

## **Addendum to ESMF**

### **Private Sector-Led Mini-Grid Energy Access Project**

#### **1. Background**

To enhance the good results and the impact of the Mini-grid Project, the Bank is proposing to add a new renewable energy technology, namely biogas activities, which have been successfully implemented under Nepal: SREP (Scaling-up Renewable Energy Program)-supported Extended Biogas Project (P131592) through project restructuring. This will enhance the impact of the Mini-grid Project in terms of energy access, and GHG emission reduction, but also facilitate the disbursement under the Mini-grid Project. Furthermore, this will also support the plan of the Government of Nepal, to increase the share of renewable energy in the country energy mix from three percent in year 2018 to seven percent by the year 2030.

SREP was closed on August 31, 2021. The PDO of this project was to promote large scale off-grid biogas generation in Nepal. This Extended Biogas Project was designed to promote private sector participation in the biogas generation and supports the use of renewable energy. In addition, it has also contributed towards the production of organic fertilizer, supplementing the demand for fertilizer in the country.

Both SREP and the Mini-grid project have been implemented by Alternative Energy Promotion Center (AEPIC). By adding biogas activities to the Mini-grid Project, the GoN will be able to complete the 11 sub-projects that are under construction/electromechanical works.

#### **2. Objectives**

The objectives of this document are to provide the basic approach applicable to manage environmental and social risks and impacts associated with 11 biogas generation sub-projects which have been under construction/electromechanical works as a part of the recently closed Bank financed project, i.e. Scaling Up Renewable Energy Project (SREP) and will be added to the Mini-grid project. No new/other existing sub-projects will be added under Mini-grid project.

#### **3. Overview of sub-projects to be added under the Mini-grid project**

The following 11 sub-projects which were financed under SREP will be continuously supported under Mini-grid project:

<b>S.N.</b>	<b>Name of Sub-Project</b>
1	<b>Kamdhenu Gas tatha Mal Udyog- Plant Size - 40 TPD</b>
2	<b>Jeewan Bikash Samaj Plant Size- 30 TPD</b>
3	<b>Kalash Cattle Farming Plant Size- 20 TPD</b>
4	<b>Dhangadhi Sub-Metropolitan City Plant Size- 30 TPD</b>
5	<b>Ghorahi Sub-Metropolitan City Plant Size-30 TPD</b>
6	<b>Kankai-Birta-Arjun Joint Implementation Plant Size-40 TPD</b>

7	<b>Birendranagar Municipality</b> Plant Size-30 TPD
8	<b>Damak Municipality</b> Plant Size-40 TPD
9	<b>Itahari Sub-Metropolitan City</b> Plant Size-30 TPD
10	<b>Eastern Star Cooperative P. Ltd.</b> Plant Size-52 TPD
11	<b>Dhaulagiri Agro Pvt. Ltd.</b> Plant Size-52 TPD

\*TPD- Ton per day

### 3.1 Kamdhenu Gas tatha Mal Udhhyog

- Plant Size- 40 TPD (Ton per Day)
- Location- Lalbandi Municipality ward no. 2, Nawalpur in Sarlahi district. It is 750 m south-west from Lakhandehi Bridge in East-West Highway. Geographically, the project location is situated at 27°04'07.82" N latitude and 85°34'41.24" E longitude at an elevation of 140 m.
- Salient Features of the Proposed Sub-project

Name of Commercial Entity:	Kamdhenu Gaushala Pvt. Ltd
Address of Commercial Entity:	Lalbandi Municipality-2, Nawalpur, Sarlahi
Name of Contact Person (Developer):	Mr. AjitLamichanne
Contact Number of Contact Person (Developer):	9841521611
Recommended Technology:	Continuously Stirred Tank Reactor (CSTR) based biogas plant
Name of Contact Person from PQ Consulting Firm:	Ms. Bisweta Bajracharya
Contact Number of Responsible Person from Consulting Firm	9847230927
Digester Volume (m <sup>3</sup> )	3472 m <sup>3</sup>
Biogas Production	4000 m <sup>3</sup> /day
Compost Production	8.14 tons/day (75% DS)
End Use:	Thermal (Bio-CNG) Captive use and Selling
Tentative Total Project Cost	NRs. 136,773,000.00
Safeguard Document prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement
	Category B project

### **Current Progress Status of the sub-project:**

- The subproject's overall progress is about 90 percent.
- Electromechanical verification has been completed.
- Testing and Commissioning (T&C) is planned in January 2022.
- ESIA(with ESMP) has been approved by the World Bank on 06 Jan 2020.
- Term of Reference (ToR) of Initial Environment Examination (IEE) submitted to Province for approval.

### **3.2 Jeewan Bikash Samaj**

- Plant Size- 30 TPD
- Location-Dhanpalthan Rural Municipality ward no. 3 (previously known as VDC, Sorabhag – 6) in Morang District. Geographically, the project location is situated at 26°26'34.88"N latitude and 87°26'11.31"E longitude at an elevation of 69 m.
- Salient Features of the Proposed Sub-project

Name of Commercial Entity:	Jeevan BikasSamaj (Profit Not Distributing Company)
Address of Commercial Entity:	Katahari, Morang
Name of Contact Person (Developer):	Mr. Rohit Bhandari
Contact Number of Contact Person (Developer):	9852026392
Biogas Project Location	Dhanpalthan Rural Municipality ward no. 3, Morang
Recommended Technology:	Continuously Stirred Tank Reactor (CSTR) based biogas plant
Name of Contact Person from PQ Consulting Firm:	Mr. Sujesh Shrestha
Contact Number of Responsible Person from Consulting Firm	9851084736
Digester Volume (m <sup>3</sup> )	2977.21 m <sup>3</sup>
Biogas Production	2609.81 m <sup>3</sup> /day
Saleable Bio-CNG Production	870.78 kg/day
Compost Production	7.60 tons/day (75% DS)
End Use:	Thermal (Bio-CNG) Captive use and Selling
Tentative Total Project Cost	NRs. 111,769,064.00
Safeguard Document prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement

**Current Status of the sub-project:**

- The subproject's overall progress is about 90 percent.
- Electromechanical verification has been completed.
- T&C is planned in end of December 2021.
- ESIA (with ESMP) has been approved by the WB on 06 Jan 2020.
- IEE has been approved in 07 Sep 2021.

