

Date: December, 2022

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

1. Full title of the Project

Road Map for Zero Fossil Fuel in Galapagos Islands Project

2. Type of the study (e.g. Master Plan, Feasibility Study, Detailed Design, etc.)

Master Plan

3. Categorization and its reason

The Study is classified as a “Category B” because the Project is not likely to have significant adverse impact on the environment under the JICA Guidelines for Environmental and Social Consideration (April, 2010) in terms of its sectors, characteristics and areas.

4. Agency or institution responsible for the implementation of the project

Ministry of Energy and Mines

5. Outline of the Project (objectives, justification, location, proposed activities, and scope of the study)

(1) Expected goal

To contribute to the promotion of the “Zero Fossil Fuel in the Galapagos Islands” policy through the implementation of activities

(2) Outputs

- 1) Geothermal resource potential in Galapagos Islands is identified.
- 2) Planning, operation & maintenance of hybrid power generation system are optimized.
- 3) Realization plan of efficient use of energy in Galapagos islands is proposed.

(3) Location: Galapagos Islands, Ecuador

(4) Activities

Activities for Output (1) consists of the followings;

- 1-1. Planning of geothermal exploration strategy
- 1-2. Acquisition of geothermal exploration data in the field
- 1-3. Data processing for geothermal conceptual model

- 1-4. Preliminary evaluation of geothermal resource in Isabela Island
 - 2-1. Verification of available Renewable Energy (RE) potential
 - 2-2. Implementation of comparative study for grid stabilization technology
 - 2-3. Preliminary design for the proposed Hybrid Power Generation System (HGPS) with Demand Response (e.g. Electric Vehicle (EV), heat pump, ice making machine)
 - 2-4. Investigation of operation & maintenance conditions of existing HPGS and propose solutions for improvements
 - 2-5. Review and introduction of Elecgalapagos's manual for the planning, operation and maintenance of HPGS
 - 2-6. Proposal of new incentive mechanism for grid-connected RE introduced by customers
 - 3-1. Review on existing electricity Demand Side Management (DSM) measures and proposal
 - 3-2. Capacity development for socialization of energy management systems (EMS), including drafting energy audit manual
 - 3-3. Analysis and proposal of the direction for modal shift from oil to power in transport
 - 3-4. Priority analysis for efficient use of energy (based on data) and drafting of the energy efficiency roadmap in Galapagos
 - 3-5. Analysis and proposal to realize ZEB (Zero Energy Building) in Galapagos
 - 3-6. Analysis and proposal of effective finance mechanism to realize the proposed projects (Common from Activity 1 to 3)
6. Description of the project site (maps, environmental and social condition, current issues, etc.)

The Galapagos Islands are located 600 nautical miles west of the Equator on the American continent, maritime bounded to the north by the Marine Reserve of the Coco Islands of the Republic of Costa Rica and to the East, West and South by international waters. The Galapagos Islands have 8,010 km² of land area of which 97% of this territory corresponds to the area of the Galapagos National Park (7,700 km² and 133,000 km² of waters that is the marine area, which is protected and recognized worldwide as the Galapagos Marine Reserve.

(1) Socio Economic Conditions

The population of the Galapagos Islands according to the Census of the National Institute

of Statistics and those of the year 2015, indicates that by 2020, the population will reach 33,042 with an average annual growth of 1.8%. The capital of the Galápagos province is Puerto Baquerizo Moreno, the urbanization rate is low compared to other capital cities in Ecuador.

The GDP per capita of the Galapagos Islands is 7,856.61 dollars, with a growth rate of 2.8% in general in the Ecuadorian economy for the year 2021. The main sources of income in the islands are tourism activities, trade, fishing and agricultural activities.

In 2020, with the impact of the SARS.COV-2 (COVID 19) pandemic, the economy of the province of Galapagos was seriously affected because the main source of income, which is tourist activities, was restricted for more than a year, causing the islands' socioeconomic development to be strongly impacted; Currently, with the vaccination plan and the biosafety measures implemented by the National Government, 97% of the population has been immunized and health security provided to visitors, this has allowed tourist and accessory activities to have begun to increase.

(2) Natural Conditions

The climate in the Galapagos Islands is tropical, and it has a winter season (rainy) from December to May with temperatures ranging between 27 to 32 ° C and another summer season (dry) from June to November with temperatures between 18 to 14 ° C. Annual rainfall is approximately 400mm per year.

