

Date: September 2023

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

1. Full title of the Project

Project for Promotion of Disaster Risk Reduction Investment to Build Safe and Resilient Municipalities for Coastal Phenomena

2. Type of the study

Detailed Design

3. Categorization and its reason

The Project is classified as “Category A” because the Project falls under the sensitive areas listed in the JICA Guidelines for Environmental and Social Considerations (April 2010).

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

Implementing Agency:

On the Nicaraguan side, Sistema Nacional para la Prevención, Mitigación y Atención de Desastres (SINAPRED) will be the counterpart agency. Other cooperating agencies or institutions will be:

- Nicaraguan Institute for Territorial Studies (Instituto Nicaragüense de Estudios Territoriales: INETER) in charge of providing the data necessary to analyze the current situation and risks.
- Nicaraguan Institute of Fisheries and Aquaculture (Instituto Nicaragüense de Pesca y Acuicultura: INPESCA) in charge of the management of the fishing industry in general and the fishing port.
- Nicaraguan Institute for Municipal Development (Instituto Nicaragüense de Fomento Municipal: INIFOM) in charge of supporting and monitoring municipal policies.
- Ministry of Transportation and Infrastructure (Ministerio de Transporte e Infraestructura: MTI), expertise in infrastructure construction.

- Ministry of Environment and Natural Resources Naturales (Ministerio del Ambiente y los Recursos Naturales: MARENA) in charge of overall climate change measures.
- Climate Change Secretariat of the Presidency of Nicaragua (Secretaría de Cambio Climático de la Presidencia de Nicaragua: SCCP), Nicaragua's representative in international and regional climate change negotiations.
- National Port Company (Empresa Portuaria Nacional: EPN): management of the port.

5. Outline of the Project

<Overall goal>

Coastal disaster management is promoted.

<Project purpose>

Framework to promote coastal disaster management at national and municipality level is established in Nicaragua.

<Output>

1. Disaster management strategy of coastal area is identified as a national system by the Government of Nicaragua.
2. The idea of the disaster management strategy of coastal area is materialized as a national system corresponding to the characteristics along the Pacific and Caribbean coasts.
3. Countermeasures according to the characteristics of the coast is understood and project formulation by related organization is prepared.
4. System to promote coastal disaster prevention and mitigation by Municipal governments is established.

<Activity>

Output 1: Disaster management strategy of coastal area is identified as a national system by the Government of Nicaragua.

- 1-1. Data collection and situation assessment on coastal disasters (tsunami, storm surge, tidal wave, beach erosion) in Nicaragua.
- 1-2. Data collection and situation assessment on environment, utilization, and development in coastal areas.

- 1-3. Analysis on related organizations and their responsibilities in coastal management.
- 1-4. Study on the matters to be considered in the national strategy.
- 1-5. Formulation of Draft Coastal Disaster Management Basic Strategy at the national level
- 1-6. Activities on capacity development such as Seminars and/or Workshops regarding Coastal Disaster Management Basic Strategy.

Output 2: The idea of the disaster management strategy of coastal area is materialized as a national system corresponding to the characteristics along the Pacific and Caribbean coasts.

- 2-1. Hazard analysis at the national level.
- 2-2. Situation assessment of land use, the future development plan damages caused by coastal disasters, and hazard exposure (population, assets, high-risk areas)
- 2-3. Determination of protectable coastal areas with the viewpoint of environmental and social consideration including implementation of SEA.
- 2-4. Determination of suitable mitigation directions for the areas determined by 2-3.
- 2-5. Formulation of Coastal Disaster Management Basic Plan based on the results of 2-1 to 2-4.
- 2-6. Activities on capacity development such as Seminars and/or Workshops regarding the Coastal Disaster Management Basic Plan.

Output 3: Countermeasures according to the characteristics of the coast is understood and ready for project formulation.

- 3-1. Identification of protectable coastal areas at the municipal level in the pilot municipalities.
- 3-2. Identification of possible measures and study of the alternatives with consideration of gender equality.
- 3-3. Evaluation of the possible alternative measures with the viewpoint of

environmental and social consideration including implementation of SEA.

- 3-4. Determination of suitable measures based on 3-1 to 3-3.
- 3-5. Formulation of Coastal Disaster Prevention Facility Plan based on the results of 3-1 to 3-3.
- 3-6. Study of financial arrangement on the priority project (s)
- 3-7. Activities on capacity development such as seminars and/or workshops regarding coastal disaster prevention planning.

Output 4: A system to promote coastal disaster prevention and mitigation by Municipal governments is structured.

- 4-1. Consideration of structural measures in pilot municipalities with consideration of gender equality
- 4-2. Evaluation of the effectiveness and cost to prioritize projects in pilot municipalities with the viewpoint of gender equality.
- 4-3. Integration of the coastal disaster section into the municipal comprehensive disaster prevention plan (Plan Municipal de Gestion Integral de Riesgos: PMGIR) in pilot municipalities
- 4-4. Formulation of budgeting plan for each project formulated based on 4-3 in pilot municipalities.
- 4-5. Preparation of contents of training and guidelines of PMGIR to integrate coastal disaster section by SINAPRED
- 4-6. Preparation of budgeting mechanism for municipalities based on PMGIR
- 4-7. Activities on capacity development such as Seminar and/or Workshop regarding coastal disaster prevention and mitigation planning at the municipality level.

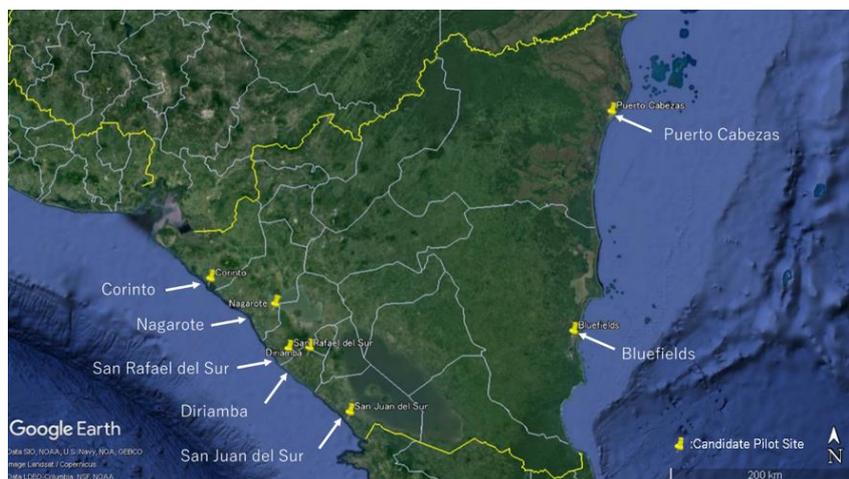
<Target Areas>

Output 1 and 2: Nicaragua's Pacific and Caribbean coasts

Output 3, 4: (4 pilot cities from the Pacific and/or Caribbean coast)

6. Description of the project site (maps, environmental and social conditions, current issues, etc.)

All candidates' sites of the Project are shown in Figure 6-1. The Project site selection will be finalized during the coming Project.