**3.3 Kalash Cattle Farming**

- Plant Size- 20 TPD
- Location-The proposed plant site is located 35 Km North West of Birgunj. The site is easily accessible by road, situated 1 km from RastraBanijya Bank, Shubarnapur Road. Geographically the proposed site is 27° 14' 01.4''N and 084° 42' 36.0''E with an elevation of 114 meter above sea level.
- Salient Features of the Proposed Sub-project

Company Name/Registration/ Address	Kalash Cattle Farming Pvt. Ltd., Subarnapur, Ward-6 in Thori Rural Municipality, Parsa district, Province 2
Contact Details (Telephone, Email)	Mr. Shyam Badan Yadav (9802981290)
Project location	A cattle farm located 35 Km North West of Birgunj (27° 14' 01.4''N and 084° 42')
Technology (type and capacity)	CSTR based biogas digester supplied by Green Energy Consultancy. A digester volume of 2400 m <sup>3</sup> with daily gas generation of 14400m <sup>3</sup> is expected from the plant
Total Project Cost	NRs. 79,372,800
Safeguard Document prepared during DD	Environmental and Social Impact Assessment (ESIA) with environmental and social mitigation plan (ESMP) – WB Requirement
	Category B project

**Current Status of the sub-project:**

- The subproject's overall progress is about 60 percent.
- Civil construction has been completed
- Electromechanical is expected to deliver on December 2021.

- T&C is planned in March 2022.
- ESIA (with ESMP) has been approved by the WB on 19 Feb 2020.
- ToR of IEE has been submitted to Ministry of Industry, Tourism, Forest and Environment, Province -02, Janakpur.

### 3.4 Dhangadhi Sub-Metropolitan City

- Plant Size- 30 TPD
- Location-The proposed project site is located at Dhangadhi Sub- Metropolitan City, Ward No.2, Tribeni that lies near to Nepal- India border having a total land area of 237,034.35 sq.m (35 Bigha). The geographical location of the proposed site is 28° 41' 12.58" N and 80° 34' 54.87" E at 178m. At present, there is no direct motorable road access to the proposed site. However, the construction of Kailali Nala bridge is being carried out to connect the road to the proposed site. The bridge joins Ward No. 1 and 2 connecting to Hulaki Sadak which finally joins the road to proposed project location.
- Salient Features of the Proposed Sub-project

<b>Name of the project</b>	<b>Municipal Waste to Energy Project at Dhangadhi Sub-Metropolitan City</b>
<b>Location</b>	Dhangadhi Sub- Metropolitan-2, Tribeni, Kailali
<b>Climate</b>	Tropical
<b>Nature of Project</b>	Municipal Solid Waste Biogas Plant
<b>Type of Digester</b>	Two staged continuous digestion with heating and stirring facility
<b>Preferred Technology</b>	EnergyBin™ supplied by Xeon Waste Managers (XWM)
<b>Estimated size of plant (digester volume)</b>	1800 m <sup>3</sup>
<b>Retention Time</b>	30 days
<b>Substrate Source</b>	Municipal Solid Waste generated from Dhangadhi SMC (Household, Vegetable Market, Street, Hotel/Restaurant, Livestock)
<b>Estimated Waste to be used</b>	28996.72 kg/day 28.997 Tons/day
<b>Estimated Gas Production</b>	1892 m <sup>3</sup> /day (894 kg of BioCNG)
<b>Estimated Fertilizer production</b>	3.413 tons/per day of compost (75% DS)
<b>Land Area</b>	Land Area: 3 Bigha (20317.23 sq.m.)
<b>Total Project Cost</b>	NPR 208,492,716.00 (Including applicable Taxes) NPR.218,631,739.00 (including pre-operative cost and interest of loan amount),
<b>Beneficiaries</b>	Nearby Communities, medium sized business entities (hotels)
<b>End-use of produced biogas</b>	Thermal (Bio CNG bottles)

<b>Safeguard Document prepared during DD</b>	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement
	Category B project

**Current Status of the sub-project:**

- The subproject's overall progress is about 90 percent.
- Electromechanical verification has been completed.
- T&C is planned in January 2022.
- ESIA (with ESMP) has been approved by the WB.
- ToR of IEE has been submitted to the municipality for approval.

