

Solar mini-grid site survey form

Version 4, 07 June 2023

Note to surveyor: Please take as many photographs as possible, GPS location tagging for each load centers and videos of the project location specific to the sections in the survey below (for example, solar array location, powerhouse, community centers, public places etc.)



means, take photos



means, record the GPS point(s)



means, use measuring tape

Tools required during survey	Checklist
GPS device	<input type="checkbox"/>
Measuring Tape (>50 meters)	<input type="checkbox"/>
Mobile phones with Camera, Calculator, Angle meter	<input type="checkbox"/>
Pen and notebook	<input type="checkbox"/>
A3 printout of Google map/Field papers with positions, HH orientation, etc., (for easy layout of site details)	<input type="checkbox"/>
Suitable mobile application to find and record sun path diagram for 12 months	<input type="checkbox"/>



Documents to be collected from the site	Checklist
Land permit for solar array erection	<input type="checkbox"/>
Land permit for powerhouse location	<input type="checkbox"/>
Minutes on user committee/local government formation (If applicable)	<input type="checkbox"/>

The following section gathers data about the selected site, community, accessibility, and related information which will be helpful in planning and designing the system and operational modality

Location information					
Project name					
Tole name					
Village					
Ward no.					
Rural municipality/municipality					
District					
Province					
How far is the national grid from the site?	_____Kms				
Which mobile network works best?	<input type="checkbox"/> NTC <input type="checkbox"/> Ncell <input type="checkbox"/> Others: _____				
Name of the client/s <i>Include names of the main local people who contributed to the information on the survey</i>	Phone no.				
1.	1.				
2.	2.				
3.	3.				
4.	4.				
Geographical coordinates of the site	Latitude		Longitude		Elevation
Temperature range	Minimum (°C)		Maximum (°C)		



General information				
Study team				
S.N.	Name	Designation	Phone no.	Signature
1				
2				
3				
User committee/ LG Sub-Committee (user's group) <i>(Information from user committee & local persons interviewed including municipality/ward chairpersons and elected leaders)</i>				
Is the user committee/User's group already formed?		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, name of the user committee: _____ Number of members in the committee: _____ If no, mention the stage/status of user committee & anticipated date for completion of process: _____		
Probable ownership of the SMG <i>(tick all that apply)</i>		<input type="checkbox"/> User committee <input type="checkbox"/> Cooperative <input type="checkbox"/> LG/PG <input type="checkbox"/> Private company		
Probable management of the SMG <i>(tick all that apply)</i>		<input type="checkbox"/> User committee <input type="checkbox"/> Cooperative <input type="checkbox"/> LG/PG <input type="checkbox"/> Private company		
Source of project funds <i>(estimated)</i>		Contribution (NPR)	Remarks <i>(if % share is applicable, indicate here)</i>	
Subsidy (mention name of the organization)				
Total household contribution				
Total enterprise contribution				
PG/LG contribution				
Civil Society Organization Or Third party (private sector) contribution				
Financial institutions-FIs <i>(loan/equity)</i>				
In case of loan from financial institutions (FI)		Interest rate per annum	Term period <i>(years)</i>	
Name of FI-1				
Name of FI-2				
Loan credit experience				
Does the community have prior loan/credit experiences from financial institutions?		<input type="checkbox"/> Yes <input type="checkbox"/> No		
If yes, for what purposes was the loan taken?		1. _____ 2. _____ 3. _____ 4. _____		
Are there any past records for bad debts in the		<input type="checkbox"/> Yes <input type="checkbox"/> No		

community	If yes, give reason for bad debt: <hr/> <hr/>		
Others			
How many schools are there in the community	Higher secondary:		
	Secondary:		
	Lower secondary:		
	Primary:		
How many health posts/Area health centers /Primary health centers are there in the community?			
Does the school and health post have electricity?	Yes <input type="checkbox"/>		No <input type="checkbox"/>
If yes, Source of electricity	Mention:		
Are there any internet service provider in the community?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If yes; Name: _____
			If no; what are options for internet?
Is there any electrical/repair shop nearby?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If yes, mention the distance from the site: _____ Kms
Has any organization provided business sensitization training	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
If yes, Name of the organization			