(Source: Google Earth modified by JICA study team)

Figure 6-1 Candidate Sites of the Project

7. Legal Framework of Environmental and Social Considerations

7.1. Laws, regulations, and standards related to environmental and social issues including requirements and procedures of Environmental Impact Assessment (EIA), stakeholder participation, and information disclosure.

7.1.1. Nicaraguan Environmental Impact Assessment Framework and JICA Guidelines for Environmental and Social Considerations

The main laws and institutions for protected areas and ecosystem conservation are listed in Table 7-1.

Table 7-1 List of laws and institutions for protected areas and ecosystem conservation

No.	Name of Law (Spanish/English)	Date of Act
	Decreto N° 20-2017 – Sistema de Evaluación Ambiental de permisos y autorizaciones para el uso sostenible de los recursos naturales	Presidential Decree No. 20-2017, Approved on November 28 th 2017.

No.	Name of Law (Spanish/English)	Date of Act
	Decree 20-2017 - the System of Environmental Assessment for permits and authorizations for the sustainable use of natural resources	Published on No. 228, Official Gazette La Gaceta on November 29 th , 2017.
	REGLAMENTO DE ÁREAS PROTEGIDAS DE NICARAGUA DECRETO EJECUTIVO N°. 01-2007 Decree 01-2007, Regulation of Protected Areas of Nicaragua	Presidential Decree No.01-2007, approved on January 8 th , 2007. Published on La Gaceta Diario Oficial on January 11 th , 2007.
	DECLARACIÓN DE LA RESERVA BIOLÓGICA MARINA "CAYOS MISKITOS Y FRANJA COSTERA INMEDIATA" DECRETO EJECUTIVO N°. 43-91 DECLARATION OF THE MARINE BIOLOGICAL RESERVE "CAYOS MISKITOS AND IMMEDIATE COASTAL STRIP". EXECUTIVE DECREE N°. 43-91	Presidential Decree No. 43-91, approved on October 1 st , 1991. Published on La Gaceta Diario Oficial on November 4 th , 1991.
	Decreto N° 66/99 - Actualiza y precisa categorías y límites de las áreas protegidas ubicadas en el territorio del sureste de Nicaragua. Decree N° 66/99 - Updates and specifies categories and limits of the protected areas located in the southeastern territory of Nicaragua.	Presidential Decree No.66-99, Approved on March 31 st 1999. Published on La Gaceta Diario Oficial on June 18 th , 1999.
	LEY DE REFORMA A LA LEY N°. 738, "LEY QUE DECLARA Y DEFINE EL SISTEMA DE LOS CAYOS PERLAS COMO REFUGIO DE VIDA SILVESTRE" LAW AMENDING LAW NO. 738, "LAW DECLARING AND DEFINING THE SYSTEM OF THE PEARL KEYS AS A WILDLIFE REFUGE"	Presidential Decree No.738, Approved on October 21 st , 2010 Published on La Gaceta 229 on November 30 th , 2010.
	DECLARACIÓN DE ÁREAS PROTEGIDAS EN VARIOS CERROS MACIZOS MONTAÑOSOS, VOLCANES Y LAGUNAS DEL PAÍS DECRETO EJECUTIVO DECLARATION OF PROTECTED AREAS IN SEVERAL MOUNTAIN	Presidential Decree No. 42-91, Approved on October 1 st , 1991 Published on La Gaceta Diario Oficial on November 4 th , 1991.

No.	Name of Law (Spanish/English)	Date of Act
	MASSIFS, VOLCANOES, AND LAGOONS OF THE COUNTRY EXECUTIVE DECREE	

Source: JICA Mission Team

7.1.2. Nicaraguan Environmental Impact Assessment Framework and JICA Guidelines for Environmental and Social Considerations

The system of environmental and social considerations in Nicaragua is defined by the 'System of Environmental Impact Assessment Permits and Approvals for the Sustainable Use of Natural Resources' (Environmental Impact Assessment Law, Decreto 20-2017). Strategic Environmental Impact Assessment (SEA) is mentioned in the Environmental Impact Assessment Law, but the procedures and requirements are not clearly defined and the system is not operational in practice. According to MARENA, the reason why it is not operational is that it does not have the technology to implement SEA practices.

Five categories of environmental impact assessment have been defined as follows:

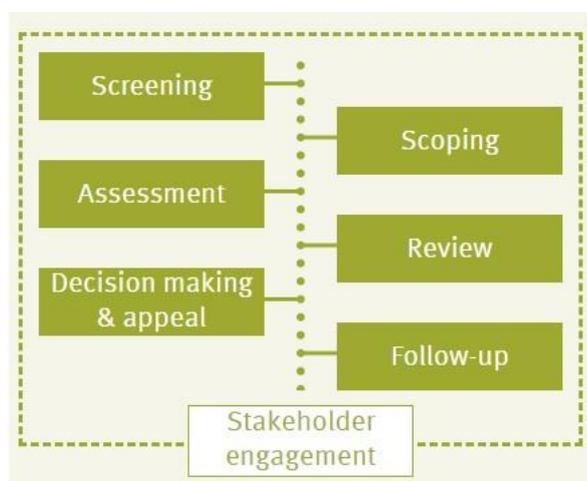
- I. projects that are considered special due to their national or transboundary nature
- II. projects considered likely to cause high potential environmental impacts
- III. projects considered likely to cause medium potential environmental impacts
- IV. projects considered likely to cause low potential environmental impacts
- V. experimental or innovative projects that are subject to investigation because their potential environmental impact is unknown.

