RAP and LRP for RUMSL's 1500 MW Solar Park Project and associated infrastructure across Neemuch, Agar and Shajapur

Final Report-Volume II A Neemuch Solar Park (Units 1, 2 & 3)

03 May 2021

Project No.: 0528741

www.erm.com

The business of sustainability

ERM

Document details	The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.
Document title	RAP and LRP for RUMSL's 1500 MW Solar Park Project and associated infrastructure across Neemuch, Agar and Shajapur
Document subtitle	Final Report-Volume II A Neemuch Solar Park (Units 1, 2 & 3)
Project No.	0528741
Date	03 May 2021
Version	2.1
Author	ERM India Private Limited
Client Name	Rewa Ultra Mega Solar Limited (RUMSL)

Document history

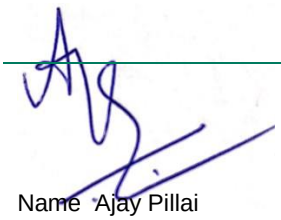
				ERM approval to issue		
Version	Revision	Author	Reviewed by	Name	Date	Comments
Draft	1.0	Aritra Chakrabarty; Shruti Srikanth	Sumati Bhatia Rutuja Tendolkar Akshita Misra	Neena Singh	30 January 2021	Draft for Client
Draft Final	2.0	Aritra Chakrabarty; Shruti Srikanth Akshita Misra	Sumati Bhatia Rutuja Tendolkar	Ajay Pillai	22 April 2021	Draft final for disclosure
Final	2.1	AAkshita Misra	Sumati Bhatia Rutuja Tendolkar	Ajay Pillai	03 May 2021	Final RAP

Signature Page

03 May 2021

RAP and LRP for RUMSL's 1500 MW Solar Park Project and associated infrastructure across Neemuch, Agar and Shajapur

Final Report-Volume II A Neemuch Solar Park (Units 1, 2 & 3)



Name Ajay Pillai
Job title Partner In Charge

Name Rutuja Tendolkar
Job title Principal Consultant

ERM India Private Limited

3rd Floor, Building 10 B

DLF Cyber city,

Gurgaon - 122 002

Tel:-0124-4170300

CONTENTS

List of Tables

List of Figures

Acronyms and Abbreviations

Name	Description
AGOL	ArcGIS Online
DC	District Collector
DEM	Draft Entitlement Matrix
DRO	District Revenue Officer
EMC	External Monitoring Consultant
ESF	Environmental and Social Framework, 2018 (of the World Bank)
ESIA	Environmental and Social Impact Assessment
ERM	ERM India Private Limited
ESMPF	Environmental and Social Management Policy Framework
GoMP	Government of Madhya Pradesh
Ha	Hectares
HoH	Head of Household
IFC	International Finance Corporation
L&A	Land and Asset
LRP	Livelihood Restoration Plan
MPLRC	Madhya Pradesh Land Revenue Code
MPNRED	Madhya Pradesh New and Renewable Energy Department
MW	Mega Watt
NSP	Neemuch Solar Park
PAE	Project Affected Entity
PAH	Project Affected Household
PAP	Project Affected Persons
PGCIL	Power Grid Corporation of India Limited
PMC	Project Management Contract
PRC	Principal Revenue Commissioner
'PS	Performance Standards, 2012 (of the IFC)

Name	Description
PWD	Public Works Department
RAP	Resettlement Action Plan
RFCTLARR	Right to Fair Compensation and Transparency in Land Acquisition, Resettlement and Rehabilitation
RUMSL	Rewa Ultra Mega Solar Limited
SDO	Sub Divisional Officer
SGURR	SgurrEnergy India
SLR	Superintendent of Land Records
SPD	Solar Project Developers
WB	World Bank

EXECUTIVE SUMMARY: NEEMUCH SOLAR PARK

Preamble

Rewa Ultra Mega Solar Limited (RUMSL) has been authorized by the Ministry of New and Renewable Energy Development (MNRED) to develop three solar parks (including internal power evacuation infrastructure and associated transmission lines) with an aggregate capacity of 1500 MW (hereafter referred to as the Project or the 1500 MW Project). This includes the 500 MW Neemuch Solar Park in Singoli Tehsil, Neemuch District of Madhya Pradesh (the Project).

The World Bank (WB) intends to finance the Project and/or its associated facilities whereas the International Finance Corporation (IFC) is providing transaction advisory to RUMSL to implement a competitive bidding and tender process to support the development of the Project.

In order to align the Project to the requirements of the WB and IFC; RUMSL appointed ERM India Private Limited (ERM) to undertake an Environmental and Social Impact Assessment (ESIA) of Neemuch Solar Park and its associated facilities. The scope of the ESIA includes two technical studies, i.e. the Resettlement Action Plan and Livelihood Restoration Plan (RAP&LRP) and the Development of the approach and strategy to undertake Free, Prior and Informed Consent (FPIC), which includes an Indigenous Peoples Development Plan (IPDP).

Volume I is the overarching RAP & LRP for the 1500 MW Project and its power evacuation infrastructure. This document (Volume II A) is a companion document to Volume I which summarises the consolidated outcome of the resettlement surveys undertaken for Neemuch Solar Park in order to provide an overview of the profile of affected communities and describe involuntary resettlement impacts. The transmission line for Neemuch Solar Park is covered as part of Volume II-D.

