and east area of Bhutan. Each consultation will constitute a two-day session. After providing an explanation of each development alternative including potential environmental and social impacts in the first day, time for small group discussions will be facilitated, while each group will deliver presentations the next day about discussion results in each group and share information. Before any discussions, explanations based on the quantitative analysis will be conducted to facilitate participants’ understandings.

The second stakeholder meeting will be held in Thimphu to explain and discuss regarding the development vision and a national land use plan. In the meeting, potential environmental and social impacts and mitigation measures for the chosen alternative will also be discussed among participants through group discussion.

**Table 2 Overview of the Stakeholder Meetings (Tentative)**

	<b>First Meeting</b>	<b>Second Meeting</b>
Purpose	Explanation and discussion about 1) the significance of the participation in the SEA and 2) the development alternatives	Explanation and discussion regarding the development vision and a national land use plan
Venue	Three places (west, central and east) <ul style="list-style-type: none"> <li>• West: covering eight Dzongkhags</li> <li>• Central: covering six Dzongkhags</li> <li>• East: covering six Dzongkhags</li> <li>• Total: 20 Dzongkhags</li> </ul>	Thimphu
Length	Two days in each location	One day
Contents	Small group workshop-style meetings will be implemented to effectively collect peoples' opinions <ul style="list-style-type: none"> <li>• Explanation of the SEA and the significance of people participation</li> <li>• Explanation of the SEA implementation method, including evaluation indicators and methods</li> <li>• Explanation of the proposed development alternatives including potential impacts</li> <li>• Discussion and suggestions about alternatives and evaluation methods (workshop)</li> </ul>	Group discussions will be held in each area to increase levels of understanding <ul style="list-style-type: none"> <li>• Introduction of opinions as suggested in the first stakeholder meeting</li> <li>• Explanation of comparison results regarding the alternatives</li> <li>• Environmental effect evaluation and environmental mitigation proposal about the chosen alternative</li> <li>• Group discussions by areas</li> </ul>
Participants	<ul style="list-style-type: none"> <li>• Related ministries</li> <li>• Representatives of Dzongkhags, Thromdes and Gewogs, and related planning officials</li> <li>• Academic sector</li> <li>• Public institution and private sector,</li> <li>• NGOs / Civil Society Organizations (CSOs), etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Related ministries</li> <li>• Representatives of Dzongkhags, Thromdes and Gewogs, and related planning officials</li> <li>• Academic sector</li> <li>• Public institution and private sector,</li> <li>• NGOs / Civil Society Organizations (CSOs), etc.</li> </ul>
Number of participants	Six persons from each administrative area; in total, 60 to 80 persons in each location	100-150 persons
Language	Local language (Dzongkha)	Dzongkha/English

## **6.4 Data Collection and Organization of Information on Environmental and Social Considerations.**

### **6.4.1 Environmental and Social Baseline**

#### **(1) Necessity of Baseline Survey**

Collection of data and information on environmental baseline and social issues is aimed at clarifying the current status of environment and social settings, which will be affected positively or negatively by the implementation of the development plan. Baseline data will be the basis for not only the identification of impact but also the formulation of development alternative itself since they can provide vital input on planning conditions and necessary considerations to the environmental and the social aspects. Baseline data can also be the basis for trend analysis of fluctuation in the future by gathering them for a certain period of time.

Target area to be covered for the data collection is the whole territory of Bhutan because the project shall cover the whole nation. In this regard, the neighbouring areas of India will be examined in a regional context as necessary. Source of the data and information will include, but not limited to, published and unpublished, official and unofficial sources, existing EIA/EA reports and ongoing works and so on.

## **(2) Range of Environment and Social Baseline**

Ranges of environmental and social settings to be examined are described in the respective guidelines as follows:

### **SEA Guidelines in Bhutan (2016):**

- SEA objectives & indicators shall cover an appropriate range of environmental, social & sustainability topics, including relevant objectives for the biological (e.g., for biodiversity & ecosystems), physical (e.g., for soil, water, air, landscape, climate change), & socio-cultural & economic components (e.g., for health, equity, poverty, heritage, or economy).

### **JICA Guidelines:**

Range of environmental and social settings are described as follows:

- Pollution (Air, water, waste, soil, noise and vibration, land subsidence, offensive odor, sediment, etc.)
- Natural Environment (Protected area, ecosystem, water regime, topography and geology including hydrology, etc.)
- Social Environment (involuntary resettlement, poverty, indigenous people/ethnic minority, local economy/employment, land use, waste use, social infrastructure/social service, social institution, misdistribution of benefit, local conflicts of interest, cultural heritage, landscape, gender, children's rights, infectious diseases such as HIV/AIDS, working conditions, etc.)
- Others (accidents, global warming, trans-boundary impacts)

Ranges of environmental and social settings are expressed differently. JICA Guidelines specifies the range or the elements of environmental and social settings more clearly than Guidelines in Bhutan. However, it can be interpreted that there is not big differences between the two. (Refer to Result of Gap Analysis between the JICA Guidelines (2010) and the SEA Guidelines in Bhutan (2016) shown in Appendix-2.)

## **(3) Range of Environment and Social Baseline to be Covered in the SEA of the Project**

The range of the collection of data and information, namely, the elements of environmental and social settings in the SEA are enumerated to meet the two Guidelines above. Since the

development alternatives are not prepared at this moment, the degree of significance among the elements of environmental and social settings, meaning the sorting of more important elements among others, cannot always be specified at this moment except for potential impacts of the following four (4) candidate sectors as general/common cases such as:

- Impacts of public pollution such as air, water, noise pollution and waste generation, etc. due to industrial development,
- Impacts on natural environment (separation of habitat and land slide, etc.) due to hydropower projects including construction of transmission lines,
- Impacts on natural environment (pressure on wildlife) and water pollution due to tourism development including construction of resort hotels, and
- Impacts of landslide, soil erosion, soil contamination, etc. due to agricultural development including usage of chemicals as fertilizer and pesticides.

The SEA is initiated with covering every element in the whole range of environmental and social settings and update time to time along with the preparation of development alternatives.

In this connection, it should be noted that the elements of environmental and social settings are categorized considering those listed in the Bhutan State of the Environment Report (BSER), which is a periodic report on Bhutan's state of the environment, covering also the elements specified in JICA Guidelines. The range of data collection and analysis, however, might be subject to change during the SEA process when necessary.

**Table 3 Range of Environmental and Social Considerations**

No.	Category	Elements in Environmental and Social Settings
1	Land	<ul style="list-style-type: none"> <li>• Geography and climate</li> <li>• Topography and geology</li> <li>• Land cover / land use, including forest, agricultural land, degraded land, built-up land, etc.</li> <li>• Land acquisition / purchase from the third parties</li> <li>• Earth-related disaster (land slide, erosion, and other earth-related disaster),</li> <li>• Mining and quarrying, and mineral resources development</li> <li>• Issues on grazing by livestock and forest fire, etc.</li> </ul>
2	Water	<ul style="list-style-type: none"> <li>• Water resource and water use (water demand and supply)</li> <li>• Water quality / water pollution of water bodies and drinking water,</li> <li>• Soil and sediment contamination</li> <li>• River water regime and flood including flash flood in river and GLOF</li> </ul>
3	Air	<ul style="list-style-type: none"> <li>• Air quality / air pollution issues and adverse impacts</li> <li>• Offensive odor</li> <li>• Noise pollution and vibration,</li> </ul>
4	Biodiversity/ Ecology/ Forest	<ul style="list-style-type: none"> <li>• Flora and fauna, including threatened species</li> <li>• Biodiversity, ecology and issues such as habitat fragmentation and ecological imbalance</li> <li>• Wetlands / marshes</li> <li>• Protected areas, including other conservation areas designated</li> <li>• Forest cover</li> <li>• Forest conservation and utilization, forest offenses and poaching</li> <li>• Pests and diseases outbreak</li> <li>• Human wildlife conflicts</li> </ul>
5	Waste Management	<ul style="list-style-type: none"> <li>• Municipal solid waste management, including collection, treatment and disposal system</li> <li>• Liquid waste (sewage water) management</li> <li>• Medical waste and hazardous waste management</li> <li>• Industrial waste</li> <li>• E-waste (electrical appliance and PC)</li> </ul>
6	Climate Change	<ul style="list-style-type: none"> <li>• Greenhouse gas emission</li> <li>• Global warming and climate change</li> <li>• Impacts of climate change on environmental elements</li> </ul>
7	Socio-economic aspect	<ul style="list-style-type: none"> <li>• Demography, including issues on urbanization/migration and informal settlers</li> <li>• Involuntary resettlement and land acquisition</li> <li>• Poverty issue</li> <li>• Ethnic minority and indigenous people</li> <li>• Socio-economy, including employment</li> <li>• Industries and energy</li> <li>• Social infrastructure and services, including transportation</li> <li>• Tourism,</li> <li>• Social institutions / local decision-making institutions</li> <li>• Misdistribution of benefit and damages</li> </ul>

No.	Category	Elements in Environmental and Social Settings
		<ul style="list-style-type: none"> <li>• Local conflicts of interest</li> <li>• Gender / vulnerable groups / rights of children</li> <li>• Religion and spirituality</li> </ul>
8	Culture and Tradition	<ul style="list-style-type: none"> <li>• Culture and heritage sites</li> <li>• Traditional architecture</li> <li>• Landscape and aesthetics</li> </ul>
9	Health and Sanitation	<ul style="list-style-type: none"> <li>• Health service and infrastructure</li> <li>• Mortality and morbidity</li> <li>• Sanitation and water borne diseases</li> <li>• Infectious disease including HIV/AIDS</li> </ul>

#### (4) Result of Initial Analysis on Baseline Conditions

Baseline survey for environmental and social baseline was conducted mainly based on collection of secondary data and its analysis. Result of the baseline survey was compiled in Appendix-3.

#### **6.4.2 Key Environmental and Socio-economic Issues**

Based on the initial analysis results of the baseline conditions, environmental issues occurring in Bhutan were briefly enumerated in Table 4. The listed environmental and social issues are not always equally identified over the country but spotted and/or strongly localized depending on the issue. These issues will be considered for anticipation and evaluation of potential impacts to be caused by the implementation of CNDP for Bhutan 2030.

**Table 4 Environmental Issues in Bhutan**

No.	Category	Environmental Issues
1	Land	<ul style="list-style-type: none"> <li>• Landslides and erosion due to infrastructure construction such as roads, hydropower plants, transmission lines, in fragile mountain geological conditions (Nationwide, rural areas, especially along mountain slope)</li> <li>• Concern of loss of agriculture land and food self-sufficiency by urbanization and other development activities (Nationwide, urban and sub-urban areas)</li> <li>• Increasing demand for land for infrastructure development (hydroelectricity and road), mining, business and commercial activities as well as urbanization and conversion of land use from arable land and forests into other ones. (Nationwide, both urban area (for business and commercial activities) and rural areas (for infrastructures development and mining))</li> <li>• Land degradation in forests and grasslands due to overgrazing by livestock although it is reducing owing to declining trend in population of cattle. (Nationwide, rural area, especially forests and glass lands)</li> </ul>
2	Water	<ul style="list-style-type: none"> <li>• Increased run-off and threat of flash flood due to vegetation loss and climate change. (Nationwide, urban and sub-urban areas, especially riparian sites)</li> <li>• Impacts on water quality and aquatic life due to loss of vegetation. (Limited to major cities, such as Thimphu, Paro, Phuentsholing, etc.)</li> <li>• Threatening water availability due to land and forest degradation. (Limited to several dzongkhags, including Trashigang)</li> <li>• Imbalanced geographical and temporal distribution of water resources and availability although highest per capita water resource availability in the world. (Nationwide, both urban and rural area)</li> <li>• Water issues facing potential water scarcity and water use conflicts between drinking and irrigation water including seven (7) cases recorded in 2012-2015 (according to NIWRM 2016). (Limited to several basins, such as Punatsangchu (Thimphu), Wangchhu (Haa), Aiechhu (Zhemgang))</li> <li>• Increasing vulnerability to and risk of Glacier Lake Outburst Flood (GLOF); there are 25 (out of 2,674) glacial lakes as potentially dangerous. (Limited to riparian areas located downstream of dangerous glacier lakes)</li> </ul>
3	Air	<ul style="list-style-type: none"> <li>• Increasing air pollution due to emission gases from increasing number of vehicles, re-suspended road dust, industrial, construction, mining and quarrying activities, forest fire, fuel wood and kerosene for heating and cooking. (Limited to such as highly populated cities including Thimphu, areas near construction work sites of hydropower plant (Wangdue), areas near industrial estates (Phuentsholing and Pasakha), and areas near mining sites)</li> <li>• Increased smoke and suspended particulate matter (PM10) in the urban area, especially near industrial estate beyond national permissible level. (Limited to areas such as Phuentsholing and Pasakha industrial estate)</li> </ul>

No.	Category	Environmental Issues
		<ul style="list-style-type: none"> <li>• Risk to human health by increasing air pollution, especially vulnerable people (children, the elderly, those suffering from asthma or bronchitis). (Limited to people who live in the risk of air pollution described above.)</li> <li>• Concern of negative impact on crop productivity (decreasing yield of fruits and vegetables) due to the increasing particulate matter concentration in the local area due to mining and industrial activities. (Limited to areas which has high air pollution risk described above)</li> <li>• Issue on trans-boundary air pollution in the South Asian regions affecting Bhutan, especially during winter months. (Nationwide/ urban areas)</li> </ul>
4	Biodiversity/ Ecology/ Forest	<ul style="list-style-type: none"> <li>• Threat to rich biodiversity due to the pressure of development, including threatened animal species (listed in IUCN Red List and domestic legislation) (Nationwide/ rural area, mainly forest lands being affected by human activities)</li> <li>• Environmental degradation due to extraction and exploitation of natural resources such as collection of cordyceps (increasing number of collectors) and other non-wood forest products. (Limited to northern montane areas (for cordyceps), and forest lands for non-wood forest products)</li> <li>• Loss of habitat and fragmentation due to development including hydropower plant, road and infrastructure facilities, human settlements (urbanization), and mining and quarrying, etc. causing impacts on wildlife including aquatic life. (Nationwide, especially forest lands where construction of roads and transmission lines are carried out)</li> <li>• Deteriorating quality of forest due to removal of hardwood stands for meeting the demand of firewood (conifers). (Limited areas including Thimphu, Paro and Haa under demand of timber and firewood)</li> <li>• Concern for ecological imbalance due to invasive plant, animal, bird and fish species, such as tree marigold, whitetop weed, spanish flag (Lava), bark beetle, etc. including alien invasive. (Nationwide/ urban and semi-urban areas, and forest lands where human activities are conducted)</li> <li>• Increasing illegal forest activities (extraction, conversion, possession, utilization, transportation, trade and disposal of forest resources and poaching) for trading of wildlife and captive bred species. (Nationwide/ rural area, especially forest lands)</li> <li>• Loss of forest and threatening to wildlife habitat due to forest fire which often occurs in dry season from November to February. (Nationwide, especially forests located near urban area)</li> <li>• Flora and fauna as well as habitats such as highland wetlands/ marshlands in the country are not yet inventoried and/or assessed. (Nationwide, montane wetlands and marshlands)</li> </ul>
5	Waste Management	<ul style="list-style-type: none"> <li>• Increasing waste generation due to rapid urbanization, increasing affluence, population growth, etc., which causes littering and visual eyesore and lowering the image of “Brand Bhutan.” (Limited to major tourism destinations including Thimphu, Paro, and their neighbouring sites)</li> </ul>



No.	Category	Environmental Issues
		<ul style="list-style-type: none"> <li>Increasing non-degradable and hazardous wastes due to pre-packed products and plastics and PET bottles, and chemicals, which threats to contamination of water bodies and aquatic life. (Nationwide, especially urban area including major cities and rivers flowing in the urban areas)</li> <li>Improper waste management such as open burning, dumping in open landfill, insufficient application of waste segregation and recycling. (Nationwide, urban area, especially major cities and neighbouring area)</li> <li>Difficulty to identify waste management site due to steep terrain in the country. (Same as above)</li> </ul>
6	Climate Change	<ul style="list-style-type: none"> <li>Increasing emission of greenhouse gas (GHG) by 45% from 2000 to 2010, especially contributed by agriculture sector in amount, but showing rapid increasing rate in other sectors. (Nationwide, urban area, especially major cities and industrial estates)</li> <li>Concern of combined issues due to Global Warming and Climate Change including the following: <ul style="list-style-type: none"> <li>Northward/ upslope migration of forests such that montane cloud forest is vulnerable to moisture stress, intensity and incidences of pest and diseases will increase, etc. (Nationwide, forest lands with elevation of around 2,500 such as deep valley slopes of Dochula-Bajo series)</li> <li>Glaciers are continuing to shrink and threatening hydropower for clean energy and increasing risk of GLOF. (Nationwide, the valleys with potentially dangerous glacier lakes upstream, including the Punakha-Wangdi and Chamkhar valleys)</li> <li>Wet monsoon season getting wetter and dry winter getting warmer and drier. (Nationwide, all over the country)</li> <li>High ozone concentration at ground level, which cause adverse public health and ecosystem impact and enhance risks of wildfires. (Nationwide, urban and sub-urban areas which have higher risk of wildfire)</li> <li>Concern to exacerbate soil erosion, cause floods and landslides leading to further reduction of biomass, and disruption of ecological and land use system leading to negative impacts on livelihoods and adaptive capacity. (Nationwide, agriculture lands)</li> </ul> </li> </ul>
7	Socio-economic aspects	<ul style="list-style-type: none"> <li>Rapid urbanization and rural-urban migration. (Nationwide, especially major cities of Thimphu, Phuentsholing, Gelephu and Paro for in-migration and rural areas for out-migration in Trasigang, Samtse, Monggar, Zhemgang)</li> <li>High poverty rate, especially in rural areas. (Rural areas of Lhuentse, Pemagatzel and Zhemgang for income poverty rate)</li> <li>Cause of migration includes such issues as poverty in rural areas, perception of better economic prospect in urban areas, poor social services, low education opportunity, and low income, etc. (Rural areas of Gasa, Monggar and Satmtse for multidimensional poverty rate)</li> <li>Perception of people on gender issue (low employment of women, domestic violence, etc.) (Nationwide, especially rural area)</li> </ul>

No.	Category	Environmental Issues
		<ul style="list-style-type: none"> <li>• Gender issue in terms of lower employment of women. (Same as above)</li> <li>• Still being spotted children labour at workshops. (Nationwide, urban area, especially major cities)</li> </ul>
8	Culture and Tradition	<ul style="list-style-type: none"> <li>• Relatively weak perception on preservation of tradition in younger generation and in urban area. (Nationwide, urban areas)</li> <li>• Inconsistency with Bhutan's traditional landscape in southern area due to existence of many buildings which do not conform with Building Rules (2002) constructed before the enactment of the Rules. (Limited to cities located near the border with India such as Phuntsholing)</li> </ul>
9	Health and Sanitation	<ul style="list-style-type: none"> <li>• Insufficient health services in terms of shortage of specialized doctors, lack of medical instrument, etc. (Nationwide, rural areas)</li> <li>• Concern on non-communicable diseases and necessity to awareness building on health settings (Nationwide, urban areas)</li> <li>• Prevalence of issues related to public health including: (Nationwide) <ul style="list-style-type: none"> <li>- Alcohol addiction,</li> <li>- Mental health,</li> <li>- Substance abuse,</li> <li>- Teenage pregnancy,</li> <li>- Suicide,</li> <li>- Domestic violence,</li> <li>- Issue on disability, and</li> <li>- Elderly care.</li> </ul> </li> </ul>

### 6.4.3 International Treaties and Accords

Reflecting the wide range of environmental issues in terms of diversity and complexity, spatial area and time period, a lot of international Treaties and Accords have been resolved in the international society, and conceded / ratified among the relevant nations so far. Some of the anticipated environmental issues to be generated by the Development Plan will be related to the international Treaties and Accords. The SEA of the Project, therefore, needs to apply some of them which provide principles and framework for compliance and good practices for environmental and social considerations.

Appendix-4 enumerates the international Treaties and Accords to be considered in the process of SEA of the Project with regard to commitments by the Government of Bhutan by category of environment and social issues.

### 6.4.4 Legislation, and National Level Plans, Policies and Strategies

Many laws and regulations as well as related Plans, Policies and Strategies, etc. have been legislated, resolved and promulgated in Bhutan as law-governed country so far. The SEA of the Project should consider the provisions, guidelines and frameworks stipulated by them related to the objectives of the SEA and the National Development Plan to be formulated in the Project.

Appendix-5 lists up the legislation and national level Plans, Policies and Strategies to be examined and taken account of in the process of SEA of the Project by category of environment and social issues.

## **6.5 Assessment of Development Plan**

### **6.5.1 Assessment of Development Alternatives including ‘No Action’**

Environmental assessment process will be applied for the development plans to be produced during the Project, for identifying likely impacts due to the implementation of the plan. The assessment in this SEA process will be undertaken for each of the development alternatives, including ‘no action.’

#### **(1) Description of Development Alternatives**

The outline of the development alternatives to be produced in the Project will be described as shown in Table 5 below. In the SEA process, the development alternatives will be described in the each viewpoint itemized in the columns of ‘items’ and ‘contents.’ These ‘items’ and ‘contents’ correspond to SEA objectives and indicators (refer to the following section), respectively, from the viewpoint of SEA process.

**Table 5 Outline of Development Alternatives (Tentative)**

Table 3: Outline of Development Alternatives (tentative)			
Item			Content (example)
Nine (9) Domains GNH	Psychological Wellbeing		• Crime rate and public safety
	Health		• Birth and death rate with natural population growth rate
	Time Use		• Lifestyle
	Education		• Human resource development
	Cultural Diversity		• Traditional culture, ethnicities and heritage
	Good Governance		• Role of central government, local government and community • Social turmoil and security
	Community Vitality		• Social participation and existence of communities in urban and rural
	Ecological Diversity	Natural environment	• Forested area, precious species, hydrology and topography, • Conservation of forested area, protected area and ecosystem
		Environmental destruction	• Air quality, water quality, solid waste, etc.
		Disaster prevention	• Risk of disaster
	Living standard	Social disparity	• Disparity between regions/Dzongkhags, gender, income classes, ethnics and age groups
		Public services	• Infrastructure, medical, education, etc.
	Socio-economic development	Population projection and economic projection	
Agriculture		• Role of agriculture, manufacturing and tourism in national development • Existence of farming village • Economic diversity and resilience	
Manufacturing			
Tourism and service			
Regional context			• Superiority of Bhutan in the regional context including India and Bangladesh
Spatial structure			• Axis of national territory, core, land use and transport system
Development approach			• Short, medium and long terms
Preliminary GNH Index			• GNH Index in urban and rural areas

## (2) SEA Objectives and Indicators

In the assessment process, SEA objectives and indicators will be set out as SEA Guidelines stipulates. SEA objectives and indicators are, in other words, environmental components to be affected and the parameters for evaluation of the impacts, respectively.

In this Project, SEA objectives and indicators will be set out from the wide range of environmental and social aspects which are shown in the previous section, meaning that the likely impacts will be evaluated from the viewpoints of the SEA objectives and indicators set out. In addition, SEA objectives and indicators will also be set out from the following aspects, which characterize Bhutan as a unique country in the world.

- Nine (9) domains highlighted in the GNH (psychological wellbeing, health, time use, education, cultural diversity, good governance, community vitality, ecological diversity and living standard)

- Correction of social disparity (those between rural and urban areas, the gender gaps, gaps among age group, and gaps among income classes,
- Technical aspects and necessary cost of the development alternatives,
- Compliance with the philosophy of “Middle Path” addressed in the National Environmental Strategy for Bhutan (1998)

The details of these SEA objectives and indicators will be examined and organized through the collection of environmental baseline data and information to be gathered in the early stage of the SEA process as well as the discussions in the SEA process.

### **(3) Assessment Method of Impacts**

The expert judgement will be applied for impact assessment by combining with other analytical tools such as checklist, spatial analysis, trends analysis, and modelling (statistical analysis). Analytical tools to be adopted will depend on the environmental objectives/components. Modeling method (statistical analysis) will be applied for evaluating the level of GNH as a result of the implementation of the development plan.

Impact description will be done in rather qualitative manner since this assessment is to be applied for a plan but not for a project. Quantitative projection, therefore, is not always applicable but it can only be applied to limited issues.

The scope of the impacts to be examined shall cover the environmental and social settings listed in Table 3 including the categories of land, water, air, biodiversity/ecology/forest, waste management, climate change, socio-economic aspects, culture and tradition, and health and sanitation. The assessment will also clarify the nature of the likely impacts by clarifying positive or negative, direct or indirect, if cumulative ones as well as reversible or irreversible.

### **(4) Elaboration of the Alternatives for Best Development Plan**

The SEA for this Project is targeted for a nation development plan. Proposal and elaboration of development alternatives will be done in collaboration of JICA Project Team and Bhutan side by incorporating SEA. The scoping process (identifying of major environmental issues and their scopes, etc.) is required to be done synchronized with the process of elaboration of development alternatives. Detailed processes are as follows:

The development alternatives will be initially proposed by the JICA Project Team. They will also be examined from environmental point of view and will be modified and/or created from Bhutan side through discussion in the Working Group. SEA objectives and indicators also can be modified/ added by Bhutan side. These elaborated development alternatives will be presented and discussed in the 1<sup>st</sup> stakeholder meeting as described in the following section. Through these processes, the most preferred alternative will be adopted as a best development plan. Thus, the process to select the best development plan is not a simple linear direction but complex, iterative and rather robust until reaching to the consensus for the best development plan. Thus, SEA eventually will contribute to appropriate decision-making process for the formulation of the development plan.