**3.5 Ghorahi Sub-Metropolitan City**

- Plant Size- 30 TPD
- Location-The proposed project lies in Ghorahi Sub metropolitan city, in Dang District, Rapti Zone, ProvinceNo 5. Geographically, it is located at inner Terai at 28<sup>0</sup>2'42" N latitude and at 82<sup>0</sup> 29'16"longitude. Landfill site is located in Ward No. 9at KarauteDanda with total area of 950,000 m<sup>2</sup>. KarauteDanda Sanitary Landfill site is owned by the municipal government and located on the western side of the Sub Metropolitan City, near to SewarKhola in east, Lettar village in north, Tulsipur highway in south which is 1 km away from the landfill site and 5.4 km from the city center and 1 km outside the urban area of Ghorahi.
- Salient Features of the Proposed Sub-project

Name of project	Waste to Energy Project Through Anaerobic Digestion (Biogas) Technology on DBFOOT Basis
Location	Ghorai Sub-Metropolitan City
Project Site	KarauteDanda Sanitary Landfill Site
Altitude	722m above sea level
GPS Coordinates	28 <sup>0</sup> 2' 19" N /82 <sup>0</sup> 26' 19" E
Land Area for Project	17,650 m <sup>2</sup>
Organic Waste Generation	37.09 Tons/ day
Organic Waste Collection Efficiency	18%
Total Waste Collected:	13.55 Tons/ day
Organic waste	6.70Tons/ day [49%]
Inorganic waste	6.86 Tons/ day [51%]
Proposed Technology	Continuous Stirred-Tank Reactor (CSTR) Imported from CEID CONSULTANTS & ENGINEERING PVT. LTD
Plant Capacity	30 Tons/Day

Expected Quantity Of Gas Per Day.	2000 m3/Day
Estimated Refined Gas Per Day	1300 m3/Day or 854 Kg/Day
Estimated Fertilizer Production	6190 kg per day
Size of Digester	2200 m3
End User of Gas	Commercial Sectors like Hotels and restaurants
End User of Compost	Farmers
Project Cost	199,783,270.00
Safeguard Document prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement
	Category B project

### **Current Status of the sub-project:**

- The subproject's overall progress is about 90 percent.
- Electromechanical verification has been completed.
- T&C has been planned in December 2021.
- ESIA (with ESMP) has been approved by the WB.
- IEE approved in 3rd July 2020.

### **3.6 Kankai-Birta-Arjun Joint Implementation**

- Plant Size- 40 TPD
- Location-The plant is located at Sukedangi, Kankai Municipality, Ward No 2, Jhapa district where the physical facility such as water supply, electricity is available. The project site is access through the 10 feet wide gravel road about 2.6 Km North of East-West Highway from Surunga chowk, Jhapa. The coordinates of the proposed plant is 26°40'08.06"N and 87° 54'2.71"E.
- Salient Features of the Proposed Sub-project

<b>Name of the Sub-project</b>	Municipal Waste to Energy plant
Sub-project location	MechiZone, Jhapa District, No.1 Province, Kankai Municipality
Altitude	300 meters above sea level
Climate	Temperate
Type of digester	Continuously stirred tank reactor (CSTR) mesophilic fitted with double membrane gasholder with safety pressure relief valve
Components	Biomass feeding and pump house system, digester, submersible mixers, digestate handling and recirculation system and pretreatment system;

	decanter for liquid solid separation, digester heating features and compost fertilizer plants
Substrates	Municipal Solid Waste (16 tons/day), Cow/buffalo dung (14 tons/day), Poultry litter (10 tons/day)
Final Product	1350 kg/day bio compressed natural gas (CNG) and 10000 kg/day fertilizer
Land Area of Sub-project	Available land area is 20317.89 m <sup>2</sup> (3 Bigah)
Total Estimated Sub- project cost	NRs 168,212,861.13
Safeguard Document prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement Category B project

**Current Status of the sub-project:**

- The subproject's overall progress is about 50 percent.
- Civil construction has been completed.
- Electromechanical partially deliver at site.
- T&C is planned in April 2022.
- ESIA (with ESMP) has been approved by the WB on 14 Oct 2019.
- IEE approved in 24Oct 2019.

**3.7 Birendranagar Municipality**

- Plant Size- 30 TPD
- Location- The proposed sub-project lies in Birendranagar Municipality Ward No. 11, Surkhet of Karnali Province. The geographic coordinate of proposed sub-project is 28°33'30.80"N and 81°38'43.44"E at an elevation of 632 above mean sea level. The sub-project location is about 2 km South from Pipira Chowk. The developer has leased 13,545.26 m<sup>2</sup> (2 Bigha) of land for 20 years for setting up the plant.
- Salient Features of the Proposed Sub-project

Name of Commercial Entity:	KP ByabasayikSewa Pvt. Ltd.
Address of Commercial Entity:	Birendranagar, Surkhet
Name of Contact Person (Developer):	Mr. Krishna Prasad Dhakal
Contact Number of Contact Person (Developer):	9858051528
Biogas Project Location	Birendranagar Municipality-11, Surkhet



Recommended Technology:	Continuously Stirred Tank Reactor (CSTR) based biogas plant
Digester Volume (m <sup>3</sup> )	1800 m <sup>3</sup>
Biogas Production	1800 m <sup>3</sup> /day
Saleable Bio-CNG Production	720 kg/day
Compost Production	9 tons/day (70% DS)
End Use:	Thermal (Bio-CNG) Captive use and Selling
Tentative Total Project Cost	NPR 159,430,715.00
Safeguard Document to be prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement
	Category B project

### **Current Status of the sub-project:**

- The subproject's overall progress is about 45 percent.
- Civil construction has been completed.
- Electromechanical equipment in the process of delivery.
- T&C is planned in April 2022.
- ESIA (with ESMP) has been approved by the WB on 16 Mar 2020.
- ToR has been submitted to Birendranagar Municipality for approval.

### **3.8 Damak Municipality**

- **Plant Size- 40 TPD**
- **Location-** The plant shall be built at Ward No. 2 Dumse-Beldagi, Damak Municipality at Jhapa district. The location of the project district is situated between 26° 43'46.86" N and 87° 42'03.31" E. The location is well linked with transport routes with nearby communities and market area. The distance to the nearest market is 9 km and distance to the nearest community is about 0.5 Km. Nearby business and industries are located in 9 Km radii.