Site Accessibility						
Name of the road up to the village						
Is the road motorable (From road-head to the village /project site)?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, road type: <input type="checkbox"/> Asphalt coated <input type="checkbox"/> Gravel <input type="checkbox"/> Earthen					
	If no, mention the means of access (E.g., Walking, two-wheeler only etc.):					
If access to the site is NOT motorable	Name of the nearest motorable road from the site: _____					
	Type of vehicle access: <input type="checkbox"/> 22ft truck <input type="checkbox"/> Tractor <input type="checkbox"/> Pickup trucks <input type="checkbox"/> Hand-held tractors					
	Distance from the site to the nearest accessible road: _____ Km					
	Time taken to reach the nearest motorable road (From the site): _____ hours					
	Road type: <input type="checkbox"/> Asphalt coated <input type="checkbox"/> Gravel <input type="checkbox"/> Earthen					
Indicate the months when the site is accessible/not accessible	January	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	February	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	March	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	April	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	May	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	June	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	July	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	August	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>



	September	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	October	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	November	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	December	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
If the location is only accessible by airplane, what is the nearest airport?	Name of the airport: _____ Walking distance from the airport to the site: _____ Km Estimated time for porter to reach the site: _____ hrs.					
Describe directions to the village (for example, landmarks, key directions)	<i>(The purpose of collection of this data is to provide guidance to anyone who wants to reach to the site by enquiring to the villagers, if communications could not be established)</i>					

The following section gather information on the socio-economic factors that will have a great impact on designing the operational modality and design of the solar mini grid.

Socio-economic information					
Demographic information					
Number of households					
Base year population (current)					
Migration rate per year (\pm)					
Seasonal migration (if applicable)		Specify months _____			
Caste/Ethnicity		Households		Population	
Dalit					
Brahmin/Chhetri/Thakuri					
Disadvantage group/differently abled people					
Single woman/widow					
Household (hh) and population					
<i>(Please refer to the ANNEX-I for individual HH survey, use extra sheets if required)</i>					
S.N.	Name of the tole	Number of hhs	Population		Remarks
			Male	Female	
1.					
2.					
3.					
4.					
5.					
6.					
Source of income					
S.N.	Income source	Household involved in such activities (in %)		Average monthly expenditure for lighting purpose per hh	
1.	Agricultural production				
2.	Any unique products				
3.	Jobs/service inside Nepal				
4.	Remittances				

5.	Business/enterprise				
6.	Other				
7.	Below poverty line (<NPR 250/Day)				
Existing enterprises or businesses (Use extra sheets if required)					
S.N.	Name of enterprise/Existing infrastructure Status	Type of products	Annual production capacity	Current energy source	Average yearly income
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
Possible future entrepreneurship/enterprise development after installation of solar mini grid					
S.N.	Name of enterprise	Type of products/service	Annual production/service capacity	Remarks (Capture possibility)	
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
From Enumerator's perspective, is there potential for future enterprise in the community?		<input type="checkbox"/> Yes <input type="checkbox"/> No Reason: <hr/> <hr/>			

The following section gathers information on the electricity demand of the community households including enterprises and public places, vital information for designing the type and size of the system.