## **6.5.2 Environmental Assessment for the Selected Alternative (the Best Development Plan)**

Environmental assessment will be applied for the selected alternative, i.e. the best development plan. In the environmental assessment, impact description and evaluation will be undertaken in the same manner as those for the development alternatives. The mitigation measures for the negative impacts and enhancement measures for positive impacts will also be addressed in the environmental assessment as Strategic Environmental Management Plan (SEMP). These analysis results of the impact assessment conducted by SEA Team will be discussed in the Working Group and presented in the 2<sup>nd</sup> stakeholder meeting as mentioned in the following section.

## **7. Deliverables**

### **7.1 Deliverables in SEA**

The following reports will be produced during the process of SEA.

- Scoping Report
- Interim SEA Report
- Draft SEA Report
- SEA Final report

All these reports will be described in English.

### **7.2 Reporting and Review Process**

#### **7.2.1 Scoping Report**

Scoping Report, aiming to clarify the scope of SEA, is to be produced at the beginning stage of SEA process in parallel with the preparation of TOR as compiled herein.

#### **7.2.2 Interim SEA Report**

Interim SEA Report will be produced after the process of assessment for the development alternatives including ‘no action’ and the results of 1<sup>st</sup> stakeholder meeting. The main contents of the report are as follows:

- Description of development alternatives
- Results of assessment for the alternatives (comparative evaluation of alternatives)
- Results of 1<sup>st</sup> stakeholder meeting (discussion raised in the workshop and meeting)

#### **7.2.3 Draft SEA Report**

Draft SEA Report will be produced after the process of the environmental assessment for the selected alternatives, i.e. best development plan. The main contents of the report are as follows:

- Description of the selected alternatives (best development plan),
- Results of assessment for the selected alternatives,
- Results of 2<sup>nd</sup> stakeholder meeting (discussions raised in the meeting)

The Draft SEA Report will be subject to a series of review by various levels of stakeholders as follows:

- Administrative review by the CM, WG and SC,

- Review by relevant stakeholders who participated in the SHM,
- Public review

Detailed process for review of draft SEA report will be determined through consultation / coordination with the Core Members and Working Group.

#### **7.2.4 Final SEA Report**

Based on the various comments through the review of the various levels of stakeholders mentioned above, the Draft SEA Report will be revised and improved for Final SEA Report. The Final SEA Report will be discussed in the Steering Committee of this Project and will be finally submitted to GNH Commission.

### **8. Work Schedule**

Work Schedule of the SEA process is shown in Figure 3. SEA Process will be undertaken incorporated in the whole activities in the Project for the Formulation of the Comprehensive Development Plan for Bhutan 2030. It will take two years and continue until December 2018 for the period of two years.

Figure 3 Work Schedule of Strategic Environmental Assessment (SEA) for the Project

Year		2017			2018		
Phase		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
The Whole Scope of the Project		Inception Work in Bhutan	Examination of existing conditions and identification of development issues in the Study Area	Establishment of the development vision	Formulation of the Comprehensive National Development Plan (CNDP)	Preparation of development guidance and recommendations for implementation	Final Report preparation and public Relations
		Preparatory work in Japan	Collection and organization of information on environmental and social considerations Preparation of TOR for the SEA and Scoping	Assessment of Development Alternatives	Environmental Assessment (EA) for the Best Development Plan	2nd consultation meeting	Review and Approval of SEA
Process of Strategic Environmental Assessment (SEA)		Preparatory work in Japan					
Assignment Schedule (Work in Bhutan)	Expert 1	Feb-Mar	Jul.	1st consultation meeting Jan.		Sep.	
	Expert 2			Jan.		Sep.	
Report / Document		TOR	Scoping Report	Interim Report		Draft SEA Report	Final SEA Report



## **Appendices**

### **Appendix-1 List of Stakeholders (Tentative) to be Invited to Stakeholder Meetings on the SEA of the Project**

#### **1. National Government**

- Gross National Happiness Commission (GNHC)
- National Land Commission (NLC)
- National Environment Commission (NEC)
- Ministry of Works and Human Settlement (MoWHS)
  - Dept of Human Settlements (DHS)
  - Dept of Roads
  - Dept of Engineering Services
  - Policy and Planning Division (PPD)
  - Other related organizations under MoWHS
- Ministry of Home and Cultural Affairs (MoHCA)
  - Dept Local Government (DLG)
  - Dept of Culture (DOC)
  - Dept of Disaster Management (DDC)
  - Bureau of Law and Order (BLO)
  - Other related organizations under MoHCA
- Ministry of Agriculture and Forests (MoAF)
  - Dept of Forests and Parks Services (DOFPS)
  - Dept of Agriculture (DOA)
  - Dept of Agriculture, Marketing and Cooperatives (DOAMC)
  - Department of Livestock (DoL)
  - Policy Planning Division (PPD)
  - National Biodiversity Centre (NBC)
  - Rural Development Training Centre
  - Bhutan Agriculture and Food Regulatory Authority (BAFRA)
  - Green Bhutan Corporation Limited (GBCL)
  - Other related organizations under MoAF
- Ministry of Economic Affairs (MoEA)
  - Dept of Trade (DOT)
  - Dept of Industry (DOI)
  - Dept of Cottage and Small Industries (DCSI)
  - Dept of Geology and Mines (DGM)
  - Dept of Renewable Energy (DRG)
  - Dept of Hydropower and Power Systems (DHPS)
  - National Center for Hydrology and Meteorology (NCHM)
  - Policy and Planning Division (PPD)
  - Other related organizations under MoEA

- Ministry of Information and Communication (MoIC)
  - Road Safety and Transport Authority (RSTA)
  - Bhutan Civil Aviation Authority (BCAA)
  - Policy and Planning Division (PPD)
  - Other related organizations under MoIC
- Ministry of Education (MoE)
  - Dept of School Education (DSE)
  - Dept of Adult and Higher Education (DAHE)
  - Dept of Youth and Sports (DYS)
  - Policy Planning Division (PPD)
  - Other related organizations under MoE
- Ministry of Health (MoH)
  - Dept of Public Health (DOPH)
  - Dept of Medical Services (DMS)
  - Dept of Medical Supplies and Health Infrastructure (DMSHI)
  - Dept of Traditional Medicine Services (DTMS)
  - Other related organizations under MoH
- Centre of Bhutan Studies (CBS)
- Tourism Council of Bhutan (TCB)
- National Statistics Bureau (NSB)
- Construction Development Board (CDB)
- National Commission for Women and Children (NCWC)
- Parliament
  - National Assembly (NA)
  - National Council (NC)
- Cabinet
- Judiciary of Bhutan

## 2. Local Government

All the 20 districts (dzongkhags) governments in Bhutan listed in the table below are included as stakeholders. In addition, concerned municipalities/ towns and villages in each dzongkhags will be included too. The details of municipalities/ towns and villages will be examined in the process of formulating development alternatives of CNDP.

**Table A-1 List of Local Government (District Level)**

No.	District (Dzongkhag)	No.	District (Dzongkhag)
1	Bumthang	11	Samdrupjongkhar
2	Chhukha	12	Samtse
3	Dagana	13	Sarpang
4	Gasa	14	Thimphu
5	Haa	15	Trashigang
6	Lhuntse	16	Trongsa
7	Mongar	17	Tsirang
8	Paro	18	Wangduephodrang
9	Pemagatsuel	19	Yangtse
10	Punakha	20	Zhemgang

### 3. Academic Sector

- Royal University of Bhutan
- Khesar Gyalpo University of Medical Sciences of Bhutan

### 4. Public Institution and Private Sector by Category

**Table A-2 List of Stakeholders from Public Institution, Private Sector and NGOs/CSO by Category**

No.	Category	Stakeholders (Candidates)		
		Public Institution	Private Sector	NGO/CSO
1	Land	<ul style="list-style-type: none"> <li>National Soil Service Centre (NSSC)</li> </ul>	<ul style="list-style-type: none"> <li>National Resources Development Corporation Limited (NRDCL)</li> </ul>	
2	Water			<ul style="list-style-type: none"> <li>Bhutan Water Partnership (BhWP)</li> </ul>
3	Air		<ul style="list-style-type: none"> <li>Automobile Workshop Association (AWA)</li> </ul>	
4	Biodiversity / Ecology/ Forest	<ul style="list-style-type: none"> <li>Ugyen Wangchuk Institute for Conservation and Environmental Research (UWIEC)</li> </ul>		<ul style="list-style-type: none"> <li>Royal Society for Protection of Nature (RSPN)</li> <li>WWF-Bhutan*</li> </ul>
5	Waste management		<ul style="list-style-type: none"> <li>Greener Way</li> </ul>	<ul style="list-style-type: none"> <li>Clean Bhutan</li> </ul>
6	Climate change			<ul style="list-style-type: none"> <li>Tarayana Foundation</li> </ul>
7	Socio-economy	<ul style="list-style-type: none"> <li>Centre for Bhutan Studies and GNH Research (CBS&amp;GNH)</li> </ul>	<ul style="list-style-type: none"> <li>Association of Bhutanese Industries (ABI)</li> <li>Bhutan Chamber of Commerce (BCC)</li> <li>Druk Holdings and Investments Ltd. (DHI)</li> <li>Wood Based Industries Association (WBIA)</li> <li>Association of Bhutan Tour Operators (ABTO)</li> <li>Hotel and Restaurant Association of Bhutan (HRAB)</li> <li>Construction Association of Bhutan (CAB)</li> </ul>	<ul style="list-style-type: none"> <li>Bhutan Youth Development Fund (BYDF)</li> <li>Bhutan Children's Parliament (BCP)</li> <li>Disabled Persons' Association of Bhutan</li> <li>Ability Bhutan Society (ABS)</li> <li>Association of Bhutanese Tour Operators (ABTO)</li> <li>Royal Society for Senior Citizens</li> <li>Bhutan Foundation*</li> <li>Save the Children USA, Bhutan Program</li> <li>Tarayana Foundation*</li> <li>Loden Foundation</li> <li>Helvetas Swiss Intercooperation Bhutan</li> <li>Bhutan Association of Women Entrepreneurs (BAOWE)</li> <li>National Women's Association of Bhutan (NWAB)</li> </ul>
8	Culture and tradition			<ul style="list-style-type: none"> <li>Bhutan Foundation*</li> <li>Handicrafts Association of Bhutan</li> <li>WWF-Bhutan*</li> <li>Tarayana Foundation*</li> </ul>

No.	Category	Stakeholders (Candidates)		
		Public Institution	Private Sector	NGO/CSO
9	Health	<ul style="list-style-type: none"> <li>Royal Center for Disease Control</li> <li>Royal Institute of Health Sciences (RIHS)</li> </ul>		<ul style="list-style-type: none"> <li>Bhutan Health Trust Fund (BHTF)</li> </ul>

Note) \*: The organizations covering plural categories of activity.

## Appendix-2 Result of Gap Analysis between the JICA Guidelines (2010) and the SEA Guidelines in Bhutan (2016)

**Table A-3 Consistency between JICA Guidelines (2010) and SEA Guidelines in Bhutan (2016)**

Main Considerations	JICA Guidelines	SEA Guidelines in Bhutan	Gap between the two Guidelines	Policy to fill up gaps in this study
Underlying Principles	Environmental impacts that may be caused by projects must be assessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan.	SEA Guidelines is to be applied to proposed PPPs (Policies, Plans and Programmes), which are the earliest possible planning stage. The Guidelines also stipulates the necessity of potential alternatives to PPPs or to possible PPPs components for formulation of optimal PPPs in terms of environmental and social considerations.	No gap.	
Examination of Measures	Multiple alternatives must be examined in order to avoid or minimize adverse impacts and to choose better project options in terms of environmental and social considerations.	Same as above.	No gap.	
Scope of Impacts to Be Assessed	Broader environmental and social components including Pollution, Natural Environment and Social Environment aspects.	Environmental, social & sustainability topics, including relevant objectives for the biological (e.g., for biodiversity & ecosystems), physical (e.g., for soil, water, air, landscape, climate change), & socio-cultural & economic components (e.g., for health, equity, poverty, heritage, or economy).	No gap.	
Compliance with Laws, Standards, and Plan	Projects must comply with the laws, ordinances, and standards related to environmental and social considerations established by the governments that have jurisdiction over project sites (including both national and local governments).	Analysis of policy and legal framework is stipulated as one of the processes to be done during the scoping, which is aiming to keep consistency with existing policy and legislation.	No gap.	
	Projects must, in principle, be undertaken outside of protected areas designated by laws or ordinances for the conservation of nature or cultural heritage. Projects are also not to impose significant adverse impacts on designated conservation areas.	As legal framework for SEA, National Environmental Protection Act (2007) clearly stipulates to ensure conservation and protection of the protected areas.	No gap.	

Main Considerations	JICA Guidelines	SEA Guidelines in Bhutan	Gap between the two Guidelines	Policy to fill up gaps in this study
Social Acceptability	Projects must be adequately coordinated so that they are accepted in a manner that is socially appropriate to the country and locality in which they are planned.	Social acceptability and participation is ensured in the forms of explanation, stakeholder consultation, meeting and workshop, public comments during various stages of the process of SEA, including scoping, assessment and review of reports.	No gap.	
Ecosystem and Biota	Projects must not involve significant conversion or significant degradation of critical natural habitats and critical forests.	SEA Guidelines does not stipulate any policy/criteria to conserve ecosystem. However, the Constitution of Bhutan (2008) and National Environmental Protection Act (2007), which are the primary legal framework for SEA in Bhutan, clearly provides the criteria for conservation of ecosystem and biota.	Conservation of ecosystem is not clearly stipulated in SEA Guidelines in Bhutan.	Conservation of ecosystem shall be secured based on the Constitution of Bhutan and other relevant laws.
	Illegal logging of forests must be avoided. Project proponents are encouraged to obtain certification by forest certification systems as a way to ensure the prevention of illegal logging.	SEA Guidelines does not stipulate any policy/criteria to ban illegal logging. Illegal logging is strictly prohibited under Forest and Nature Conservation Act (1995) and its rules and regulations.	There is no description on prohibition of illegal logging in SEA Guidelines in Bhutan.	Illegal logging is prohibited under Forest and Nature Conservation Act (1995) and its rules and regulations.
Involuntary Resettlement	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.	SEA Guidelines does not stipulate any policy/criteria to avoid negative impacts such as involuntary resettlement to be caused by the process of land acquisition. The procedures of land acquisition and compensation (but not including resettlement) are provided in Land Act (2007) and Land Rules and Regulations (2007).	Issue on resettlement is not stipulated in SEA Guidelines in Bhutan.	Issue on resettlement shall be addressed pursuant to both JICA Guidelines and Environmental Assessment General Guidelines (2012) of Bhutan.

Main Considerations	JICA Guidelines	SEA Guidelines in Bhutan	Gap between the two Guidelines	Policy to fill up gaps in this study
	People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported by project proponents etc. in a timely manner at full replacement cost as much as possible to improve or at least to restore these to pre-project levels.	SEA Guidelines does not stipulate any policy/criteria to avoid negative impacts such as involuntary resettlement to be caused by the process of land acquisition. According to Land Act (2007) and Land Rules and Regulations (2007), the targets of compensation are land rights, structures, crops and trees, etc. Specifically, Land Rules and Regulations (2007) stipulate that the land to be acquired shall be compensated in cash or substitute land or both. Property Assessment and Valuation Agency (PAVA) shall be established under Ministry of Finance to valuate and fix the value of land and other collateral property. The value of compensation shall be approved by the National Land Commission. (Clause 132 to 134). EA General Guidelines (2012) stipulate the necessity of compensation based on current market price. Specifically, it is described in “Section 4.2.8 Mitigation Measures for Socio Economic Impacts” that compensation for land should be based on the current market price, and in “Section 2.2.7 Mitigation and Environmental Management Plan (EMP)” that the resettlement and rehabilitation plan (R&R) should include details of the compensation, provisions at the resettlement colony such as basic amenities including housing, educational facilities, infrastructure and alternate livelihood potential, a clear timeline for implementation, responsibility, budges, grievance mechanisms, etc.	No clear description on compensation based on replacement cost. But relevant laws and regulations stipulate the level of compensation.	Issue on resettlement shall be addressed pursuant to both JICA Guidelines and relevant laws and regulations in Bhutan.

Main Considerations	JICA Guidelines	SEA Guidelines in Bhutan	Gap between the two Guidelines	Policy to fill up gaps in this study
	Participation by affected people must be promoted in the planning, implementation, and monitoring of resettlement action plans and measures to prevent the loss of their means of livelihood. In addition, grievance mechanisms must be established for the affected people.	SEA Guidelines does not stipulate any policy/criteria to promote participation of affected people in the planning, implementation, or monitoring of resettlement. EA General Guidelines (2012) stipulate the necessity of public participation regarding resettlement. Specifically, it is stipulated in Section 4.2.8 that the R&R should be framed in consultation with the Project Affected Population (PAP).	No clear description on participation of affected people. But relevant laws and regulations stipulate the level of compensation.	Issue on resettlement shall be addressed pursuant to both JICA Guidelines and Environmental Assessment General Guidelines (2012) of Bhutan.
	For projects that will result in large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public.	SEA Guidelines does not stipulate any policy/criteria on formulation of resettlement action plan. EA General Guidelines (2012) stipulate the necessity to formulate resettlement. Specifically, it is stipulated in Section 2.2.7 that preparation of a resettlement and rehabilitation plan (P&R) shall be prepared in case of displacement is involved and that public hearing should be included on the R&R.	No clear description on formulation of resettlement action plan. But relevant laws and regulations stipulate the level of compensation.	Issue on resettlement shall be addressed pursuant to both JICA Guidelines and Environmental Assessment General Guidelines (2012) of Bhutan.
Indigenous Peoples	Any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures must be taken to minimize impacts and to compensate indigenous peoples for their losses.	SEA Guidelines stipulates the necessity of consideration to indigenous people by means of inclusion of them to public participation process to draw their perception since they are one of the vulnerable people who would often receive the negative aspects of pressures and impacts to be caused by human interventions / projects.	No gap.	
	When projects may have adverse impacts on indigenous peoples, all of their rights in relation to land and resources must be respected in accordance with the spirit of relevant international declarations and treaties.	SEA Guidelines stipulates the necessity of consideration to indigenous people by means of inclusion of them to public participation process to draw their perception.	No gap	



Main Considerations	JICA Guidelines	SEA Guidelines in Bhutan	Gap between the two Guidelines	Policy to fill up gaps in this study
	Measures for the affected indigenous peoples must be prepared as an indigenous peoples plan and must be made public in compliance with the relevant laws and ordinances of the host country.	SEA Guidelines stipulates the necessity of consideration to indigenous people by means of inclusion of them to public participation process to draw their perception.	No gap.	
Monitoring	After projects begin, project proponents etc. monitor whether any unforeseeable situations occur and whether the performance and effectiveness of mitigation measures are consistent with the assessment's prediction. They then take appropriate measures based on the results of such monitoring.	SEA Guidelines stipulates that the PPP proponent is responsible for monitoring and evaluation of the implementation of the PPP, guided by the monitoring recommendations in the SEA report.	No gap.	
	Project proponents etc. should make efforts to make the results of the monitoring process available to local project stakeholders.	SEA Guidelines recommends the proponent to submit the monitoring report to NECS and make available to the public.	No gap.	

Source: JPT's Gap Analysis based on JICA Guidelines and SEA Guidelines in Bhutan.

## Appendix-3 Result of Initial Analysis on Baseline Conditions

The following is the result of initial analysis of baseline conditions. The data sources of the analysis are Bhutan State of Environment Report (NEC, 2016), Fifth National Report (NEC, 2014) and National Biodiversity Strategies and Action Plan (2014), unless otherwise described.

### 1. Land

- Geography

Bhutan is located on the southern slopes of the eastern Himalaya with an area of 38,394 km<sup>2</sup>, lying between latitude 26 °N and 29 °N and longitudes 88 °E and 93 °E. The country is almost entirely mountainous with altitudes ranging from 150 to 7,500 m above sea level. The topography of the country is featured by the high Himalayas in the north with snowcapped peaks and alpine pastures, north–south valleys and ranges forming watersheds, deep valleys created by fast flowing rivers, rugged foothills, and alluvial plains with broad river valleys.

- Climate

Bhutan is composed of three (3) climatic zones as shown in the table below. Around 70% of the precipitation in Bhutan is generated by the monsoons which usually last from late June through late September, while pre-monsoon activities generate about 20% of the precipitation. The northern region gets about 40mm of annual precipitation, mostly in the form of snow. The temperate central valley get a yearly average of about 1,000mm of rainfall while the southern region gets about 1,500mm of rainfall annually (NSB, 2007).

**Table A-4 Climatic Zones of Bhutan**

Belt	Physical features	Altitude	Climatic characteristics	Temperature
Southern belt	Himalayan foothills	150 m – 2,000 m	Subtropical climate High humidity and heavy rainfall	15°C – 30°C all year round.
Central belt	River valleys	2,000 m – 4,000 m	Cool winters, hot summers and moderate rainfall.	15°C – 26°C (June –September) and -4°C – 15°C (winter season).
Northern belt	Snowcapped peaks and alpine meadows	above 4,000 m	Cold winter and cool summer	

Source: SNC, NEC, 2011

- Land Use / Land Cover

According to Bhutan Land Cover Assessment (BLCA) conducted by Ministry of Agriculture and Forests in 2010 reports, the present state of land cover and land use as shown in the table below. Forests remain dominant (70.46%) in Bhutan, which exceeds the minimum percentage (60%) of the forest lands stipulated in the Constitution of Bhutan, 2008. This is followed by shrub (10.43%), snow cover (7.44%) and so on.

**Table A-5 Land Cover in Bhutan**

Land Cover	Area (km <sup>2</sup> )	Ratio (%)
Forests	27,052.9	70.46
Shrubs	4,005.30	10.43
Snow cover	2,854.80	7.44
Meadows	1,575.70	4.10
Bare Areas	1,229.8	3.20
Cultivated agricultural land	1,125.6	2.93
Water bodies	275.7	0.71
Degraded areas	206.4	0.54
Built-up areas	61.5	0.16
Marshy areas	3.2	0.01
Non-built up areas	3.3	0.01
Total	38,394	100.0

Source: Bhutan Land Cover Assessment (2010)

- Demand for Land

Demand for land on Government Reserved Forest (GRF) / State Land comes mainly from the infrastructure development (hydroelectricity and road), mining, business and commercial activities. Demand for development services, particularly for rural development, has increased for land in the past decade with acceleration in rural electrification and construction of rural farm roads after 2008. The largest areas of State Land were leased for construction of electricity transmission lines, especially of low voltage distribution lines of 33kV and 11kV to achieve 100% rural household electrification by 2020. The second largest demand was for road construction on GRF, especially for accelerated construction of rural farm roads, total length of which has increased from 1,045 km in 2008 to 5,218 km by 2013.

- Land Requirement by Urbanization

Land requirement by urbanization is significant due to direct utilization of agricultural land and increased requirements for construction materials such as sand, stones and timber along with requirements for waste dumpsites, which may lead to land degradation and pollution. Rate of urbanization was estimated at 7.3 % average annual growth in urban population (Bhutan National Urbanization Strategy (MoWHS, 2008)). The Strategy projects the urban population growth of 250,000 by 2020 and the additional land requirement of 2,465 ha (total land area) as most likely scenario, which will be the demand for urban land falling on agricultural land.

- Grazing by Livestock

Cattle grazing takes place in forests, open pastures and grasslands on a free-range basis. Due to migratory practices, most grazing areas in temperate zones are subject to grazing throughout the year by cattle in the summer and yaks in winter. Overgrazing is regarded as contributing to land degradation in Bhutan. However, the trend in total population of cattle appears to be declining and would imply decline pressures from grazing by cattle in forests and grasslands.

- Forest Fire

Forest fire repeatedly occurs every year in most areas in the country especially during dry season from November to February. Forest fire is one of the main causes of forest degradation and loss of forests and associated biodiversity in Bhutan. DoFPS has recorded an average of

48 fire incidents annually in the last five years causing damage to a total of 47,501 acres of forest land.

In 2016, the total of 72 fire incidences damaged 21,057.5 acres of forest areas. Thimphu Dzongkhag recorded the highest number of fire incidences of 21 nos. while Wangdue recorded maximum area of 9,750.94 acres damaged by 11 fire incidences.

## 2. Water

- Watershed and water resources

The land of Bhutan is composed of several river watersheds including Amochhu, Wangchhu, Punatsangchhu, Mangdechhu and Drangmechhu, etc. The total annual water availability stands at 70,576.02 m<sup>3</sup> which works out to average flow of 2,238 m<sup>3</sup>/s in 2015, which endows the highest per capita water resources availability in the world (see table below). The estimated hydropower generation potential is 30,000 MW of which currently being developed 1,488 MW as total installed capacity. (DGPC, 2016).

**Table A-6 Basin and Flow Calculation**

Management Basin	Area (km <sup>2</sup> )	River Basins	Area (km <sup>2</sup> )	Annual flow (MCM)
Amochhu,	3,252	Jaldakha	942	9,375.07
		Amochhu	2,310	
Wangchhu	4,596	Wangchhu	4,596	5,209.06
Punatsangchhu	11,582	Punatsangchhu	9,645	19,129.79
		Aiechhu	1,937	6,989.14
Mangdechhu	7,380	Mangdechhu	7,380	11,797.24
Drangmechhu	11,584	Drangmechhu	8,457	13,569.14
		Nyera amachhu	2,348	4,506.57
		Jomori	642	
		Merak - Sakteng	137	
Total	38,394	Total	38,394	70,576.01
		Population		746,773
		Per Capita Water Available		94,508.04 m <sup>3</sup> /Annum
		Flow		2,238.0 m <sup>3</sup> /s

Source: BSER, 2016 (NEC)

In the meantime, proportion of population with access to improved drinking water source is 97.7% according to National Health Survey (2012). Cases of water-borne diseases (diarrhea and dysentery) are declining largely attributed to the improved sanitation.