The Galapagos Island is made up of 13 large islands, 6 small and 107 islets and rocks, its highest point is the Wolf volcano with 1707 m.s.n.m, and is located at the north of Isabela Island, the archipelago is surrounded by three main currents, namely the north the El Niño Current (warm), the south the Humboldt Current (cold) and the west the Cromwell Current (cold subsurface). The Isabela and Fernandina islands located at the west of the archipelago have high volcanic activity.

The vegetation of the Galapagos Islands in the coastal areas is characterized by Mangle trees, Opuntias, Manzanillo and Chala shrubs, in the transition areas there are Palo Santo and Matazarno forests and in the humid areas by Escalecía and Miconia forests; there are also areas of wetlands and fresh and saltwater lagoons where unique ecosystems develop in the world.

The Galapagos Islands were declared as Natural Heritage of Humanity, by UNESCO in 1978, additionally it has other titles such as Biosphere Reserve, Whale Sanctuary, Ramsar Reserve for the wetlands located on Isabela Island and Marine Sanctuary, additionally it has two protected areas that are the Galapagos Marine Reserve (2001) and the Galapagos National Park (1959) covering 100% of the marine area and 97% of the land

area respectively.

The flora of the Galapagos Islands has around 560 native plant species and 180 endemic species, additionally due to colonization and anthropic activities around 700 plant species have been introduced, also, the terrestrial fauna reaches a biodiversity in the islands of 17 mammalian species, 152 bird species, 22 reptile species and more than 2000 invertebrate species. According to the IUCN Red List, there are 50 Near Threatened species, 54 Vulnerable species, 19 Endangered species, 12 Critically Endangered species and 9 Extinct species, respectively.

7. Legal Framework of Environmental and Social Considerations

(1) *Laws, regulations and standards related to environmental and social issues including requirements and procedures of Environmental Impact Assessment (EIA), stakeholder participation, and information disclosure. Table.1 is a list of policies, laws and regulations related to environmental and social issues in Ecuador.*

Table 1 Laws, Regulations and Standards Related to Environmental and Social Issues

Category	Name
Policy	Environmental Management Law (No.418/2004)
	Organic Law of Rural Lands and Territories Ancestral (Law No. 711/2016)
	Forest Law and Conservation of Natural Areas and Wildlife (Law No. 418/2004)
	Law that Protects Biodiversity in the Ecuador (Law No. 418/2004)
	Culture Heritage Law (Law No. 465/2004)
Regulations	Regulations for social participation (Decree No.1040/2008)
	Regulations on environmental regularization of projects (Ministry Agreement No. 061/2011)
	Regulations for Environmental Evaluation (Decree No. 3516/2003)
	Regulations for Environmental Impact Studies (Decree No. 983/2017)

Article 20 of the environmental management law states that for the start of any activity that involves environmental risk, the respective license, granted by the Ministry of the branch, must be obtained.

Executive Decree 1040 of 2008 regulates the mechanisms of social participation that the developer of a project must comply with, for the community in a public consultation the result of the environmental impact study will be shared and all additional relevant points, the community may recommend or object to the results presented and the developer must meet the requirements until the observations are resolved, all this endorsed by the environmental authority (MAATE).

In article 34 of Book VI of the Unified Text of the Secondary Environmental Legislation of the Environment indicates that the person in charge of the environmental impact study will be the promoter of the project, work or activity, in accordance with the guidelines and procedures of national environmental categorization and applicable environmental regulations. The Control Subject who submits the environmental studies is responsible for the veracity and accuracy of their contents. The environmental studies of categories III and IV¹ must be carried out by consultants qualified by the National Environmental Authority.

The Environmental Organ Code in article 180 indicates that the developer must present a policy or guarantee for environmental responsibilities, in the case of an environmental impact study; The insurance or guarantee will be specifically and exclusively intended to cover the developer's environmental responsibilities arising from its economic or professional activity. Likewise, this guarantee or policy will not be required when the developers of the project, work or activity are public sector entities or companies whose capital belongs to public entities, at least to two-thirds. However, the executing entity will respond administratively and civilly for the full and timely compliance with the Environmental Management Plan of the project, work or licensed activity and any contingencies.

In Ecuador, it requires that environmental studies should be conducted only by experts or firms whose names and qualifications are registered by Ministry of the Environment, Water and Ecological Transition (MAATE).

Figure 2 is the flow chart of the EIA procedure of Ecuador.

¹ *In Ecuador, environmental categorization based on its impact is as follows; category I (non-significant), category II (low), category III (medium) and category IV (high)*

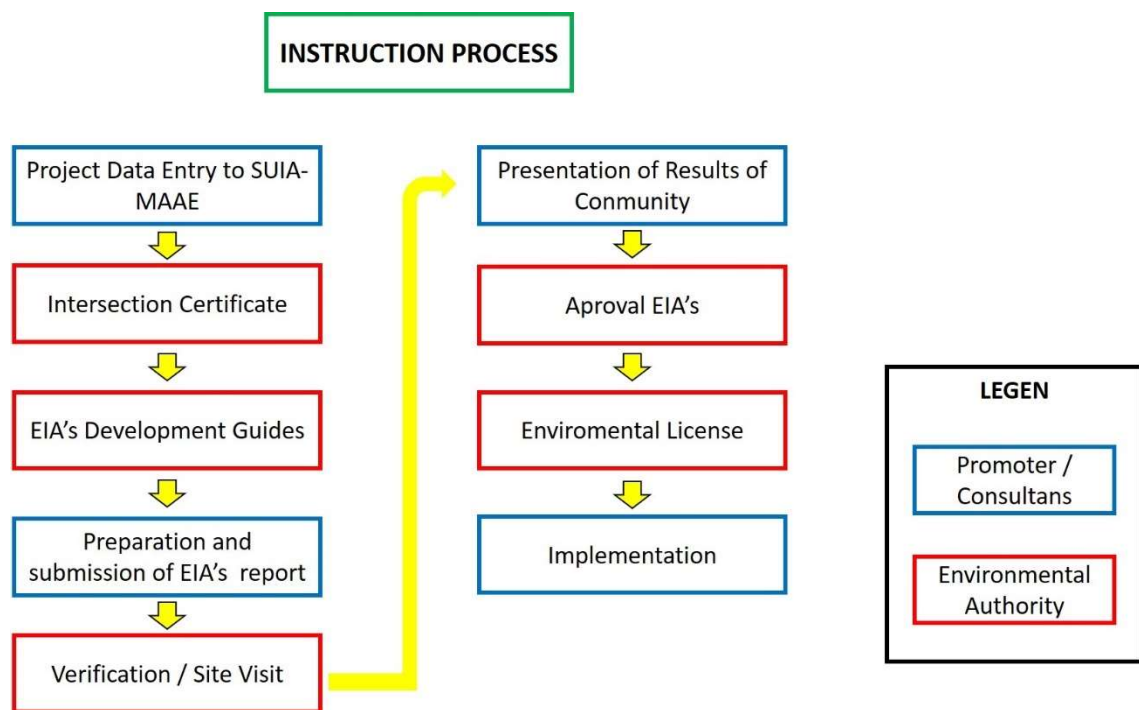


Figure 2 Instruction Process

In Ecuador there are environmental regulations that allow evaluating negative impacts and potential positive ones in projects to be developed in areas of the National System of Protected Areas, Protective Forests and Wildlife Reserve, as well as projects that are located in urban or rural areas that due to their size and complexity corresponds to environmentally and socially evaluate the project, to regularize its activities through the environmental license that covers the construction and operation of the project.

The Environmental Management Law in its literature e) of article 9 indicates that the Ministry of the Branch determines the works, projects and investments that require to undergo the approval process of environmental impact studies.

The Unified Text of the Secondary Environmental Legislation in its number 13 of article 1 indicates that the state's policy on environmental matters does the following: "Recognizing that an effective tool for the prevention of environmental damage is the obligation, on the part of the interested party, of the Environmental Impact Study (EIA) and the proposal of Environmental Management Plans (PMA), for each case, accompanying the requests for authorization to carry out activities which likely degrade or pollute the environment, which must be subject to review and decision of the competent authorities.

The Ecuadorian State establishes a mandatory instrument prior to carrying out activities which likely degrade or contaminate the environment, the interested parties to carry out these

activities, prepare an Environmental Impact Study (EIA) and the respective Environmental Management Plan (PMA) and the presentation of these together with requests for authorization before the competent authorities, which have the obligation to decide on the matter and to control compliance with the provisions of said studies and programs in order to prevent degradation and contamination, ensuring, in addition, adequate and sustainable environmental management. The Environmental Impact Study and the Environmental Management Plan must be based on the principle of achieving the most appropriate level of action for the respective space or resource to be protected, through the most effective action.