Electricity demand and current energy source information						
Current source of electricity (Please also refer to ANNEX-I for individual hh information, please use extra sheets, if required)						
S.N.	Type of energy Source	Nos. of hhs using the energy source	Nos. of enterprise using the energy source	Nos. of institutions using the energy source	Installation Year	Current status (if not functional, state reasons)
1.	Small/Solar Home systems					
2.	Institutional solar power systems					
3.	Pico-hydro/Peltric Set					
4.	Micro/Mini-Hydro power					
5.	Kerosene/petrol/candles					
6.	Diesel generator					
7.	Other sources, please specify					
8.	Jharo					
Average household electricity demand- TYPE A - High demand case (Please use extra sheets, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption - watts (B)	Total power (C=A x B)	Average daily use (hours/day)	Usage hours (Over 24-hour period)
1.	LED lights (High Capacity)					
2.	LED lights (Low capacity)					
3.	Radio					
4.	Mobile charging					
5.	Television					
6.	Direct to Home receiver (DTH)					
7.	Desktop computer/laptop					
8.	Refrigerator					
9.	Water pump					
10.	Fan					
11.	Others					
Total household power demand (kW) $[(\text{Sum "C"})/1000]$						
Average household electricity demand- TYPE B - Low demand case (Please use extra sheets, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption - watts (B)	Total power (C=A x B)	Average daily use (hours/day)	Usage hours (Over 24-hour period)
1.	LED lights					
2.	Radio					
3.	Mobile charging					
4.	Television					
5.	Fans					
6.	Others					
Total household power demand (kW) $[(\text{Sum "C"})/1000]$						
School/college power demand (Please use extra sheets, if required)						
S.N.	Appliances	Quantity (A)	Estimated power	Total	Average daily use	Usage hours

			consumption - watts (B)	power (C=A x B)	(hours/day)	(Over 24-hour period)
1.	LED lights					
2.	Desktop computer/laptop					
3.	Mobile charging					
4.	Television					
5.	Printers					
6.	Projector					
7.	Water pump					
8.	Others					
Total school power demand (kW) $[(\text{Sum "C"})/1000]$						
Health post/hospital power demand (Please use extra sheets, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption - watts (B)	Total power (C=A x B)	Average daily use (hours/day)	Usage hours (Over 24-hour period)
1.	LED Lights					
2.	LED lights for OT room					
3.	Desktop Computer/Laptop					
4.	Mobile charging					
5.	Refrigerator/Vaccine fridge					
6.	Printers					
7.	Sterilization unit					
8.	Infant radiant warmer/Heater unit					
9.	Suction pump					
10.	Water pump					
11.	Others					
Total health post power demand (kW) $[(\text{Sum "C"})/1000]$						
Municipality power demand (Please use extra sheets for each category, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption -Watts (B)	Total power (C=A x B)	Average daily use (Hours/Day)	Usage hours (Over 24-hour period)
1.	LED Lights					
2.	Desktop Computer/Laptop					
3.	Mobile charging					
4.	Printers					
5.	Water pump					
6.	Others					
Total power demand (kW) $[(\text{Sum "C"})/1000]$						
Ward office power demand (Please use extra sheets for each category, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption - Watts (B)	Total power (C=A x B)	Average daily use (Hours/Day)	Usage hours (Over 24-hour period)
1.	LED Lights					
2.	Desktop Computer/Laptop					
3.	Mobile charging					
4.	Printers					
5.	Water pump					

6.	Others					
Total power demand (kW) [(Sum "C")/1000]						
Police station power demand (Please use extra sheets for each category, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption -Watts (B)	Total power (C=A x B)	Average daily use (Hours/Day)	Usage hours (Over 24-hour period)
1.	LED Lights					
2.	Desktop Computer/Laptop					
3.	Mobile charging					
4.	Walkie talkie					
5.	Printers					
6.	Water pump					
7.	Others					
Total power demand (kW) [(Sum "C")/1000]						
Existing Industry/Enterprise power demand (Please use extra sheets, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption -Watts (B)	Total power (C=A x B)	Average daily Use (Hours/Day)	Usage hours (Over 24-hour period)
1.	Agro-processing					
2.	Saw-mill					
3.	Mechanical/Grill workshop					
4.	Automobile workshop					
5.	Tailoring business					
6.	Shops					
7.	Hotels					
8.	Private clinics					
9.	Telecom towers					
10.	Cold storage					
11.	Banks/ FIs					
12.	Others					
Total power demand (kW) [(Sum "C")/1000]						