- Water quality

NECS establishes monitoring stations of water quality targeted for major rivers in Bhutan. According to NECS assessment for the river stretch of Wangchhu in Thimphu, it was suggested deterioration of water quality around the city core area due to high anthropogenic contamination. The water quality along the upstream Wangchhu is relatively better than downstream of town areas.

A rapid assessment of rural drinking water quality in 2012 indicate that 17% of the stream water sources and 28% of the spring water sources are safe for consumption (RCDC, 2012). The test is conducted through assessment of microbiological parameters. Recent water quality monitoring result also indicates that rivers in Thimphu and Paro were found to contain bacteria E. Coli according to the water quality monitoring programme launched by Clean

Bhutan and Water Keeper Alliance (NGO). The monitoring result suggests that sewage water leaking from septic tanks is entering the river (Kuensel, Local Newspaper, July 22, 2017).

- **Water pollution sources**

Domestic sewage, waste oil and effluents from automobile and industries are the major water pollutants. Increasing waste, particularly untreated wastewater generation, pollute pristine water bodies. In Thimphu City, household connection to the sewerage treatment plant in Babesa remains below 15%. The remaining 85% rely on individual septic tanks and have higher risk of sewerage outflow as described above.

Water bodies in urban centers, such as Thimphu and Phuentsholing, are subjected to additional pressure from automobile workshops, which generated waste oil and other effluents. Thimphu alone has more than 47 automobile workshops.

- **Issues on flooding and landslide due to heavy rainfall**

Issues on increased run-off rivers and risk of flash floods during monsoon season have become a major water related disaster in Bhutan. Flash flood of 2009 which is ignited by Cyclon Aila is one of the biggest climate inducted disasters affecting most parts of Bhutan. It has caused an estimated loss of about 7 million Nu. and took 12 lives. (State of Climate Change Report for the RNR Sector, 2016) Flooding damages are reported almost every year. A flood disaster in Lhuentse Dzongkhag was reported by local newspaper, Kuensel, in which around 20 households and 17 acres of crops were lost at the night of July 17, 2017.

Increased run-off and flash floods aggravate the damage of disasters combined with landslide and landslips due to geo-environmental hazards, or unstable geological conditions in the steep slope of mountains in the country. The disaster caused by floods and landslides occurs almost every year during monsoon season. Local newspaper, Kuensel (July 25, 2017), reported a landslide near Bubja in Trongsa along the Trongsa-Gelephu highway, which completely wasted away the roads with about 50 m caused by prolonged heavy rainfall.

- **Glacial Lake Outburst Flood (GLOF)**

It is estimated that 10 % of total surface area of Bhutan are covered by glaciers in 1980's. Glaciers are formed and fed by snow in the winter and slow melting in the summer, moving slowly downstream along the valley for a very long time period. Glacial lakes are often formed where glacial movement temporary blocks river flows. There are a number of glacier lakes in Bhutan amounting to 2,674. A glacial lake outburst flood (GLOF) is a type of outburst flood that occurs when the dam containing a glacial lake fails. Based on remote sensing analysis, glacial lakes are facing to a risk of outburst: 25 of 2,674 glacial lakes are identified as potentially dangerous glacial lakes.

### **3. Air**

- **Air pollution**

Air quality in Bhutan has long been regarded as pristine. However, recent rapid development is placing pressure on air quality in the major urban centers and at several industrial areas. Today, air pollution is becoming one of the emerging issues that have a risk to human and environment health.

Air pollution in Bhutan has been monitored with varying degree of reliability since the early 2000. PM10 is the longest data available, showing that there is an increasing trend in the concentration of PM10, which is still within the national permissible limit in Thimphu but is exceeding the WHO guidelines and EU directives for annual average levels.

The levels of PM10 at the Pasakha industrial estate, the town of Rinchending and Bajothang exceed the national permissible limits for sensitive area. The increased incidences of exceeding the permissible limits indicate deterioration of overall air quality over the years.

- **Causes of air pollution**

Bhutan State of the Environment Report (2016) indicates the following causes for the air pollution: Increasing vehicles, road surfacing and re-suspended road dust, Industrial mining activities, Construction activities, Forest fires and hazards, and Fuel wood and kerosene for heating and cooking:

- Increasing vehicles, road surfacing and re-suspended road dust: Increasing number of motor vehicles contributes to local air pollution. Besides tailpipe emissions, other related emissions include particulate matter from tire and brake wear-out, and re-suspended road dust. The number of vehicles in the country has almost doubled from 40,532 to 76,118 in 2008 and 2015.
- Industrial mining activities: Manufacturing industries and mining activities generate significant dust pollution within the local area due to excavation and loss of vegetation. The number of manufacturing and production industries has increased by 103.2% from 1,389 in 2008 to 2,823 in 2014.
- Construction activities: Windblown dust particles from the construction sites, such as hydropower plants, are source of dust pollution. Rapid urbanization has fueled a boom in the construction industry in the past decade.
- Forest fires and hazards: Forest fires contribute to local air pollution. Most forest fires are human induced, commonly from burning of agricultural debris, careless smokers, road workers, electricity short-circuits, lemon grass harvesters and children playing with matchsticks.
- Fuel wood and kerosene for heating and cooking: Use of fuel wood and Kerosene for household heating and cooking contributes to air pollution. Fuelwood is a primary source of household energy and Bhutan has the highest per capital consumption of fuelwood at 1.2 metric tons per year.

#### **4. Biodiversity, Ecology and Forest**

- **Biodiversity**

Although Bhutan is one of the smallest countries in the world, it has one of the richest concentration of biodiversity. Bhutan is located in the Eastern Himalayas which have been identified as a global biodiversity hotspot, and counted among the 234 globally outstanding eco-regions of the world in a comprehensive analysis of global biodiversity undertaken by the WWF (1995-1997). Biogeographically, the country lies in a global ecotone, in between the warm Indo-Malayan ecozone in the south and the temperate Palearctic ecozone in the north (WWF-Bhutan, 2009).

Forests constitute the dominant ecosystem in Bhutan, with 70.46 % (LCAP, 2010) of the country under forest cover. Further, as a result of variance in the altitudinal range, with corresponding variation in climatic conditions, the country supports a wide range of forest types and vegetation zones.

- Flora and fauna

Bhutan has a wide range of forest ecosystem ranging from tropical lowland forests, coniferous and temperate broadleaf forests and alpine meadows and scrub forests, where records more than 5,000 vascular plant species, 200 mammal species, over 700 species of avifauna, 124 species of reptiles, 61 species of amphibians and 91 fish species. Invertebrate is one of the least studied groups in the country giving an incomplete picture of the diversity. Of the expected 800 to 900 species, only 140 species with photographs were catalogued by the Royal Society for Protection of Nature (2007) and further 42 species by UWICE in 2012. Native species of plants record 94.5 % of them, in which 105 are known as endemic.

Regarding non-vascular plants, only 282 species under 156 genera of mosses are recorded. In terms of fungal diversity, about 350 species have been identified and recorded, although the number could be much higher once a complete survey is carried out. The diversity and complexity of the associations of insect-fungi are poorly understood. Lichens are conspicuous element of the biodiversity all over Bhutan. However, very little studies are undertaken in this group.

- Threatened species

Threatened species of animals and plants are stipulated in Forest and Nature Conservation Act, 2006 as “Totally Protected Species, consisting of 24 animals and birds and 7 plant species.” Hunting, Killing, Trapping, Transporting, Capturing, Breeding, Cultivating, Possessing or keeping as pet of totally protected species are basically prohibited. The Totally Protected Species are listed in the table below.

**Table A-7 Totally Protected Animal and Birds Listed in Schedule 1**

No.	Common name	Scientific name	No.	Common name	Scientific name
1	Asian Elephant	<i>Elephas maximus</i>	13	Peacock Pheasant	<i>Polyplectron bicalcaratum</i>
2	Clouded Leopard	<i>Neofelis nebulosa</i>	14	Raven	<i>Corvus coras</i>
3	Golden Langur	<i>Presbytis geei</i>	15	Rufous-Necked Hornbill	<i>Aceros neplalensis</i>
4	Musk Deer	<i>Moschus chrysogaster</i>	16	Golden Mahseer	<i>Tof tor</i>
5	Pangolin	<i>Manis emssicaudata</i>	17	Spotted Deer	<i>Axis axis</i>
6	Pigmy Hog	<i>Sus sylvanicus</i>	18	Gaur	<i>Bos gaurus</i>
7	Snow Leopard	<i>Panthera uncia</i>	19	Leopard	<i>Panthera pardus</i>
8	Takin	<i>Budorcas taxicolor</i>	20	Leopard Cat	<i>Felis benalensis</i>
9	Tiger	<i>Panthera tigris</i>	21	Himalayan Black Bear	<i>Selenarctos thibetanus</i>
10	Wild Buffalo	<i>Bubalus bubalis</i>	22	Red Panda	<i>Ailurus fulgens</i>
11	Black Necked Crane	<i>Grus nigricollis</i>	23	Serow	<i>Capricornis sumatraensis</i>
12	Monal Pheasant	<i>Lophophorus impejenu</i>	24	White bellied heron	<i>Ardea insignis</i>

Source: Forest and Nature Conservation Rules, 2006

**Table A-8 Totally Protected Plants Species Listed in Schedule 1**

No.	Dzongkha name	English name	Scientific name
1	Agar/agaru	Eagle Wood/Indian Aloe Wood	<i>Aquilaria agalocha</i>
2	Pang-gen-metog	Gentianes	<i>Gentiana crassuloides</i>
3	-	Snow down Lily	<i>Lloydia hunnanensis</i>
4	Tsher-ngeon meto	Blue Poppy	<i>Meconopsis grandis</i>
5	Hashing	Himalayan Yew	<i>Taxus baccata</i>
6	Bhreeng-geera-dza	Ginseng	<i>Panax pseudoginseng</i>
7	Yar-tsa-Goen-bup	Chinese caterpillar	<i>Cordyceps sinensis</i>

Source: Forest and Nature Conservation Rules, 2006

Meanwhile, 27 of the mammal species, consisting of 11 critically endangered and 15 vulnerable ones, and 18 of the avifauna, consisting of four (4) critically endangered and 14 vulnerable ones, are listed as globally threatened species in IUCN Red List.

According to the survey results so far, the protected species are mainly inhabited in the areas designated as protected areas and biological corridors (BAP, 2009). However, detailed habitats of them are not opened in terms of conservation of the species and prevention of poaching.

- Invasive species

Invasive plant, animal, bird and fish species are of concern for ecological imbalance. Global Invasive Species database records 46 Invasive Species from Bhutan out of which 11 are alien. However, there has been no systematic and comprehensive inventory of IAS (Invasive Alien Species) in Bhutan, apart from few scattered studies. A pilot inventory carried out by the NBC recorded more than 30 invasive plant species, out of which eight were categorized as major invasive plant species.

There is also no assessment carried out on the socio-economic and environmental impacts of IAS. However, the spread of some of the IAS such as *Trifolium repens* (white clover), etc. into the local landscape and water bodies is well known. Concerns also arise from the accelerated establishment of IAS due to changing climate and native plant species becoming invasive, which is reported to reduce rice yield by 35 %.

- Lakes and wetlands/marshlands

In Bhutan, there are large numbers of lakes spreading across the country, most of which are located in high land areas. Rajbanshi and Csavas (1982) had listed 52 lakes from which about 24 were above 3,000 m above sea level (masl) and added eight as unexplored HAWs (High Altitude Wetlands, or open water lakes and marshes above 3,000 masl) in the Dagala area. Further, a total of 2, 674 glacial lakes are recorded in the country. The sizes of the lakes are small and medium, varying from the smallest at about 35 m<sup>2</sup> to the largest at about 1.5 km<sup>2</sup>. The largest of all the lakes is the glacial lake at the terminus of Luggye glaciers at 4, 506 masl (UWICE & WWF, 2010).

In addition, marshlands in the form of depressions and water-logged areas are envisaged to be a major part of the aquatic ecosystem in the country. Marshlands are generally known to be rich in biota and are good habitats for resident as well as migratory birds, reptiles, amphibians and fishes. The best-known marshland in the country is the Phobjikha valley, where the globally threatened Black-necked Cranes roost in large numbers during winter. Other



important marshlands recognized as wetlands of international importance are Bumdeling and Khotokha, all of these three are designated as Ramsar site.

- Protected area

Bhutan has more than half the country's geographical land under protected area system corresponding to 19,750.57 km<sup>2</sup> or 51.44%. This includes 42.71 % under protected areas, 8.61 % under biological corridors, 0.12 % under conservation areas.

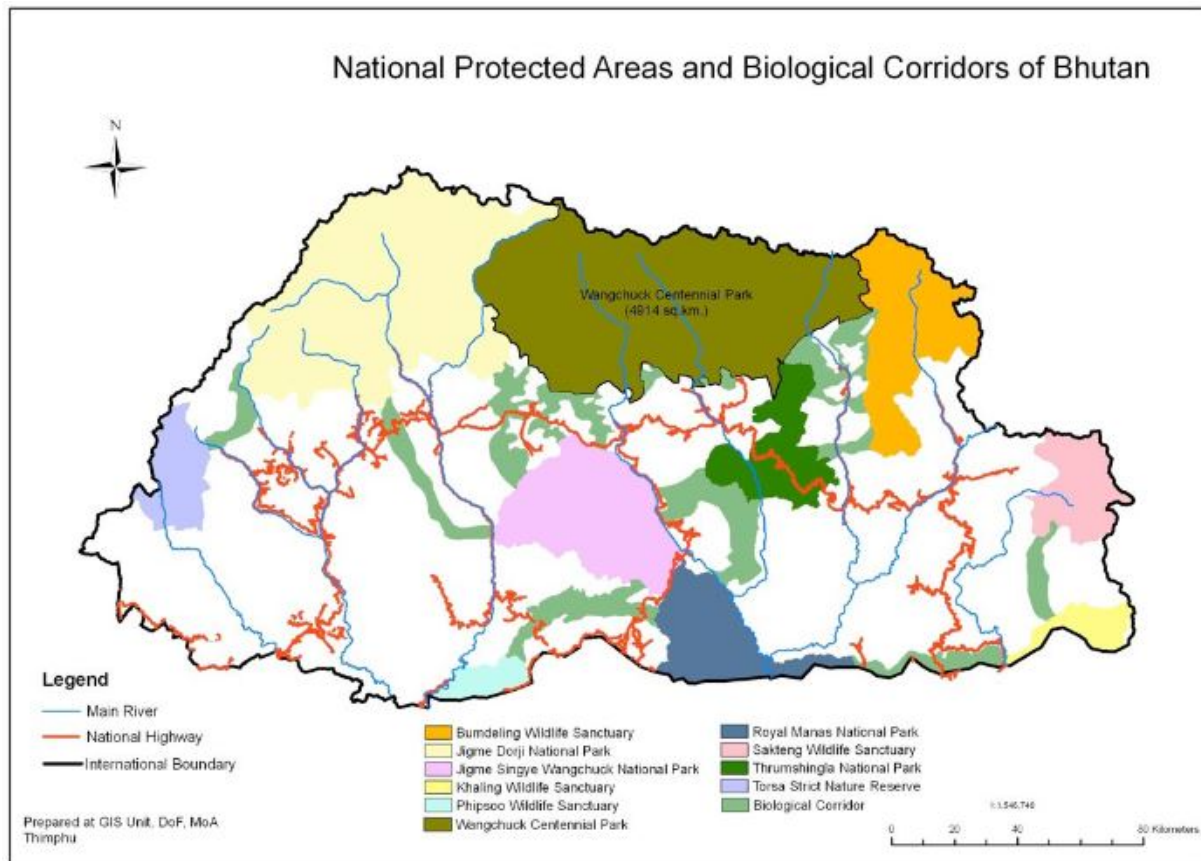
Protected areas are designated based on the Nature and Forest Conservation Act (1995/ Amended 2006). The Protected Areas are divided into three zones pursuant to Forest and Nature Conservation Rules and Regulations of Bhutan (FNCRR), 2017: Core Zone, Buffer Zone and Multiple Use Zone. The Regulations regulate human activities within the protected areas by imposing “prohibited activities” and “restricted activities.” The latter is allowed only when special permissions are issued by the authority.

**Table A-9 Protected Area System in Bhutan**

Name of Protected areas	Year of Established	Total Area(km <sup>2</sup> )	Dzongkhags
<b>A. National Parks</b>			
1. Wangchuck Centennial Park	2008 (gazetted)	4,914.00	Gasa, Wangdue, Bumthang, Trongsa & Lhuentse
2. Jigme Dorji National Park	1995	4,316.00	Punakha, Gasa, Thimphu & Paro
3. Jigme Singye Wangchuck National Park	1995	1,730.00	Trongsa, Wangdue, Sarpang, Tsirang & Zhemgang
4. Royal Manas National Park	1966	1,057.00	Sarpang & Zhemgang
5. Thrumshingla National Park	2000	905.05	Bumthang, Lhuentse, Mongar & Zhemgang
<b>B. Wildlife Sanctuaries</b>			
1. Bumdelling Wildlife Sanctuary	1998	1520.61	Trashiyangtse, Lhuentse & Mongar
2. Sakten Wildlife Sanctuary	2003	740.60	Trashigang & Samdrupjongkhar
3. Phibsoo Wildlife Sanctuary	1993	268.93	Sarpang & Dagana
4. Khaling Wildlife Sanctuary	1993	334.73	Samdrupjongkhar
<b>C. Strict Nature Reserve</b>			
1. Jigme Khesar Strict Nature Reserve	2010*	609.51	Haa
<b>Total Protected Areas</b>		<b>16,396.43</b>	
Biological Corridors	1999	3307.14	Haa, Paro, Thimphu, Punakha, Wangdue, Sarpang, Tsirang, Trongsa, Zhemgang, Bumthang, Mongar, Lhuentse, Trashigang & Samdrupjongkhar
<b>E. Recreational Park</b>			
1. Royal Botanical Park	2004	47.00	
<b>Total</b>		<b>19,750.57</b>	

Note) \*: The year when operationalized.

Source: Forest Facts and Figures 2016, DOFPS



Source: Forest Facts and Figures, 2016 (DOFPS)

**Figure A-1 Location Map of Protected Areas and Biological Corridors**

- Ramsar Sites

There are three (3) Ramsar sites designated by UNESCO in Bhutan as follows:

- Bumdeling:

Site number: 2,032; Administrative region: Tashiyangtse Dzongkhag; Area: 141.5 ha; Coordinates: 27°40'N 91°26'E

- Khotokha

Site number: 2,033; Administrative region: Wangdue Dzongkhag District; Area: 113.5 ha; Coordinates: 27°26'N 90°00'E

- Gangtey-Phobji

Site number: 2,264; Administrative region: Wangdue Phodrang; within Phobji and Gangtey geogs/blocks, Area: 970 ha; Coordinates: 27°27'N 90°11'E

- World Heritage Site

There is no natural heritage sites designated by UNESCO in Bhutan, but the following four sites are listed in the Tentative List, an inventory of those properties which a country intends to consider for nomination to the World Heritage List:

- Bumdeling Wildlife Sanctuary
  - Jigme Dorji National Park (JDNP)

- Royal Manas National Park (RMNP)
- Sakteng Wildlife Sanctuary (SWS)
- Forest Cover

According to National Forest Inventory Report Vol. I, 2016, 2,730,889 ha of total geographical area, equivalent to 71 % of the country is under forest cover. Major forests are Cool Broadleaved Forest (986,765 ha, or 26%), Warm Broadleaved Forest (693,683 ha, or 18%), Fir Forest (352,552 ha, or 9%), and so on.

**Table A-10 Forest Cover by Forest Type**

Forest Type	Forest Area (ha)	Forest cover (%)
Subtropical Forest	241,804	6
Warm Broadleaved Forest	693,683	18
Chirpine Forest	98,563	3
Cool Broadleaved Forest	986,765	26
Evergreen Oak Forest	31,464	1
Blue Pine Forest	137,230	4
Spruce Forest	40,183	1
Hemlock Forest	88,327	2
Fir Forest	352,552	9
Juniper- Rhododendron Scrub	57,242	1
Dry Alpine Scrub	2,654	0
Total	2,730,889	100

Source: National Forest Inventory Report Vol. I, DOFPS (2016)

- Community Forest

Community Forest (CF) is any area of Government Reserved Forest (GRF) designated for management by a local community in accordance with the Forest and Nature Conservation Rules and Regulations (2017), where the Community Forest Management Group (CFMG) shall be established to manage a GRF as a Community Forest and shall be authorized to undertake the forestry activities and harvesting forest products. There are a total of 677 registered CFs covering an area of 75,390.72 ha, or 1.96% within the country as of December 2016, involving a total of 28,311 households who are participating in community forest management as CFMG.

- Forest Management Unit

Forest Management Unit (FMU) is a geographical area of Government Reserved Forest (GRF) designated pursuant to the Forest and Nature Conservation Rules and Regulations (2017) for scientific management of forest. There are 20 FMUs in the country catering to the forest produce needs of the people for both commercial and rural purposes as of 2016 with a total area of 193,821.77 ha, or 5.05% within the country.

- Demand for Timber and Fuelwood

Demand for timber and wood has been increasing for construction of houses and buildings, and increasing natural and manmade disasters, including earthquake hit on September 18, 2011 and the fire of Wangdue Phodrang Dzong in 2012, respectively.

Fuelwood is a primary source of energy for households in Bhutan, especially of rural households. Bhutan's per capita fuelwood consumption is 1.2 metric tons/year, which is considered one of the highest in the world. The demand for fuelwood, however, appears to be

declining recent years between 2008 and 2015: the total quantity of fuelwood supplied has declined steadily from 109,416.6 m<sup>3</sup> to 67,589.74 m<sup>3</sup>, which shows 38.2% of decrease.

- Human wildlife conflicts

Human wildlife conflict is becoming a growing concern in a country. Livestock depredation and crop damage are two major problems caused by wildlife, posing serious threats to livelihood and domestic diversity. Records show that about 55 percent of the crop damage in the country is attributed to wildlife damages, while livestock losses account to more than 2,035 numbers from 2002-12. Continual conflicts impact rural livelihood and quality of life and lead to agriculture land fallowing and rural-urban migration.

Since human wildlife conflict causes substantial economic and social costs to the rural communities, it also results in retaliatory killings, resentment against policies, and lack of support towards conservation initiatives, such as retaliatory killing through poisoning of dholes few decades ago almost eliminated the species from the wild (HWF report, WCD, 2013).

## **5. Waste Management**

- Municipal Solid Waste

The first National Solid Management Survey in the urban areas (MOWHS, 2008) found that municipal per capita waste generation was 0.53 kg/day. It also revealed that the bulk of municipal solid waste is composed of organic matters at 58.1% followed by paper waste (17.2 %) and plastic materials (12.7%). Municipal waste management in Bhutan at present is featured as follows:

- In most Dzongkhags, common practice of waste management is open burning or dumping in open landfill,
- Waste segregation and recycling is minimal in most Dzongkhags,
- Collection of recyclable materials takes place on an informal basis and is slowly picking up across the country.

- Sewage Management

Septic tanks are the most prominent sewer management system for house and buildings which are cleaned and emptied when it reaches its maximum capacity. Recently, there has been an introduction of eco-friendly wastewater treatment plant installing eco-line bio film technology across many of Dzongkhags.

- Waste Management of other wastes

Medical waste: consisting of non-infectious wastes and infectious ones, of which non-infectious wastes constitutes most. Deep pit burial is the predominant method of disposal of medical wastes throughout the country. Infectious wastes are autoclaved before disposal and dumped into pit. There are four waste autoclaves in Bhutan.

- Industrial waste (in case of Pasakha Industrial Area)

Pasakha Industrial Area (PIA) was established in 2003 and by 2010 there were 37 registered industries of which 11 are not operational. These industries manufacture TMT bars, ingots,

billets, ferro alloys, calcium carbide, marble slabs, liquid oxygen, nitrogen, bitumen, beer, soap, and carbonated drinks.

The common practice of industries had been to stockpile the waste in their premises and the Pasakha industrial landfill has been under operation only since July 2015. As per the report from the Compliance Monitoring Division (CMD), NECS, 1,476.37 tons of waste has been collected from July 2015 - March 2016.

- E-waste

According to a survey conducted by NIIT in 2007, electrical and electronic wastes formed only 0.37% of the total municipal wastes and it consisted mostly of printer cartridges from the offices (MOWHS 2008). It also estimated that e-waste generated in Bhutan ranged from 1,105 – 1,810 metric tones in 2014 (Kuensel, January 2, 2016).

Waste management of E-wastes such as electrical and electronic wastes is not adequately conducted. The current practice of managing e-waste from government offices is by surrendering non-functional electronics/appliances to the Department of National Properties, while the e-waste generated by the private sector is usually repaired and reused and those beyond repair are sold to scrap dealers (Kuensel, January 2, 2016).