- **Salient Features of the Proposed Sub-project**

Sub-project Location	Mechi Zone, Jhapa District, No.1 Province, Damak Municipality
Climate	Temperate

Type of digester	Continuously stirred tank reactor (CSTR) mesophilic fitted with double membrane gas holder with safety pressure
Components	Pre-treatment system for Unsegregated waste and organic waste, Biomass feeding and pump house system, digester, submersible mixers, biogas purification and up-gradation system, digestate handling and recirculation system and pretreatment system, Solid Liquid separator, digester heating features, and fertilizer plant
Substrates	Organic fraction of Municipal solid waste (23 TPD), Poultry litter (7 TPD), Cattle dung (5TPD), and vegetable market waste (5 TPD)
Final Product	1084 kg/day bio CNG and 10000 kg/day fertilizer
Land Area of Sub-project	Available land area for the project is 2 Bigha (13,545.26 sq. m)
Total Estimated Sub-project cost	NPR 182,683,303.82
Safeguard Document to be prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement Category B project

**Current Status of the sub-project:**

- The subproject's overall progress is about 90 percent.
- Electromechanical verification has been completed.
- T&C is planned in January 2022.
- ESIA (with ESMP) has been approved by the WB on 1<sup>st</sup> Mar 2020.
- IEE has been approved on 22 Aug 2021.

**3.9 Itahari Sub-Metropolitan City**

- Plant Size- 30 TPD
- **Location-** The plant location site is Khanar 6, Ward No. 10, Itahari Sub-metropolitan, Sunsari District of Koshi Zone in Eastern Development Region of Nepal. The access to the site is black topped road from the Itahari-Biratnagar highway. The junction to the site is at 2.5 km away from the Itahari chowk and the project site is at 2.4 km from the junction at the bank of Seti River.

• **Salient Features of the Proposed Sub-project**

Name of project	Waste To Energy Project Through Anaerobic Digestion (Biogas) Technology On DBFOOT Basis
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Location	Itahari Sub-Metropolitan City, Khanar, Sunsari, Province 1
Waste Generation	50.39 Tons/day
Collection Efficiency	61 %
Total Waste Collected	30.73 Tons/day
Organic waste	21.01 Tons/day [68 %]
Inorganic waste	9.63 Tons/day [32 %]
Proposed technology	Anaerobic Digestion (Biogas) Technology
Plant capacity	30 TPD
Expected quantity of crude gas per day	1860 m <sup>3</sup> /day
Estimated natural gas per day	1116 m <sup>3</sup> /day
Latitude	26° 38' 12.90419"N
Longitude	87° 17' 38.43424"E
LAND AREA [Approx. Project Site]	4864 m <sup>2</sup> (3 Bigha.)
Project Cost	144,462.00
Safeguard Document to be prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement
	Category B project

**Current Status of the sub-project:**

- The subproject's overall progress is about 90 percent.
- Electromechanical verification has been completed.
- T&C is planned in February 2022.
- IEE has been approved on 16 Aug 2021.
- ESIA (with ESMP) has been approved by the WB on 1st Mar 2020.
- Hydrological Assessment has been forwarded to the WB for clearance.

**3.10 Eastern Star Cooperative P. Ltd**

- **Plant Size- 52 TPD**
- **Location-** The proposed biogas plant sub-project is located at ward no. 2 of Rangeli Municipality of Morang District. Rangeli is south-central municipality of Morang district and the sub-project site is northeast of the Biratnagar city. The proposed part of the sub-project is located on the premises of Eastern Star Agriculture Cooperative Limited at Jaliya. The geographical location of the plant is 26°31'22.93"N and 87°27'2.06"E. The sub-project area lies in the tropical climatic region at an elevation of 66 meters from the mean sea level (msl).

- **Salient Features of the Proposed Sub-project**

Name of sub-project	Biogas Plant Project of Eastern Star Agriculture Cooperative Limited (Waste to Energy Project)
Project Site	Jaliya in the cooperative farm boundary, Rangeli Municipality Ward No. 2, Province No. 1,
Name of the Proponent	Eastern Star Agriculture Cooperative Limited
Altitude	66 m above mean sea level
Temperature	Max 36.7 °C and Min 7.5 °C
GPS Coordinates	26°31'22.93"N and 87°27'2.06"E
Land Area for Project	1 hectare
Type of digester	CSTR
Size of digester	3,500 m <sup>3</sup> of gas per day
Crude Biogas Production (50-60 % CH <sub>4</sub> )	2,080 m <sup>3</sup> /day
Refined CNG (97% CH <sub>4</sub> )	920 kg/day
Fertilizer	7,800 kg/day
End User of Gas	Commercial Sectors like Hotels and restaurants
End User of Compost	Farmers
Project Investment	NPR. 170,518,162.17 (Inclusive of VAT)
Net Present Value (NPV)	NPR 79,055,936.07
Construction Period	9 Months
Safeguard Document prepared during DD	Environmental and Social Impact Assessment (ESIA)with environmental and social mitigation plan (ESMP)– WB Requirement
	Category B project

**Current Status of the sub-project:**

- The subproject's overall progress is about 10 percent.
- Land preparation work has been started.
- T&C is planned in December2022.
- ESIA has been forwarded to the WB for clearance on 12 August 2021,
- Initiated Preparation of IEE Term of Reference (ToR).