Other public power demands (Please use extra sheets, if required)						
S.N.	Appliances	Quantity (A)	Estimated power consumption -Watts (B)	Total power (C=A x B)	Average daily use (Hours/Day)	Usage hours (Over 24-hour period)
1.	Streetlights					
2.	Community centers					
3.	Temples/mosques/Church/ Monastery					
4.	Community water pumps					
5.	Others - 1					
6.	Others - 2					
Total power demand (kW) [(Sum "C")/1000]						

Cumulative electricity demand from the community					
S.N.	Users	Quantity (A)	Estimated power demand (kW) (B)	Total power (C=A x B)	Usage hours (Over a 24-hour period)
1.	Households				
2.	School/College				
3.	Health post/Hospital				
4.	Municipality				
5.	Ward office				
6.	Police station				
7.	Existing & future industry/enterprise				
8.	Other public power demand				
9.	Others, if any				
Total power demand (kW)					

The following section gathers information to access solar PV potential and assessment of location used for designing and installation of solar mini grid at the given location.

Assessment for Solar Mini-grid design				
Solar Photovoltaic energy assessment				
S.N.	Parameters	Value		Remarks
1.	Average number of sunshine days	Month	Sunshine days	
		January		
		February		
		March		
		April		
		May		
		June		
		July		
		August		
		September		
		October		
		November		
		December		
2.	Average hours of sunshine/day	Winter_____	Summer_____	
3.	Are there any obstacle in the horizon during sunshine hours throughout the year or on seasons?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	

Solar Array and Powerhouse location

Identify the location for solar panel considering the following criteria: -

- South facing land with maximum sunlight
- Free from tall trees, buildings, and hills (no shading)
- Safe from landslide and floods
- Near the powerhouse
- The powerhouse must be chosen in such a way that it lies close to the village/load centers and approximately at the center of the village (Advocate the community on benefits and risk of having powerhouse at one end of the village)

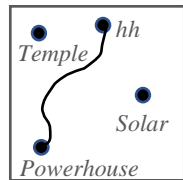
S.N.	Parameters	Value	Remarks
Solar PV array location			
1.	Is the feasible land area available	Yes <input type="checkbox"/> No <input type="checkbox"/>	
2.	Type of land	Private <input type="checkbox"/> Public <input type="checkbox"/>	
3.	Total land area available (M ²)		
4.	Land facing direction (if applicable)	E <input type="checkbox"/> W <input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/>	
	Azimuth angle	_____°	
5.	Commitment letter from landowner permitting use of land for the project	Done <input type="checkbox"/> Not done <input type="checkbox"/>	
6.	In case of lease, land lease agreement tenure?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
	If yes, agreement timeline (in years)	_____ Years	
	Land lease amount/ Year	_____ NPR/Year	
7.	Exact PV array location	Pictures Taken <input type="checkbox"/> Not taken <input type="checkbox"/>	
8.	GPS coordinates of the exact array location	_____ N _____ E	
9.	Free from shading from all directions	Yes <input type="checkbox"/> No <input type="checkbox"/>	
10.	Proposed land features	Slopy area <input type="checkbox"/> ~Slope _____° Flat/inclined land <input type="checkbox"/> Damp area <input type="checkbox"/> Rocky area <input type="checkbox"/> Others (Mention) <input type="checkbox"/>	
11.	Any noticeable wind blowing observed? Describe, if any mishaps occurred due to extreme wind in the past.	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Describe location identification marks (school, temple, pond, public center etc.), if applicable			
Powerhouse location			
1.	Distance of powerhouse from the solar array location (<i>It is mandatory that PH must be located near the PV array location</i>)	_____ Meters	
2.	Total area allocated for powerhouse	_____ M ²	
3.	Powerhouse location features	Slopy area <input type="checkbox"/> ~Slope _____° Flat land/Inclined <input type="checkbox"/> Damp area <input type="checkbox"/> Rocky area <input type="checkbox"/> Others (Mention) <input type="checkbox"/>	
4.	Commitment letter from landowner	Done <input type="checkbox"/> Not done <input type="checkbox"/>	