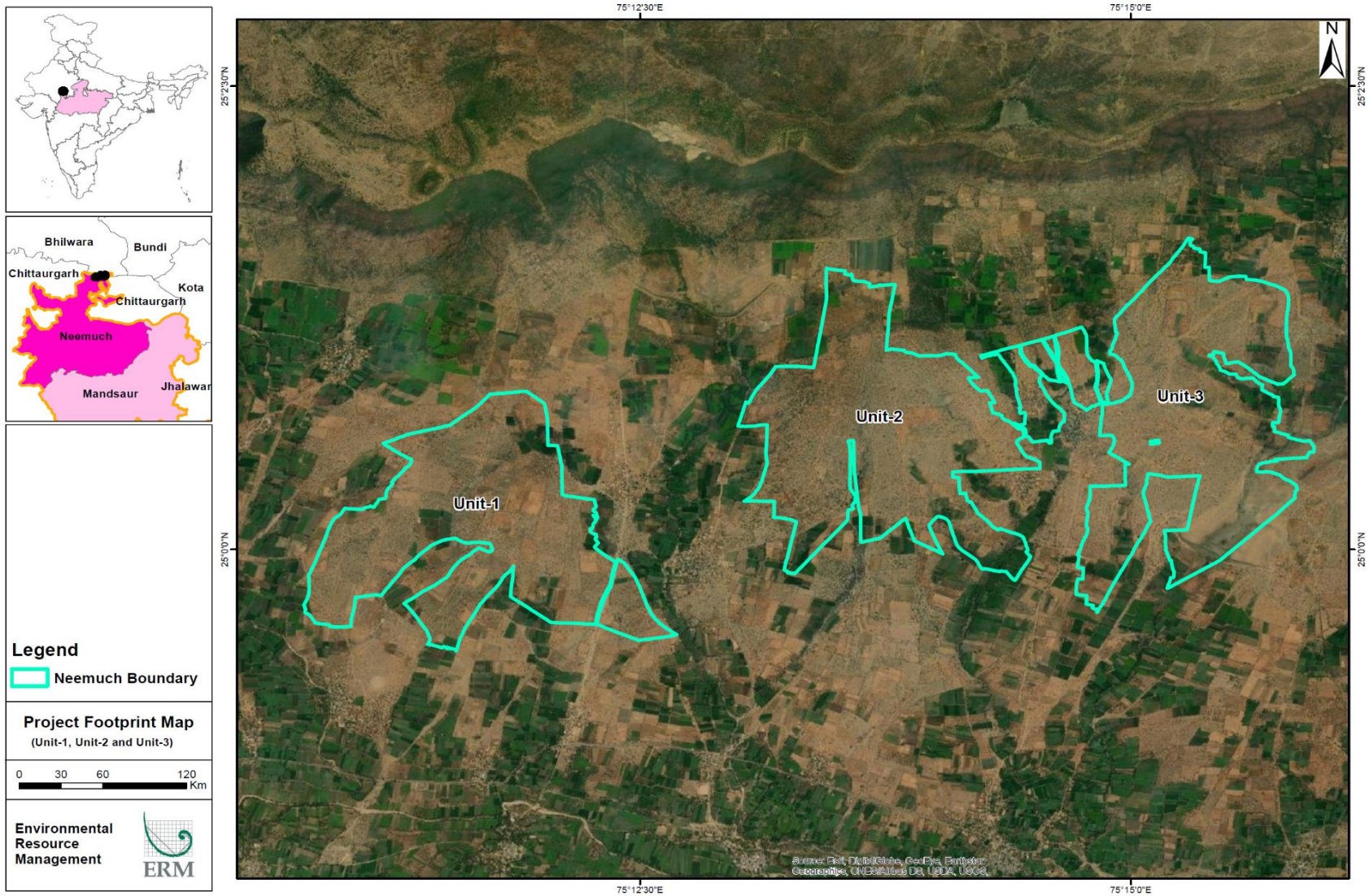
Project Overview

The following table summarises salient features of the Neemuch Solar Park. This is followed by an overview of the project layout, key project development timelines as of March 2021, the land footprint, and specific impact avoidance and mitigation that was undertaken to optimize the layout.

Table 0.1 Salient Features: Neemuch Solar Park: 500 MW

S. No.	Particulars	Description		
		Unit 1 (160 MW)	Unit 2 (170 MW)	Unit 3 (170 MW)
1.	Project Village Location	Bardawada and Kawai	Kawai and Badi	Badi
2.	Capacity	160 MW	170 MW	170 MW
3.	Pooling State and Power Evacuation	Three Pooling substations of 33/220 kV (PSS), one in each Unit; Power evacuation through proposed 220/400 kV ISTS substation of PGCIL at Badi village located north of Project site		
4.	Site Conditions	Flat land with minimal vegetation cover, rocky surface and light soil condition. There is agricultural activity in private/patta khasras and the government khasras that have been under informal use through encroachment/squatting.		
5.	Land Area Required and (Allotted) for Solar Park	351.50 ha (357.918 ha)	347.08 ha (362 ha)	367.07 ha (372.78 ha)

Figure 0-1 Overview of Neemuch Solar Park Layout



Key Project Development Timelines

As of March 2021, the following activities have been undertaken for the planning and development of Neemuch Solar Park:

- ***Site Selection***: The Project location was selected within Singoli tehsil by RUMSL during 2016-2017. These potential project areas were thereafter discussed and finalised through workshops between RUMSL, potential lenders and third party consultants (engaged to undertake a preliminary environmental and social baseline of identified land areas); further to which the process of formal land allotment was initiated based on the MP Solar Policy, 2012 and MP Land Revenue Code, 1959 from March 2017;
- ***Environmental and Social Baseline and Scoping***: An E&S baseline review was undertaken in May-June 2019 which was prepared in August 2017 followed by a scoping visit in September 2018 to assess environmental and social sensitivities;
- ***DPR and Project Layout Finalisation:*** RUMSL engaged third party consultants to finalise the project layout as well as the detailed project report (DPR) with the technical details concurrently with the initial activities associated with a parallel Environmental and Social Impact Assessment (ESIA) process. The Final Project Layout was finalised in June 2020 and the associated DPR was finalised in September 2020;
- ***Environmental and Social Impact Assessment (ESIA) and Resettlement Scoping***: ERM undertook site visits from 19 to 22 November, 30 Nov-3 December (Resettlement Scoping) and 19 to 25 December 2019 to undertake the ESIA study. Iterative activities during the ESIA development and resettlement scoping phase also helped to suggest avoidance and impact minimization measures;
- ***Boundary Demarcation Process***: The boundary demarcation exercise was initiated by the revenue department in August-September 2020;
- ***Resettlement Surveys***: The RAP and LRP related site visit was undertaken from 30th November up to 10th December 2020, based on which this report has been prepared
- ***Land Procurement and Land Access***: Further to the land allotment process, RUMSL will initiate land procurement and land access in accordance to the Madhya Pradesh Mutual Consent-based Land Purchase Policy (2014). As of March 2021, preparatory activities associated with land procurement are understood to have commenced through the Singoli Tehsil authorities;
- ***Bid Process for the Neemuch Solar Park***: To be completed;
- ***Construction work***: Timeline to be determined basis the completion of the bid process; and
- ***Indicated Commercial Operations Date (CoD)***: To be Decided.