The Ministerial Agreement of the Ministry of the Environment No. 61, in its article 12 indicates that the Single System of Environmental Information (SUIA) is obligatory use of the computer tool for the entities that make up the National Decentralized System of Environmental Management; It will be administered by the National Environmental Authority and it will be available only online to carry out the entire environmental regularization process, in accordance with the principles of speed, simplification of procedures and transparency.

Likewise, in the Ministerial Agreement of the MAE No. 61, in its article 25 it indicates that the Environmental License is the environmental permit granted by the Competent Environmental Authority through the SUIA, will be mandatory for those projects, works or activities considered as medium or high impact and environmental risk. The Controlling Subject must comply with the obligations arising from the environmental permit granted.

Book VI of the Unified Text of the Secondary Environmental Law of the Environment indicates in its articles 33 to 44, the methodology to be carried out the Environmental Impact Study, terms of reference to be fulfilled, system of evaluation and review of the study and issuance and scope of the environmental license for the regularization of a project.

According to the aforementioned regulations and the guidelines issued by the Ministry of the Environment, Water and Ecological Transition, there are regulations for environmentally projects to be developed in protected and unprotected areas as well as in ancestral cultural areas, therefore, the relevant World Bank safeguard policies is referred, so there is no significant gap between national legislation and the World Bank protects policies in terms of environmental and social considerations.

The following table shows the main differences between the JICA Guidelines for Environmental and Social Considerations (April 2010) and the relevant legislation in Ecuador.

Table 2. Comparison of the JICA Guidelines and relevant legislation in Ecuador

Item	JICA Guidelines	Legislation in Ecuador
Information disclosure	<ul style="list-style-type: none"> • EIA report is disclosed to all stakeholders and locals and on JICA's website. 	<ul style="list-style-type: none"> • According to article 48 of Ministerial Agreement No.61 of the MAAE, the results of the EIA ² and other relevant documents of the project must be presented and publicized to the community.
Public participation	<ul style="list-style-type: none"> • Project proponents are encouraged to disclose information about their projects and consult with local communities and stakeholders (especially those directly affected). • In the case of Category A projects, JICA encourages project proponents to consult with local stakeholders about their understanding of development needs, the likely adverse impacts on the environment and society, and the analysis of alternatives at an early stage of the project. • In case of Category A projects, public consultations must be held twice; during scoping process and during preparation of EIA report. In case of Category B projects, consultations should be held when necessary. 	<ul style="list-style-type: none"> • Article 15 of the EIA regulations stipulates process of public participation throughout the preparation of EIA report. • Public consultation is mandatory for all Category II, III and IV projects and must be held during scoping process and during preparation of EIA report. • The announcement of public consultation must be made 15 days prior and all stakeholders must be invited for their opinions.
Resettlement	<ul style="list-style-type: none"> • For projects that will result in large scale involuntary resettlement, a Resettlement Action Plan (RAP) also must be prepared and disclosed. • It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP 4.12, Annex A. 	<p>Article 284 of the Book VI of the Unified Text of the Secondary Environmental Law of the Environment establishes that the project presenting environmental damage or risk or third parties will proceed with the compensation in addition to the corresponding fine for non-compliance with environmental regulations.</p>

² When a specific project is identified which likely degrade or contaminate the environment, its developer/promotor shall prepare EIA.

		<p><i>Most of the elements of the World Bank Safeguarding Policy are covered by the Articles.</i></p>
<p>Mitigation measures</p>	<ul style="list-style-type: none"> • Multiple alternatives must be examined in order to avoid or minimize adverse impacts and to choose better project options • In the examination of measures, priority is to be given to avoidance of environmental impacts; when this is not possible, minimization and reduction of impacts must be considered next. • Compensation measures must be examined only when impacts cannot be avoided by any of the aforementioned measures. • Appropriate follow up plans and systems, such as monitoring plans and environmental management plans, must be prepared including the implementation costs and the financial methods to fund such costs. Plans for projects with particularly large potential adverse impacts must be accompanied by detailed environmental management plans. 	<ul style="list-style-type: none"> • <i>Article 181 of the Environmental Organ Code defines the Environmental Management Plan, which comprises several sub-plans, depending on the characteristics of the project, work or activity. The purpose of the management plan will be to establish detail and chronological order, the actions whose execution is required to prevent, avoid, control, mitigate, correct, compensate, restore and repair, as appropriate.</i> <p><i>Articles 256 and 257 establish the scope of the environmental management plan that will be established within the technical document of the EIA. This plan must include mitigation measures, impact monitoring.</i></p> <ul style="list-style-type: none"> • <i>Article 239 of Book VI of the Unified Text of the Secondary Environmental Law of the Environment states that good environmental practices must be carried out to prevent, reduce or mitigate</i>