Of these, categories I and II require a full-scale environmental impact assessment.

The categorization is determined during the screening stage of the environmental impact assessment flow. Specifically, it is determined based on the project information submitted by the project proponent and the categorization table according to the type and scale of the project, which is described below. On the other hand, MARENA attempted to clarify the procedures for environmental impact assessment in this study, but MARENA replied that no clear flow has been

defined. Therefore, the World Bank's Republic of Nicaragua Analysis of the Process of Environmental Impact Assessment in Nicaragua and the Netherlands Commission for Environmental Assessment are shown in Figure 7-1.

The Environmental Impact Assessment in GIPRO following this study is classified as Category A in the JICA Guidelines for Environmental and Social Considerations, taking into account the presence of valuable species on the Caribbean coast side and the possibility of overlap between the project area and the protected area defined by the Nicaraguan Government. On the other hand, the project is considered to be classified as Category II under the Nicaraguan system, as it is considered to be classified as a project that may cause high potential environmental impacts on protected areas. Category I is considered to be a project that is considered exceptional due to its transboundary nature, and neither is Category III or below, as no environmental impact assessment is carried out. It should be noted that there have been no protective measures against hurricanes or tsunamis equivalent to Category I or II of the Nicaragua EIA.



Source: Netherlands Commission for Environmental Assessment

Figure 7-1 Flow of Environmental Impact Assessment in Nicaragua

7.1.3. Land Acquisition Laws and Regulations

The legislation for land acquisition in Nicaragua includes the Land Expropriation Law (Ley de Expropiación, Ley 229, 1976), but to avoid complicated exchanges such as court procedures, MTI has adopted social consideration measures, including land acquisition, which is a problem in road construction projects, based on the Social Management Manual (Manual de Gestión Social, MTI 2003), which is based on the actual acquisition of the land for the project, the negotiation

committee is the main body responsible for confirming the project details, calculating the compensation price and signing the agreement.

The Negotiating Committee, which is the main body of the procedure, is positioned as a special committee consisting of a dedicated legal advisor for the subject project appointed by the minister of the competent ministry, staff from the secretariat of the subject project, and a price evaluation expert. At the stage of carrying out land asset valuation, a Land Valuation and Appraisal Committee will also be established, which together with the Negotiating Committee will carry out a scrutiny of the market value of the affected assets. The Land Valuation and Appraisal Committee consists of the Head of the Project Section, the Director of the Roads Department, and a legal counseling representative.

There are also similar provisions in the Constitution, the Civil Code, and the manual on land acquisition within road sites (published by MTI). In the MTI manual, provisions on compensation for land acquisition and resettlement in the road right-of-way include provisions on procedures, the right to receive compensation, and compensation costs, while support for livelihood reconstruction is not clearly defined.

Furthermore, in the event of complaints from Project Affected Persons (PAPs) for any reason after compensation payment or resettlement, the Municipal Legal Department will verify and arbitrate the grievance, but if it cannot be resolved, the Approval Committee or MTI's Legal Department will review the content of the complaint, make a decision on acceptance and propose a solution. In such cases, the final decision on the legitimacy of the grievance content in the absence of agreement is left to the judiciary.

7.1.4. Law for the Development of Coastal Areas (Ley 690)

The Law for the Development of Coastal Areas (2009) applies to properties adjacent to beaches, rivers, lagoons, lakes, or other bodies of water. The law regulates the use and development of private and public lands, coastal access, and properties in these areas. By law, public areas are open to the public between low and high tides, plus within 50 meters of the high tide mark. However, the regulations established by this law may also affect ownership, use, construction, leasing, and occupancy rights beyond the 50-meter point of these properties. More thorough due diligence should be conducted before any real estate transaction on these properties, tracing ownership back to pre-1917, or at least

to where ownership originated. It should be noted that there have been many property disputes in the coastal areas affected by this law.

7.1.5. Hazardous and Non-Hazardous Solid Waste Integrated Management Policy 2005-2023

It exists as a basic environmental policy, and standards and plans have been established based on this policy. Corporations and individuals involved in the waste management business are required to comply with various laws and regulations, including the Environmental Technical Standard for the Handling and Final Disposal of Non-Hazardous Solid Waste (NTON 05 014-02, enacted in 2002)¹.

7.2. Relative agencies and institutions

The central organization for environmental protection is MARENA.

Like other ministries, MARENA is a centralized government-centered organization, with a branch office in each city. The function of the branch office is to make decisions on environmental issues independently of the city government and to seek decisions from the central government agency, MARENA.

For example, in an environmental impact assessment of an infrastructure development project funded by a city budget, the city or a city contractor prepares an environmental impact assessment, which is reviewed by an external committee consisting of experts and others convened by MARENA as the central government. The environmental permit is issued by this external committee.

For small projects implemented with city budgets that have negligible environmental impacts, a common checklist is used for all cities nationwide, rather than a full-scale environmental impact assessment, and a record is kept of the city's environmental staff scoring the impacts.

8. Alternatives to the project activities including the 'without project' option will be analyzed during the project when conducting the Strategic Environmental Assessment (SEA).

See section 10 (5, 8, 14, and 15).

9. Scoping (types and magnitudes of possible adverse impacts)

¹ JICA (2019)

Field	Item	Evaluation		Evaluation Reason
		Before and During Construction	In-Service	
Anti-Pollution measures	Air Pollution	✓	—	During construction: At present, many of the coastal roads in the vicinity of the proposed project area are small roads with one lane in each direction, and many construction vehicles will be operating during construction, which may cause temporary intensive air pollutant emissions due to traffic congestion and other effects. In-Service: No impact on this item is envisaged.
	Water Quality	✓	—	During construction: Small-scale coastal fisheries are flourishing at the pilot coast, and deterioration of water quality (turbidity generation) due to turbid water from construction works near sea areas such as seawalls, breakwaters, rings, breakwaters, and jetties may have direct or indirect adverse effects on these fisheries and the fishery resources such as young fish and bottom fish. In-service: No impacts on this item are envisaged.
	Waste	✓	—	During construction: Construction waste, such as construction debris and concrete waste, is expected to be generated during construction. The project area is also affected by hurricanes, which may cause waste to be dispersed into the surrounding area during construction, requiring appropriate waste management. In-service: No impacts on this item are envisaged.
	Soil Pollution	✓	—	During construction: Inland raising works and construction works on land, such as evacuation facilities, require excavation of the local ground during construction. Currently, no information on soil contamination at the site has been obtained, but if there are contaminants underground, excavation due to construction