## **6. Climate Change**

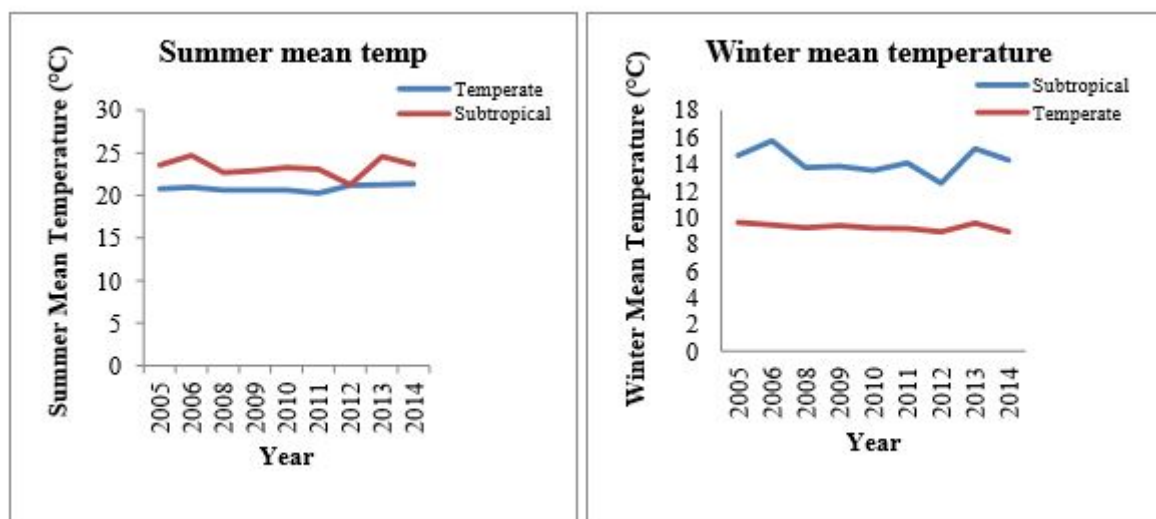
- Greenhouse house gas emission

Global warming and climate change is a global phenomenon that has been attributed to human activities since the start of industrial revolution (IPCC, 2014). Climate change is viewed as largely driven by global level activities but is affecting all sectors in Bhutan.

The emission of greenhouse gases from Bhutan is largely negligible at a global level and in fact Bhutan's vast forests absorbs more CO<sub>2</sub> than total GHG emissions indicating the country is a net sink of green gases. Emission of carbon in 2013 is estimated at 2.2 million tons while sequestration by forests is estimated at 6.3 million tons of carbon (State of Climate Change Report for RNR Sector, 2016).

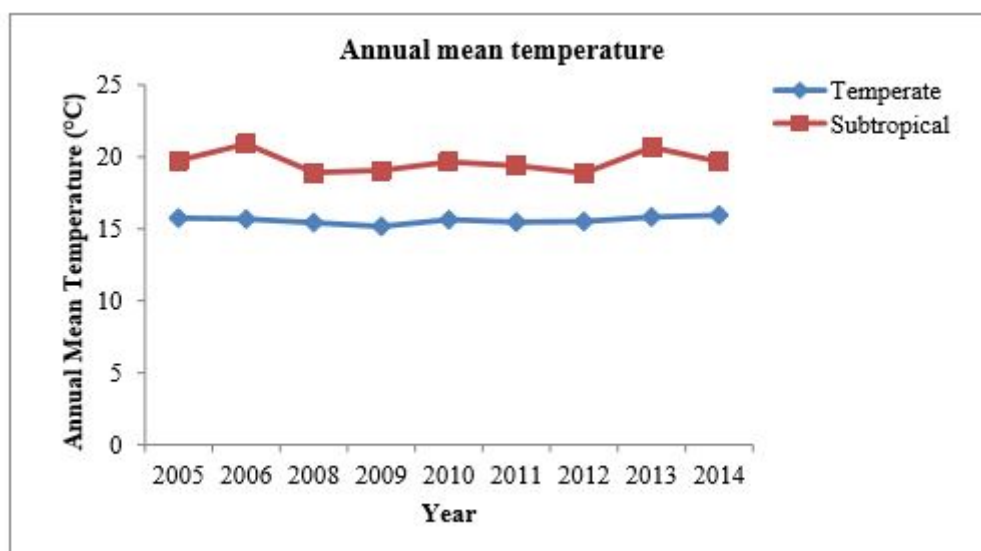
- Temperature Trend Change

Figure A-2 shows an analysis of summer and winter mean air temperature from 2005 to 2014 in Bhutan, indicating that the summer mean temperature of temperate and subtropical regions are steadily rising while winter mean temperatures seem declining. However, annual mean temperatures in both temperate and subtropical regions are gradually rising (see Figure A-3).



Source: State of Climate Change Report for RNR Sector, 2016

**Figure A-2 Summer and Winter Mean Temperature (2005-2014) in Bhutan**

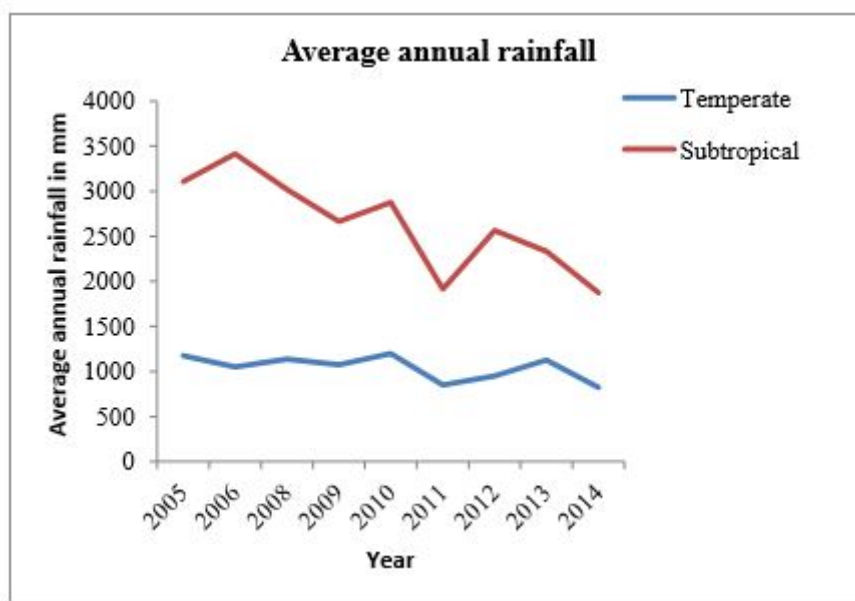


Source: State of Climate Change Report for RNR Sector, 2016

**Figure A-3 Annual Mean Temperature (2005-2014) in Bhutan**

- Rainfall Pattern Change

An analysis of rainfall data from 2005 to 2014 in Bhutan shows that the annual mean rainfall pattern is decreasing (Figure A-4). However, it is pointed out that the rainfall fluctuations are largely random with no systematic change detectable on either annual or monthly scale.



Source: State of Climate Change Report for RNR Sector, 2016

**Figure A-4 Average annual rainfall pattern (2005-2014) in Bhutan**

Bhutan remains highly vulnerable to emerging climate change impacts due to its geographic location and dependence of country's economy on climate sensitive sectors such as agriculture, hydropower and forestry. Climate vulnerability shows considerable impacts on the glaciers and snows in Himalayan Mountains, which are the sources of drinking water, irrigation and generation of hydropower.

- Impacts of climate change

Climate change impacts are no more an alarm for distant future as its consequences are already being felt. Number of studies revealed rapid changes in average temperatures, precipitation patterns, and increased risks of climate related hazards in the recent years. Department of Agriculture, MOAF, reported that the climate-induced hazards such as excessive rains, flash floods, windstorms, hailstorm, droughts etc. have caused massive loss and damage to farming households. There is also evidence of new pests and diseases affecting crops and livestock production. (State of Climate Change Report for RNR Sector, 2016)

## 7. Socio-economic Aspect

- Demography

Bhutan is one of the least populated countries in Asia with an estimated population of 757,042 in 2015. Regarding population structure, those under the age of 14 years constitute 31.4 % in 2008, and are estimated to decline to 22.8% by 2030. On the contrary, the population above the age of 65 years was estimated at 4.76% in 2008 and is projected to reach 6.55 % by 2030, indicating the diminishing number of children and growing proportion of elderly people.

- Urbanization/Migration

Rapid urbanization occurs in Bhutan. Only 5 % of the total population was estimated to reside in urban area in 1980. This increased to 15% in 1994 and 30.8 % in 2005 according to the Population and Housing Census of Bhutan 2005. Bhutan 2020 document estimates that nearly

one-half of Bhutan's total population would be living in urban areas by 2020. The western region which includes Thimphu ranks the highest (65.1%) urban population and the central western ranks the lowest (7.1%).

A major cause of increasing urbanization is rural-urban migration. It is pointed out that poverty, drudgery of rural life and perception of better economic prospects in the urban areas has led to rural-urban migration. Poverty Analysis Report (PAR), 2009 points out that incidence of poverty is less than 2% in the urban area vis-a-vis 23.2% in rural area. The Rapid Impact Assessment of Rural Development (Planning Commission, 2007), also indicated that accessibility to services that could support income generation was only 16% in the rural areas.

- **Poverty issue**

Poverty incidence has declined from 31.7% in 2003 to 12% in 2012 according to the Poverty Analysis Report (2012). It revealed that rural poverty has decreased from 38.3 to 16.7%, although poverty is a rural phenomenon as indicated by the same Reports issued in 2003, 2007 and 2012. Poverty in rural area is significant in terms of that rural poor are dependent on natural resources for their livelihood, often engaging in unsustainable harvesting of timber and non-wood forest products resulting in depletion of these resources.

- **Ethnic Groups**

Bhutanese people can be generally categorized into three main ethnic groups. The Tshanglas, Ngalops and the Lhotshampas. The other minority groups are the Bumthaps and the Khengpas of Central Bhutan, the Kurtoeps in Lhuentse, the Brokpas and the Bramis of Merak and Sakteng in eastern Bhutan, the Doyas of Samtse and finally the Monpas of Rukha villages in WangduePhodrang.

(<http://www.tourism.gov.bt/about-bhutan/people>)

- **Socio-economy**

Bhutan's economy has grown rapidly in recent years although the amount of DGP is small. The International Monetary Fund (IMF) in 2012 recognized Bhutan as the fourth fastest growing economy in the world (RGoB, 2013). Bhutan's GDP per capita in 2014 increased to USD 2,611.7 from USD 2,463.8 in 2013, and GDP growth rate at constant price dropped from 11.7% in 2010/11 to 5.5% in 2014/15 (RMA, 2015).

According to Statistical Year Book of Bhutan 2016, Gross Domestic Product (GDP) in 2015 accounts for 132,021.3 million Nu. (approximately 1.93 billion USD), dividing into the primary sector (agriculture, livestock, forestry, and mining, etc.) with 17 %, the secondary sector (manufacturing, electricity and construction, etc.) with 41%, and the tertiary sector (services, including financing, business, etc.) with 42 %. Growth rate of GDP in 2015 accounted for 6.49%, in which the primary sector recorded 0.59 %, the secondary sector recorded 3.52 %, and the tertiary sector recorded 2.39 %. Inflation rate at June, 2016 was 3.56 %.

- **Industry**

Industries cover the whole range of industrial activities carried out by businesses in all fields including mining, manufacturing, wholesale and retail trade, and other service industries. In Bhutan, the industrial sector has until recently played a relatively small role in the economy.



There were 55,588 industrial establishments licensed by the authority as of 2015 (Statistical Yearbook of Bhutan, 2016). The major industrial activities include mining, manufacturing, whole sale and retail trade and other service industries.

The manufacturing sector consists of wood based, agro-based, and mineral-based industries and accounted to 8.12% of GDP in 2014 while employing 7% of the total employed population. The manufacturing industry is dominated by a small number of major operators (companies). Besides, there are a number of other small manufacturing plants concentrated in the food processing activities. Cottage industry also plays a prominent role with its good timber resources and favorable agricultural conditions.

Mining and quarrying activities accounted to 2.83% to the GDP, contributing to 0.9% employment in the same year (NSB, 2015). Most mining activities are limited to relatively small operations, mainly involved in the mining of dolomite, gypsum, limestone, slate, coal, marbles, quartzite and talc.

- **Energy**

Electricity is the main energy source of lighting in 88 % of households in Bhutan as per the Bhutan Living Standard Survey (BLSS), 2012. It is also the most widely used sources of energy for cooking with 84 % households. Electricity generation by hydropower, though still relatively small in comparison with the rest of the world, is growing in importance. Up until recently, electricity generation was based on small diesel generating and micro hydro stations, providing limited supply of electricity, which was supplemented by imports from India.

The economy of the country is largely dependent on the development of Hydropower generations. Hydropower plants contribute significantly to the overall GDP Growth and economy, both during constructions and operation phases. Hydropower sector accounted for 14.1% of the country's GDP in 2014. The revenue earned from export of electricity to India is a significant contributor to the overall revenues of the country.

- **Social infrastructure**

Transport in Bhutan comprises approximately 8,000 km of roads and four (4) airports, out of which 3 are operational and interconnected. As part of Bhutan's infrastructure and modernization programs, its road system has been under development since the 1960s.

Roads in Bhutan are classified into several types: highway, dzongkhag road, urban road, farm road and forest roads. Highways are sub-classified into again highway, primary highway and secondary highways. The primary road in Bhutan is the East-West highway, locally known as the Lateral Road. The road starts in Phuentsholing on the south western Indian border and terminates in Trashigang in far east, connecting main centres including Paro, Thimphu, Punakha and Bumthang, etc. The Lateral Road traverses a number of high passes, such as Tremo La and Do Chu La. Because the country is mountainous and the geology is unstable, there are frequent erosion and landslides along the roads, which are aggravated by rainfall in summer monsoon.

The number of vehicles has been increasing at an average of 8.8 % for the period from 2008 to 2015. As of April 2016, there were 77,813 registered vehicles (RSTA, 2016)

There are four (4) airports in Bhutan at present: 1) Paro Airport, Bathpalathang Airport, Gelephu Airport and Yongphulla Airport. Paro Airport is the country's only international

airport. During the monsoon season, however, flights are often delayed by cloud cover. Air transport was introduced in 1983 with links to neighboring countries through national airline (Druk Air). Private airline (Bhutan Airlines), joined the national carrier in November 2011. Domestic airline service was introduced in December 2011, operating on Paro - Bumthang, Yonphula – Gelephu route. Recently, a helicopter service was also introduced.

- Tourism

The tourism industry in Bhutan began in 1974. The government agency, erstwhile Bhutan Tourism Corporation, controlled tourism until its privatization in 1991. The revenue generation from the tourism sector has increased from over USD 2 million in the late 1980's to over USD 73 million in 2014.

The number of visitors gradually increased to around 6,000-7,500 nos. by 2001. It has increased to 57,431 in 2014 from 44,241 in 2013, growth rate of which recorded 29.8%. Major source market of tourism, or countries of visitors include Thailand, China, USA, Germany, Japan, United Kingdom, and so on. (SYB, 2016)

Despite being open to foreigners, the government is acutely aware of the environmental impact that tourists can have on Bhutan's unique and virtually unspoiled landscape and culture. All tourists (group or individual) must travel on a planned, prepaid, guided package tour or custom designed travel program. Most foreigners cannot travel independently but the arrangements must be made through an officially approved tour operator, either directly or through an overseas agent.

- Gender Issue / Vulnerable groups / right of children

In Bhutan, legal equality between man and woman is guaranteed and it is often supposed that there is no disparity between men and women, and therefore, women in Bhutan enjoys the legal equality. The reality, however, is not always as supposed but the situation is much different among the region in the country.

According to Labour Force Survey in Bhutan (2015), unemployment rate in 2015 was 2.5 %, consisting of 3.1% for women and 1.8% for men. Women account for 59.9% of all the unemployed people. Labour force participation rate of men and women are 55.9% and 71.2%, respectively. Lower rate in women indicates that necessity to facilitate women's participation to labour force is a major task in gender issues in Bhutan.

Labour Force Survey in Bhutan (2015) also revealed that women's participation rates are different in areas: it accounts for 60.4 % (69.7 % for men) in rural area while that in urban area is 45.5% (74.6 % for men). This indicates that getting employment in urban areas where in-migration occurs is not easy for women, and that working on other work than in agriculture is difficult in rural areas.

- Rights of children / child labour

Issues on child labour have declined in recent years in Bhutan. Child labour mostly spotted in industrial and construction workshops. There has been also such case that young children from remote areas come to urban areas and babysit. These cases have reduced since in the olden days and not been spotted nowadays.

- Religion and spiritual heritage

Bhutan is a Buddhist country and people often refer to it as the last stronghold of Vajrayana Buddhism, which forms majority. Buddhism was first introduced by the Indian Tantric master Guru Padmasambhava in the 8th century. Until then the people practiced Bonism, a religion that worshipped all forms of nature, remnants of which are still evident even today in some remote villages in the country. Hinduism, Christianity and Islam are also present in the country. The Bhutanese constitution guarantees freedom of religion and citizens and visitors are free to practice any form of worship so long as it does not impinge on the rights of others. (<http://www.tourism.gov.bt/about-bhutan/buddhism>)

## 8. Culture and Tradition

- Overview

Bhutan has a rich and unique culture and tradition that has largely remained intact, which is one of the main attractions for tourists characterized by architecture, dress, music and dance, family structure, cuisine, and so on. Bhutanese tradition is deeply steeped in its Buddhist heritage. Bhutan government is increasingly making efforts to preserve and sustain the current culture and traditions of the country.

The Constitution of Bhutan stipulates that the State shall endeavour to preserve, protect and promote the cultural heritage of the country to enrich society and the cultural life of the citizens. It also stipulates that Bhutanese shall have the duty to preserve, protect and respect the environment, culture and heritage of the nation. Preservation and promotion of culture is stipulated as one of the four pillars of GNH.

Cultural heritage in Bhutan are categorized to the following three: heritage buildings, cultural sites and archaeological sites, stipulated by Cultural Heritage Act (draft). Inventory of cultural heritage is underway at present. One of the main features in preservation of cultural heritage is the recognition of the whole land of Bhutan as “Cultural Landscape.” (MoHCA)

- Architecture

The traditional architecture of Bhutan is one of the most beautiful expressions of the ancient culture of the people of Bhutan. Harmonious proportions and graceful designs reflect the integration of the simple daily lives of the Bhutanese people with the breath-taking landscapes of peaceful valleys and soaring mountains, which is a key nature of Bhutanese traditional architecture.

Large fortress (called Dzong), temples (Lhakhang), monasteries (Goenpa), stupas (Choeten), palaces (Phodrang), bridges (Zam) and vernacular housing (Yue Chim) that dot the countryside of Bhutan form diverse examples of traditional Bhutanese architecture, which adapted over many centuries to suit the local environment, climate, materials, technology, and more significantly, cultural traditions and spiritual beliefs. (Bhutanese Architecture Guidelines, MoWHS, 2014)

- Dress

One of the most distinctive features of the Bhutanese is their traditional dress, unique garments that have evolved over thousands of years. Men wear the *Gho*, a knee-length robe somewhat resembling a kimono that is tied at the waist by a traditional belt known as *Kera*. Women wear the *Kira*, a long, ankle-length dress accompanied by a light outer jacket known as a *Tego* with an inner layer known as a *Wonju*.

However, tribal and semi-nomadic people like the Bramis and Brokpas of eastern Bhutan generally wear clothing that differs from the rest of the Bhutanese population. The Brokpas and the Bramis both wear dresses woven either out of Yak or Sheep hair. (<http://www.tourism.gov.bt/about-bhutan/bhutanese-dress>)

- **World Heritage Sites**

There is no cultural heritage sites designated by UNESCO in Bhutan, but the following four sites are listed in the Tentative List, an inventory of those properties which a country intends to consider for nomination to the World Heritage List:

- 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
- Tamzhing Monastery

## **9. Health and Sanitation**

- **Health Facility and infrastructure**

Health Care in Bhutan is delivered in a totally integrated three-tiered system with National Referral Hospital at the apex, regional referral hospitals, district hospitals, and Basic Health Units (BHUs) at the Community Level. BHUs, composed of Grade I and II, serve remote populace and are staffed by well-trained health personnel who are equipped to treat minor ailments and advice on preventive measures to avoid the spread of communicable diseases. Extended Health Centers such as Out Reach Clinics (ORCs) and Sub-posts support these BHUs. As of 2014, there were 31 hospitals, 206 BHUs and over 562 ORCs spread across the country providing primary health care services. There exists a well-established network of Indigenous medical facilities and services integrated within the main health systems. (SYB, 2016)

The Ministry of Health has now a wide spread network of Health Facilities covering around 95 % of the total population within three hours walking distance of the health facility. According to Department of Health (DOH), during road blocks and other obstructions, they conduct “clinic day,” clinic delivering services, once a month in small catchment area and twice a month in larger ones. Air ambulance by helicopter is also provided based on the condition of the patient.

Regarding health service and infrastructure, Bhutan has a issue of shortage of specialized doctors although general ones are sufficient. In terms of medical instrument, high-end services are lacking. There is only one MRI machine in Bhutan, and other medical facilities such as X-ray, etc. are not sufficient. Lack of proper disposal of medical waste due to limited waste autoclave can be pointed out as a significant issue in Bhutan.

- **Mortality and morbidity**

The main indicators of the health status of the population are morbidity, the type of illness people suffer from, and mortality, deaths and causes of death. Over-all the Infant mortality rate per 1000 live birth is 30 estimated from the National Health Survey (NHS), 2012, which is relatively lower than neighboring countries, but causes of death data have not yet become available. Regarding morbidity, major diseases in Bhutan include common cold, skin

infections, other musculo-skeletal disorders, other diseases of the digestive system, and other disorders of skin & subcutaneous-tissues. (SYB, 2016)

- Sanitation

According to Annual Health Bulletin, 2016, the ratio of access to safe drinking water and sanitation facility has increased from 78 % in 2000 to 95 % in 2015. Similarly, the ratio of access to safe (improved) sanitation facility (latrine) has increased from 90% to 96 % during the same period.

- Communicable and Non-communicable diseases

Major communicable diseases in Bhutan includes Diarrhea, Dysentery, Tuberculosis, Genital Ulcer/Bubo, Urethral/Vaginal Discharges, Rickettsial Disease, etc., of which Diarrhea and Dysentery account for approximately 90% in 2015 (SYB 2016). In addition, non-communicable diseases (lifestyle diseases) such as diabetes, cardiovascular diseases, kidney diseases, cancers are also given importance.

- HIV/AIDS

According to Country Progress Report on the HIV Response in Bhutan, 2015, morbidity rate of HIV/AIDS in Bhutan accounts for 0.1 %, which is relatively low level compared with other south Asian countries although there are maybe some unreported cases. The number of patients with HIV/AIDS is 403, in which there is no big difference in the number of patients between male and female. There is a tendency that female patients with HIV/AIDS are detected in younger age.