**3.11 Dhaulagiri Agro Pvt. Ltd**

- **Plant Size- 52 TPD**
- **Location-** The proposed biogas plant sub-roject is located at ward no. 8 of JitpurSimara Sub-metropolitan City of bara District. JitpurSimara Sub-metropolitan

City is north-western municipality of Bara district and the sub-project site is southwest of the Simara city. The proposed plant of the sub-project is located on the premises of Dhauligiri Natural Herbs and Foods Pvt. Ltd. at Ramauli. The geographical location of the plant is 27°6'30.40"N and 84°58'30.83"E. The sub-project area lies in the tropical climatic region at an elevation of 84 meters from the mean sea level (msl).

- **Salient Features of the Proposed Sub-project**

Name of sub-project	Biogas Plant Project of Dhauligiri Natural Foods and Herbs Pvt. Ltd (Waste to Energy Project)
Location	Jitpur Simara Sub-metropolitan city, Ward No. 8, Province No.2
Sub-project Site	Ramauli in the company's farm boundary
Name of the Proponent	Dhauligiri Natural Foods and Herbs Pvt. Ltd
Altitude	94m above mean sea level
Temperature	Max 38.7 °C and Min 5.5 °C
GPS Coordinates	27°6'30.40" N and 84°58'30.83" E
Land Area for Sub-project	1 hectare
Type of digester	CSTR
Size of digester	3500 m <sup>3</sup> of gas per day
Crude Biogas Production (50-60 % CH <sub>4</sub> )	2080 m <sup>3</sup> /day
Refined CNG (97% CH <sub>4</sub> )	920 kg/day
Fertilizer	7800 kg/day
Total animal dung used	52 TPD
Waste from own farm	40 TPD
Waste from other farms	12 TPD
End User of Gas	Commercial Sectors like Hotels and restaurants
End User of Compost	Farmers
Project Investment	NPR. 171,705,828.41 (Inclusive of VAT)
Construction Period	9 Months
Safeguard Document to be prepared during DD	Environmental and Social Impact Assessment (ESIA) with environmental and social mitigation plan (ESMP)– WB Requirement
	Category B project

**Current Status of the sub-project:**

- The subproject's overall progress is about 10 percent.
- Land preparation has been started.
- T&C is planned in December 2022.

- ESIA has been forwarded to the WB for clearance on 12 August 2021
- Initiated preparation of IEE term of reference (ToR).

## **4. Safeguard Approaches**

### **4.1. EA Category and safeguard policies triggered**

Mini-grid project is classified as EA Category FI and SREP is classified as EA Category B. SREP triggered OP4.01 Environmental Assessment, OP4.04 Natural Habitats, OP4.36 Forest, OP4.10 Indigenous People, OP4.11 Physical Cultural Resources and OP4.12 Involuntary Resettlement. While OP4.36 Forest was not triggered in Mini-grid project, the policy will not be triggered after project restructuring as all 11 sub-projects to be supported under Mini-grid project are not located in forest area and there will be neither impacts on quality of forest nor forest management practices.

### **4.2. Safeguard instruments**

Environmental and Social Assessment (ESA)/Environmental and Social Impact Assessment (ESIA) for all the 11 sub-projects which will be supported under Mini-grid project were already prepared, cleared by the Bank and disclosed in public prior to the start of construction. Each ESA/ESIA includes a section of environmental and social mitigation plan (ESMP) which includes comprehensive mitigation measures associated with identified environmental and social (E&S) risks and impacts, timing of actions, responsibility for implementation & monitoring and cost. The ESMPs for 11 sub-projects will be continued applicable after project restructuring.

In addition, the following plans have been prepared by AEPC and applied for the sub-projects above 100 m<sup>3</sup> and implemented by the developer during construction and operation phase:

- Occupational Health and Safety plan
- Emergency Preparedness and Response Plan
- Traffic Management Plan
- Health and Safety Policy and Plan
- Stakeholder Engagement Plan
- Labour Management Plan
- Gender Equality and Social Inclusion Action Plan
- Substrate Handling and Slurry Management Plan

Though the ESMF of the project incorporates a Resettlement Policy Framework (RPF), the ESMF has discouraged land acquisition and resettlement, thus the possible negative impacts of land acquisition and resettlement are unlikely to occur under the project. All the commercial sub-projects that have managed the land on their own for sub-project through the purchase of private land under willing-buyer-willing-seller method. Similarly, most of the municipal subprojects have also managed land that is under the ownership of the concerned municipality while a sub-project has taken private land under a long-term lease and partnership arrangement. Though the ESMF envisaged the preparation of Vulnerable Community Development Plan (VCDP), the sub-projects have not prepared the document as the ESIA of those sub-projects found no impacts on vulnerable communities, including the indigenous people (Ips).

## 5. Environmental and Social Performance of 11 sub-projects

The following are the key issues which have been identified in the sub-project sites during the latest monitoring period (July 2020 – Aug 2021) as well as the review of sub-project performance in December 2021. These issues and necessary actions to address these issues will be continuously monitored during and after project restructuring.

- Compliance monitoring indicated the EHS compliance issues below:
  - First aid kits were not properly placed
  - Display of sub-project information board and safety signage was not sufficient
  - Proper maintenance of labor log has not been observed
  - Use of PPE was not sufficient
  - Provision of fire extinguishers, hose, buckets and accessories are not enough
  - Installation of perimeter fence at the construction site before construction start
  - Appointment of designated staff for grievance handling and communication with community has been delayed
  - Lack of functional Grievance Redress Mechanism (GRM) at sub-project as grievances are not register in the sub-project.
  - Contractor's Code of conduct –CoC to be displayed at worksite. The CoC to include requirements for workers on sexual exploitation and abuse/sexual harassment (SEA/SH), including a grievance mechanism for contractor's personnel and local communities.
- Not a single COVID-19 infection case recorded in sub-projects and continuous implementation COVID 19 SOPs are recommended.
- It has been difficult to assure implementation of ESMP due to COVID 19 restriction. Field investigation and verification need to be strengthened.
- Proper training and orientation to the sub-project developers, concerned municipalities, engineers and consulting firms must be periodically organized physically (as possible) to sensitize on importance of environmental and social risks and impacts. In particular, specific Capacity Building training regarding handling GRM, Occupational Health and Safety for the dedicated staffs from project and sub-projects is required.
- The GRM system established or to be established in each sub-project needs to be made functional and the stakeholders need to be made aware of such a system- a two-tier GRM system (national and sub-project levels) with GRCs to be in place. AEPC to establish multiple grievance uptake channels (suggestion box, telephone, and email) for grievance registration. Public outreach program to be conducted to inform stakeholders (including workers and communities) about grievance service. All grievances to be recorded in a central grievance excel-sheet to enable tracking and review.
- Stakeholder engagement activities need to be strengthened by incorporating project affected-people, beneficiaries, and local community leaders.

- As required by the ESMF of the project, each sub-project is supposed to prepare a number of safeguard instruments namely Occupational Health and Safety plan, Gender Action Plan, Emergency Management Plan, Labor Management Plan and Health and Safety Policy and Plan. Given that the preparation and implementation of such instruments have been limited to a few sub-projects, the remaining sub-project should be encouraged to fulfill the ESMF requirement.
- Periodic reporting on implementation of the ESA/ESIA needs to be strengthened- the client to provide quarterly monitoring report on ESMP implementation compliance.

## 6. Environmental and social monitoring

Environmental and social mitigation plans were prepared as part of ESAs/ESIAs of 11 sub-projects. These mitigation plans cover both construction and operations phases and define responsibilities, monitoring methods and frequency, location and cost. After project restructuring, Environmental and social mitigation plans will be continuously applied for these sub-projects under Mini-grid project.

## 7. Stakeholder Consultation

Stakeholder consultations were carried out during preparation of the ESAs/ESIAs of 11 sub-projects. Further stakeholder consultations will be conducted during the project life to seek community and stakeholders' feedbacks on sub-project activities. The AEPC has developed a stakeholder engagement plan or SEP which will be followed. To understand the current E&S related issues of the sub-projects, summary report of operational issues from ongoing sub-projects as lesson learned will be prepared which will be valuable insights for 11 subprojects.

The periodic stakeholder consultation meetings were conducted especially in the municipal waste to energy sub-projects with the representative of municipal, ward, CBO, local people and vulnerable people residing near the sub-project site. The environmental and social issues raised during the consultation and response from AEPC are as follow:

<b>Dhangadhi Sub-Metropolitan City (1892 m<sup>3</sup>)</b>	
<b>Conducted on 2075 Baisakh 06 (April 19, 2018)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• Any wastes generated from the industry must be managed within the industry premises. The industry should not pollute environment in any way.</li> </ul>	<ul style="list-style-type: none"> <li>• The locals shall be given preference while employing staffs or labors during construction and operation phase.</li> </ul>



<ul style="list-style-type: none"> <li>• The construction work shall be done with in the defined direct impact zone and as per the construction schedule.</li> <li>• The nearby agricultural lands shall not be impacted by discharging wastewater or disposing solid or semi-solid wastes in nearby land area.</li> </ul>	
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<b>Kamdhenu Gaushala Pvt Ltd Sarlahi (3472 m<sup>3</sup>)</b>	
<b>Conducted on 2075 Ashad 12 (June 26, 2018)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• The project is related to cattle waste (cow dung and buffalo dung) and press-mud and hence may have odor problem in the project premises. Hence, the proponent shall be cautious to reduce such problem.</li> <li>• The waste generated from the project shall not be disposed into nearby areas and <b>Lakhandehi river.</b></li> </ul>	<ul style="list-style-type: none"> <li>• The locals should be given preference of employment, during the construction and operation phase, according to their skills and abilities.</li> <li>• Despite being a commercial project, the biogas and compost produced should be provided with some concessions to the locals.</li> </ul>

<b>Kankai, arjundhara and Birtamod Municipalities</b>	
<b>Conducted on 2075 Bhadra 02 (August 18, 2018) &amp; 2075 Bhadra 29/30 (September 14-15, 2018)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• Participants expressed the concern about the environmental pollution (odor) due to project implementation.</li> </ul>	<ul style="list-style-type: none"> <li>• Possible project employment opportunities.</li> <li>• Opportunities for investment in share in the project.</li> <li>• Support for road and other infrastructure development.</li> <li>• Benefits to the community nearby the project site (e.g subsidy in fertilizers).</li> </ul>

<b>Damak Municipality, Jhapa</b>	
<b>Conducted on 2075 Falgun 22 (March 06, 2019) and 2076 Magh 17 (January 31, 2020)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>

<ul style="list-style-type: none"> <li>• Water pollution of nearby RatuwaKholafrom the slurry discharge from the biogas plant</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunities to the local community for employment</li> <li>• Support in Infrastructure development (e.g road connectivity )</li> <li>• Benefits to the community nearby the project site (e.g subsidy in fertilizers)</li> </ul>
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<b>Ghorahi Sub-Metropolitan City, Dang</b>	
<b>Conducted on 2074 Baisakh 16 (April 29, 2018)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• As the large biogas concept is new to them, they want to know more about safety of the biogas plants.</li> <li>• The construction work shall be done as per defined construction schedule</li> </ul>	<ul style="list-style-type: none"> <li>• The locals shall be given preference while employing staffs or labors during construction and operation phase.</li> </ul>

<b>Kalash Cattle Farming Pvt Ltd., Parsa</b>
Community consultation has not been conducted at this project site. It was agreed to conduct the consultation once the COVID situation normalizes.

<b>Itahari Sub-Metropolitan City, Sunsari</b>	
<b>Conducted on 2075 Ashad 19 (July 01, 2018)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• Any wastes generated from the industry must be managed withintge industry premises. The industry should not pollute environment in any way.</li> <li>• The construction work shall be done as per defined construction schedule</li> <li>• The nearby agricultural lands and river shall not be impacted by discharging wastewater or disposing solid or semi-solid wastes.</li> </ul>	<ul style="list-style-type: none"> <li>• The locals shall be given preference while employing staffs or labors during construction and operation phase.</li> </ul>

<b>Jeevan Bikas Samaj Biogas, Sundari</b>	
<b>Conducted on 2075 Chaitra 13 (March 27, 2019)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>

<ul style="list-style-type: none"> <li>• The proponent or project management unit shall implement mitigation measures to reduce the negative impacts caused by the project.</li> <li>• The nearby agricultural lands shall not be obstructed by discharging slurry to the nearby land.</li> </ul>	<ul style="list-style-type: none"> <li>• The locals should be given preference for employment, during the construction and operation phase, according to their skills and abilities.</li> <li>• The compost produced from the project should be provided to the locals with some concessions.</li> </ul>
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<b>Birendranagar Municipality, Surkhet</b>	
<b>Conducted on 2076 Asoj 02 (September 19, 2019)</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• Regarding the environmental impacts of the proposed sub-project; the settlement does not lie near the sub-project so there is less environmental impacts and the biogas plant industry should be responsible to minimize the adverse environmental impacts.</li> <li>• Suggestion for implementing the sub-project as the sub-project does not have any environmental issues instead the sub-project will manage the municipal and other wastes.</li> </ul>	<ul style="list-style-type: none"> <li>• The locals should be given preference of employment, during the construction and operation phase, according to their skills and abilities.</li> <li>• The compost produced from the sub-project should be provided with priority to the locals</li> </ul>

<b>Dhaulagiri Natural Foods and Herbs Private Limited</b>	
<b>Conducted on April 11, 2021</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• Potential accidental release of gas from the plant.</li> <li>• Impact on health and safety of the worker during the construction and operation of the project.</li> <li>• Impact in and around the environment of the project area due to the odor substrate (cattle dung) and the slurry, byproduct.</li> <li>• Impact on sources of water due to the project.</li> <li>• Quality structures should be constructed considering potential accident.</li> </ul>	<ul style="list-style-type: none"> <li>• The project should be implemented in collaboration and coordination with local government.</li> <li>• Employment opportunities to locals based on their skill.</li> <li>• The project should give priority to the locally available substrates such as grass, grains and cattle dung as per the requirement of project.</li> </ul>

<b>Eastern Star Agriculture Cooperative Ltd</b>	
<b>Conducted on April 11, 2021</b>	
<b>Environmental Issues</b>	<b>Social Issues</b>
<ul style="list-style-type: none"> <li>• Potential accidental release of gas from the plant.</li> <li>• Impact on health and safety of the worker.</li> <li>• Impact in and around the environment of the project area due to the odor from substrate (cattle dung) and the slurry, byproduct.</li> <li>• The wastewater from the plant could mix with water sources.</li> <li>• Quality structures should be constructed considering potential accident.</li> </ul>	<ul style="list-style-type: none"> <li>• Employment opportunities to locals based on their skill.</li> <li>• Biogas and fertilizer shall be available for the local in subsidized cost.</li> </ul>

Response from the PIU to the developers to address the public issue raised during ESIA/ESMP stakeholder consultation are as follows

- Orientation to all the developers on the Environment and Social Management Plan (ESMP) and Environment and Social Impact Assessment (ESIA). During orientation, SREP ESS team have guided them to understand the seriousness of the public issues and urge the developer to conduct regular environment monitoring of the environment and social parameters as per the ESIA and ESMP reports
- SREP ESS team have urged all the developer to enhance the beneficial aspect of the project to the local people and the SREP team periodically followed-up on the implementation of the beneficial activities/actions through the phone conversation/virtual meeting.
- During compliance monitoring, SREP team had randomly interviewed with the local people nearby project area on the public issues raised during ESIA/ESMP and ask them on their satisfaction as per the developer action on it. If the local people are not satisfied by the developer works as per their ESIA commitment then SREP team suggested them to accomplish those ESIA commitments and fulfil the requirement as per the local people expectations.
- In some case, SREP- ESS team had also given counseling to the developer to understand the public issues raised during the stakeholder consultation and its link with the project development and sustainability.