Other details				
(Use extra sheets, if required)				
S.N.	Parameters	Value		Remarks
1.	Total nos. of poles (Estimated)	1-Phase: _____	3-Phase: _____	
2.	Transmission and distribution line length (Estimated)	1-Phase: _____ Kms	3Phase (400V/11kV) _____ Kms	
3.	Total transmission and distribution line length	_____ Meters		
4.	Recommended Cable type	ACSR _____ Kms	ABC _____ Kms	
5.	Proximity to the nearest national grid	_____ Kms		
6.	Is there a possibility of NEA grid expansion in the near future?	If yes: _____ anticipated Month/Year		
7.	Required number of transformers, If applicable			
8.	Other identified issues (if any)			



Sketch the overall project layout including solar array location, powerhouse, transmission line along with load points, enterprise, public places, identification landmarks, rivers, and road crossings etc.

For example



North

Annex-I

Focused group discussion and questionnaire					
S.N	Parameters	Value			Remarks
1.	How can the community/LG contribute	Cash <input type="checkbox"/>	Kind <input type="checkbox"/>	Others <input type="checkbox"/>	
2.	Where would be the most suitable location for powerhouse and solar PV array	1. _____ 2. _____ 3. _____			
3.	What kind of enterprise development (local business opportunities) is possible after installation of the mini grid?	1. _____ 2. _____ 3. _____ 4. _____			
4.	Is the community willing and able to pay certain % of upfront project cost? (Note down all the perspectives received)				
5.	Who are other potential financial contributors in the village (upfront cost)	PG <input type="checkbox"/>	LG <input type="checkbox"/>	Existing enterprise <input type="checkbox"/>	Others(mention) <input type="checkbox"/>
	If yes, how much can/will they invest/provide	Up to 20% <input type="checkbox"/>	>20%(mention) _____	Other % (mention) _____	Cash _____NPR
6.	Is there a possibility of grid extension in next 5 years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
	If yes, note down relevant discussion points				
7.	Are there any conflicts in the past, between the communities (Provide reasons and examples)				
8.	Is LG ready to own the system or allocate the budget for O &M, or provide service contract after guarantee period (Consult with LG)	Yes <input type="checkbox"/>			No <input type="checkbox"/>
9.	Which business model does the community prefer?	User committee <input type="checkbox"/>			Cooperative <input type="checkbox"/>

Follow up assessment questionnaire (Only for Enumerator's response)						
Appraisal of enabling environment						
Items	Excellent	Very Good	Good	Fair	Poor	comments
General interest in solar mini grid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Understanding of safety measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Understanding about tariff mechanism and payment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Understanding of need for O & M fund	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Understanding about PEU possibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Aptitude for ownership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ease in adaptation of RE technology (prior experience)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low/no conflict in adapting new technology among the community members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Favorable social and political conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Community driven initiatives seen prevalent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Relevancy of SMG at the proposed site (mention)						

Annex- II

Labor cost				
S.N.	Type of Labor	Available at site (Yes/No)	Rate (NPR/day)	Remarks
1.	Unskilled			
2.	Skilled (Mason)			
3.	Solar technician/Electrician			
4.	People with basic computer skills			
5.	Porter			

Construction materials cost				
S.N.	Materials	Place of availability and distance from site (km)	Rate/unit	Comments
1.	Stone			
2.	Brick			
3.	Sand			
4.	Aggregate			
5.	Bamboo			
6.	Wood			
7.	Cement (53 grade, OPC/PPC)			
8.	Steel bar/TMT rod			
9.	Binding wire			
10.	Diesel cost			
11.	Others			

Additional information	
Remarks (any other relevant information)	

Name of the Consultant:	Name of the community representative:
Date:	Date:
Signature:	Signature:
Phone Number:	Phone Number: