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January 9, 2025

# Site Assessment Report

Site Assessment Report for installation of 3kWh Solar PV System under Bardo & Goshing Gewog under Zhamgang Dzongkhag

## Project Background

The Department is currently implementing an ADB-funded solar project aimed at distributing 3 kWp solar PV systems to 305 households across Dagana, Lhuntse, and Pemagatshel in its first phase. Under the second phase, 200 solar PV systems will be distributed in Zhemgang Dzongkhag, with a focus on Bardo and Goshing Gewog due to its high Multidimensional Poverty Index (MPI) rank of 50.78%, as per data provided by the National Statistics Bureau (NSB) and officials from the Department of Energy (DoE) and Bhutan Power Corporation (BPC) conducted a joint field survey in Bardo and Goshing Gewog under Zhemgang Dzongkhag as part of the second phase of the ADB-funded solar project and the our visit was accompany by the head of the village (Tshokapa) for the each and every chiwog.

## Selection Basis

Considering the tight project implementation timeline, the selection of villages and households was guided by the following criteria:

i. Clustered nature of households to ensure efficient resource allocation and reduced installation time.

ii. Accessibility to roads, electricity, and network coverage to facilitate logistics, installation, and monitoring.

## Summary of Household Site Assessments in Bardo Gewog

### Bardo Chiwog

i. A total of 71 households were assessed, excluding double houses and vacant houses (Gungtong), as listed attached. One household from Shingkhar Gewog staying in Samath village, was not included, if this household included it would make the 72 households in Bardo Chiwog.

ii. All the villages in this chiwog are connected with the grid, providing them with access to electricity.

iii. The network coverage for mobile services is reliable, with 4G connectivity available through both BT and TC networks.

iv. Most households are located near road heads, with easy access to roads.

v. Cardamom serves as the main cash crop, while maize is primarily grown for food consumption.

vi. Based on site assessments, we recommended 48 households out of 71 households to conduct the site assessment for solar PV installation for detailed assessment.

### Langdhurbi Chiwog

i. A total of 66 households were assessed, excluding double houses and vacant ones (Gungtong), as detailed in the attached list. The assessment identified two families living together in a single house.

ii. All villages in Langdhurbi Chiwog have access to grid electricity, ensuring reliable power supply for all households.

iii. Connectivity to mobile networks is available through 3G and 4G, with both BT and TC networks offering coverage across the villages.

iv. Every household in the chiwog has access to a motorable road, ensuring smooth transportation.

v. Households have cardamom and oranges as cash crops and grow maize as their main food crop. However, some households don't have either of these crops.

vi. Based on site assessments, we recommended 30 households out of 66 households to conduct the site assessment for solar PV installation for detailed assessment.

### Digala Chiwog

i. The team carried out site assessments for 51 households across 24 villages, ranging from one household in smaller settlements to a maximum of nine households in others.

ii. All the villages within Digala Chiwog have access to grid electricity, ensuring all households are connected to the power grid.

iii. Connectivity to mobile networks is available through 3G and 4G, with both BT and TC networks offering coverage across the villages.

iv. In terms of road access, all villages except Rilangbi, which requires a 10-minute uphill walk, are reachable by motorable roads.

v. Most households generate cash income from growing oranges, while maize is cultivated for food.

vi. Out of the 51 households assessed for solar PV systems, 38 were recommended for detailed assessment.

### Phulabi Chiwog

i. A total of 18 households were assessed, excluding double houses and vacant houses, as outlined in the attached list. Four households are located below the road, with access from the gewog feeder road.

ii. All villages in this chiwog are connected to the national grid, providing consistent electricity access for every household.

iii. In terms of network coverage, three households are connected through 2G TashiCell, while the rest of the households have 3G/4G connectivity from both BT and TashiCell.

iv. All villages in Phulabi are accessible via motorable roads.

v. The primary livelihood source for almost all households is maize cultivation for food, with oranges being the main cash crop.

vi. Based on site assessments, we recommended all the 18 households for detailed assessment solar PV installation.

### Khomshar Chiwog

i. A total of 135 households were assessed, excluding double houses and vacant houses (Gungtong), as detailed in the attached list. One of the households consists of two families living together in a single dwelling.

ii. All villages in this chiwog are connected to grid electricity, ensuring every household has access to reliable power.

iii. For network coverage, 65 households are connected via 3G and 4G services from TashiCell, while the remaining households are either connected through both 4G and 3G via BT and TC networks or BT alone.

iv. All villages have motorable roads, with distances ranging from 1 to 3 kilometers from the village center.

v. Most households rely on cardamom and orange cultivation for cash income, while they grow paddy and maize as main foodcrop.

vi. Based on site assessments, 70 households were recommended for solar PV installation, with other households excluded due to issues such as distance from installation sites, network coverage problems, and shading concerns.

## Summary of Household Site Assessments in Goshing Gewog

### Budheshi Chiwog

i. A total of 16 households were assessed, excluding double houses and vacant houses (Gungtong), as detailed in the attached list.

ii. All households in this chiwog are connected to the national grid, providing access to reliable electricity.

iii. In terms of network coverage, seven out of the 16 households are connected to both BT and TC for 4G services, while the remaining households are connected to 4G via TashiCell.

iv. All the villages in this chiwog are accessible via motor able roads, ensuring good connectivity.

v. The primary food crop in the area is maize, and there are no other identified cash crops.

vi. The chiwog is considered to have the highest number of households living below the poverty line compared to Bardo Gewog, which has influenced recommendations for solar PV installation based on the poverty levels in the area. We have also found two villages in the chiwog making total household 14 nos and the team recommended 30 households for further carry out site assessment.

### Lamtang Chiwog

i. The site assessments covered a total of 32 households, excluding double houses and vacant ones (Gungtong), as reflected in the attached list.

ii. All the households in Lamtang Chiwog have access to grid electricity, ensuring a stable power supply.

iii. The chiwog is well covered by BT's 4G network, providing strong mobile connectivity throughout.

iv. All the villages in the chiwog are connected by motorable roads, ensuring easy transportation access.

v. They grow oranges as the main cash crop in Lamtang, and calculate maize as main food crops.

vi. Based on the assessments, the majority of households in this chiwog are found compared to other villages in the chiwog.

### Samcholing/Lingmapong Chiwog

i. A total of 47 households were assessed, with 20 households in Samcholing and 27 in Lingmapong, excluding double houses and vacant houses (Gungtong), as listed.

ii. All villages in both Samcholing and Lingmapong have access to grid electricity, ensuring each household has power.

iii. The chiwog is well covered by BT's 4G network, providing strong mobile connectivity throughout.

iv. All the villages in this area are also accessible via motorable roads, ensuring ease of movement.

v. In terms of livelihood, 13 out of the 27 households in Lingmapong grow oranges as their cash crop, while the rest cultivate maize for food.

vi. Most households in these villages are above the poverty line compared to other chiwog.

### Lechibi Chiwog

i. The site assessments in Lechibi Chiwog were conducted for a total of 35 households, excluding double houses and vacant houses (Gungtong), as detailed in the attached list.

ii. All the villages in Lechibi are connected to the grid, providing electricity to each household.

iii. The area has good network coverage, with 4G connectivity from both Tashi Cell and BT, ensuring reliable mobile services.

iv. All villages in the chiwog are accessible by motorable roads.

v. The main livelihood source is the cultivation of oranges as a cash crop, and maize is grown for food.

vi. Compared to Bardo Gewog, almost all households in Lechibi are above the poverty line.

Submitted for further information and necessary action.



22nd December, 2024

# Decision on Field Survey

Decision on Field Survey Conducted at Bardo Gewog conducted from 11th to 22nd, December 2024.

The officials from the Department of Energy (DoE) and Bhutan Power Corporation (BPC) conducted a field survey in Bardo Gewog under Zhemgang Dzongkhag as part of the second phase of the ADB-funded solar project.

The survey team informed the Gup of the following:

## Project Background:

* The Department is currently implementing an ADB-funded solar project aimed at distributing 3 kWp solar PV systems to 305 households across Dagana, Lhuntse, and Pemagatshel in its first phase.
* under the second phase, 200 solar PV systems will be distributed in Zhemgang Dzongkhag, with a focus on Bardo Gewog due to its high Multidimensional Poverty Index (MPI) rank of 50.78%, as per data provided by the National Statistics Bureau (NSB).

## Selection Basis:

considering the tight project implementation timeline, the selection of villages and households was guided by the following criteria:

* Clustered nature of households to ensure efficient resource allocation and reduced installation time.
* Accessibility to roads, electricity, and network coverage to facilitate logistics, installation, and monitoring.

## Summary of Household Site Assessments in Bardo Gewog

### Bardo Chiwog

* a total of 71 household site assessments were conducted, excluding double houses and vacant houses (Gungtong), as detailed in the attached list.
* an additional household from Samath village, belonging to Shingkhar Gewog, was included, bringing the total to 72 households.

### Langdhurbi Chiwog

* a total of 68 household site assessments were conducted, excluding double houses and vacant houses (Gungtong), as per the attached list.
* two families residing in the same house were identified during the assessment.

### Digala Chiwog

* a total of 51 household site assessments were completed, excluding double houses and vacant houses (Gungtong), as documented in the attached list.

### Phulabi Chiwog

* A total of 18 household site assessments were carried out, excluding double houses and vacant houses (Gungtong), as reflected in the attached list.

### Khomshar Chiwog

* A total of 135 household site assessments were performed, excluding double houses and vacant houses (Gungtong), as per the attached list.
* One instance of two families residing in the same house was identified.

The Gewog administration has agreed to the decisions made by the survey team, ensuring the alignment of project objectives with community needs and logistical considerations.