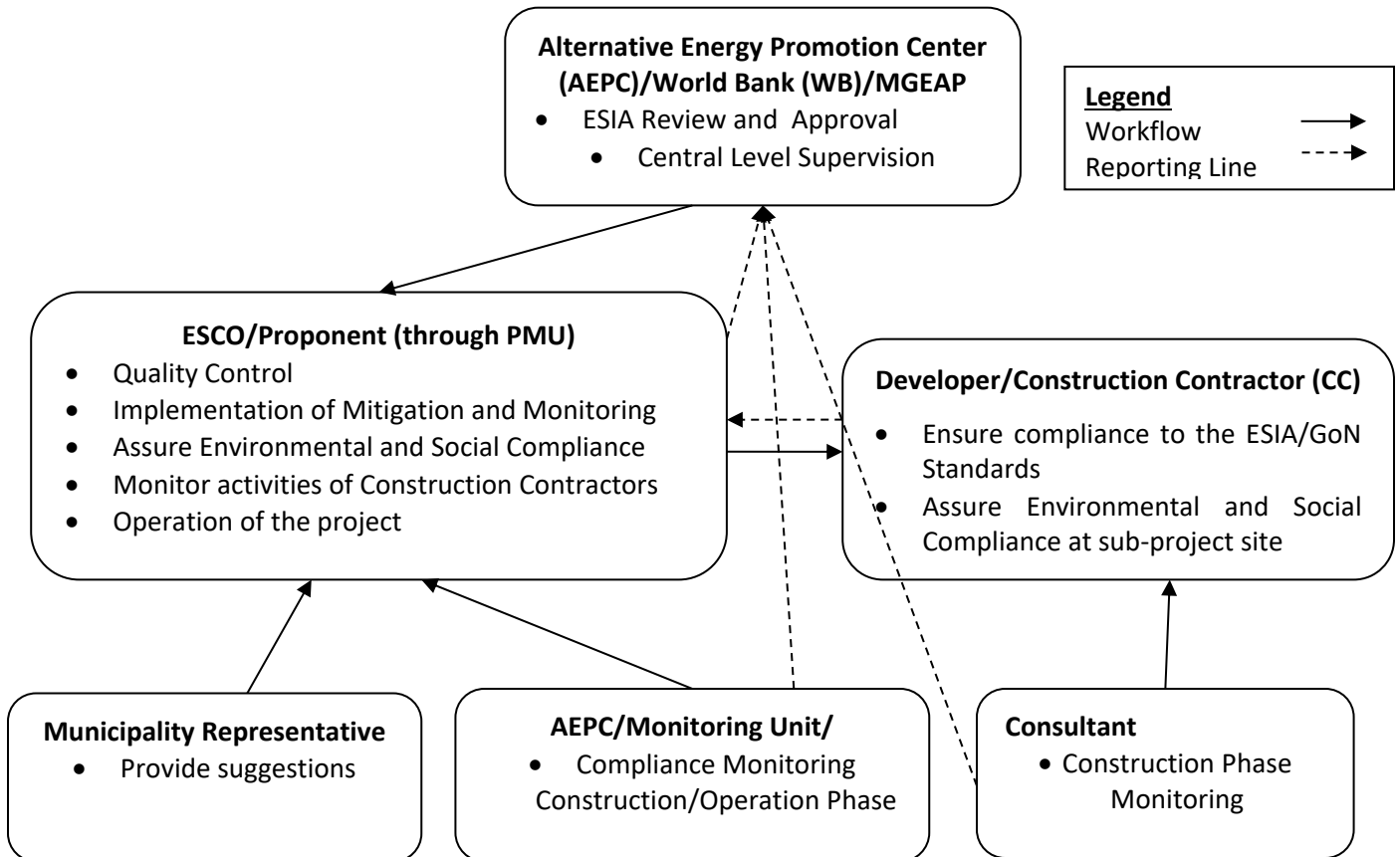
## **8. Institutional arrangement**

## 8.1. Organizational structure to manage E&S risks and impacts

After the project restructuring, the same institutional arrangement to manage environmental and social risk management will be maintained. Overall project environmental and social management is the responsibility of the proponent of the proposed sub-project. AEPC is responsible for E&S compliance monitoring and reporting. Key stakeholders to be involved for project environmental and social management in the hierarchy order are:

- Alternative Energy Promotion Center (AEPC)/World Bank (WB)
- Monitoring Unit of AEPC
- ESCOs/Proponent (through Project Management Unit - PMU)
- Developer and Construction Contractor (CC);
- Representative from Sub-Project Affected Municipality (SPAMR)

The organization structure, and roles and responsibility of each entity to address and manage E&S and Impacts is follows:



## 8.2. Grievance Redressal Mechanism (GRM)

The ESMF has proposed to establish an effective grievance redressal mechanism to address complaints/grievances related to social issues that may arise during the construction and operation of sub-projects. The ESMF envisaged two-tier GRM system with Grievances Redress Committee (GRC), the national level and sub-project level GRCs. The national-level GRC is formed at central/AEPC while each subproject has a subproject level GRC. Standard procedures of the GRM such as registration of all written and oral grievances, investigation of the complaints, development of resolution, and the process of reporting back to complainant have been discussed in the SMF of the project.

### **8.3. Capacity development measures**

Capacity development measures were proposed in each ESA/ESIA and have been implemented at each sub-project level. These capacity development measures will be continued under Mini-grid project. For AEPC to manage the E&S safeguard issue related to biogas activities properly, 100,000NRs./each sub-project will be allocated for the training purposes.

### **8.4. E&S Performance Reporting**

The same E&S reporting requirements and procedures will be followed after restructuring. The AEPC prepares quarterly monitoring reports on ESMP implementation compliance and submit to WB and these reports will be made available to all the stakeholders from the information centre established in subproject area. The monitoring reports will provide the information below but not limited to:

- Overall summary of the ESS activities in the reporting period.
- Overall progress during the reporting period.
- E&S compliance monitoring status during the reporting period.
- Status of ESIA/IEE/GRC (including summary of grievance registered against project, status of pending cases, GRM training, etc.), E&S trainings of the sub-projects.
- Summary information on stakeholder engagement and public outreach activities.
- Issues/challenges/shortfalls experienced during the reporting period.
- Status of agreed actions and actions taken to resolve the issues/challenges/shortfalls.
- Lesson learned.
- Way forward.