Field	Item	Evaluation		Evaluation Reason
		Before and During Construction	In-Service	
				work may contaminate the surrounding environment. In addition, if fuel and lubricating oil for construction vehicles are stored underground, there is concern about pollution of the surrounding environment due to leakage. In-service: No impact on this item is envisaged.
	Noise and Vibration	✓	—	During construction: Noise and vibration from heavy machinery during construction may have a temporary negative impact on the lives of nearby residents. In service: No impact on this item is envisaged.
	Land Subsidence	—	—	No impact on this item is envisaged.
	Odor	—	—	No impact on this item is envisaged.
Natural Environment	Protected Area	✓	✓	During construction: There are nature reserves designated by the State of Nicaragua and the Caribbean region, mainly along the Caribbean coast and coast. The necessary procedures, etc. for development in protected areas need to be confirmed. In service: No impacts on this item are envisaged, but the impact of the presence of seawalls, breakwaters, rings, breakwaters, jetties, etc. on the ecosystem in the protected area should be ascertained.
	Biodiversity	✓	✓	During construction: There is concern that noise and vibration during construction may affect the habitat and breeding activities of rare animals that should be protected, such as sea turtles and migratory birds. In addition, the generation of muddy water from the construction of seawalls, breakwaters, rings, breakwaters, and

Field	Item	Evaluation		Evaluation Reason
		Before and During Construction	In-Service	
				<p>jetties and the rising of land areas may harm the organisms that form the basis of biodiversity, such as seaweed, benthic organisms, and juvenile fish.</p> <p>In service: The presence of seawalls, breakwaters, rings, breakwaters, jetties and raised areas on the coastline may divide the ecosystem between sea and land, reducing habitats and harming biodiversity.</p>
	Water-related phenomena	—	✓	<p>During construction: No impacts on this item are envisaged.</p> <p>In-service: Coastal structures such as seawalls, breakwaters, rings, breakwaters, and jetties could reduce drainage functions after inundation by hurricanes and tsunamis and delay post-disaster recovery.</p>
	Topography and geology	✓	✓	<p>During construction/in-service: The presence of submarine structures such as seawalls, breakwaters, breakwaters, and jetties can lead to accelerated beach erosion and alteration of beach morphology, such as extreme sedimentation.</p>
Social Environment	Site acquisition and resettlement	✓	—	<p>During construction: Although Nicaragua has a law in force prohibiting habitation 200 m from the coast, many residents have lived in the coastal area before the law came into force, and it is difficult to secure a coherent site in the vicinity of existing coastal settlements to avoid large-scale resettlement. In such cases, it is necessary to consider candidate sites where structures can be built in or near protected areas as areas where residents do not live, but it is necessary to check in advance as the implementation of projects in protected areas may be prohibited even if it is in the public interest.</p>

Field	Item	Evaluation		Evaluation Reason
		Before and During Construction	In-Service	
				In-service: No activities induce land acquisition and resettlement.
	Livelihoods	✓	✓	During construction: Fishery resources may be affected by deterioration of water quality, such as muddy water run-off during construction. In-service: Some parts of the coastal area are located with tourist resources such as hotels and beaches, and the presence of structures such as seawalls, breakwaters, rings, breakwaters, and jetties may harm tourism and fishing due to their impact on the landscape and access to the coast.
	Socially vulnerable group	-	✓	During construction: The project is not expected to have a significant impact during construction, but consideration should be given to the employment of construction workers, for example by prioritizing the employment of vulnerable groups. In-service: The project aims to reduce damage to the entire community, so vulnerable groups will also benefit. On the other hand, the prioritization of access to evacuation and other facilities for vulnerable groups may not be sufficiently taken into account.
	Cultural Heritage	✓	✓	During construction/In-service: There are two World Heritage Sites in Nicaragua, the Leon Cathedral and the Leon Viejo Complex, which are located inland, and there is no concern about the impact of this project, which is planned in the coastal area. The location of Nicaragua's national cultural heritage sites is not known at this stage and requires confirmation.
	Scenery	✓	✓	During construction / in-service: There is concern that tourism may be adversely affected by the deterioration of the landscape due to the construction of structures such as seawalls,

Field	Item	Evaluation		Evaluation Reason
		Before and During Construction	In-Service	
				breakwaters, rings, and jetties in the coastal area.
	Ethnic minorities and indigenous peoples	✓	✓	During construction/In-service: Nicaragua is a multi-ethnic country and indigenous peoples, represented by the Miskito and Lama tribes, live in the coastal areas, there are concerns about the impact of the project area in these indigenous areas. The residential areas of these indigenous peoples will be surveyed in advance and necessary consideration will be given if residential areas are targeted.
	Working environment (including occupational safety)	✓	—	During construction: The construction working environment needs to be secured as there will be a large influx of construction workers during construction. In-service: no impact on this item is envisaged.
	Community health, safety, and security	✓	—	During construction: The influx of construction workers may lead to the spread of STDs (sexually transmitted diseases) and infectious diseases such as COVID-19. Land changes due to cut and fill may create new habitats for mosquitoes, which can be vectors of malaria. The influx of construction vehicles may increase traffic accidents. In-service: No impacts on this item are envisaged. The health, safety, and security of the local community will be restored to its original state when the construction works are completed and the influx of construction workers ceases.
Others	Transboundary impacts and climate change	—	—	During construction/in-service: The structure will remain in one area within Nicaragua, with no transboundary impacts and no adverse effects on climate change.