Land Footprint for Neemuch Solar Park

The following table summarises the total land footprint for Neemuch Solar Park across the three (3) affected villages as well as by type of land ownership:

Table 0.2 Village Wise Land Requirement for the Project (ha)

Unit	Village	Government land (NRED Allotted and Newly Identified) - Ha	Private Land (Ha)	Patta Land (Ha)	Total Land (Ha)
Unit 1	Bardawada	201.83	5.1	50.7	**257.63**
	Kawai	89.62	4.25	0	**93.87**

Unit	Village	Government land (NRED Allotted and Newly Identified) - Ha	Private Land (Ha)	Patta Land (Ha)	Total Land (Ha)
Unit 1 Sub-Total (Ha)		**291.45**	**9.35**	**50.7**	**351.5**
Unit 2	Kawai	156. 1	0	22.41	**178.51**
	Badi	163.28	1.74	3.6	**168.62**
Unit 2 Sub-Total (Ha)		**319.38**	**1.74**	**26.01**	**347.13**
Unit 3	Badi	351.71	10.36	5	**367.1**
Unit 3 Sub-Total (Ha)		**351.71**	**10.36**	**5**	**367.1**
Grand Total (Ha)		**962.49**	**21.44**	**81.72**	**1065.73**

Source: RUMSL, June 2020

As indicated above, of the total land requirement of 1065.73 ha; 103.16 ha or 9.6% is comprised of land under private and/or patta title (which convers Bhumiswami rights[1] to titleholders under the MP Land Revenue Code, 1954 as amended). The balance government land identified in the villages across Units 1, 2 and 3 of the Solar Park comprise mostly of land classified as Charnoi, Charagah and Germumkin. These land categories are included in the Nistar Patrak[2] data of each village implying common property resources and collective dependence; primarily firewood collection as well as open grazing.

While open grazing of livestock is permitted, two other types of informal use of government land are also apparent:

- Encroachment of government land by private/patta land owners in the immediate vicinity of their khasras for agricultural use;
- Informal users or squatters who have occupied government land (including charnoi/charagah/kabil kast) for agricultural use or homestead area or creation of fodder lots who may or may not have private/patta land.

Further to the completion of the land allotment, private/patta land procurement and physical land access and the concurrent change of ownership; RUMSL will allot the required land to selected solar park developers (SPD) through a lease process.

Avoidance and Impact Minimization

The following table documents impact avoidance and minimization undertaken for Neemuch Solar Park based on confirmed land footprint and therefore are excluded from resettlement impacts. This has led to an overall reduction of the land requirement by 27 ha:

Table 0.3 Impact avoidance undertaken by village

Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
Unit 1	Bardawada	172/2	Habitat cluster with an area of 0.013 hectare excluded from project boundary.

[1] For the purposes of this project, the bhumiswami is considered as the titleholder with formal rights over private land and/or patta land in accordance with Section 158 of the Madhya Pradesh Land Revenue Code, 1954 as amended

[2] Nistar Patrak for every village embodying a scheme of management of all unoccupied land in the village. The Collector may divert unoccupied land, for exercise of Nistar rights for – pasture, grass, bir or fodder reserve (clause b) subject to a minimum of two (2) percent of the total agricultural land of that village.

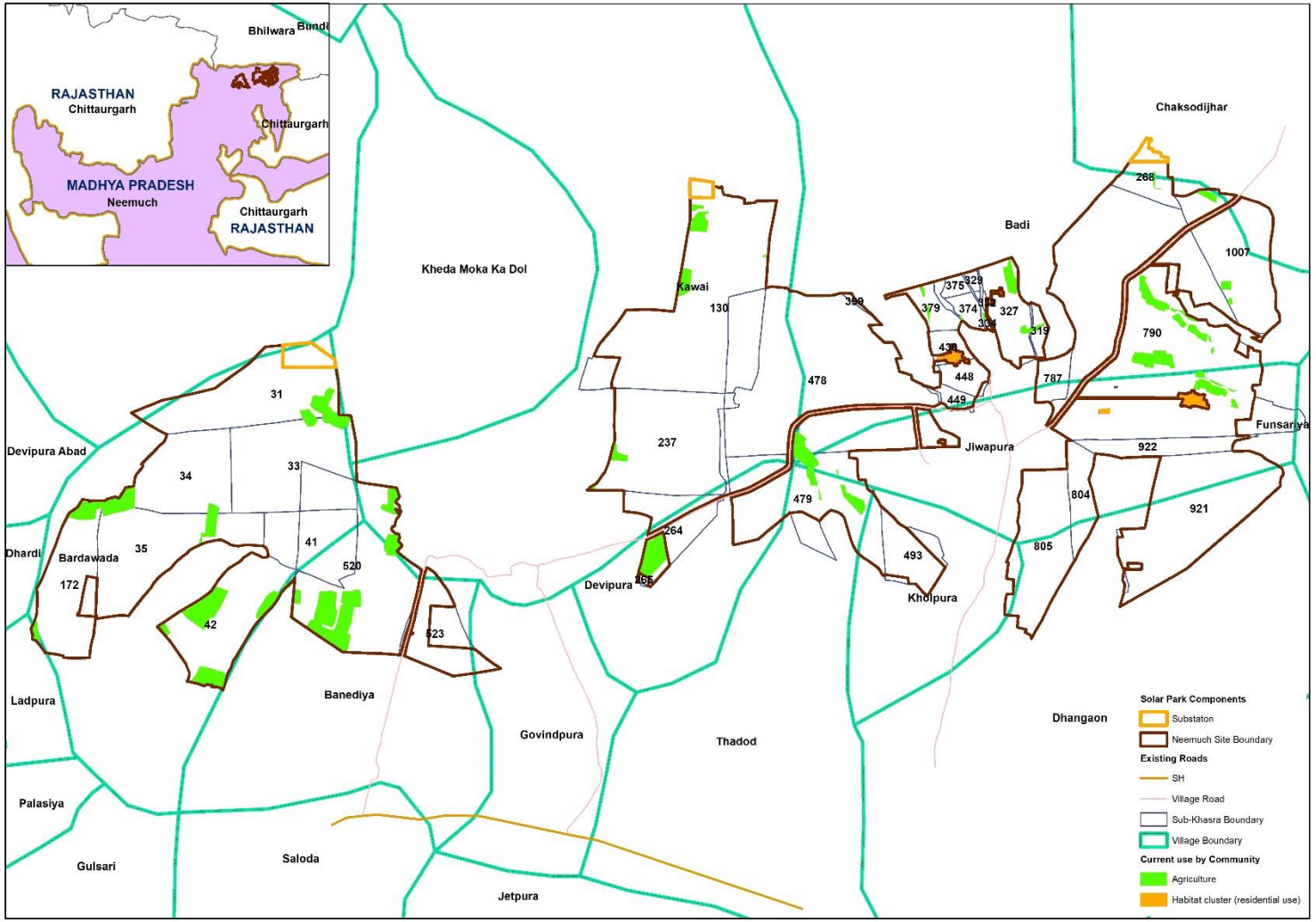
Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
Unit 1	Bardawada	42/1 , 42/1/2 and 42/3	Habitat cluster with an area of 0.061 hectares has been excluded from Project boundary including area for access road of 0.040 hectare.
Unit 2	Kawai	523/3	Structures including temple and community hall with an area of 0.020 hectare has been excluded from Project boundary.
Unit 2	Badi	478 (2,3)	Habitat cluster with an area of 0.091 hectares has been excluded from Project boundary including area for access road of 0.038 hectare.
Unit 3	Badi	430 and 448/2	Habitat cluster with an area of 1.560 hectare excluded from project boundary.
Unit 3	Badi	449/2	Cremation ground for dead livestock animals with an area of less than One hectare.
Unit 3	Badi	327/1/1	Habitat cluster with an area of 0.415 hectares has been excluded from Project boundary including area for access road of 0.161 hectare.
Unit 3	Badi	790/1	Habitat cluster with an area of 1.747 hectares has been excluded from Project boundary including area for access road of 0.434 hectare.
Unit 3	Badi	790/1	Cremation land with an area 0.377 hectares has been excluded from Project boundary including area for access road of 0.092 hectare.

Source: Based on site visits undertaken, review of drone imagery of land use, and land allotment details provided by RUMSL.

In addition to the above impact avoidance; two specific khasras were recommended for exclusion further to the completion of the resettlement surveys in December 2020. These exclusions are yet to be formally approved/confirmed and are therefore included in the assessment of resettlement impacts as part of this RAP and LRP:

- Unit 3 - Khasra 430 of Badi Village: There are 20 isolated residential structures (Gujjar settlement) currently part of the Project Footprint in Badi;
- Unit 3 – Khasra 790/3 of Badi Village: The Bhil settlement on this Khasra comprises 25 households. Although their physical displacement (main settlement area on 790/3) has been avoided, their physical displacement may be induced as the rest of the khasra (which is under informal use for agriculture and grazing) is allocated to the project. In view of loss of access to this land (economic displacement); they may also need to physically relocate to another area.

Figure 0.2 Habitat Clusters in the Solar Park avoided & suggested



Source: Land Use sensitivity mapping by ERM

Overview of Project Affected Households

Project Affected Villages

The following table provides an overview of the three (3) project affected villages and the balance land that is available post government land allotment and private/patta land procurement:

Table 0.4 Land Footprint by Ownership, in Project Villages

Village Name	Geographical Area of Village (ha)	Land required for the Neemuch solar park (ha)				Land remaining (ha)	Proportion of Land Remaining (%)
		Government land	Private land	Patta land	Total		
Bardawada	565.09	201.83	5.1	50.7	257.63	307.46	54.4
Kawai	826.46	245.7	4.25	22.41	272.38	554.08	67.04
Badi	1300.43	514.99	12.1	8.6	535.72	764.71	58.8
Total	***2691.98***	***962.52***	***35.5***	***87.72***	***1065.73***	***1626.25***	***60.4***

Source: Land data provided by RUMSL as on November 2020

As part of the resettlement surveys, ERM surveyed all of these three (3) villages through a Village Questionnaire as well as select qualitative discussions and focus group discussions in order to identify livelihood impacts, collective dependence concerns, general stakeholder insights and profiling vulnerable social groups (gender, economic vulnerabilities, caste groups etc.).

Project Affected Khasras

The following table provides an overview of the government and private/patta khasras which are affected across the villages as well as those that were surveyed:

Table 0.5 Land required for Solar Park

Unit	Type	Number of Khasras	Land Area (ha)
Unit 1	Government	15	291.45
	Private	10	9.35
	Patta	43	50.71
Sub - total		**78**	**351.50**
Unit 2	Government	9	319.38
	Private	1	1.74
	Patta	22	26.01
Sub - total		**32**	**347.13**
Unit 3	Government	25	351.71
	Private	20	10.36
	Patta	3	5.0

Unit	Type	Number of Khasras	Land Area (ha)
Sub - total		**48**	**367.1**
Grand Total		**158**	**1065.73**

Source: Land data provided by RUMSL as on June 2020 (Figures in brackets indicates parcels either entirely or partially that were surveyed during the Land and Asset inventory)
(Figures in brackets indicates coverage)

As part of the resettlement surveys, ERM undertook a Land and Asset Inventory of 58.2 hectares of private and patta khasras as well as 144.37 hectares of government khasras in order to identify assets, impacts on titleholders and any non-titleholders as well as their intensity. For the remaining parcels that could not be surveyed, ERM undertook a spatial analysis of the khasras as well as their land use in order to ascertain involuntary resettlement impacts.

Titleholders and Non-titleholders

The following table provides an overview of the titleholders and non-titleholders for Neemuch Solar Park, including the ones that could be identified and therefore including in either the land and asset inventory and/or household survey (see 0.3.4):

Unit	Village	Title Holders (coverage)		Non-Title Holders (coverage)	
		Private	*Patta*	*Encroachers*	*Informal users*
I	Bardawada	06 (06)	57 (34)	06 (06)	23 (23)
II	Kawai	35 (07)	39 (17)	06 (06)	07 (07)
III	Badi	58 (28)	09 (07)	10 (10)	30 (09)
	Total	99 (41)	105 (58)	22 (22)	60 (39)

(Figures in brackets indicates coverage)

Project Affected Households

Based on the above, Neemuch Solar Park will lead to involuntary resettlement of 225 Project Affected Households as summarised in the subsequent table:

Table 0.6: Status of Household Survey Coverage

Survey Coverage by category	Household Count (in numbers)	Proportion (%)
Total PAH	225	100
Physically and Economically Displaced PAHs	23	10.6
Only Economically Displaced PAHs	202	89.4
Impacted Categories Surveyed		
Households Surveyed	127	56.4
PAH Households surveyed	126	56
Physically Displaced PAHs surveyed	4	16.67

Survey Coverage by category	Household Count (in numbers)	Proportion (%)
Economically Displaced PAHs (private/patta land owners) surveyed	77	38.12
Economically Displaced PAHs (squatters on govt. land) surveyed	39	19.3
Women Headed PAHs surveyed	11	5.4
Vulnerable PAHs surveyed	15	7.42
Sample Households	1	0.4
Households that did not consent to the survey or are absentee households	98	48.5

Source: HH survey 2020

Of these PAH, ERM covered 126 households through a household census survey in order to obtain a socio-economic, demographic, livelihood, vulnerability and access to infrastructure profile. An additional household that was landless was also covered as a part of the household survey. Of the 98 PAHs who could not be surveyed, 61 were absentee and were not available for survey during the site visit and 37 did not consent to participating the survey process. Section 1.3.4 provides the details for the same.

Key Survey Milestones

Based on field surveys undertaken from in December 2020, the following resettlement survey milestones have been flagged for specific attention in order to influence implications for entitlements and RAP and LRP implementation:

- Village kick-off meetings: 3
- Survey completion meetings: 3
- Reiteration of grievance redressal mechanism in the above meetings: 3

The dates for the survey completion meeting can be considered as a cut-off date only to identify nature of impacts and categories of impacts. As the project is not formally initiating land acquisition and in view of the parallel government allotment process; these survey completion dates cannot be considered as a formal cut-off date to recognise rights and titleholders/non-titleholders in view of the following:

- Land titles can still change due to any potential transactions and buying and selling up to commencement of the procurement process under the MP Mutual Consent-based Land Procurement Policy (2014);
- The survey process may encourage opportunistic use of the government land.

In view of the above, for households that could not be covered as part of the resettlement surveys; RUMSL will have to put in place the following process elements during RAP and LRP implementation[3]:

- For land owners (private and patta): Households of land owners that could not be surveyed can be covered as part of the engagement process during land procurement;
- For informal users (encroachers and squatters): As part of physical land access, additional households of informal users can be identified and thereafter surveyed provided they can demonstrate that the occupation and use of government land predates the survey. This can be

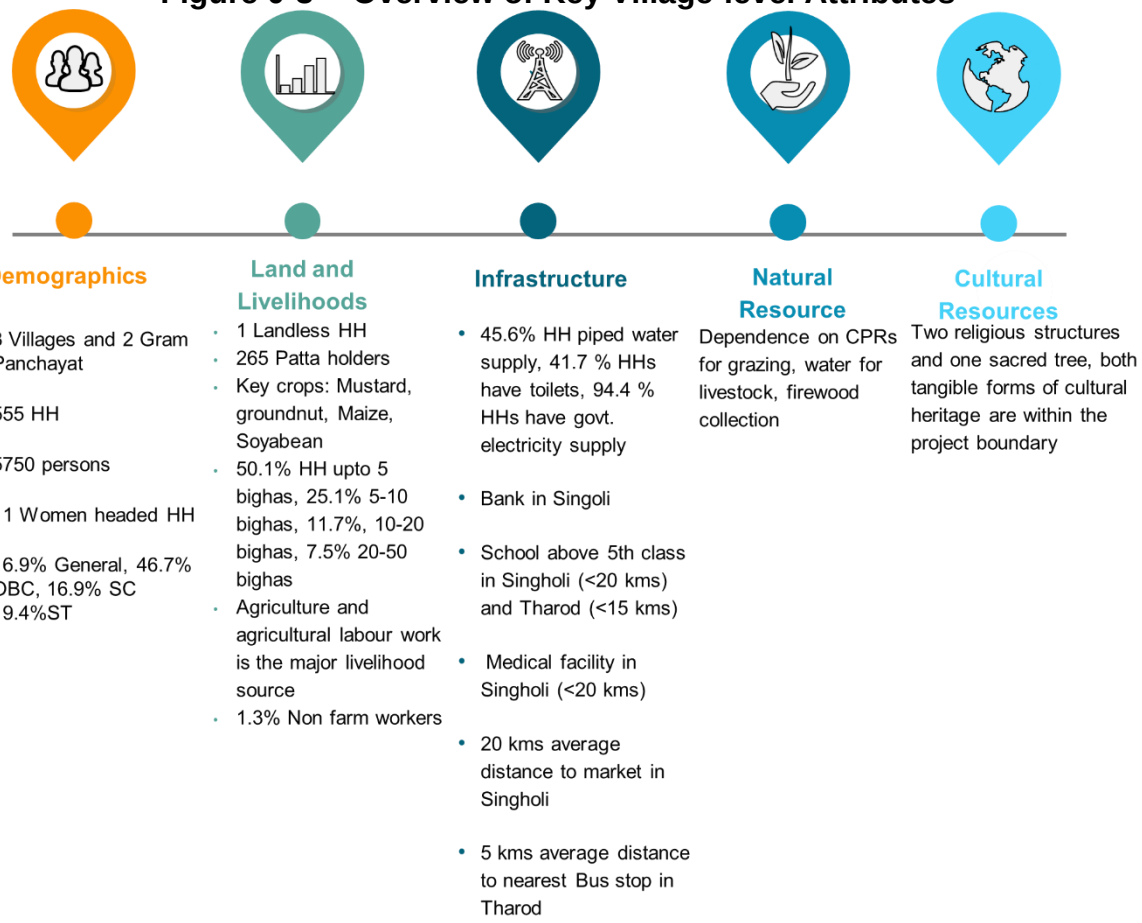
[3] This scope is included in the ToR of the Resettlement Implementation Consultant provided as an appendix in Volume I.

confirmed through drone imagery of December 2019-January 2020 available with RUMSL, and records of the local Patwaris linked to any fines or notices that may have been issued as well as through village leaders).

Profile of Project Affected Communities

Profile of Villages in the Project Footprint

Figure 0-3 Overview of Key Village-level Attributes



Source: Village Survey Tool

Profile of Project Affected Households

Based on the survey of 126 Project Affected Households (coverage of 56.4% of total PAH) as well as some sample households; the following table provides a qualitative overview of their socio-economic and livelihood profile:

Table 0.7 Profile of Households Surveyed

Parameter	Key Observations/ Findings –Neemuch Solar Park
Household Level Demographics	There are 225 households to be impacted by the project of which 126 impacted households were surveyed.
	Most of the community (more than 97%) is Hindu. 3% of the PAHs are reported as Muslims.
	The sex ratio within this population is 844 to 1000 males

Parameter	Key Observations/ Findings –Neemuch Solar Park
	The average family size of the surveyed households is reported to be 5.8
	The average literacy rate in Unit 4 is 58.1%.
Land Ownership and Use	Average land holding size is 2ha under predominantly agricultural use Most of the agricultural land is under a multi-cropping system, with the key crops being Soyabean, Mustard, Groundnut, Maize and Dal
Livelihood	Farm-based activities are the main earning source of the families. Agriculture, followed by livestock and labour are the main economic activities. Non-farm based livelihood are limited to daily wage labour, construction work, petty businesses, etc.
Key gender disaggregated data points	There are 11 women headed households that were surveyed. They have reported a marginally smaller family size as compared to male headed households. Women in women-led households reported an average annual income of INR 250,750 approximately as compared to women in male- led households who report an annual average income of INR 204,790 approximately. The most common livelihood reported by women was agriculture and agricultural labours
Income and Expenditure	The major source of income for the households are agriculture, livestock, wages and businesses. The avg. annual income levels is 2,35,220 INR per year and the avg annual expenditure is reported to be 3,186,05 INR per year. The reasons for higher expenses compared to income earning was due to higher expenditure on debt (repayment/new loan), which is a recurring liability for the households.
Standard of Living	House structure: 1) 40.1 percent of the housing is of kutcha type 2) 27.5 percent of the surveyed households have a pucca housing structure
	Asset ownership: 3) Majority of the surveyed households reported owning land between 1-2ha. 4) Cows were reported to be the common livestock among all PAHs. 5) In terms of household appliances, the highest proportion of assets is of ceiling fans, mobile phones, television sets and cable connections. 6) In terms of vehicles, most of the PAHs reported ownership of two wheelers including bicycles and motor cycles. 7) Amongst the agricultural implements, PAHs reported ownership mostly of implements such as tractors and water pump sets.
	Participation in collectives: 8) Women SHGs are the most popular SHGs in the surveyed villages, even though they are mostly inactive 9) The Van Samiti in Badi and Kawai has been active since the past 12-15 years.
Dependence on Natural Resources	Community dependence on natural resources is mainly for grazing and fodder, water for livestock and firewood and dung collection

Parameter	Key Observations/ Findings –Neemuch Solar Park
Access to Physical and Social Infrastructure	The access to primary healthcare is limited within the project footprint, and resident typically have to travel 5-10 km for a hospital. There are no doctors or clinics within the villages. The average distance for schools is 4 km. on an average, 41.7% of the households have a functional toilet at and 94.4% of households are connected to the government grid supply for electricity

Source: RAP & LRP surveys 2020

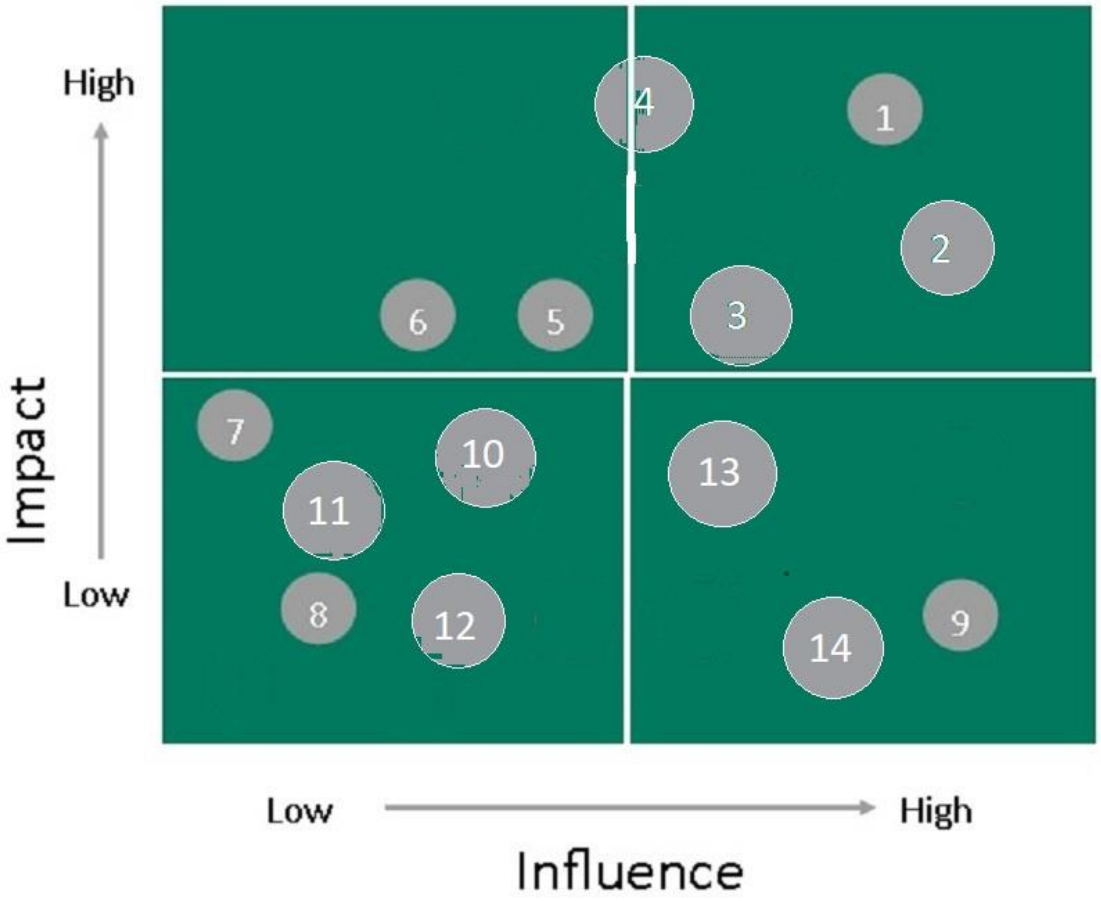
Profile of Key Stakeholder Groups and Feedback

Stakeholder Identification and Analysis

Table 0.8: Stakeholder Group Categorization

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Individual and Community	■ Private land owners and Patta land owners from the Project Area villages ■ Informal land users (encroachers/squatters to be impacted) ■ Agricultural labourers ■ ST households ■ Women groups ■ Vulnerable groups (Below Poverty Line households, women headed households) ■ Owners of land required for temporary occupation or use during construction phase	■ Fence line community
Government Bodies and Institutional Stakeholders	■ District administration of Neemuch ■ Gram panchayat of impacted villages ■ Tehsildar of Singoli and Patwaris ■ EPC Contractor ■ RUMSL	■ Civil society/Local Non-governmental organizations (NGOs) ■ Local media ■ Local political groups 10) Forest Department, Singoli Agriculture and Livestock Department at Neemuch 11) Industrial Training Institute (ITI), Neemuch ■ Department of Animal Husbandry, Dairy Development, Neemuch

Figure 0-4 Prioritisation of Stakeholders



As a part of the resettlement planning, engagement was undertaken at various stages with the stakeholders. RUMSL was responsible for overall coordination across various stakeholders including the district administration, and the administration at the tehsil level

12) A District Renewable Energy Officer (DREO) has been appointed by RUMSL to undertake the initial meetings with the Tehsil office, and guide the land allotment process. The land allotment process was initiated in 2017 for the government khasras.

13) For Neemuch Solar Park, government land allotment process was undertaken in 2 phases over 2017 and 2018. As a part of the land procurement process of private and patta land RUMSL through the Patwari and Tehsil department is understood to be reaching out to the concerned land owners for the purpose of land purchase. 70 percent of the land allotment was completed at the time of RAP survey and the remaining is still under process.

14) As a part of the resettlement surveys undertaken for the solar park in December 2020, an engagement process was set up at the start and end of surveys in each village. The kick-off meetings were used to understand the existing level of information about the project available with the community and incorporate any feedback received from the community on the concerns regarding involuntary impacts, and feedback for project planning. The close-out meeting was carried out at the end of the survey process to summarise key outcomes, relay the significance of survey completion dates to identify categories and types of impacts and to reiterate the mechanism to register any grievances from the community to the DREO.

15) The survey team faced a level of reluctance from the residents of Bardawada village in undertaking RAP study in their village. The community stated that there was no engagement process undertaken regarding information disclosure on the project, the land demarcation process was undertaken without providing them any scope for engagement and suggestions on the land

take, and moreover, there has been a lack of transparency regarding the land purchase and guidance on the valuation of land. However, the residents of the Bardawada village eventually agreed to participate in the survey process, upon being explained the purpose of the survey and its use

16) Similar resistance was faced from the gurjar settlement of Badi village were particularly non-cooperative to participate in the survey. Their grievance was regarding the lack of any engagement process undertaken regarding information disclosure on the project, the land demarcation process was undertaken without providing them any scope for engagement and suggestions on the land take, and moreover, there has been a lack of transparency regarding the land purchase and guidance on the valuation of land. The residents had submitted a written letter to the Tehsil office regarding their grievance on the extent of land being utilized for the project three years ago. However, there was no action or course of redressal undertaken thereafter.

Table 0.9 Feedback Received for Incorporation into Resettlement Planning

Feedback Received	Incorporation into Resettlement Planning
Lack of information disclosure and absence of engagement process as part of land procurement	Requirement is to identify personnel from the Tehsil administration (preferably the Patwari) and ensure all information is shared through the Patwari with the village community in the form of group discussions.
Provision of water supply infrastructure	It is suggested that the Project take into consideration providing water supply infrastructure for agriculture, as part of community level resettlement program.
Increase in distance to access grazing land	The specific mitigation measures have been included in the Grazing Management Plan.
Concerns of loss of informal land use of government land	Villagers across the three villages of the Solar Park are well aware of the extent of encroached/squatted area, and duration of such use.

Involuntary Resettlement Impacts

Overview of Project-Affected Land and Assets

Khasras

An overview of the project affected land and assets highlight that approximately 103.16 hectares of private and patta agricultural khasras will be impacted due to project activities. Out of this, 66 percent is patta land, and the remaining is private land (**Table 0.4**). Out of the total private land,34 percent of this private the land is in Badi village (Unit 2 & 3).

Similarly, 151.51 hectares of government land used informally for agriculture and fodder cultivation was assessed through the land and asset inventory survey. Of the total area under informal use, 77.8 percent is under squatting for agriculture. The **Table 0.10** below provides details on the extent of informal use of government land.

The highest impact of permanent land loss is observed in Bardawada village (Unit 1). The village accounts for more than 49 percent of impacted private and patta land.

Table 0.10 Land Area under Informal land Use

Unit	Encroachment for agriculture (ha)	Squatter for agriculture (ha)	Encroachment for Fodder lot (ha)	Squatter for fodder lot (ha)	Grand Total
Unit 1					
	16.7	44.4	3.4	5	69.5
Unit 2					
	3.8	30	3.3	0	37.1
Unit 3					
	5.26	22.5	9.95	7.2	44.91
	25.76	**92.1**	**16.65**	**12.2**	**151.51**

Source: LA survey 2020

Crops

A total of 254.67 ha of land is under agricultural use (private/patta and government, including non-surveyed private land under farming). Cultivators of this agricultural land would be impacted by loss of standing crop at the time of land clearing, depending on the season. The khasras under multi-cropping would be more likely to be impacted by loss of standing crops. The loss to farmers, from clearing standing crops will depend on when the possession of the land required for the project will be taken by the Solar Park Developer (SPD). The more favourable option would be to allow standing crops to be harvested before taking possession and thus not needing to clear standing crops. This will reduce the extent of economic displacement (economic loss of produce).

Immovable Structures

There are 22 residential structures located in Badi in addition to two (2) residential structures in Badi and 2 in Bardawada that would be affected by land procurement for the project. The LA survey was undertaken for 2 structures in Badi village and 2 structures in Bardawada village.

Similarly, the project will result in impact on 64 fixed and salvageable assets on khasra surveyed, which includes wire fencing, hand pumps, shed and water tank. The highest impact, however, is seen on the loss of dug (open) wells. There are 50 open wells, of which 60 percent have been assessed on private/patta khasras. The counts of all such immovable and fixed assets are as given below:

Table 0.11 Count of Immovable and Fixed Assets

nit	Number of PAHs	Open Wlell	Cattle shed	Bore well	Hand pump	Water stall	Water tank	Wire fencing with wooden pole
Unit 1	16	10	6	12	6	NA	1	NA
Unit 2	22	19	3	8	1	1	NA	1
Unit 3	21	21	3	19	3	NA	NA	NA
Grand Total	**59**	**50**	**12**	**39**	**10**	**1**	**1**	**1**

Source: LA survey 2020

NA: Not Applicable

Trees

264 trees (timber and fruit) have been identified spread across 42 khasras which are to be impacted. Out of these, 237 trees are of timber use. On an average, there are 5 - 10 trees on a single private khasra. Similarly, 27 fruit trees were assessed on 13 khasras with an average of two (2) fruit trees on one khasra. It has been found that 62 percent of the fruit trees are in the young productive (fruit bearing) years. Majority of the fruit trees are mango (77 percent).

Common Property Resources

Government land is used for open grazing of livestock (grazing on shrubs, grasses that grow in the open) and there are designated land areas (*Charnoi, Charagarh*) which are meant to be used for grazing by the village community. However, there are no physical identifiers for such khasras, and typically, grazing is undertaken on any open government khasra.