		<i>environmental impacts,.</i>
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Since the Project and its activities do not include any specific activity nor sub-project which involve specific environmental risks, no license is required. However, Strategic Environmental Assessment will be carried out in accordance with JICA Guidelines during implementation of the Project. Legal framework for SEA is still under preparation in MMATE, and it's necessary to keep close communication with the SEA unit in MAATE to meet its SEA procedure under preparation.

(2) Relative agencies and institutions

Ministry of the Environment, Water and Ecological Transition (MAATE)

Ministry of the Environment, Water and Ecological Transition provides environmental and social assessment support for foreign and locally funded projects implemented by Ministry of the Environment, Water and Ecological Transition Municipality. The functions includes conducting assessments for environmental, social impact and land acquisition, preparing relevant environmental assessment documents/ reports and RAP their implementation and conducting monitoring.

In addition, the MAATE is responsible for supervising the process of the Social Participation Process (PPS: Proceso de Participación Social in Spanish) and providing advice and recommendations, including the coordination of public participation and the participation of interested parties, the liaison with the pertinent authorities and the review of documents / reports relevant to PPS.

Galapagos National Park (PNG)

Responsible for overseeing the environmental assessment procedure and reviewing documents/reports relevant to environmental assessment and issuing environmental licenses.

8. Provisional Scoping (types and magnitudes of possible adverse impacts)

At this detailed planning survey stage, no specific projects are assumed for discussion. In the Project, a long list of strategic projects will be proposed, but exact site location, layout design and specification of the priority projects are not determined in the Project. Therefore, in this

provisional scoping, typical and/or general scoping items are presented as a reference for environmental and social considerations in the Project. And provisional rating is carried out as a reference although the extent of impact is almost unknown at this detailed planning survey stage.

If serious adverse impacts are predicted in the Project, possible measures to avoid and/or mitigate such impacts should be proposed in the Project.

Environmental Items	Scoping Description	Rating
1) Air pollution	If infrastructure or facility development/improvement is implemented, exhaust gas from construction equipment and vehicles, and the dust caused by construction works may increase temporarily during construction period.	B
2) Water pollution	If infrastructure or facility development/improvement is implemented, discharge of mud, oil, etc. from the construction site may cause water pollution during construction period. Possibility of water pollution due to effluents from operation of the facility will depend on what kind of facility is proposed in the Project. Development of the proposed projects may create new employment opportunities and lead to population influx. Increase of workers/employees may cause sewage contamination.	C
3) Soil Contamination	Infrastructure or facility development/improvement may induce soil contamination during construction period. Any industries to produce or use hazardous substances may not be planned, so possibility of soil contamination is low.	C
4) Waste	Infrastructure or facility development/improvement may generate wastes during construction period. Development of the proposed projects may create new employment opportunities and lead to population influx. Increase of inhabitants may generate more wastes.	C
5) Noise and vibration	Construction noise and vibration from construction equipment and vehicles may	B

	occur during construction period, if infrastructure or facility development/improvement is implemented. Growth in traffic volume due to increase of flow of goods may generate more noise and vibration.	
6) Offensive odor	Some construction activities may produce offensive odor during operation, but it depends on what kind of industry or facility is proposed in the Project.	C
7) Bottom sediment	Unknown	C
8) Accident	If infrastructure or facility development/improvement is implemented, the risk of accident may increase during construction period. Growth in traffic volume due to increase of flow of goods may cause an increase in traffic accidents.	B
9) Topography and geographical features	If infrastructure or facility development/improvement is implemented, some impact may occur.	B
10) Hydrological situation	Unknown	C
11) Protected areas	The target area Galapagos Islands themselves are national parks.	A
12) Flora, fauna and biodiversity	There are flora, fauna and biodiversity in the area of project.	A
13) Meteorology	Increase of concrete structures may surge the heat effect on the project area.	C
14) Landscape	Careful attention should be paid when selecting the location of infrastructure.	B
15) Global warning Environmental Items	Growth in traffic volume due to increase of flow of goods may increase emission of carbon dioxide.	C
16) Involuntary resettlement	Depending on the proposals of the project, involuntary resettlement is not avoidable.	C
17) Local economy such as employment and livelihood, etc.	The development of the proposed projects and pilot project for recovery of the livelihood may lead to the creation of new employment opportunities, vitalization of local economy, and then improvement of people's livelihood.	C
18) Land use and utilization of local resources	Land use plan and the proposed projects may cause confusion of local resources.	C
19) Social	Unknown	C

institutions such as social infrastructure and local decision-making institutions		
20) Existing social infrastructures and services	Development of the proposed projects may create new employment opportunities and lead to population influx. It is quite probable that existing social infrastructure and services such as water supply, electricity, waste disposal, education and health facilities, etc. could not meet the needs.	B
21) The poor indigenous and ethnic people	Require further detailed study	C
22) Misdistribution of benefit and damage	Require further detailed study	C
23) Cultural heritage	Require further detailed study	C
24) Local conflict of interests	Require further detailed study	C
25) Water usage or water rights and communal rights	Require further detailed study	C
26) Hazard (risks), infectious diseases such as HIV/AIDS	Transport workers (e.g. truck drivers, dock workers), who often endure harsh working and living conditions, will be more in danger of damaging their health in general as well as at higher risk of contracting sexually transmitted infection such as HIV/AIDS.	B-
27) Gender	Require further detailed study	C
28) Children's right	Require further detailed study	C

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C+/-: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)

D: No impact

9. Result of the consultation with recipient government on environmental and social

consideration including roles and responsibilities. Ecuador side agreed to abide JICA guidelines for Environmental and Social Considerations (April 2010) in order to ensure that appropriate considerations will be made for the environmental and social impacts of the Project.

10. Terms of Reference for Environmental and Social Considerations

During implementation of the Project, Strategic Environmental Assessment should be carried out in accordance with JICA Guidelines as well as the legislations of the country. Since presently in Ecuador, legal framework for SEA is under preparation, but not yet finalized, it is advisable to communicate closely with the SEA unit under MAATE for their guidance on SEA procedure. It is also necessary to provide some capacity development activities relating SEA for the Environmental and Social Department and decision makers of the Ministry of the Environment, Water and Ecological Transition and as well as other relevant authorities so that the experience will be applied to other master planning activities in future.

Terms of Reference for the Study include, but not limited to, the followings.

Supporting and collaborating with Ministry of the Environment, Water and Ecological Transition and SEA team to carry out SEA in accordance with JICA Guidelines and the relevant legislations of the country. For examples;

Establishing SEA team with Ministry of the Environment, Water and Ecological Transition, and other relevant authorities.

In collaboration with Ministry of the Environment, Water and Ecological Transition (MAATE), Ministry of Energy and Non-Renewable Natural Resources (MERNNR), and other relevant authorities, and other relevant authorities, preparing TOR by reviewing SEA cases in Ecuador and in other countries and reflecting comments by MAATE

- *Review the existing development plans (upper level/related plans), development projects, studies, and policies.*
- *Examine the issues on environmental and social aspects for energy and power development planning.*
- *Review of regulatory framework and institution of the Government of the Republic of Ecuador on environmental and social considerations, and SEA cases in Ecuador.*
 - *Laws, regulations and standards related to environmental and social considerations (environmental impact assessment, resettlement, public participation, information*

- disclosure and others).*
- *Gaps between the international standards including “JICA Guidelines for Environmental and Social Considerations, April 2010”, and regulatory framework of Ecuador on environmental and social considerations.*
 - *Outlines of relative agencies and institutions responsible for the implementation of the Project.*
 - *SEA cases conducted in Ecuador*
 - *Examine the methods to implement the SEA for the Project*
 - *Examine the plans, and configure alternatives, which are subject to the SEA.*
 - *Study the baseline situation on environmental and social aspects of the plans subject to the SEA.*
 - *Conduct scoping to clarify extremely important items on environmental and social impacts and its evaluation methods at the time of decision making such as policy, plan, and program levels.*
 - *Predict the environmental and social impacts of each alternative based on the results of scoping.*
 - *Compare and evaluate the alternatives including “zero option” and “without project option” from technical, financial, and impacts of environmental and social points of view, and select the optimal plan.*
 - *Study the mitigation measures in the optimal plan in order to avoid, minimize and compensate impacts.*
 - *Study the monitoring method based on the mitigation measures.*
 - *Support to hold stakeholder consultations hosted by the counterparts, and incorporate the outputs into the Project.*

11. Other relevant information

None

END