10. Terms of Reference for Environmental and Social Considerations

Strategic Environmental Assessment (SEA) shall be conducted during the Project by JICA Guidelines for Environmental and Social Considerations (the JICA Guidelines) in addition to the Decree no. 20-2017, System of Environmental Assessment for permits and authorization for the sustainable use of natural resources (the Decree). Terms of Reference for the SEA include, but are not limited to, the following:

1. Establish SEA team with SINAPRED and relevant organizations, and JICA study team, and provide SEA team members with guidance on SEA so that this activity is properly embedded in the process of formulation of the Basic Plan;
2. Review existing development policies, plans, projects, studies, and public/private investment at/around the Project sites;
3. Review the latest legislations relevant to environmental and social considerations, including the system of public participation, information disclosure, the gap between the legislations in the Nicaragua and JICA Guidelines, and an outline of the relevant authorities;
 - ① Laws, regulations, standards, etc. related to environmental and social considerations (environmental impact assessment, resettlement, public participation, information disclosure, etc.)
 - ② Deviations from the JICA Guidelines for Environmental and Social Considerations
 - ③ Outline of relevant institutions
4. Identify environmental and social restrictions to the disaster risk reduction measure;
5. Examine the aims and objectives of the policies and plans with a viewpoint of environmental and social considerations and contemplate strategic scenarios, concepts, and prioritization of proposed alternatives to achieve the objectives within various constraints. The content of the policies and plans in the project (e.g., development forecasts, lists of measures, maps of routes, and future development areas) is then examined.
6. Conduct scoping (identify environmental and social issues to be evaluated and the methods with indicators and criteria for evaluation);
7. Conduct a baseline survey of the existing environmental and social conditions such as land use, natural environment, living area of indigenous

- people, economic and social conditions;
8. Conduct a comparative analysis of possible impacts of alternatives including the 'without project' option;
 9. Analyze possible impacts based on the scoping and provide mitigation measures and monitoring methods based on expected environmental and social impacts;
 10. Identify baseline of environmental and social conditions (e.g. land use, natural environment, indigenous living areas, and economic and social conditions).
 11. Prepare recommendations for reflecting on the basic planning which includes mitigation measures to avoid, minimize, and compensate for the impacts and/or monitoring methods (monitoring items, frequencies, and methods) for the selected plan;
 12. Conduct a stakeholder analysis and support stakeholder meetings by identifying the purpose such as meetings, participants, consultation methodologies, and agenda to be held on at least two occasions, 1) at the time of scoping; and 2) at the time of preparation of a draft SEA report; and
 13. Prepare a SEA report and finalize it by incorporating comments from stakeholders and relevant institutions;
 14. Conduct a provisional scoping for the Project in the Basic Plan;
 15. If necessary, after formulating the Basic Plan, scoping will be carried out for the prioritized pilot projects selected through comparative alternative examinations. Specifically, the environmental and social impact items necessary for the environmental assessment of priority projects will be selected, and survey and prediction methods will be determined;
 16. If necessary, for the prioritized pilot projects, scoping, and impact prediction including comparative alternative studies, mitigation measures preparation, environmental management plan preparation, and monitoring plan preparation will be carried out. This process also includes stakeholder meeting implementation if needed.

11. Result of investigations for Environmental and Social Consideration

11.1. KBA Protected Area in Nicaragua

The distance from the candidate Project site to the nearest Key Biodiversity Area (KBA) site is shown in Table 11-1 and the location of the potential project site and

KBA site is shown in Figure 11-1.

Table 11-1 Name of KBA, description, and distance from potential target sites

Name of KBA site	Contents (Protected Area / Ramsar Site)	Distance from the Project candidate site (refer to Figure 11-1)
Cayos Miskitos and terrestrial landscape	Cayos Miskitos Marine Biological Reserve and immediate Coastal Strip	Pueruto Cabezas: 0 km
Cerro Wawashang	Cerro Wawashang Natural Reserve	Bluefields: 55 km
Bluefields Bay and surroundings	Cerro Silva Natural Reserve and Bluefields Bay Wetland System RAMSAR No.1139	Bluefields: 0 km

Source: Mission Team of the Detailed Design Survey

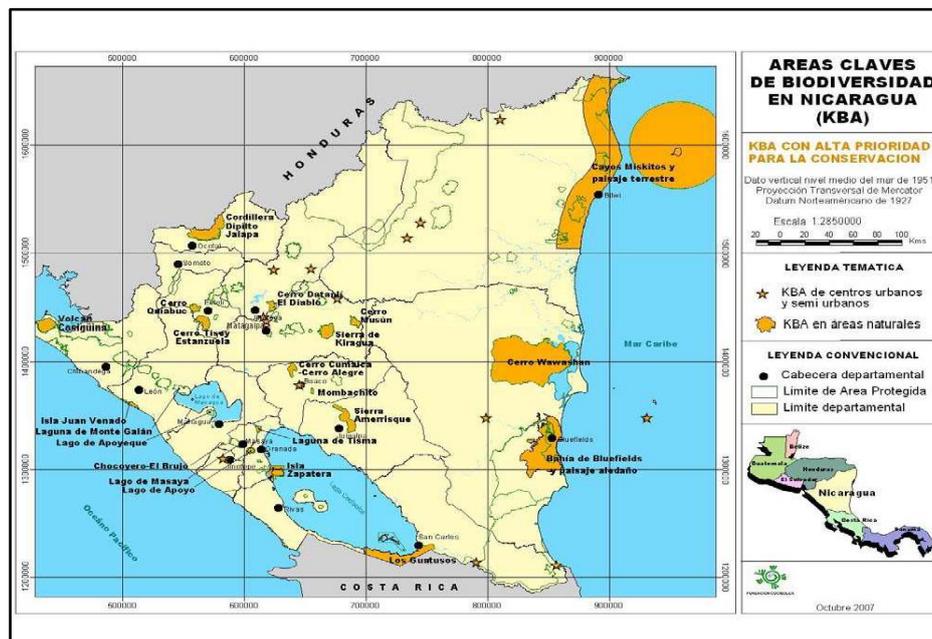


Figure 11-1 The distribution map of KBAs and potential project sites in Nicaragua (GMBA, 2022).

The distance from the candidate Project site to the nearest Important Bird Area (IBA) site is shown where there is a protected area near the potential project site, and the location of the potential project site and the IBA site is shown in Figure 11-2.

Table 11-2 Names of sites for IBAs in Nicaragua (Birdlife International (2009)).