- Other issues related to public health

According to Department of Health, MOH (2017), social issues currently seen in Bhutan, regardless of the frequency, are related to following:

- Alcohol addiction, which is seen in wide generation from youth to elderly,
- Mental health, which is given importance in the 12<sup>th</sup> FYP,
- Substance abuse, including not only alcohol, tobacco but also drugs,
- Teenage pregnancy, which is often seen in high teen age from 15 years old,
- Suicide,
- Domestic violence, which is mostly from men to women, but also vice versa. There still may be cases, which are unreported,
- Disability, which is often the victims of domestic violence and suicide, including the case of elderly, single parent family, etc.
- Elderly care (aging population)

# Appendix-4 International Treaties and Accords to be Considered in the SEA of the Project

Table A-11 International Treaties and Accords to be examined in SEA of the Project

No.	Category	International Treaties and Accords	
		Those ratified by Bhutan	Others applicable to SEA of the Project
-	General		<ul style="list-style-type: none"> <li>• Rio Declaration on Environment and Development (1992)</li> <li>• Espoo Convention on Environmental Impact Assessment in a Transboundary Context (1991)</li> <li>• Protocol on Strategic Environmental Assessment (to the Espoo Convention) (2003, Kiev)</li> <li>• Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (1998)</li> </ul>
1	Land	• UN Convention to Combat Desertification (accession - 2004)	
2	Water	• UN Convention on the Law of Sea (accession - 1982)	
3	Air	<ul style="list-style-type: none"> <li>• Vienna Convention for the Protection of the Ozone Layer (accession 2004)</li> <li>• Montreal Protocol on Substances that Deplete the Ozone Layer (accession 2004)</li> <li>• Male Declaration on Control and Prevention of Air Pollution and its likely transboundary effects for South Asia: to achieve intergovernmental cooperation to address the threat of transboundary air pollution and its impact. The NEC is the focal agency for this cooperation (accession - 1998).</li> </ul>	
4	Biodiversity / Ecology/ Forest	<ul style="list-style-type: none"> <li>• International Plant Protection Convention (adherence - 1994)</li> <li>• FAO International Treaty on Plant Genetic Resources for Food and Agriculture (ratification – 2003)</li> <li>• UN Convention on Biological Diversity (ratification - 1995)</li> <li>• Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (accession - 2002).</li> <li>• Cartagena Protocol on Biosafety to the Convention on Biological Diversity (accession - 2002)</li> <li>• Nagoya Protocol on Access and Benefit-sharing (accession - 2011)</li> <li>• The Ramsar Convention on Wetlands (accession - 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979)</li> <li>• UN International Forest Policy (2007)</li> </ul>
5	Waste Management	<ul style="list-style-type: none"> <li>• Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (accession - 2002)</li> </ul>	<ul style="list-style-type: none"> <li>• Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)</li> </ul>

No.	Category	International Treaties and Accords	
		Those ratified by Bhutan	Others applicable to SEA of the Project
6	Climate change	<ul style="list-style-type: none"> <li>• UN Framework Convention on Climate Change (UNFCCC) (ratification - 1995)</li> <li>• The Kyoto Protocol – linked to UNFCCC (accession - 2002)</li> </ul>	<ul style="list-style-type: none"> <li>• Stockholm Convention on Persistent Organic Pollutants (2001)</li> </ul>
7	Socio-economic aspects	<ul style="list-style-type: none"> <li>• International Convention on the Elimination of All Forms of Racial Discrimination (signature – 1973)</li> <li>• International Convention on the Elimination of All Forms of Discrimination Against Women (accession – 1981)</li> <li>• Convention on the Rights of the Child (ratification – 1990)</li> </ul>	
8	Culture and tradition	<ul style="list-style-type: none"> <li>• Constitution of UNESCO (acceptance – 1982)</li> <li>• UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (ratification – 2002)</li> <li>• Convention on the Safeguarding of the Intangible Cultural Heritage (ratification – 2005)</li> <li>• UNESCO World Heritage Convention (ratification – 2001)</li> </ul>	
9	Health	<ul style="list-style-type: none"> <li>• Constitution of the WHO (acceptance – 1982)</li> <li>• WHO Framework Convention on Tobacco Control (ratification – 2004)</li> </ul>	

Appendix-5 List of Legislation, and Policies, Programs and Guidelines Related to Environment

Table A-12 List of Legal Framework, and Policies, Programs and Guidelines related to Environment

No.	Category	Legal Framework	Policies/ Program/Guidelines
-	General	<ul style="list-style-type: none"> <li>Constitution of Bhutan (2008)</li> <li>National Environmental Protection Act (2007)</li> <li>Environmental Standards (2010)*</li> <li>Environmental Assessment Act (2000)</li> <li>Environmental Assessment General Guidelines (2012)</li> <li>Regulation on Environmental Clearance of Projects (2002/amended 2016)</li> <li>Regulation on Strategic Environmental Assessment (2002)</li> <li>Bhutan SEA Guidelines (Draft) (9/2016)</li> <li>Interim Guidelines for Mainstreaming Environment in Policies and Programmes (2009)</li> </ul>	<ul style="list-style-type: none"> <li>Bhutan 11<sup>th</sup> Five Year Plan (2012-2017)</li> <li>Bhutan 12<sup>th</sup> Five Year Plan (2018-) (draft ?)</li> <li>The Middle Path National Environmental Strategy for Bhutan (1998)</li> <li>Bhutan 2020 – A Vision for Peace, Prosperity and Happiness, Planning Commission,</li> </ul>
1	Land	<ul style="list-style-type: none"> <li>Land Act (2007)</li> <li>Land Rules and Regulations (2007)</li> <li>Lease Rules and Regulations for GRF Land_2009</li> <li>Disaster Management Act_2013</li> <li>Disaster Management Rules and Regulations (2014)</li> <li>Disaster Management Contingency Guidelines (2014)</li> <li>Disaster Management Planning Guidelines (2014)</li> <li>Rural Construction Rules (2013)</li> <li>Environmental Code of Practice for Highways and Road (2003)</li> <li>Guidelines for Planning and Development of Human Settlements in Urban and Rural Areas of Bhutan to Minimize Environmental Impacts (2008)</li> <li>Mines and Mineral Management Act (1995)</li> <li>Road Act (2013)</li> <li>Road Safety and Transport Act (1999)</li> <li>Spatial Planning Act_draft</li> <li>Spatial Planning Standards_draft</li> </ul>	<ul style="list-style-type: none"> <li>National Action Program (NAP) to Combat Land Degradation (MOAF, 2014)</li> <li>National Action Plan for School Earthquake Safety (2013)</li> <li>National Action Plan for Earthquake Safety of Health Facility (2013)</li> <li>Road Sector Master Plan 2007-2027 (2006)</li> <li>Strategy for Protection of Agricultural Land (2010)</li> <li>Mineral Development Policy (draft 2012)</li> <li>National Human Settlement Policy (draft)</li> <li>National Land Policy (2011)</li> <li>Bhutan National Urbanization Strategy (MOWHS, 2008)</li> <li>National Disaster Risk Management Framework_2006</li> <li>Bhutan Disaster Management_2015</li> </ul>
2	Water	<ul style="list-style-type: none"> <li>Water Act of Bhutan, 2011</li> <li>Water Regulation of Bhutan (2014)</li> <li>Ambient Water Quality Criteria for various uses_2010</li> <li>Industrial Effluent Discharge Standards_2010</li> </ul>	<ul style="list-style-type: none"> <li>National Integrated Water Resources Management Plan (NIWRMP) 2016</li> <li>Bhutan Water Vision 2025 and Water Policy (draft)</li> <li>National Irrigation Policy (2011)</li> </ul>



No.	Category	Legal Framework	Policies/ Program/Guidelines
		<ul style="list-style-type: none"> <li>Standard for final effluent from Sewerage Treatment Plant (STP)_2010</li> <li>Bhutan Drinking Water Standard (2016)</li> <li>Pesticide Act (2000)</li> </ul>	
3	Air	<ul style="list-style-type: none"> <li>Ambient Air Quality Standards (maximum Permissible Limits in <math>\mu\text{g}/\text{m}^3</math> 2010</li> <li>Industrial Emissions: Maximum limits for Pollutants (<math>\text{mg}/\text{Nm}^3</math>)_2010</li> <li>Workplace Emissions for 8 hours average_2010</li> <li>Vehicle Emission Standards_2010</li> <li>Noise Level Limits_2010</li> </ul>	
4	Biodiversity / Ecology/ Forest	<ul style="list-style-type: none"> <li>Biodiversity Act of Bhutan (2003)</li> <li>Biosafety Act (2015)</li> <li>Forest and Nature Conservation Act of Bhutan (1995)/ 2006 amended)</li> <li>Forest and Nature Conservation Rules of Bhutan (2006)</li> <li>Forest and Nature Conservation Rules and Regulations of Bhutan_2017</li> <li>Interim Guidelines for Lease of GRF (Government Reserve Forest) Land for Commercial Agriculture (2011)</li> </ul>	<ul style="list-style-type: none"> <li>National Forest Policy (2011)</li> <li>National Biodiversity Strategies and Action Plan (2014)</li> <li>National Forest Policy (2010 (or 2011?))</li> <li>Vision and Strategy for the Nature Conservation Division (Table of Contents) 2003</li> <li>National Strategy for Community Forestry_2010</li> <li>Bhutan National Adaptation Programme of Action_2006</li> <li>Bhutan National Human Wildlife Conflict Management Strategy (2008)</li> </ul>
5	Waste Management	<ul style="list-style-type: none"> <li>Integrated Solid Waste Management_2007</li> <li>Waste Prevention and Management Act_2009</li> <li>Waste Prevention and Management Regulation_2012/2016 amended</li> </ul>	<ul style="list-style-type: none"> <li>National Strategy and Action Plan, National Integrated Solid Waste Management Strategy (2014) (BSER, p. 61)</li> </ul>
6	Climate change		<ul style="list-style-type: none"> <li>Carbon Neutral Strategy (2009)</li> <li>National Action Plan, Biodiversity Persistence and Climate Change_2011</li> <li>Bhutan National Adaptation Programme of Action_2006</li> <li>Sectoral Adaptation Program of Action</li> <li>A Renewable Natural Resources – Climate Change Adaptation Programme</li> </ul>
7	Socio-economic aspects	<ul style="list-style-type: none"> <li>Domestic Violence Prevention Act (2013)</li> <li>Child Care and Protect Act (2011)</li> <li>Child Adoption Act (2012)</li> <li>Labour and Employment Act of Bhutan (2007)</li> </ul>	<ul style="list-style-type: none"> <li>Road Safety and Transport Bill (2017)</li> <li>Targeted household Poverty Programme (under drafting)</li> <li>Rural Advancement Programme (supported by UNDP &amp; UNEP)</li> <li>Power System Master Plan_2003-2022</li> </ul>

No	Category	Legal Framework	Policies/ Program/Guidelines
		<ul style="list-style-type: none"> <li>• Immigration Act (2009)</li> <li>• Immigration Rules and Regulations (2015)</li> </ul>	<ul style="list-style-type: none"> <li>• Bhutan Sustainable Hydropower Policy (2008)</li> <li>• Economic Development Policy (2010/revised 2016)</li> <li>• Food and Nutrition Security Policy (2014)</li> <li>• Industrial Infrastructure Development Policy (draft)</li> <li>• Cottage, Small and Medium Industry Action Plan 2015-18</li> <li>• Cottage, Small and Medium Industry Policy 2012</li> <li>• National Human Resources Development Policy (2010)</li> <li>• National Renewable Energy Policy (draft 2011)</li> <li>• National Youth Policy (2010)</li> <li>• National Education Policy (draft 2012)</li> <li>• Special Education Policy (draft 2012)</li> <li>• National Employment Policy (draft 2012)</li> <li>• National Population Policy (draft)</li> <li>• Population Perspective Plan (2010)</li> <li>• Special Economic Zone Policy (draft)</li> <li>• National Plan of Action for Gender 2008-2013</li> </ul>
8	Culture and tradition	<ul style="list-style-type: none"> <li>• Bhutan Building Rules (2002)</li> <li>• Bhutan Green Building Design Guidelines (2008)</li> <li>• Bhutan Architectural Guidelines (2015)</li> <li>• Cultural Heritage Act (Draft) (2016)</li> <li>• Framework and Key Principles of the Cultural Heritage Bill (Act) 2016</li> <li>• Rules and Regulations on Cultural Heritages (Draft)</li> <li>• Conservation of Archeological Heritage Act (draft)</li> <li>• Tobacco Control Act of Bhutan (2010)</li> </ul>	
9	Health and sanitation		<ul style="list-style-type: none"> <li>• National Health Policy (2011)</li> </ul>

Note) \*: Environmental Standards are listed in the tables in Appendix-6, in which WHO standards are also incorporated in case of comparable.

## Appendix-6 Environmental Standards (2010)

### 1) Ambient Water Quality Criteria for various uses (September 2010)

No.	Parameter	Unit	Bhutan Standards			WHO Standards (2004)
			A	B	C	
1	pH	-	6.5 – 8.5	6 – 9	6 – 9	-
2	Colour	Hz	5	50	-	15 (TCU)
3	TSS	mg/l	25	100	-	-
4	Conductivity	μS/cm	800	1,000	2,000	-
5	Odour	-	Un-objectionable	Un-objectionable	-	Acceptable
6	Mineral oil	-	No film	No film	-	-
7	Nitrate	mg/l	10	50	-	50
8	Fluoride	mg/l	1.0	2.0	-	1.5
9	Sulphates	mg/l	25	100	-	250
10	Chloride	mg/l	50	200	-	250
11	Surfactants	mg/l	0.1	0.2	-	-
12	Phosphates	mg/l	0.5	< 1.0	-	-
13	DO	mg/l	6	4	-	-
14	BOD	mg/l	2	5	50	-
15	TKN	mg/l	0.5	2	-	-
16	Ammonia	mg/l	0.05	0.5	-	1.5
17	Total Coliform	MPN/100ml	50	5,000	10,000	Not detected
18	F. Coliform	MPN/100ml	20	2,000	5,000	Not detected
19	F. Streptococci	MPN/100ml	20	1,000	1,000	-
20	Dissolved iron	mg/l	0.2	0.5	-	0.3
21	Copper	mg/l	0.05	0.1	-	2
22	Zinc	mg/l	0.2	0.5	-	3
23	Arsenic	mg/l	0.01	0.05	-	0.01
24	Cadmium	mg/l	0.003	0.003	-	0.003
25	Total Chromium	mg/l	0.05	0.05	-	0.05
26	Lead	mg/l	0.02	0.02	-	0.01
27	Selenium	mg/l	0.01	0.01	-	0.01
28	Mercury	mg/l	0.0005	0.0005	-	0.001
29	Phenols	mg/l	0.001	0.002	-	-
30	Cyanides	mg/l	0.05	0.05	-	0.07
31	PAH	mg/l	0.0002	0.0002	0.001	-
32	Total Pesticides	mg/l	0.0005	0.0005	0.001	-
33	PCB	mg/l	0.0002	0.0002	-	-
34	SAR	-	-	-	26	0.5
35	Boron	mg/l	-	-	1	0.5
36	Floating Materials such as wood, plastic, rubber, excreta, garbage, etc.	-	Absent	Absent	-	-

#### Note (Bhutan Standards):

##### A: Very good

Drinking water sources without conventional treatment, but after disinfection whenever necessary.

##### B: Good

Drinking water sources with conventional treatment.

##### C: Moderate

Uses for irrigation, industrial cooling, etc.

“To achieve the drinking quality standard, disinfection/ boiling of the water is recommended. The total coliform may be high due to their contribution from natural sources like soil, litter etc. which does not relate to pathogen. If MPN of total coliform is noticed to be more than the limit suggested, then regular tests should be carried out. The criteria would be satisfied if during a period not more than 5% samples show greater than prescribed limit.

#### Anonymous:

SAR: Sodium Absorption Ratio; PAH: Poly Aromatic Hydrocarbon; MPN: Most Probable Number; PCB: Poly Chlorinated Biphenyl; BOD: Biochemical Oxygen Demand; DO: Dissolved Oxygen.

## 2) Industrial Effluent Discharge Standards (September 2010)

No.	Parameter (maximum permissible)	Generic	Specific Standards (by Industries)				
			Food	Mining	Metals Industries	Chemicals	Wood
1	Ammoniacal Nitrogen (NH <sub>3</sub> -N)	10	10			8	8
2	Arsenic (As)	0.1		0.1	0.1		
3	BOD <sub>5</sub>	30	30	30	30	30	100
4	Boron (B)	1.0					
5	Cadmium total (Cd)	0.05					
6	COD	150	150				200
7	Chloride (Cl)	500					
8	Chromium total (Cr)	0.5					
9	Chromium Hexavalent (Cr <sup>6+</sup> )	0.1					
10	Colour and Odour	*					
11	Copper total (Cu)	0.1		0.5	0.5		
12	Cyanide (CN)	0.1					
13	Fluoride (F)	2.0					
14	Phosphate (PO <sub>4</sub> )	3.0					
15	Nitrate (NO <sub>3</sub> )	10.0					
16	Iron total	2.0					
17	Lead total (Pb)	0.1		0.1	0.1		
18	Manganese (Mn)	0.5					
19	Mercury (Hg)	0.001		0.001	0.001		
20	Nickel (Ni)	0.1		0.5	0.5		
21	Oil and Grease	5.0					
22	pH	6.5 - 8.5	6.5 - 8.5				
23	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	0.5				0.5	0.5
24	Selenium (Se)	0.05					
25	Sulphate (SO <sub>4</sub> )	500					
26	Sulphide (S)	1.0				0.2	
27	Total Dissolved Solids (TDS)	1,500					
28	Total Suspended Solids (TSS)	80	80	50.0	50.0		
29	Temperature, degree C	<3*					
30	Total Kjeldahl Nitrogen	20					
31	Total residual chlorine	0.5					
32	Zinc total (Zn)	3.0		2.0	2.0		

NOTE:

The generic standard will apply unless otherwise stated.

All units in mg/l unless otherwise stated.

\*: For colour and odour, it is recommended that, as far as practicable, colour and unpleasant odour should be absent in the samples.

\*\*: Temperature of the receiving water bodies shall not exceed 3 degree Celsius from the ambient in any section of the streams within 15m downstream from the point of effluent discharge.

### 3) Standard for final effluent from Sewerage Treatment Plant (STP))

No.	Parameter (Max. Permissible Limit)	Unit	Concentration not to exceed
1	BOD	mg/l	30
2	Total Suspended Solids (TSS)		100
3	Fecal Coliform	MPN/100ml	1,000

### 4) Ambient Air Quality Standards (Maximum Permissible Limits in $\mu\text{g}/\text{m}^3$ )

Parameter / Time Range	Bhutan Standards			WHO Standards (2005)
	Industrial Area	Mixed Area*	Sensitive Area**	
<i>Total Suspended Particulate Matter</i>				
24 Hours Average	500	200	100	
Yearly Average	360	140	70	
<i>Respirable Particulate Matter (PM10)</i>				
24 Hours Average	200	100	75	50
Yearly Average	120	60	50	20
<i>Sulfur Dioxide</i>				
24 Hours Average	120	80	30	20
Yearly Average	80	60	15	-
<i>Nitrogen Dioxide</i>				
24 Hours Average	120	80	30	40
Yearly Average	80	60	15	-
<i>Carbon Monoxide</i>				
24 Hours Average	5,000	2,000	1,000	-
Yearly Average	10,000	4,000	2,000	-

\*: **Mixed Area** means the area where residential, commercial or both activities take place.

\*\* : **Sensitive Area** means the area where sensitive targets are in place like hospitals, schools, sensitive ecosystems.

### 5) Industrial Emissions: Maximum Limits for Pollutants ( $\text{mg}/\text{Nm}^3$ )

Industrial Type by Technology	Maximum Limits for Pollutants ( $\text{mg}/\text{Nm}^3$ )			
	SPM	SO <sub>2</sub>	NO <sub>x</sub>	CO
Lime Kilns	150	100	100	50
Arc Furnace, Induction Furnace	150	100	100	50
Tapping Fume Stack	150	-	-	-
Coal fired, Oil fired and Wood fired Boiler	150	100	100	50
Horizontal/ Rotary Kiln, Vertical Shaft Kiln and other Kiln	150	100	100	50
Other Technologies: for sectors that are not covered in the above sections	150	100	100	50

### 6) Workplace Emissions for 8 hour average

Parameter	Standard
Total Suspended Particulate	10 $\text{mg}/\text{Nm}^3$
Respirable Particulate Matter	5 $\text{mg}/\text{Nm}^3$
Sulfur Dioxides	1 $\text{mg}/\text{Nm}^3$
Nitrogen Dioxides	1 $\text{mg}/\text{Nm}^3$
Carbon Monoxide	5 $\text{mg}/\text{Nm}^3$

## 7) Vehicle Emission Standards

Fuel Type	Vehicles registered prior to 1 Jan. 2005	Vehicles registered after 1 Jan. 2005	Type Approval
Petrol (%CO)	4.5	4	Euro II
Diesel (%HSU)	75	70	

Note: Two strokes engine banned from Import.

## 8) Noise Level Limits

Bhutan Standards	Industrial Area		Mixed Area		Sensitive Area	
	Day	Night*	Day	Night	Day	Night
	75dB (A)	65dB (A)	65dB (A)	55dB (A)	55dB (A)	45dB (A)
WHO Standards (1999)	Industrial commercial shopping and traffic areas		Outdoor living areas		School, playground outdoor	
	Hearing impairment		Serious annoyance	Moderate annoyance	Annoyance (external source)	
	70 dB (A)		55 dB (A)	50 dB (A)	55 dB (A)	

Note: All the values are maximum values.

\*: Day time is from 0600 hours to 2200 hours (human activities)

\*\*: Night time is from 2200 hours to 0600 hours (no human activities)

**Maximum Value allowed in workplace in any point of time is 75 dB(A).**

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#### **Information retrieved from Websites:**

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**Appendix 3**  
**Record of Stakeholder Meeting**



## **Summary**

### 1st Stakeholder Meeting

Total Number of participants: 117 (including 10 staffs from DHS MoWHS in total)

Date: 25 to 26 of January 2018  
Place Institute for Management Studies, Serbithang, Thimphu  
Participants: 43 Participants (Including 4 from DHS as facilitator and 7 locals)

Date: 29 to 30 of January 2018  
Place Wangchuk Hotel, Mongar  
Participants: 36 Participants (Including 3 from DHS as facilitator and 3 locals)

Date: 2 to 3 of February 2018  
Place Dewaling Hotel, Gelephu  
Participants: 38 Participants (Including 3 from DHS as facilitator and 4 locals)

### Minutes of Meeting

Theme : 1st Stakeholder Meeting  
Data : January, 25<sup>th</sup>-26<sup>th</sup>, 2018 08:30~16:30  
Place : Institute for Management Studies, Serbithang, Thimphu  
Attendance : Attached

#### Day 1

1<sup>st</sup> Presentation on introduction of the Project and point of group discussion presented by Yangchen Lhamu DHS.

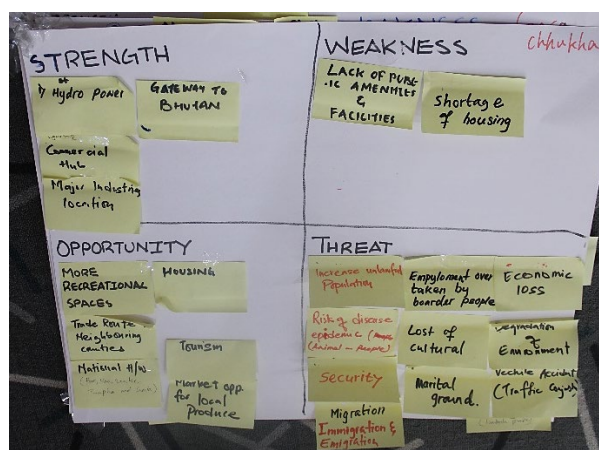
#### (1) SWOT Analysis

SWOT analyses of Each Dzongkhags were presented as the Groups' first exercise in the SHM.

Arrow (➤) shows the comments from stakeholders, Dot (●) shows the comments from Project team, unless otherwise noted.

##### 1) Chhukha

- Phuentsholing Thromde highlighted that the area already has a recreational plan imbedded in the Amo Chu land reclamation and planning project.
- The Project Team clarified that migration (especially immigration) will come under 'Threat' as it is an external influence.
- The Project Team also pointed out that sourcing Indian labourers imply outflow of economy.



##### 2) Gasa

- Both low income and low enrolment rate contribute to poverty, so it can be clubbed under multi-dimensional poverty.
- Nomad's community vitality has been observed to be decreasing due to most nomads settling in the town area. This will come under weakness.
- Dzongkhag administration shall assist local people to establish hotels and restaurants. This has been delayed as the town planning has not been finalized.
- Need for water treatment plant.
- Clean Gasa has been an initiative in the Dzongkhag to help Gasa maintain cleanliness.



### 3) Haa

- Haa LAP is under preparation.
- Ap Chundu can come under heritage landscape; and lomba festival under culture & tradition.
- Pointing out Imtrat and RBA as a threat is a sensitive issue and it is not necessarily a threat but if its purpose is analyzed, it could be a strength. Or maybe a weakness since it has been there in Haa.
- An additional strength could be that there is a clear delineation between mountain (no development zone) and settlements (development zone) regarding the physical 'topography' of Haa town area.
- Illegal extraction of forest products (threat)?
- Since nomads settling in the town are increasing, it is critical to enhance their livelihood in the highlands since it also concerns security.



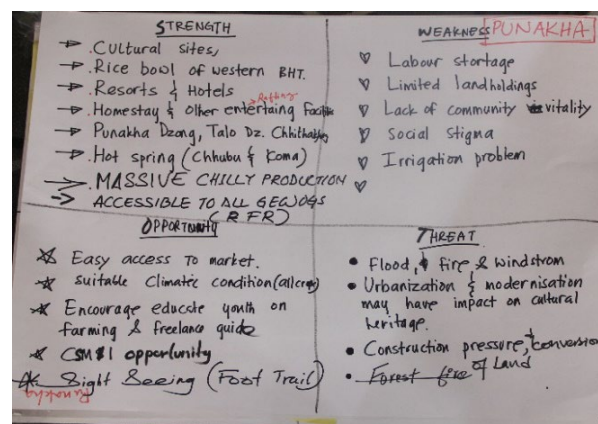
### 4) Paro

- Rather than lack of job opportunity, it is more of a mismatch between demand and type of jobs available in the market.
- Rural-urban migration in Paro is also characterized by nomads who settle in town permanently rather than staying in the highlands.



### 5) Punakha

- Land fragmentation of Chhuzhing leads to lesser agricultural production and leasing other private lands for production is not reliable as it could mean low production at times.



6) Samtse

- Samtse – Haa Highway can allow Samtse to be transit camp for those travelling to India.
- The highway is also expected to bring about various social and economic issues.

<b>Strength</b> <ul style="list-style-type: none"> <li>Geographical area</li> <li>Abundant Water Supply</li> <li>Cost-effective</li> <li>Waste Management</li> </ul>	<b>Weakness</b> <ul style="list-style-type: none"> <li>Negative influential impact</li> <li>Multi-religion</li> <li>Multi-dimensional poverty</li> <li>Lack of competent human resources.</li> </ul>
<b>Opportunity</b> <ul style="list-style-type: none"> <li>Accessibility to resources</li> <li>Accessibility to materials</li> <li>Low labour cost</li> <li>Favourable climatic condition</li> <li>Samtse-Haa Highway</li> </ul>	<b>Threat</b> <ul style="list-style-type: none"> <li>Impact on culture and tradition</li> <li>Impact on social harmony</li> <li>Market competition</li> </ul>

7) Thimphu

<b>THIMPHU DZONGKHAG</b> <b>STRENGTH</b> <ul style="list-style-type: none"> <li>Capital - Administrative, Capital City</li> <li>Political, Commercial centre.</li> <li>Location Advantage</li> <li>Natural Resources</li> </ul>	<b>WEAKNESS</b> <ul style="list-style-type: none"> <li>Waste</li> <li>Pressure on resources</li> <li>Unbalanced developmental activities.</li> <li>Adverse Environmental Effects</li> </ul>
<b>Opportunity</b> <ul style="list-style-type: none"> <li>Business</li> <li>Employment</li> <li>Tourism</li> <li>Relationship with Druk Yag</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>Population Growth (Migration)</li> <li>Traffic, drugs, crime, HIV/AIDS</li> <li>Community vitality/Cultural</li> <li>Implications</li> <li>Climatic Condition</li> </ul>

8) Wangdue Phodrang

- An issue of agricultural land fragmentation due to inheritance is also raised by the Dzongkhag.
- There is existing stigma in terms of enhancement of livestock rearing since people believe that, it is against Buddhism.

<b>STRENGTH</b> <ul style="list-style-type: none"> <li>Mega Hydro Projects</li> <li>Rich natural biodiversity</li> <li>Heritage Village</li> <li>Granite Mining &amp; Processing</li> <li>Livestock Products</li> <li>Black Necked cranes</li> <li>Local Dzongkhag</li> </ul>	<b>WEAKNESS</b> <ul style="list-style-type: none"> <li>Scattered Settlement</li> <li>Insufficient Water</li> <li>Floating Popn</li> <li>Rural-Urban Migration</li> </ul>
<b>OPPORTUNITY</b> <ul style="list-style-type: none"> <li>Tourism</li> <li>Favourable Agro climatic Conditions</li> <li>Employment</li> <li>Valley Dev. Plan</li> <li>Organic farming</li> </ul>	<b>THREAT</b> <ul style="list-style-type: none"> <li>Glacier lake outburst flooding</li> <li>Land fragmentation</li> <li>Backflow of Damming</li> <li>Youth: less interest in Agriculture</li> <li>Extinction of Black necked crane</li> <li>Social Stigma</li> </ul>

2<sup>nd</sup> Presentation on Development Alternatives (DA) and SEA presented by Tshering Pelden and Deki Wangmo DHS.

Assignments were given to the groups to discuss on DA of their respective Dzongkhags and to mention the impacts as per the SEA.



## Day 2

### (1) Presentation

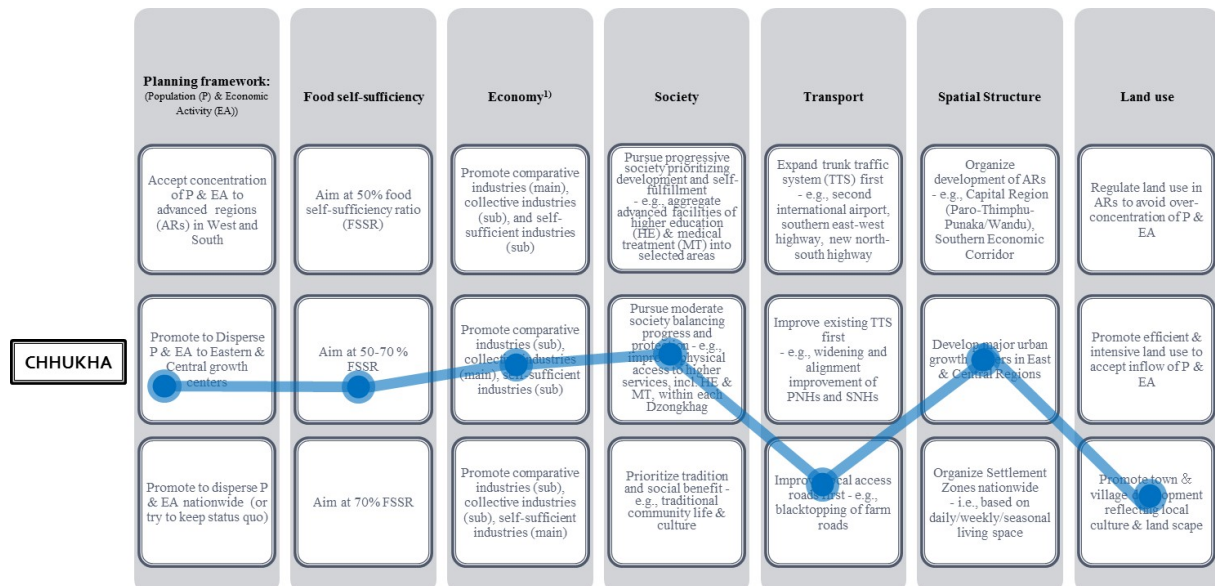
Presentation 1 “Vision and Objectives of the Project” by Junko MASAKI, SHM Coordinator, JICA Project Team

- Planning framework: The team suggested the group to include and incorporate potential growth centres particular to their district.
- Land use: The main objective of the project CNDP is to curb rural-urban migration which can’t be achieved by the chosen condition. The group was advised to reconsider the parameter.
- SEA: Mention the environmental and social components that the group put importance to.

### (2) Group Discussion and Presentation on Development Alternatives and SEA by Dzongkhag officials;

\*Note: Presentation of each Dzongkhag attached.

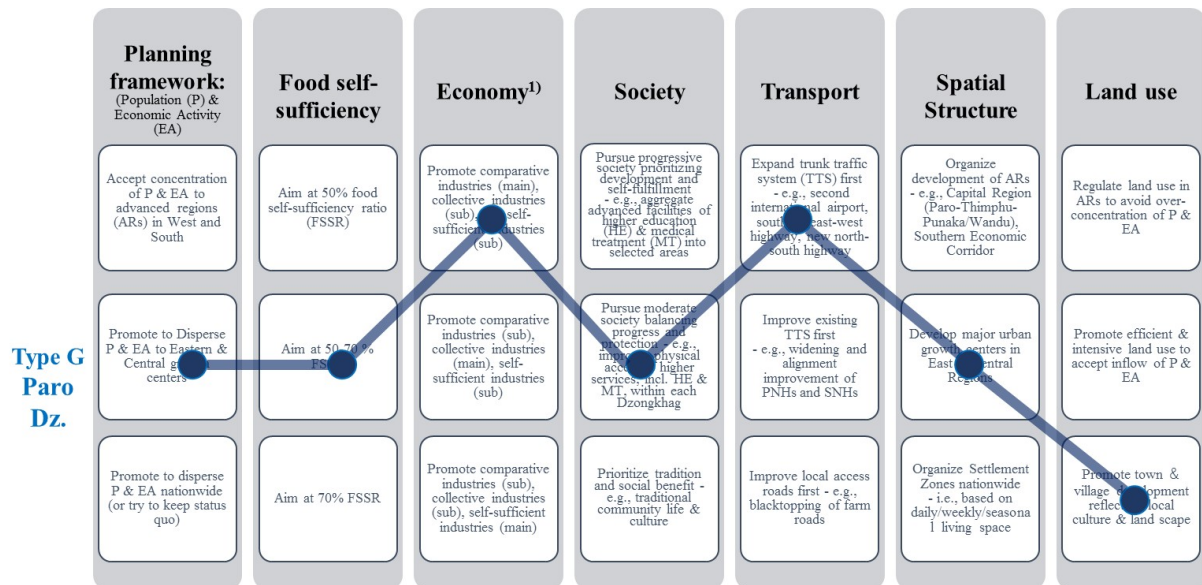
#### 1) Chukha Dzongkhag



- The members chose a different development alternative than the ones presented by the project team (i.e, Type A,B,C and G).
- The Dzongkhag officials responded that the convenient living conditions is the social components that the group put importance to.



## 2) Paro Dzongkhag

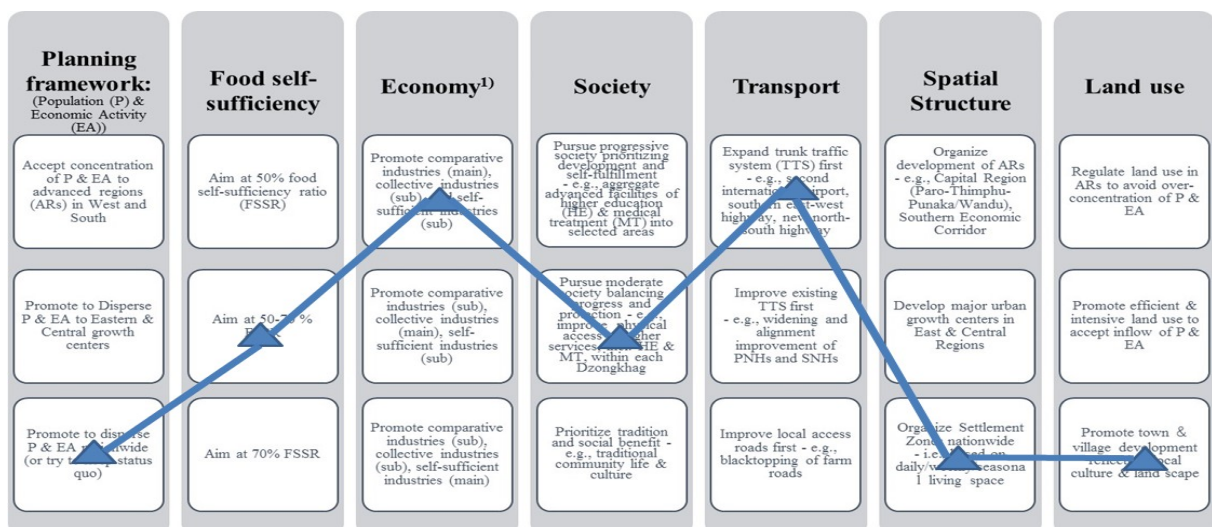


Food self-sufficiency: can be achieved by utilization of barren/unutilized lands and with support from relevant stakeholders.

Some of the necessary development and protection as mentioned by the group:

- Conservation of culture & tradition
- Proper waste management system
- Development of Agriculture & livestock sector-semi-commercial/commercial/mega farms-organic farming
- Infrastructure development for nomadic communities of Soe and Nubri
- Watershed management-domestic/hydropower
- Local area plan for Naja/Dogar
- Proper public transport system-Bus terminal-pedestrian foot path-cycling track
- Conservation of environment-forest coverage

## 3) Wangduephodrang Dzongkhag

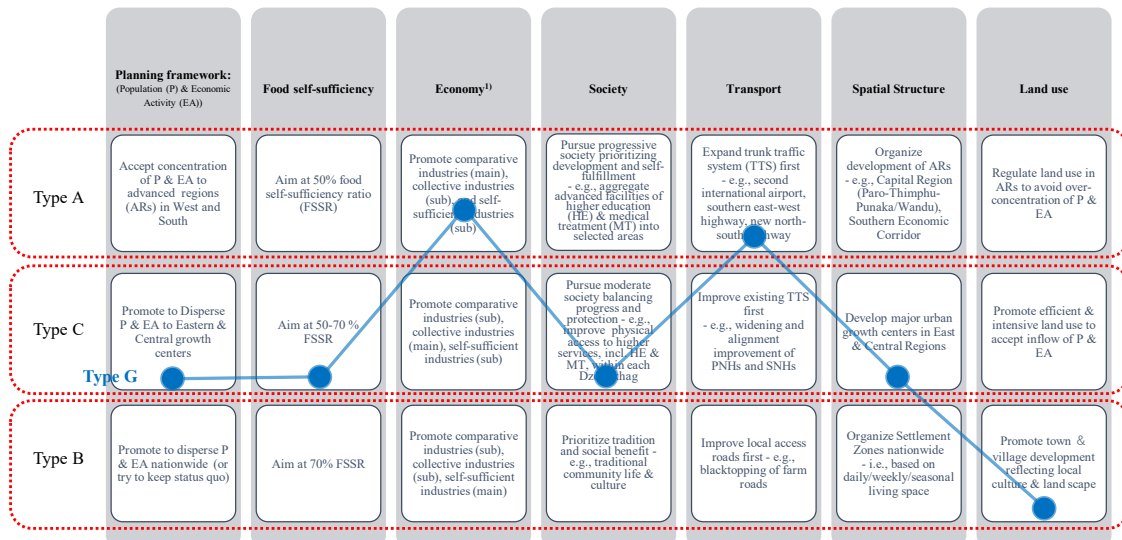


The group has developed a different alternative to suit their priority. The district aims to disperse P & EA all over the district by organizing settlement zones.

- It was clarified that Planning framework and spatial structure is related and the same conditions should be selected.

#### 4) Punakha Dzongkhag

##### Seven Types of Development Alternatives



The group considers Type G as the ideal development alternative, but with inclusion of Institutional establishments and offices in the economic sector along with comparative industries. They suggested that heritage and religious structures be included as well.

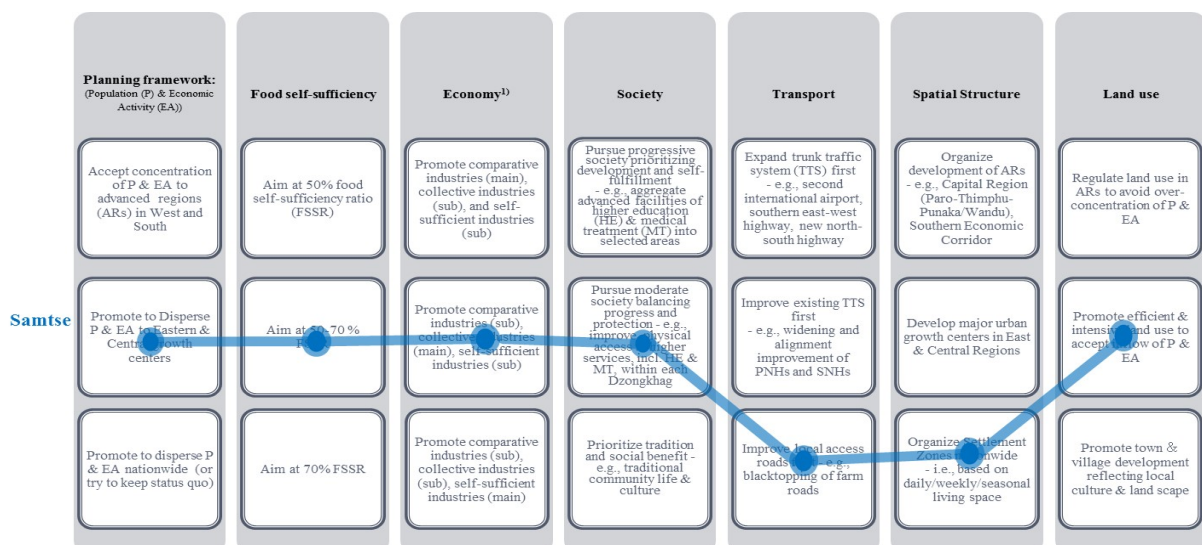
**Economy:** Hydropower is not applicable for Punakha district. The focus would rather be into SMEs and cottage industries.

**Society:** Apart from including the conditions in the alternative G, the district plans to encourage community and stakeholder collaboration in decision making processes concerning developmental activities. The focus is also on making development decisions predictable, fair, and cost effective.

**Land use:** Wetland conversion to other uses like dry land and residential land is a critical issue that needs to be addressed.

- If hydropower is not applicable for the district as a comparative industry, the district could focus on tourism and export-oriented agriculture.

#### 5) Samtse Dzongkhag

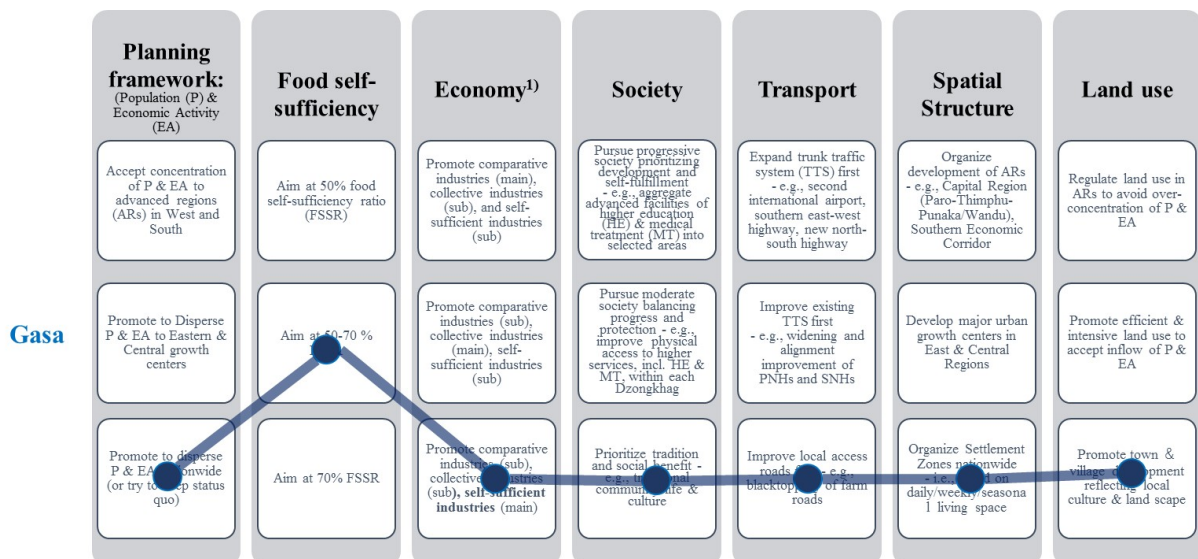


The group members considers Type G as the ideal alternative. The district's focus will be more on multi-dimensional poverty index which includes parameters of health, education and poverty. The district is mentioned to be lagging behind by about 20 years in terms of education due to '90s problem when

schools were closed down for years. In terms of health, the district is vulnerable as it is situated at the border.

- Questions were raised regarding the district's plan to tackle social issues which arises due to different people following different religion residing in the same district.
- The district gives development importance to conservation of culture and traditions under which religion and its related issues will be taken care of.

## 6) Gasa Dzongkhag

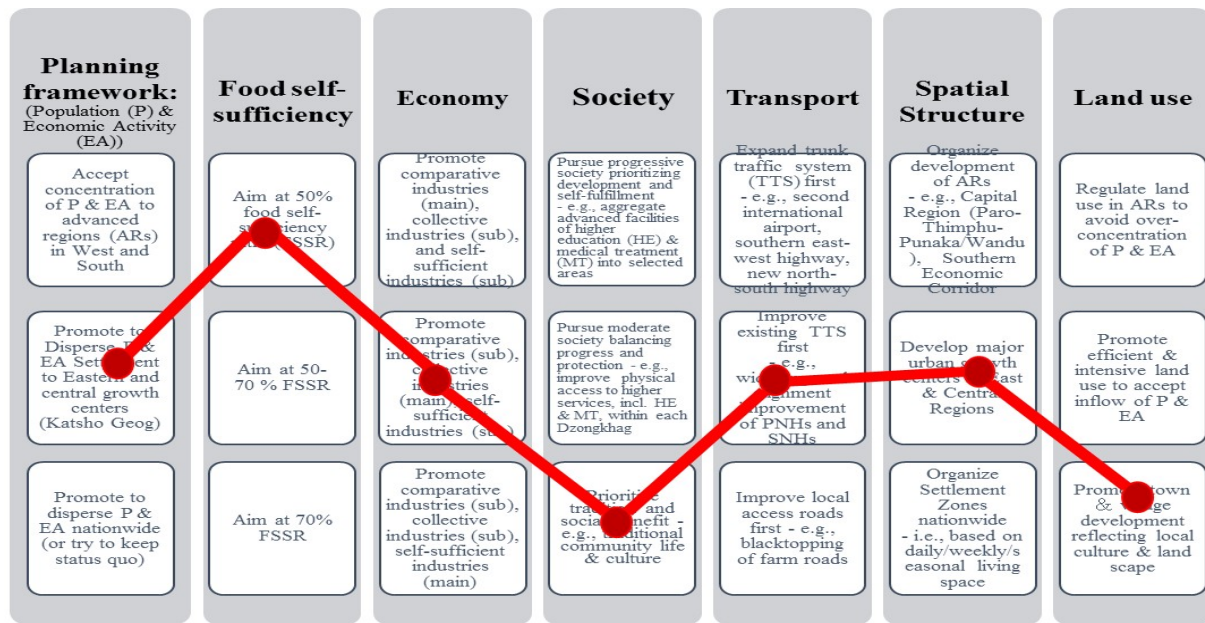


The members mentioned that the district is more into organic food production which are of export quality. The Dzongkhag Development Driving Centre (DDDC) is a community owned company and the engine of sustainable socio-economic development of Good to Great Gasa with self-reliance as its objective.

- Concerns were raised regarding the export of organic food produced within the country and in return import chemically affected food items.
- The group hasn't put up any negative impact for the industries (focusing on organic food production)
- As far as it is produced organically produced, it may not have any adverse negative impact. But a possible negative effect could be the price/product affordability for the Bhutanese consumers.

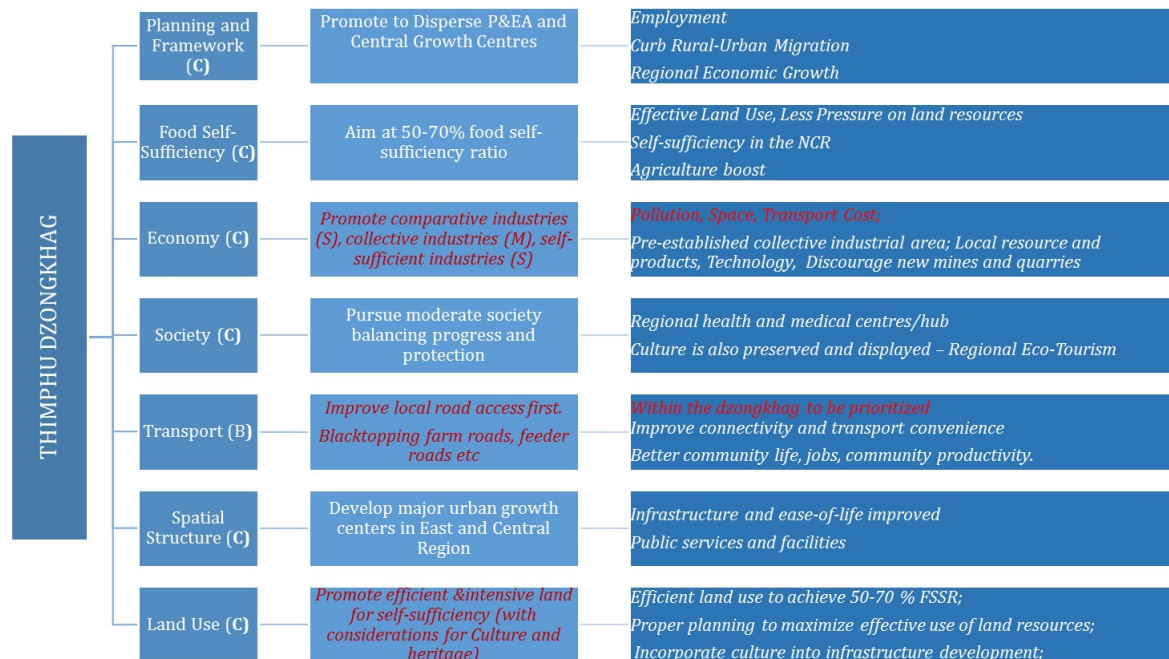


## 7) Haa Dzongkhag



The district cannot disperse the population and economic activities throughout the district because of the extreme climatic condition in some areas. The district's priority sector for Economy is eco-tourism and cottage industries.

## 8) Thimphu Dzongkhag



### (Positive impact of the chosen alternative)

- Thimphu, being a capital city deals with a lot of in-migrants. The team raised concerns regarding the group's choice of promoting efficient and intensive land use in ARs to avoid over concentration of P and EA.
- The members clarified that their focus is on promoting efficient and intensive land use for self-sufficiency with considerations for culture and heritage.
- The team clarified that ARs are the four districts in western region, namely, Thimphu, Paro, Punakha and Wangdue.

### **(3) Objectives and Vision**

The team reminded the participants that the vision and objectives are in draft stage and the deliberation is aimed at to get the feedback from the local level.

- Good governance is one of the four pillars of GNH and an integral component of development and needs to be emphasized although it could be slightly covered under the objective of Global epicenter of the people.
- It was recommended that carbon neutral be used in place of zero emission under the objective Eco-friendly Technology as zero emission is not achievable.
- Maximization of GNH is very important according to the officials. But without value system, it will be quite difficult to achieve the objective of making it global epicenter. It was suggested that value system education be incorporated in the school curriculum.
- It was also suggested that an objective regarding the disabled population be included.
- It was pointed out that some of the objectives are very vague and needs to be rephrased. Overall, it was agreed that the objectives will be relooked to make it shorter and to the point.

## Minutes of Meeting

Theme : 1st Stakeholder Meeting  
Data : January, 29th – 30th, 2018 08:30~16:30  
Place : Wangchuk Hotel, Mongar  
Attendance : Attached

### DAY 1

The officials were welcomed by the Project Team, followed by opening remark by the Mongar Dzongkhag Tshogdu Chairperson. The chairperson highlighted the importance of planning being a very important precautionary measure for a sustainable future and issue of rural- urban migration being a nationwide issue.

The Project Team made the first presentation on ‘Introduction of the Project’ which includes the objectives, output and the issues related to the project.

The participants were asked to do a SWOT analysis of their respective Dzongkhags as the groups’ first exercise in the SHM.

SWOT analysis were done by each Dzongkhags and presented, the discussion are as follows;

- shows the comments from the Project Team
- shows the comments from stakeholders

### (1) SWOT analysis

#### 1) Lhuntse

- The impacts of more drop out cases is dependent on the situation of the area. Some rural areas are benefited since the dropouts contribute to the family’s human resource. On the other hand, more dropouts imply out-migration of youth, which affects the vitality and viability of the villages. It also leads to more *gungtongs*.
- The issue of management and/or coordination and ownership of the public properties has also been raised as a weakness of Mongar. It was suggested that the Dzongkhag initiate such kind of management strategies and to enhance the community vitality.
- Low population was to be kept under weakness since it is an internal issue.



## 2) Mongar

- It was suggested that the *Drametse Ngacham* and *Sanga Lingpa Cham* (mask dances); and Chortens and Lhakhangs be grouped under 'cultural and religious sites' under strength. It was also highlighted that more analysis on historical background has to be done for public's awareness and for tourism.
- Ecotourism (bird watching & trekking trails) is a strength.
- There is also an opportunity for diversification of dairy products such as ice cream manufacturing and processed cheese.
- Increasing exposure and influence of youth to western culture is also a threat to diminishing culture and tradition.
- The Dzongkhag also identified heavy rainfall as a threat since it gives rise to landslides and mudslides owing to its steep topography.
- On questioning whether the organic products were certified, Mongar Dzongkhag clarified that the upper floor of vegetable market is dedicated for organic vegetables, although it is not certified but is tested for chemicals.

STRENGTH	WEAKNESS
<ol style="list-style-type: none"> <li>1. Suitable Location.</li> <li>2. Favourable Climatic Cond.</li> <li>3. Availability of local/traditional handicrafts.</li> <li>4. Agro-industry/Organic Products.</li> <li>5. Eco-tourism.</li> <li>6. Sufficient production of milk and eggs.</li> </ol>	<ol style="list-style-type: none"> <li>1. Unfavourable to poverty.</li> <li>2. Limited/scarcity of water.</li> <li>3. Lack of income genert.</li> <li>4. Land degradation.</li> <li>5. Lack of market.</li> <li>6. Huge Production Cost.</li> </ol>
OPPORTUNITIES	THREAT
<ol style="list-style-type: none"> <li>1. Business opportunity.</li> <li>2. Horti-culture.</li> <li>3. Enhanced cultural visits.</li> <li>4. Eco-tourism.</li> </ol>	<ol style="list-style-type: none"> <li>1. Diminishing Cultural values.</li> <li>2. Instability of Land Strata (earthquake).</li> <li>3.</li> </ol>

## 3) Pemagatshel

- 9.6% of the total land in Pemagatshel is arable land (figure was not reflected in the presentation).
- Gypsum is not a state mining but comes under corporation therefore the advantages and disadvantages should be weighed for the long run.
- There are opportunities in horticulture, trekking tracks, historical visiting site (DUAR War), soft power; and Research & Development Centres.
- They also raised that improper management plan for Gypsum extraction may lead to land scars and deteriorate cultural landscape.

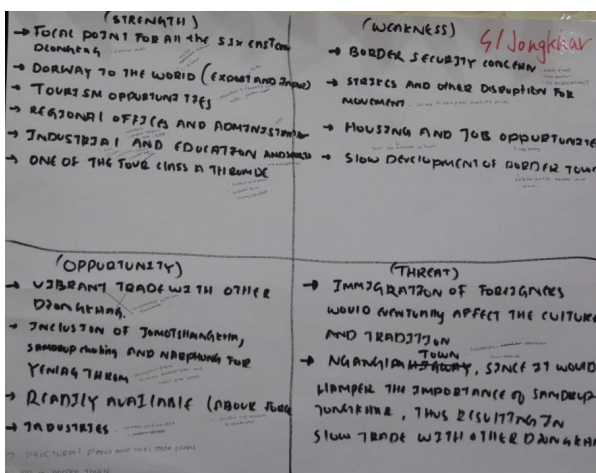
Strength	Weakness
<ul style="list-style-type: none"> <li>- State Mining/Industries</li> <li>- Historical Places (Tshechig)</li> <li>- Local Products</li> <li>- Road connectivity</li> <li>- Forest coverage (84%, NREM)</li> </ul> <p>"HAPPIEST DZONGKHAG IN BHUTAN" -2017</p>	<ul style="list-style-type: none"> <li>- Migration</li> <li>- Lack of market access</li> <li>- Lack of arable land</li> <li>- Unbalance development</li> <li>- Traffic Congestion</li> </ul>
Opportunity	THREAT
<ul style="list-style-type: none"> <li>- Employment</li> <li>- Nganglam - Gyalpoishing highway (7 Entry gates)</li> <li>- Tourism (Salt route, rafting, etc)</li> <li>- Development of towns (Regional)</li> <li>- Kuri-Gangri Hydro Project (395)</li> <li>- Relationship across border.....</li> </ul>	<ul style="list-style-type: none"> <li>- Pollution (Air, Water, Ewra)</li> <li>- Land degradation</li> <li>- Reduction of population</li> <li>- Exploitation of resources (border area)</li> </ul>

## 4) Samdrup Jongkhar

The SWOT analysis is not comprehensive enough since it has been focused mostly on the Thromde area and not inclusive of rural areas.



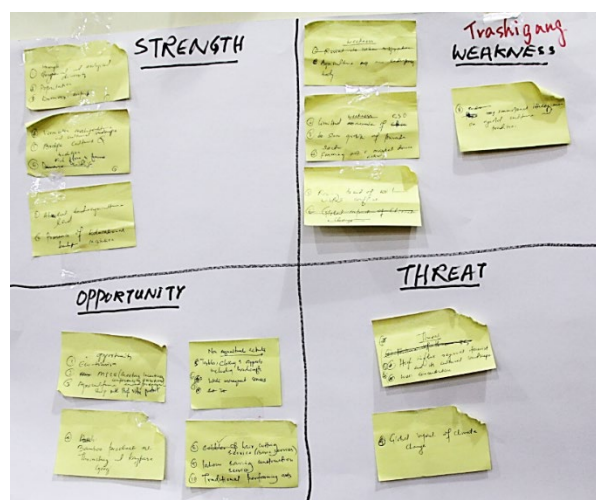
- Enhancing external market in border town in India may impact the markets and shops in Samdrup Jongkhar.
- Being a gateway to Bhutan, it gives the first impression of Bhutanese landscape and architecture. It is recommended that the structures in the thromde showcase the traditional bhutanese architecture.
- It was questioned that the import of cheap labourer from Indian border area may increase the outflow of the economy. The Dzongkhag officials responded that the net gain is to the Bhutanese people for the short term.



5) Trashigang

People in Trashigang mostly focus on doing retail business, rather than agriculture and livestock. It is important to diversify economy and also to focus on SMEs.

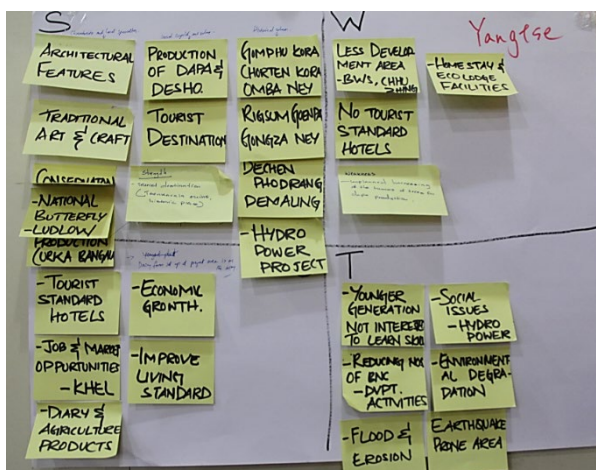
- Global warming could be a threat instead of weakness.
- 60% reduction of subsidy/tourist tariff for regional tourist were mentioned as weakness and could be a threat in the long run due to the negative impacts it may cause to the the environment as well as preservation of tradition and culture. While other participants mentioned that it could be an opportunity if the rules and guidelines are well implemented.



6) Trashiyangtse

The Dzongkhag officials were asked to gather more information on Tsenkhar Dzong (Kamdhang Gewog) as it could be one of the historical sites which could be reflected under strength.

- Although making of *dapa* is good for Trashiyangtse's identity and economy, utilization of trees for *Dapa* making, which is rare could lead to extinction. Therefore, they should initiate afforestation of such trees and proper management plan is required in the Dzongkhag.
- Paddy fields near Bumdeling has been affected due to frequent flooding despite river protection works.
- There is also an opportunity for good market especially for export to Arunachal border town, although there may be security issue.





## (2) Development Alternatives (DA) & SEA

### 1) Lhuntse

#### Analysis of Development Alternative plan Lhuentse Dzongkhag

	Planning framework: (Population (P) & Economic Activity (EA))	Food self-sufficiency	Economy <sup>1)</sup>	Society	Transport	Spatial Structure	Land use
	Accept concentration of P & EA to advanced regions (ARs) in West and South	Aim at 50% food self-sufficiency ratio (FSSR)	Promote comparative industries (main), collective industries (sub), and self-sufficient industries (sub)	Pursue progressive society prioritizing development and self-fulfillment - e.g., aggregate advanced facilities of higher education (HE) & medical treatment (MT) into selected areas	Expand trunk traffic system (TTS) first - e.g., second international airport, southern east-west highway, new north-south highway	Organize development of ARs - e.g., Capital Region (Paro-Thimphu-Punaka/Wandu), Southern Economic Corridor	Regulate land use in ARs to avoid over-concentration of P & EA
	Promote to Disperse P & EA to Eastern & Central growth centers	Aim at 50-70 % FSSR	Promote comparative industries (sub), collective industries (main), self-sufficient industries (sub)	Pursue moderate society balancing progress and protection - e.g., improve physical access to higher services, incl. HE & MT, within each Dzongkhag	Improve existing TTS first - e.g., widening and alignment improvement of PNhs and SNhs	Develop major urban growth centers in East & Central Regions	Promote efficient & intensive land use to accept inflow of P & EA
Type H	Promote to disperse P & EA nationwide (or try to keep status quo)	Aim at 70% FSSR	Promote comparative industries (sub), collective industries (sub), self-sufficient industries (main)	Prioritize tradition and social benefit - e.g., traditional community life & culture	Improve local access roads first - e.g., blacktopping of farm roads	Organize Settlement Zones nationwide - i.e., based on daily/weekly/seasonal living space	Promote town & village development reflecting local culture & land scape

- The Dzongkhag suggested inclusion of officials from local governments in the working group.
- It is important to consider nutrients and balanced diet under FSSR parameter.
- Question regarding what the regional balanced development meant. Concerns were also raised regarding the link between 12th FYP and CNDP.
- The draft 12th FYP has been reviewed and incorporated as far as possible in the CNDP. Moreover, 12th FYP is a fiscal plan while CNDP is a plan for human settlement and land use but not foregoing other sectors like agriculture, industries, health, education, forest and other cross cutting sectors.

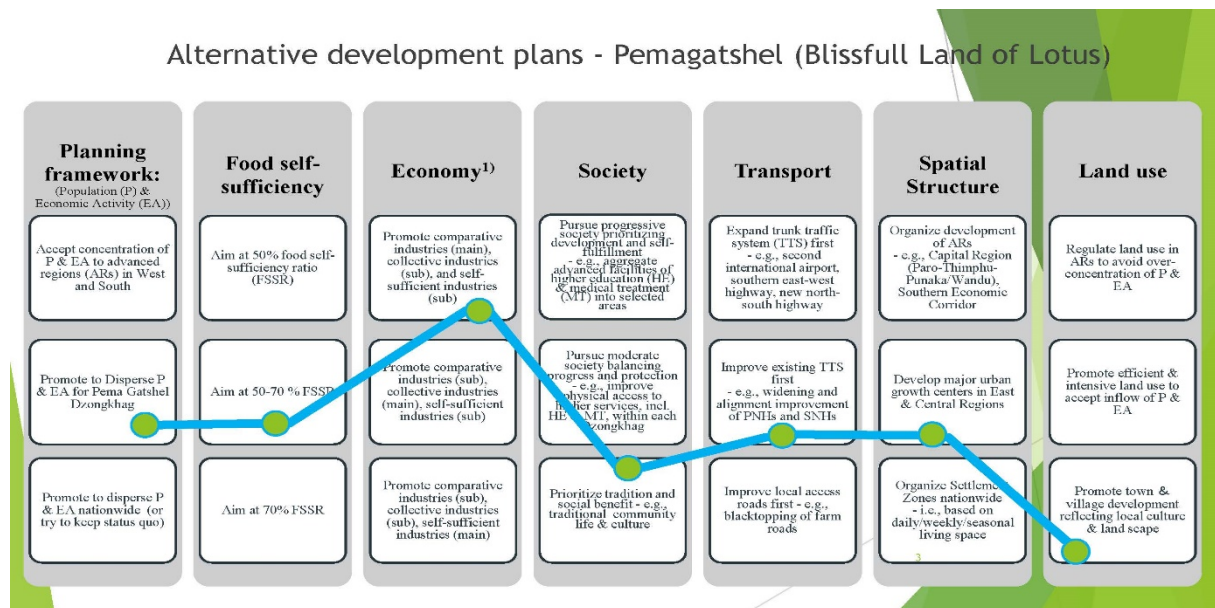
### 2) Mongar

#### ANALYSIS OF SEVEN TYPES OF DEVELOPMENT ALTERNATIVES

	Planning framework: (Population (P) & Economic Activity (EA))	Food self-sufficiency	Economy <sup>1)</sup>	Society	Transport	Spatial Structure	Land use
Type A	Accept concentration of P & EA to advanced regions (ARs) in West and South	Aim at 50% food self-sufficiency ratio (FSSR)	Promote comparative industries (main), collective industries (sub), and self-sufficient industries (sub)	Pursue progressive society prioritizing development and self-fulfillment - e.g., aggregate advanced facilities of higher education (HE) & medical treatment (MT) into selected areas	Expand trunk traffic system (TTS) first - e.g., second international airport, southern east-west highway, new north-south highway	Organize development of ARs - e.g., Capital Region (Paro-Thimphu-Punaka/Wandu), Southern Economic Corridor	Regulate land use in ARs to avoid over-concentration of P & EA
Type C	Promote to Disperse P & EA to Eastern & Central growth centers	Aim at 50-70 % FSSR	Promote comparative industries (sub), collective industries (main), self-sufficient industries (sub)	Pursue moderate society balancing progress and protection - e.g., improve physical access to higher services, incl. HE & MT, within each Dzongkhag	Improve existing TTS first - e.g., widening and alignment improvement of PNhs and SNhs	Develop major urban growth centers in East & Central Regions	Promote efficient & intensive land use to accept inflow of P & EA
Type B	Promote to disperse P & EA nationwide (or try to keep status quo)	Aim at 70% FSSR	Promote comparative industries (sub), collective industries (sub), self-sufficient industries (main)	Prioritize tradition and social benefit - e.g., traditional community life & culture	Improve local access roads first - e.g., blacktopping of farm roads	Organize Settlement Zones nationwide - i.e., based on daily/weekly/seasonal living space	Promote town & village development reflecting local culture & land scape

- There is a need to rephrase: improved nutrition and reduction of poverty; and minimization of rural-urban migration.
- Local buses (town bus) are proposed in the 12<sup>th</sup> Five Year Plan to enhance accessibility.
- Population density is an important index. Since the villages are scattered and far flung, bringing in facilities and infrastructure can mean huge investments.
- Less environmental degradation (positive impact) & water scarcity (negative impact) are contradicting. If the environment is managed by 2030, water scarcity would be managed too.
- Traffic congestion should be included under negative impacts.

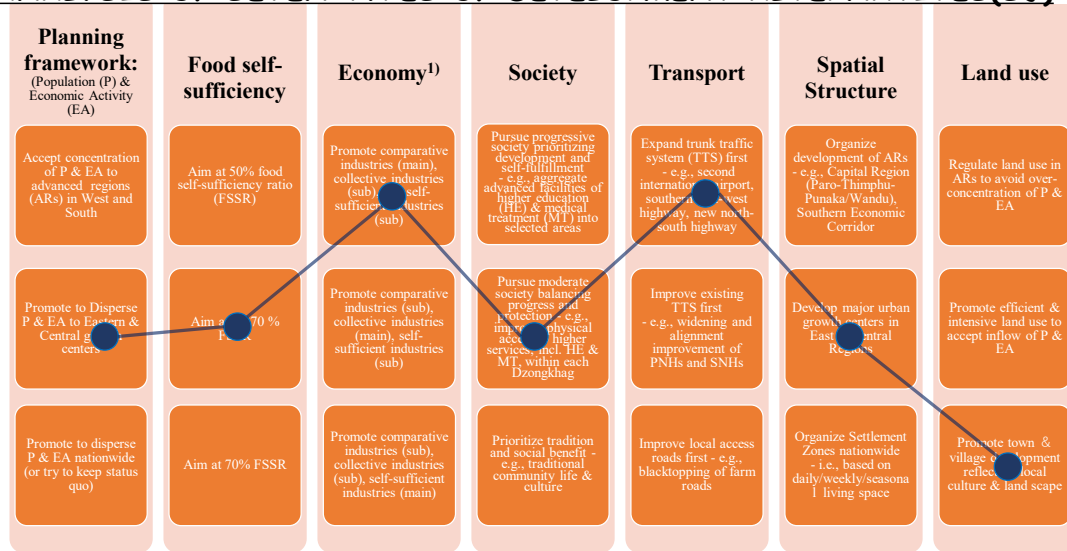
### 3) Pema Gatshel



- The first and foremost step to improve the condition of the dzongkhag is to improve the public infrastructure and facilities. Providing accessible market place in each village can reduce current monopolistic trend and farmers will be benefited directly.
- The Dzongkhag has to reconsider the name 'Denchhi SMART town' and change it to sustainable, green and eco-friendly.
- *Negative impacts: human-wildlife conflict = Nganglam regional hub (biological corridor) from development*

4) Samdrup Jongkhar

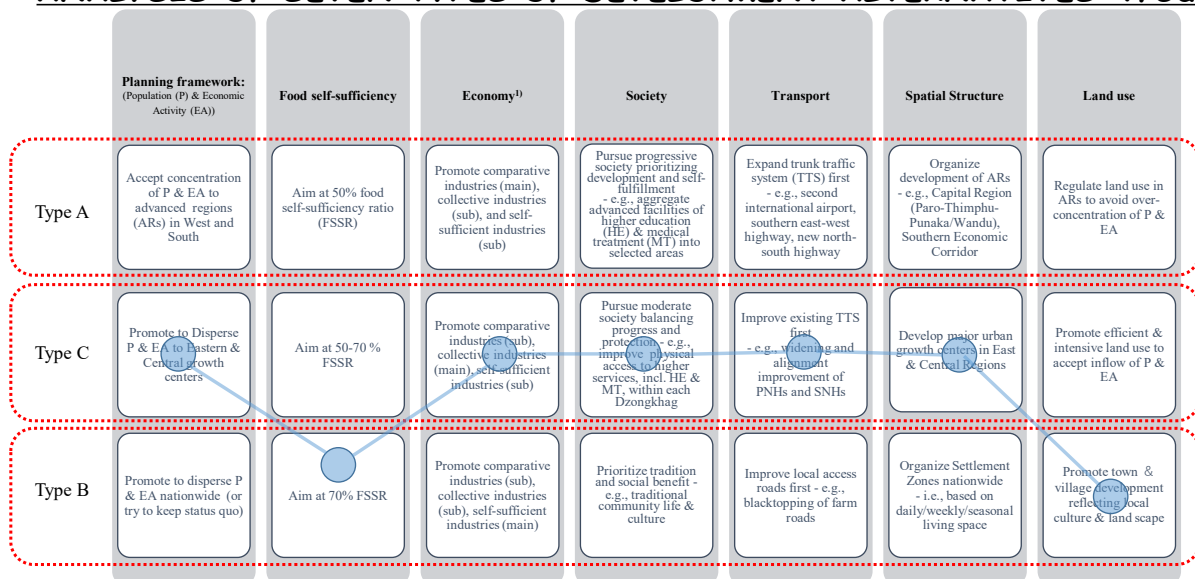
**ANALYSIS OF SEVEN TYPES OF DEVELOPMENT ALTERNATIVES(SJ)**



- The groups suggested all the stakeholders to initiate PURA 'Provision of Urban Amenities in Rural Areas', a strategy adopted in India.
- The DA emphasize on Jomotshangkha and Samdrupchoeling town: The question was raised if development focused on the town areas would be well balanced development for the Dzongkhag? Need for zones with developments, so that there are no afflux of population. But would it not lead to Gewog disparity.
- Not inclusive of rural development.
- Samdrupchoeling and Jomotshangkha has potential for development.
- Since there are two hydropower projects in the same river, they may damage the aquatic ecology.

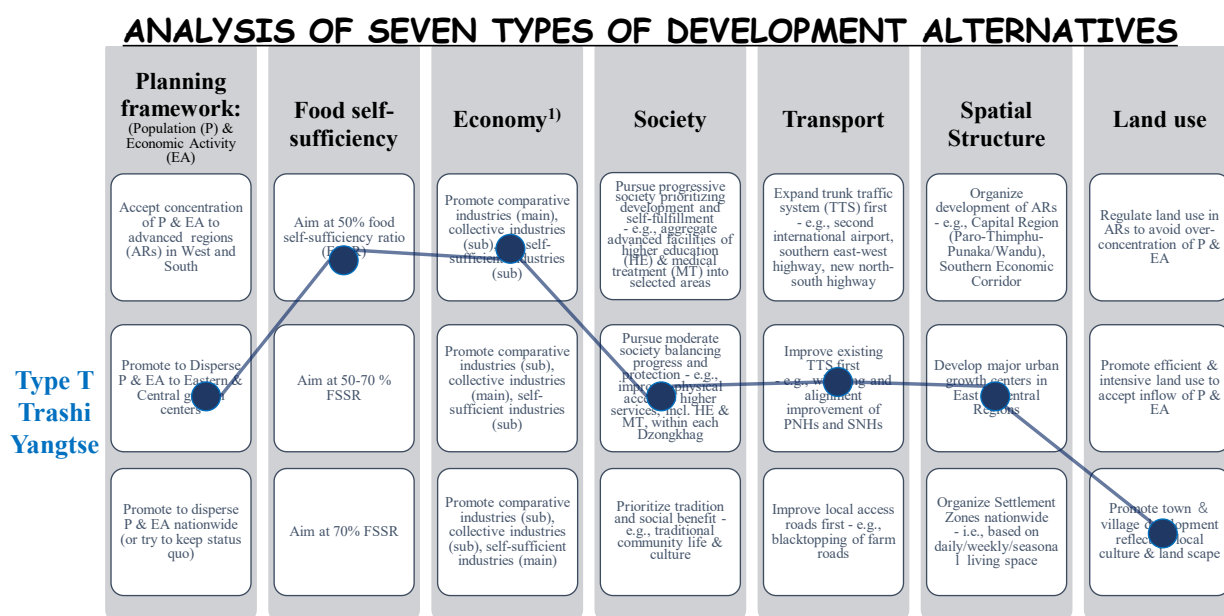
5) Trashigang

**ANALYSIS OF SEVEN TYPES OF DEVELOPMENT ALTERNATIVES-T/Gang**



- The Dzongkhag has mentioned about having abundant timber supply, but there was no mention of plans for regeneration/afforestation.
- The agriculture production at present is almost sufficient for their Dzongkhag and in the DA, the FSSR is aimed at 70%. It was suggested that the Dzongkhag could commercialize their produce and explore the market in other Dzongkhags as well as to border towns.
- GNH data of Trashigang Dzongkhag indicates that the level of GNH within the farmers group is low, therefore, there is a need to identify ways to increase GNH for them. This figure is an important baseline for Trashigang.
- Almost 9782 m3 of trees has been cut down for timber supply as per their baseline data which could lead to depletion of rare tree species.
- Trashigang currently experiences intra rural-urban migration, for which market provision and strengthening is considered crucial in the rural areas.
- Proper management of HR is very critical: zhungchong chogjur one method
- Rangjung in Trashigang has a potential to be a growth centre since it is a place of convergence for other areas.

## 6) Trashiyangtse



- On enquiring about the specific environmental degradation from hydropower by JICA Project Team, the Dzongkhag raised issues of inflicting scars to landscape during the hydropower and access roads construction; production of excavated materials; pollutions (noise, dust etc.); blasting (social issues- health); and disturbance to the habitat of the biodiversity.
- The group has chosen the condition to achieve 50% FSSR for the dzongkhag. They are asked why it was not possible to achieve a FSSR of 50-70% as their statement were focused only for the growth centre or economic centre/upcoming towns. They were asked to take the whole dzongkhag analysis instead.
- The arable land is less considering the difficult terrain. Moreover, upper Trashiyangtse receives less precipitation and frequent flooding in Bumdeling area despite river protection works.
- The baseline data on which the development alternatives should be based were missing.

**(3) Comments on GREENIST vision**

- There is a need to qualify and quantify the meaning behind ‘*sustainable use of national land*’. This phrase could come under objectives and may not be mentioned in the Vision statement. This phrase could also lead to misconception as ‘*national land*’ could mean or restrict only to the state land.
- This plan is a basis for upcoming projects for development of human settlements, so land use should be a part of the vision.
- An article specific to the ‘GREENIST’ should be formulated, for better understanding of the general public.
- Is it in line with Vision 2020? How is it different from CNDP 2030.
- How to quantify the term rich?
- What is a self-sufficient society based on? If it’s in terms of human resource, how can aging society be counter-measured?
- New economic model: Which model does it refer to? It is important to relate it to theories, best practice model. Or if it is new, how is it different from the other existing models?

**(4) General Comments:**

To summarize the issues and concerns raised by the officials regarding well balanced development;

- i) Marketing problems in villages. If farmer shops are initiated and enhanced, it contradicts with strengthening private sector.
- ii) Public service delivery in a mountainous terrain where the settlements are sparsely located.
- iii) Capitalistic approach of development.

Regarding the missing statistics and detailed data for the exercises/Dzongkhag wise group presentation, the participants raised question on how comprehensive it would be? The team responded that the statistics were already provided by the different Ministries/headquarter. The detail WG members, the responsibilities and the meetings/workshop held so far were explained along with the Progress Report 1 document.

In closing, DASHO DZONGRAB thanked the team on behalf of all officials and also mentioned while planning is an important task, effective implementation is crucial. He also highlighted the appreciation regarding the process of the Project which seems well developed/formulated.



### Minutes of Meeting

Theme : 1st Stakeholder Meeting  
 Date : February 2nd – 3rd, 2018 08:30~16:30  
 Place : Dewaling Hotel, Gelephu  
 Attendance : Attached

#### Day 1

The officials were welcomed by the Project Team, followed by opening remark by the Dzongkhag Tshogdu Deputy Chairperson.

The Project Team made the first presentation on 'Introduction of the Project' which includes the objectives, output and the issues related to the project.

The participants were asked to do a SWOT analysis of their respective Dzongkhags as the groups' first exercise in the SHM.

- shows the comments from the Project Team
- shows the comments from stakeholders

#### (1) SWOT analysis

##### 1) Bumthang

- The Project Team asked the Dzongkhag whether the existing domestic airport land was enough for expansion and for upgradation to international airport.
- The Dzongkhag team emphasized on Bumthang's central location and in future it has high potential of acting as a central hub for the Nation in the aim of having a balanced development to benefit both the eastern and western regions equally.

<b>Strength</b> <ul style="list-style-type: none"> <li>- Tourist destination</li> <li>- Pilgrimage Destination</li> <li>- Topographically Suitable for agricultural development activities</li> <li>- Suitable for livestock farming.</li> <li>- Domestic Airport</li> <li>- Accessibility</li> <li>- Timber harvesting (CF)</li> <li>- Rich Architecture</li> </ul>	<b>Weakness</b> <i>Bumthang</i> <ul style="list-style-type: none"> <li>- Weather Conditions</li> <li>- Loss of agriculture lands (conversion)</li> </ul>
<b>Opportunity</b> <ul style="list-style-type: none"> <li>- Local tour operators/guides</li> <li>- Organic Farming (commercialise)</li> <li>- Value-added dairy Products</li> <li>- Potential for International Airport</li> <li>- Low Increase in economy</li> <li>- Inter-Dzongkhag timber supply</li> </ul>	<b>Threat</b> <ul style="list-style-type: none"> <li>- Land use Change</li> <li>- GLOF</li> <li>- Unproductive animals</li> </ul>

##### 2) Dagana

- Issue of social disharmony to come under threat because of influx of people with different backgrounds.
- Due to the resettlement program, different ethnic groups has settled in Dagana but there are incidences of social disharmony owing to religion. So, if things go unchecked, it could be a threat.

<b>STRENGTH</b> <i>539734</i> <ul style="list-style-type: none"> <li>① Conducive Climate</li> <li>② Geographical location</li> <li>③ Mixed Ethnic Group</li> <li>④ Abundant natural Resources</li> <li>⑤ Rich Cultural/Religion Heritage</li> </ul>	<b>WEAKNESS</b> <i>Dagana</i> <ul style="list-style-type: none"> <li>① steep Gradient</li> <li>② Small land holding</li> <li>③ poor inter-Dzongkhag road network</li> <li>④ limited business opportunities</li> </ul>
<b>OPPORTUNITY</b> <ul style="list-style-type: none"> <li>① Natural Farming</li> <li>② Tourism</li> <li>③ Road Connectivity</li> <li>④ Improve Community vitality</li> <li>⑤ Mining/Minerals</li> </ul>	<b>THREAT</b> <ul style="list-style-type: none"> <li>① Disaster vulnerability</li> <li>② Out-Migration</li> <li>③ Social/Spiritual Disharmony</li> </ul>

### 3) Sarpang

- The festival of foothills is a platform for local markets to sell agriculture and livestock produce, although some produce go to waste sometimes.
- Sarpang also has an opportunity to become a metropolitan city in the future.
- Question was raised about the difference of CNDP 2030 to the Five Year Plans.
- Feasible topography for any kind of development to be incorporated as strength.

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>• DOMESTIC AIRPORT</li> <li>• SPORT PROMOTION/FACILITIES</li> <li>• CRKH (CENTRAL REFUGEE HOSPITAL)</li> <li>• Suitable topography</li> <li>• DIVERSITY OF CULTURE</li> <li>• BORDER SHARING (INDIA)</li> <li>• WILDLIFE SANCTUARY</li> <li>• DIVERSIFICATION OF AGRICULTURE AND LIVESTOCK PRODUCTION</li> <li>• JIGME LING INDUSTRIAL PARK</li> <li>• HISTORICAL SITES</li> </ul>	<ul style="list-style-type: none"> <li>• LACK OF MARKET</li> <li>• LABOUR SHORTAGE/DEPENDENT</li> <li>• LACK OF PROFESSIONALS</li> <li>• MIX CULTURE</li> <li>• WATER SHORTAGE (DRY SEASON)</li> <li>• POLICY</li> </ul>
OPPORTUNITY	THREAT
<ul style="list-style-type: none"> <li>• TOURISM</li> <li>• EMPLOYMENT OPPORTUNITY</li> <li>• VALUE ADDITION OF PRODUCT</li> <li>• SME</li> <li>• CENTRALLY LOCATED</li> <li>• MINING / SURFACE COLLECTION</li> <li>• CLASS A TOWN (GELEPHU)</li> <li>• RDC (RESEARCH)</li> <li>• ORGANIC FARMING</li> <li>• GEOTHERMAL</li> </ul>	<ul style="list-style-type: none"> <li>• SECURITY</li> <li>• DISASTER (FLASH FLOOD)</li> <li>• WASTE MANAGEMENT</li> <li>• VECTOR BORNE DISEASES / FARM</li> <li>• RURAL-URBAN MIGRATION</li> <li>• HUMAN WILDLIFE CONFLICT</li> <li>• TRANS BOUNDARY POLLUTION</li> </ul>

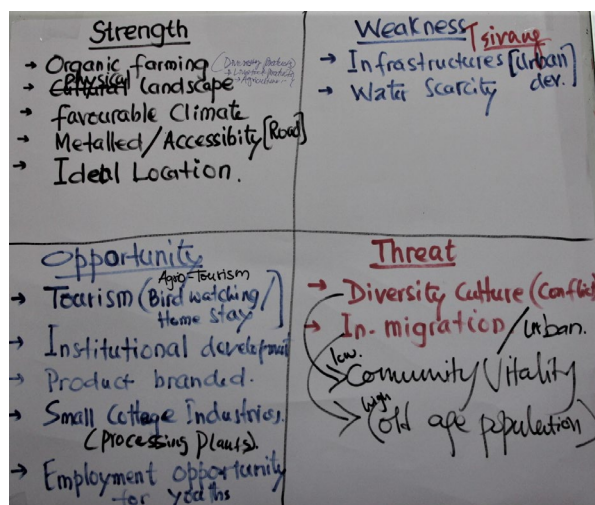
### 4) Trongsa

- The existing agricultural lands mostly belong to people of other dzongkhags, therefore, it is observed that there is very low sense of belonging by the locals and hence, they put less effort and importance to agriculture.
- This trend of ownership of land by other Dzongkhag people restricts its utilization or intervention by the locals, so there is a need to identify strategies to curb these issues such as leasing of private lands left fallow.
- From its strength of being centrally located and its connectivity to other dzongkhags, Trongsa has the opportunity to be the centre of logistics and to be a transport hub.
- The Dzongkhag has mentioned Rural-urban migration as weakness but having so much of strength within the dzongkhag it could be an opportunity.
- Human-wildlife conflict is reflected as thread instead of weakness as there are not much mitigation to be done in the declared forest protected areas.
- Trongsa's low population base could be its weakness.
- The Monpa community in Trongsa can be both strength and weakness. It is a strength because of their historical background as first settlers (primitive tribe) and also its unique culture and language, which should be preserved. However, they are orthodox and averse to change and they have difficulty catching up with the modern developments (weakness). So, justification for low GNH level in Trongsa is not because of existing monpa community but because of land fragmentation and other indexes.

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> <li>- Seat of Trongsa Fort</li> <li>- Monpa Community</li> <li>- Winter Residence of 1st and 2nd King</li> <li>- Green Tea Production</li> <li>- Centrally Located</li> <li>- Two Hydro Projects</li> <li>- More Farming Population</li> </ul>	<ul style="list-style-type: none"> <li>- Steep Terrain</li> <li>- Rural-Urban Migration</li> <li>- More Agricultural land belongs to people from other Dzongkhags</li> <li>- Low Happiness Rate</li> <li>- Land Fragmentation</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>- MRPA &amp; NIRA CHU (SIT)</li> <li>- ECO-TOURISM</li> <li>- Dairy Production</li> <li>- More Festivals and for Commercialization</li> </ul>	<ul style="list-style-type: none"> <li>- Disaster Risk (Flood Risk)</li> <li>- Wildlife Depredation, Crop and Livestock</li> <li>- Low Population Growth</li> <li>- Human Wildlife Conflict (Conservation Area (CWA) (PM)</li> </ul>

## 5) Tsirang

- Tsirang is well known for organic farming and the vegetables would be registered as organic and it is also an objective under the 2020 vision for the Dzongkhag.
- The Audit Training Centre will be established in Tsirang, which will enhance institutional development.
- In-migration is a threat to Tsirang because most of the lands are occupied and owned by retirees and landlords, leaving very less suitable land for other people of the Dzongkhag. Moreover, in-migration of older groups contribute to growing proportion of older sector of the community, which may lead to ageing society, and reduction in number of production groups.
- Since water scarcity is a weakness, it could pose threat to organic farming. Hence, there is an opportunity for stormwater management in the future.



Currently, Tsirang has a rainwater storage project for cardamom, and also practice of collecting waste water from kitchen.

- Cultural diversity may pose threat to community vitality and bring about internal conflict.
- Tsirang has a potential for agro-tourism (study tours), eco tourism etc. besides bird watching and home stay.
- A nursing home for old age could also be established in Tsirang due to its favourable weather.

## 6) Zhemgang

- Zhemgang has ample infrastructure but in some cases, it is a weakness. There are schools in rural areas which are closing down since students prefer to go to central school; and also since parents in rural areas cannot afford to send their children in normal schools.

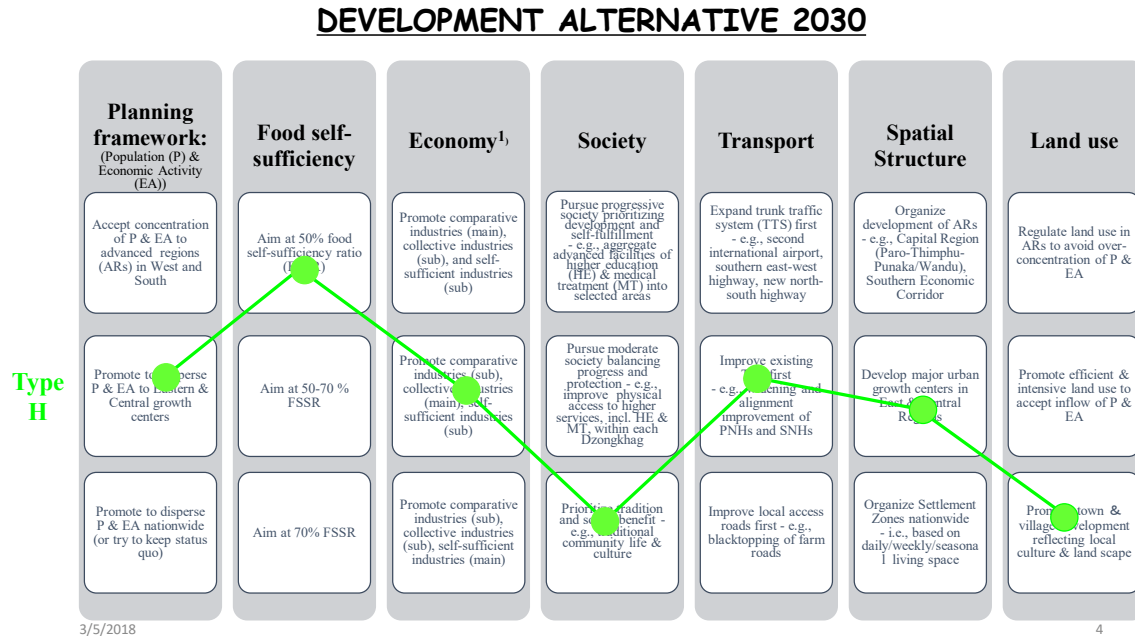




## Day 2

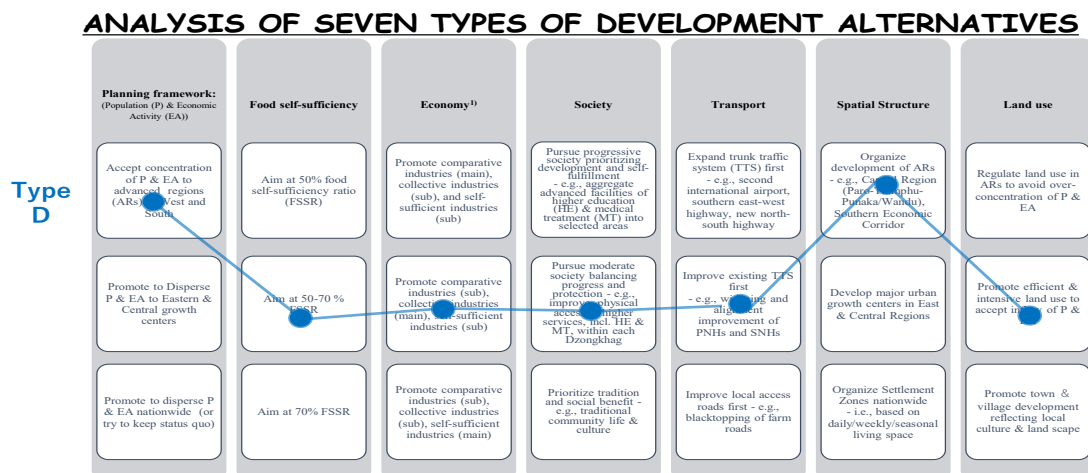
### (2) Development Alternatives (DA) and SEA

#### 1) Bumthang



- The eco-trail from Bumthang to Trongsa is actually the trail used in olden days.
- Implementation of *Action Plan* refers to effective implementation of Development Control Regulations. Using the term ‘Action Plan’ could be mistaken for Action Area Plan (*draft Spatial Planning Act 2018*).
- In terms of FSSR, Bhutan’s current FSSR of 45% is rice sufficiency, and not food sufficiency per se. Therefore, FSSR should clarify what it composes of and if it is a combination of all types of food, we will need to identify the food basket of our country.

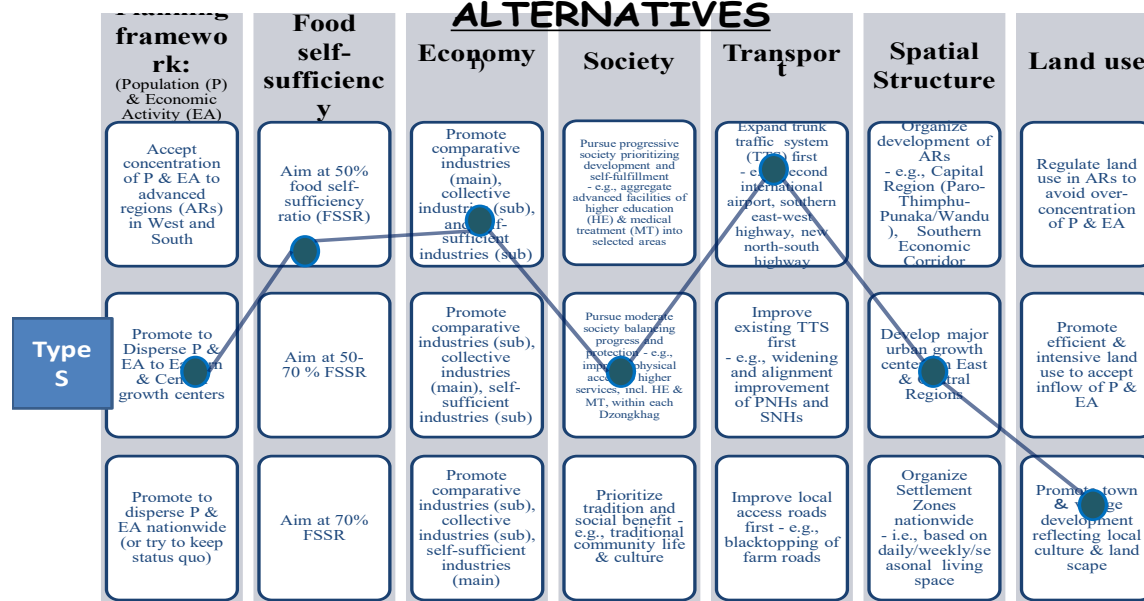
#### 2) Dagana



- The growth centres of Dagana are Dagapela, Dagana Town and Lhamoi zingkha.
- The AR’s for Dagana Dzongkhag in their DA are considered to be the above mentioned growth centers.

### 3) Sarpang

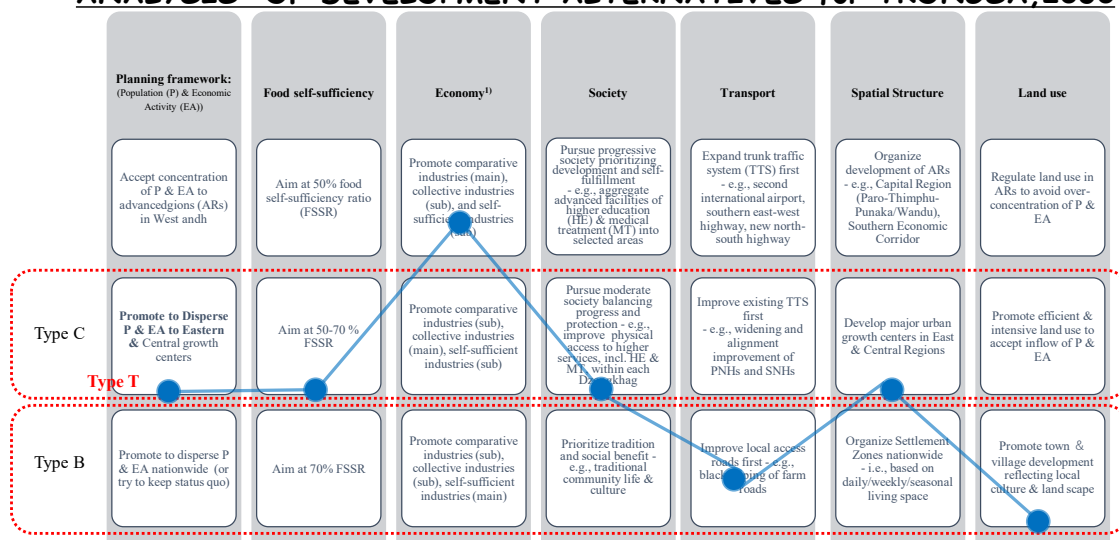
## ANALYSIS OF SEVEN TYPES OF DEVELOPMENT ALTERNATIVES



- There is a scarcity of water especially during winter, which is the main agriculture season for Sarpang.
- In-migration is a cause and not an impact.
- The future potential for Sarpang and Gelephu to become a metropolitan city could lead to reduction of community vitality, so, the Dzongkhag should find a way to enhance and vitalize community livelihood.
- Sarpang experiences flash flood every monsoon, although the flash flood of 2016 was the worse.

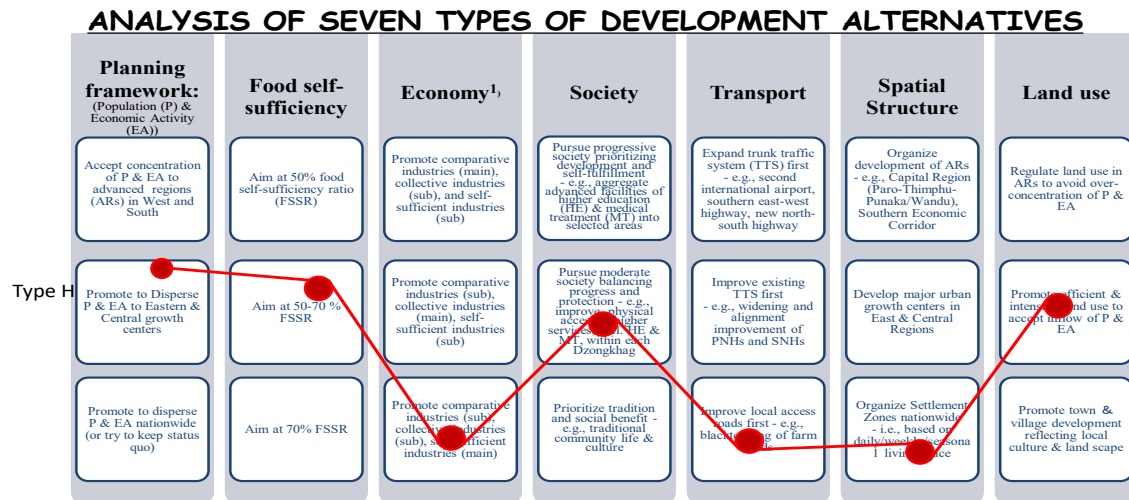
### 4) Trongsa

## ANALYSIS OF DEVELOPMENT ALTERNATIVES for TRONGSA, 2030



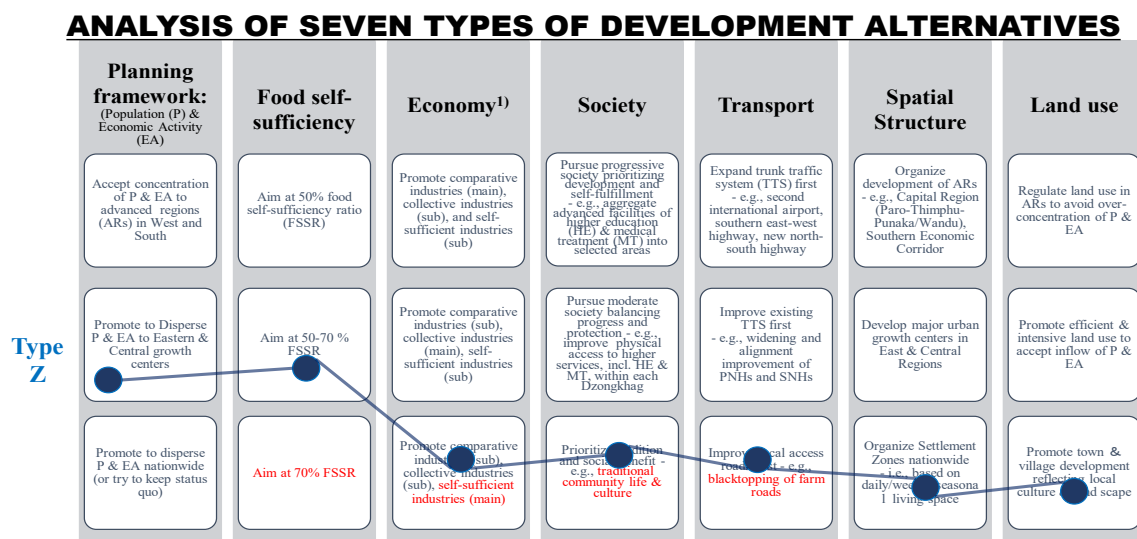
- The Korphu-Retina route has a historical and religious Guru sites.

## 5) Tsirang



- The reason why Tsirang wanted to have marketing relationship only with Wangdue Phodrang, Punakha and Thimphu is because of Tsirang's locational advantage to these Dzongkhags; and also since other nearby Dzongkhags already have similar products. However the Dzongkhag would explore more to export their produce nationwide in near future.
- Since the planning framework to develop growth centres and the spatial structure of developing settlement zones are contradicting, the Dzongkhag gives priority to develop the growth centres.
  - Since the water shortage issue will impact economic activities of agriculture, what alternative solutions are there?
- SEA will identify the impacts of the selected development alternative and give suggestions and recommendations to CNDP 2030.
  - Aiming for 70% FSSR could be problematic for Tsirang due to water scarcity issue.

## 6) Zhemgang



- There is a mismatch between the planning framework and spatial structure. In addition, the economic model to promote self-sufficient industries has few challenges to tackle. Is the market within Zhemgang enough to distribute the products? Or would local road blacktopping help?
- There is a need of highway through Zhemgang Dzongkhag since the bypass reduces the vitality of the core area. Also, no public bus services can be availed presently.

### **(3) VISION**

- Is the word ‘epicenter’ a correct use of word? Need an explanation. Epicenter is mostly to do with disaster.
- What does a well-ordered environmental management refer to?
- Instead of zero emission country, carbon negative?
- Advanced means of Transport; Is it Improvement of road? Fuel efficient transport? Air Service? Trains service in southern belt?
- It was clarified that the project team is exploring transport modes such as helipad, cable cars and ropeways in hilly areas and potential tunneling scopes apart from the ones mentioned in the Road Master Plan. Further clarifications are to be made while presenting the proposals in the next stakeholder meeting with suggestions from the JICA experts.
- Overall, it was agreed that the vision and objectives are still in draft stage and that it will be rephrased and finalized after incorporating the suggestions made by the officials in the SHM.

Closing Remark by DT Chairperson, Gelephu.



## Photos

Stakeholder Meeting in Thimphu

25<sup>th</sup>, 26<sup>th</sup> January 2018





**Stakeholder Meeting in Mongar**

29<sup>th</sup>, 30 January 2018





**Stakeholder Meeting in Gelephu**

**2<sup>th</sup>, 3 February 2018**



End,