IBA Site Number	Name of the site	Distance from the candidate Project site
NI001	Farallones de Cosiguina	Corinto: 100 km
NI002	Volcán Cosiguina	Corinto: 80 km
NI003	Delta del Estero Real y Llanos de Apacunca	Corinto: 55 km
NI004	Complejo Volcánico San Cristóbal-Casita- Chonco	Corinto: 45 km
NI005	Complejo Volcánico Momotombo	Nagarote: 35 km
NI006	Humedales del Norte del Lago de Managua	Nagarote: 55 km
NI007	Chocoyero - El Brujo y paisaje aledaño	Diriamba: 25 km
NI008	Río Escalante-Chococente-Tecomapa	Diriamba: 10 km
NI009	Laguna de Tisma	Diriamba: 65 km
NI010	Volcán Mombacho	Diriamba: 50 km
NI011	Domitila	Diriamba: 55 km
NI012	Volcán Maderas	San Juan del Sur: 35 km
NI013	Cordillera Dipilto-Jalapa	Corinto: 70 km
NI014	Miraflor	Corinto: 135 km
NI015	El Jaguar	Nagarote: 120 km
NI016	Cerro Datanlí-El Diablo	Nagarote: 140 km
NI017	Cerro Arenal	Nagarote: 130 km
NI018	Cerro Kilambe	Nagarote: 185 km
NI019	Macizo Peñas Blancas	Nagarote: 160 km
NI020	Serranía de Quirragua y paisaje aledaño	Nagarote: 165 km
NI021	Cerro Musun	Bluefields: 35 km
NI022	Archipiélago Solentiname	San Juan del Sur: 90 km
NI023	Los Guatuzos	San Juan del Sur: 75 km
NI024	Bosawas	Puerto Cabezas: 155 km
NI025	Cayos Miskitos y paisaje terrestre	Puerto Cabezas: 0 km
NI026	Ríos Prinzapolka/Alamikamba	Puerto Cabezas: 75 km
NI027	Wawashan	Bluefields: 40 km
NI028	Bahía de Bluefields y paisaje aledaño	Bluefields: 0 km
NI029	Cerro Silva	Bluefields: 15 km
NI030	Punta Gorda	Bluefields: 45 km
NI031	Isla Booby Cay	Bluefields: 55 km
NI032	Indio Maíz	Bluefields: 55 km
NI033	Río San Juan - La Inmaculada Concepción de Maria	Bluefields: 120 km

Source : Birdlife International (2009)

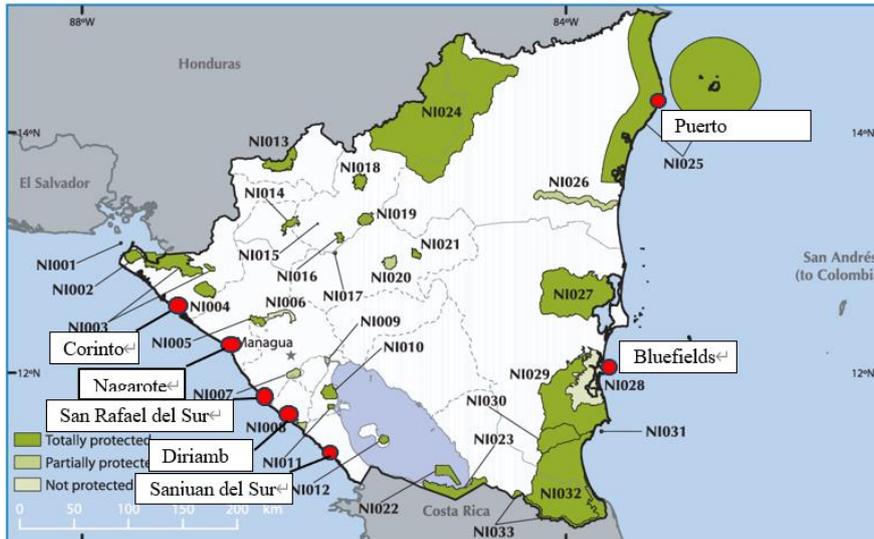


Figure 11-2 . Additions to the distribution map of IBAs sites and potential project sites in Nicaragua (Birdlife International (2009)).

Nicaragua also has nine internationally recognized wetlands. These wetlands provide habitats for a wide variety of organisms, including swamps, peatlands, floodplains, rivers and lakes mangroves, and seagrass beds. In addition, there are three Caribbean coastal reefs of great importance for bird conservation, namely.

- Cayos Miskitos and the Immediate Coastal Strip
- Bluefields Bay Wetland System
- Rio San Juan Wildlife Refuge

The following list of endangered species (IUCN NT species and above) to be aware of when considering projects in or around protected areas and critical habitats in Nicaragua is summarized below.

Table 11-3 List of Amphibians and Reptiles

Class	Scientific name	IUCN Red List Category*
Amphibians	<i>Craugastor lauraster</i>	EN
Amphibians	<i>Craugastor ranoides</i>	CR
Amphibians	<i>Ecnomiohyla miliaria</i>	VU

Class	Scientific name	IUCN Red List Category*
Amphibians	<i>Craugastor laevissimus</i>	EN
Amphibians	<i>Ptychohyla hypomykter</i>	CR
Amphibians	<i>Lithobates midis</i>	VU
Amphibians	<i>Bolitoglossa mombachoensis</i>	VU
Amphibians	<i>Nototriton saslaya</i>	VU
Amphibians	<i>Dermophis mexicanus</i>	VU
Reptile	<i>Crocodylus acutus</i>	VU
Reptile	<i>Norops warmth</i>	VU
Reptile	<i>Ctenosaura quinquecarinata</i>	EN
Reptile	<i>Chelonia mydas</i>	EN
Reptile	<i>Kinosternon angustipons</i>	VU
Reptile	<i>Caretta caretta</i>	VU
Reptile	<i>Dermochelys coriácea</i>	VU
Reptile	<i>Eretmochelys imbricata</i>	CR
Reptile	<i>Lepidochelys olivácea</i>	VU

*CR: Critically Endangered, EN: Endangered, VU: Vulnerable
Source : LIBRO ROJO ANFIBIOS Y REPTILES DE NICARAGUA (2017)

Table 11-4 Species in vulnerable categories

Class	Scientific name	IUCN Red List Category*
Amphibians	<i>Incilius coniferus</i>	VU
Amphibians	<i>Incilius melanochlorus</i>	VU
Amphibians	<i>Sachatamia albomaculata</i>	VU
Amphibians	<i>Craugastor laevissimus</i>	VU
Amphibians	<i>Craugastor mimus</i>	VU
Amphibians	<i>Pristimantis cerasinus</i>	VU
Amphibians	<i>Dendrobates auratus</i>	VU

Class	Scientific name	IUCN Red List Category*
Amphibians	<i>Oophaga pumilio</i>	VU
Amphibians	<i>Agalychnis saltator</i>	VU
Amphibians	<i>Cruziohyla calcarifer</i>	VU
Amphibians	<i>Hypsiboas rufitelus</i>	VU
Amphibians	<i>Smilisca puma</i>	VU
Amphibians	<i>Dermophis mexicanus</i>	VU
Reptile	<i>Caiman crocodilus</i>	VU
Reptile	<i>Crocodylus acutus</i>	VU
Reptile	<i>Basiliscus basiliscus</i>	VU
Reptile	<i>Basiliscus plumifrons</i>	VU
Reptile	<i>Norops carpenter</i>	VU
Reptile	<i>Norops laeviventris</i>	VU
Reptile	<i>Ctenosaura quinquecarinata</i>	VU
Reptile	<i>Corallus annulatus</i>	VU
Reptile	<i>Drymobius chloroticus</i>	VU
Reptile	<i>Drymobius melanotropis</i>	VU
Reptile	<i>Leptophis nebulosus</i>	VU
Reptile	<i>Mastigodryas dorsalis</i>	VU
Reptile	<i>Tantilla alticola</i>	VU
Reptile	<i>Tantilla reticulata</i>	VU
Reptile	<i>Tantillita lintoni</i>	VU
Reptile	<i>Dipsas bicolor</i>	VU
Reptile	<i>Tropidodipsas sartorii</i>	VU
Reptile	<i>Sibon annulatus</i>	VU
Reptile	<i>Sibon dimidiatus</i>	VU
Reptile	<i>Sibon longifrenis</i>	VU

Class	Scientific name	IUCN Red List Category*
Reptile	<i>Urotheca decipiens</i>	VU
Reptile	<i>Urotheca guentheri</i>	VU
Reptile	<i>Micrurus alleni</i>	VU
Reptile	<i>Rhinoclemmys funereal</i>	VU
Reptile	<i>Kinosternon angustipons</i>	VU
Reptile	<i>Caretta caretta</i>	VU
Reptile	<i>Lepidochelys olivacea</i>	VU

*VU:Vulnerable

Source : LIBRO ROJO ANFIBIOS Y REPTILES DE NICARAGUA (2017)

Figure 11.1.5. Information on Mammals

Class	Scientific name	IUCN Red List Category*
Mammals	<i>Myrmecophaga tridactyla</i>	VU
Mammals	<i>Ateles geoffroyi</i>	EN
Mammals	<i>Sciurus Richmond</i>	NT
Mammals	<i>Panthera onca</i>	NT
Mammals	<i>Trichechus manatus</i>	VU
Mammals	<i>Tapirus bairdii</i>	EN
Mammals	<i>Tayassu pecari</i>	VU

*CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened

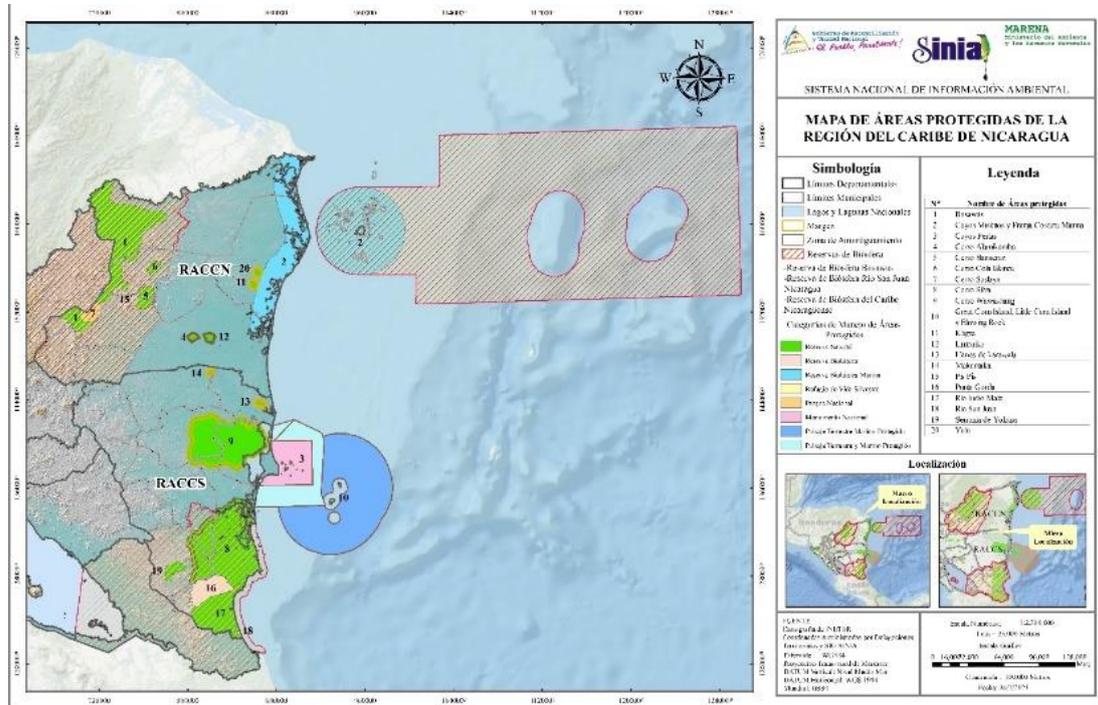
Source : LIBRO ROJO ANFIBIOS Y REPTILES DE NICARAGUA (2017)

11.2. Environmental Considerations

11.2.1. Ecosystem

The protected areas in Nicaragua are shown in Figure 11-2-1. It shows that most of the areas designated as protected areas under order 01-2007, Restriction for protected areas in Nicaragua (green area in the figure) are near the Caribbean coast. However, on the Pacific coast, which is not designated as a protected area, there are nesting sites for sea turtles and migratory birds in some places, and corals

and mangroves are also known to exist (as explained by SINAPRED during the field survey).



Source : MARENA

Figure 11-3 Protected area in Nicaragua

- (1) Sea turtle
 It is known that there are places where sea turtles come ashore to lay eggs on some of the beaches not in industrial use that were visited during the survey.
- (2) Migratory bird
 It is known that some of the industrially unused beaches visited in this study are places where migratory birds come ashore for nesting.
- (3) Mangrove
 Mangroves are often found in salt marshes along the coast. Mangroves are generally known to have a wave-dissipating function, but this fact has not been confirmed at the Project site.
- (4) Coral reef
 Many beaches have coral reefs present on the coast, which are respected as natural wave-dissipating admirals.

11.2.2. Landscape

Assuming that structures such as seawalls against tsunamis and storm surges are constructed on the coast, this could harm the seascape as a tourist resource.

The Nicaraguan coast is home to many tourist facilities that cater to visitors, including foreign tourists, and adverse effects on the landscape can be a serious problem for the source of income in the important industry of tourism, so the installation of coastal structures, even as a disaster measure, should be done with caution.

11.2.3. Marine Litter

Plastic litter is the main source of litter on many beaches. The beach in front of the restaurants and hotels is not littered with plastic debris, perhaps due to cleaning efforts.

Because of concerns about adverse effects on fisheries, reduction measures at the source, rather than beachside cleanup, are considered necessary.

11.3. Social Considerations

11.3.1. Involuntary Resettlement

Although the city plans and encourages relocation to higher ground away from the seafront, many residents prefer to live by the seafront. When relocating to higher ground, the city conducts detailed interviews with each household and for residents who have already invested in housing construction, and the value of their homes is included in the relocation compensation. The Constitution stipulates that 'expropriation of property shall be established insofar as fair compensation is provided' and explicitly recognizes the guarantee of rights to private property - movable and immovable property, means of subsistence, and tools - in cases of involuntary resettlement. It also recognizes respect for human rights, including the right of citizens to adequate and safe housing (Nicaragua - Project de Agua y Saneamiento de Managua, 2008).

However, the implementation of involuntary resettlement could lead to a change of occupation to the traditional one. Here, residents who run small fishing businesses along the coast or small shops along the coastal road are among those who may face this possibility, but the municipality does not force them to relocate and persistently encourages them to do so out of respect for human life

in the long term. For those residents who are forced to change their occupations, the city provides for the guarantee of their rights to a means of livelihood.

11.3.2. Appropriate considerations for vulnerable social groups

Disaster preparedness teams at the municipal level and within communities are trained to recognize that not only women but also the elderly and children should be prioritized in evacuation plans and drills and to make this a reality during actual evacuation drills.

11.3.3. Tourism

The area around Nicaragua's sandy beaches is home to many tourist facilities such as restaurants and hotels, which are visited by tourists from abroad. If coastal preservation measures harm the landscape, it could lead to a decline in the value of tourist facilities. A balance between defense and coastal preservation is necessary.

11.3.4. Fishery

Many micro-fishing boats may be placed on the beaches along the coastline, which is not a desirable scenic condition for the tourism industry. In addition, during tsunamis and storm surges, the boats may become a factor in increasing disaster damage by drifting away. One solution is to dredge the adjacent blocked estuary to create a boat pool and move the boats there. One example is shown there in Figure 11-4.



Figure 11-4 Candidate dredging point at the coast of Diriamba

11.4. Problems to be solved regarding Environmental and Social considerations.

11.4.1. Shoreline residents

In Nicaragua, the regulation states that no residence can be located within 200 m of the coastline at high tide. However, there are residents in the shoreline area (Figure 11-5).

The problem is that those who have lived within 200 m of the site before these regulations were established have land ownership rights to the site and have refused to relocate. Although there is a contradiction between the new regulations and the actual land use, the Nicaraguan government has not yet taken any action toward a concrete solution. In addition, in some areas where erosion is progressing, the shoreline is approaching homes in proximity.



Figure 11-5 Coastal residents

11.4.1 Progress of resettlement inland

Although the relocation of residents inland is supposed to be proceeding according to the city's administration, there were places where there was no evidence that residents had been relocated to the relocation sites provided by the city (Figure 11-6). The progress of resettlement to the relocation sites guided by city officials during the field inspection could not be said to have produced any tangible results.



Figure 11-6 Relocation site prepared by the city

12. Impact Assessment

No impact is assessed during the detailed planning survey as the Project is a planning study, and it does not include any facility localization and/or construction works that are common in projects of feasibility study and/or detailed design. However, considering the selection of pilot sites, SEA will be conducted through the technical cooperation project.

13. Environmental Management Plan (Mitigation measures for adverse impact)

The environmental management plan has not been established because the Project is a planning study, and it does not include any facility localization and/or construction works that are common in projects of feasibility study and/or detailed design. EMP will be considered based on the results of the SEA.

14. Environmental Monitoring Plan

The environmental monitoring plan has not been established because the Project is a planning study, and it does not include any facility localization and/or construction works that are common in projects of feasibility study and/or detailed design. An Environmental Monitoring Plan will be considered based on the results of the SEA.

15. Result of the consultation with the recipient government on environmental and social considerations including roles and responsibilities.

Like other ministries and agencies, MARENA is a centralized government

organization, with a branch office in each city. The function of the branch office is to make decisions on environmental issues independently of the city government and to seek decisions from the central government agency, MARENA.

For example, in an environmental impact assessment of an infrastructure development project funded by a city budget, the city or a city contractor prepares an environmental impact assessment, which is reviewed by an external committee consisting of experts and others convened by MARENA, the central government. The environmental permit is issued by this external committee.

For small projects implemented with city budgets that have negligible environmental impacts, a common checklist is used for all cities nationwide, rather than a full-scale environmental impact assessment, and a record is kept of the city's environmental staff scoring the impacts.

16. Other relevant information

16.1. Risks of Thermal Power Plants (GEOSA)

A thermal power plant with the largest output (120 MW) in Nicaragua exists on the coast about 25 km west-southwest of the city of Nagalote (Figure 16-1). In the event of a tsunami higher than that anticipated at the time of design, the fuel oil (heavy oil C) could spill into the sea, and by advection and diffusion, cause widespread marine pollution. The oil pollution itself will be decomposed by bacteria and other organisms in the ocean and become harmless in the long term, but in the medium term, it will harm the marine ecosystem.

16.2. Concerns due to risk

If coral reefs, sea turtle spawning grounds, and migratory bird nesting sites scattered along Nicaragua's Pacific coast are contaminated by oil spills, there is concern that these areas will lose the places where they can reproduce their next generation, and at worst become extinct or require a long period to recover.



Figure 16-1 Thermal power plant (GEOSA)

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