Table 0.12 Designated government grazing land

Unit	Village	Charnoi & Kadim available after Project allotment (ha)	Total Government land left after Project allotment (ha)	Total Agricullture land (Net Sown) in the Village as per Census 2011 data (in Hectare)	Share of Charnoi & Kadim to government land in the village after Project allotment (%)	Share of Charnoi & Kadim to agricultural land in the village after Project allotment (%)
Unit 1	Bardawada	0	137.31	181.06	0	0
	Kawai	NA	89.62		NA	
Unit 2	Kawai	3.97	379.96	145.89	1.04	2.72
	Badi	NA	163.28		NA	
Unit 3	Badi	0	449.6	294.59	0	0
Grand Total		**3.97**	**966.87**		**0.41**	

Source: *Nistar Patrak* data of each village, and land allotment letters

NA: Not Applicable

The major impact at the community level in terms of loss of CPR is linked to loss of open grazing land due to land use change. There will be loss of livelihood and sustenance linked to use of government land for open grazing of livestock. According to government records, 105.6 hectares is designated as grazing land. Another loss linked to loss of open land in general, and restricted access to government land is collection of firewood for cooking and grass (for livestock feed).

Table 0.13 Dependence of households on grazing land

Village	No.of HHs using government land for grazing	% of total HHs in the village
Bardawada	~300-320	90

Village	No.of HHs using government land for grazing	% of total HHs in the village
Kawai	~65-70	50
Badi	~250	77
Grand Total	**~615-640**	**~77.8**

Source: Village Profiling 2020

The overall magnitude of the impact is assessed as medium for most of the villages in the project footprint. This is in keeping with the understanding that while alternative grazing land will be available within the village after Project related land procurement, the location in terms of distance from settlement and suitability of the land for fodder or grazing is presently unknown. The loss of grazing land may thus result in an increased travel time for grazing purposes as well as increased pressure on the remaining grazing land in the village.

Intensity of Involuntary Resettlement Impacts

Table 0.14 Economic and Physical displacement of PAHs

Unit	Total PAHs	Economically displaced PAHs	Physically and Economically displaced PAHs
Unit 1			
	78	76	2
Unit 2			
	57	57	0
Unit 3			
	90	68	21
Grand Total	**225**	**202**	**23**

Source: HH survey 2020

Physical Displacement

The 24 residential structures correspond to impact on 23 PAHs. These 23 households will be impacted by loss of physical structure in addition to loss of land for agricultural use. The structures which are within the project footprint and are at a risk of physical displacement are observed to be of seasonal use, constructed with very low costs, since these are mainly made of wooden walls with thatched roof. As reported during consultations with the households, no investments have been undertaken on such type of structures in the past two (2) years. The structures that will be impacted are isolated structures, away from the main village settlement and have seasonal use. The loss of such physical assets is concurrent with the loss of livelihood due to economic displacement.

Economic Displacement

a total of 204 households are to be impacted by the loss of private/patta land. Based on the survey analysis, 58 percent of the PAHs are patta land owners (131 PAHs), while the remaining 94 are private land owning PAHs. There are 82 PAHs who will be impacted by loss of livelihood arising from informal use of government land for agriculture and fodder cultivation for private consumption, due to project land allotment. Of these 82 PAHs. Among the surveyed PAHs, 39 (47 percent) of the PAHs

are squatters, and the remaining are private land owners who have encroached upon adjacent government land for agriculture.

Each of these PAH have an average area of two (2) hectares under agricultural use. Among the surveyed PAHs, 59 households will be impacted by loss of immovable structures. Out of these PAHs, 22 households have constructed these structures on their private land holdings, and 21 PAHs have utilized their patta land for building such structures.

Land procurement for the project is reported to impact land holdings, this includes loss of private and patta land due to the land procurement for the project and the overall reduction in land holding amongst the PAHs. As mentioned above, the surveyed villages have reported that their primary source of livelihood is agriculture and this loss of land will result in a permanent loss of agriculture and livelihood. Moreover, loss of government land, is another concern for the households who have reported encroachment of informal use of government land for agricultural use or fodder cultivation. A reduction in overall land under agriculture per household will also impact the food security of the household, thereby increasing the dependence on the Government PDS schemes or increasing the expenditure on food grains.

Community based livelihood impacts

The primary impact at the community level arises due to reduction in available land for open grazing, due to land allotment, i.e. loss of livelihood and sustenance linked to use of government land for open grazing of livestock. The reduction in common land for grazing will also lead to reduction in count of livestock head by households, due to reduction in land available per unit of livestock, especially for those in economically weaker groups, as input costs will increase (creation of stall-shed, feeding stalls etc.) which may trigger livestock being sold and/or abandoned.

The secondary impact linked to loss of open grazing is reduced/loss of access to collection of firewood. Out of the surveyed PAHs, 43 percent depend on common land for collection of firewood for cooking and grass (for livestock feed). Dependence on government forest land was reported by 22 percent of the PAHs for collection of grass. There are three cultural structures, in Badi village (Unit 3) which are likely to be displaced by the land procurement. The structures belong to the Gujjar settlement and have been in use for more than 50 years.

Gendered livelihood impacts

It is estimated that there are 20 women headed households who are vulnerable due to their dependence on farm produce from their own khasras. Out of these, 11 women headed households were identified and surveyed. These households have reported to primarily depend on income from farm produce on their own khasras, supplemented by agricultural labour work. The average land holding size of the private and patta land holders is 1- 2 hectares, with the highest land holding reported to be of 3 hectares.

Impacts on women headed household, specifically, is expected to be higher as they are considered a vulnerable group. The women-led households would not only be economically displaced due to the project, they would also lose their supplementary income from agricultural labour due to loss of land. These women-led households would be impacted more severely than the other affected households as they are a vulnerable group and have no other source of income. Their socio-economic backwardness is discussed in the baseline section of the report. Moreover, the loss of land would lead to women travelling greater distances from the village settlements to collect natural resources such as firewood, water etc.

Impact on Vulnerable groups

The vulnerability profiling (Section 4.2.12) of impacted households shows that there are 16 vulnerable households, extrapolated to 29 PAHs in total. Of the surveyed PAHs 11 of which are women headed,

one household resided by only elderly members, four households dependent on artisan income. The impacts on these households are similar to the impacts discussed for the rest of PAHs, and uniform.

The Bhil settlement in Badi village will be economically displaced due to land procurement. The size of land holding is an average of 2-3 hectares, with majority of the Bhil households being patta holders Majority of the Bhils are patta land-holders (55 percent of the PAHs) and undertake single-cropping on their khasras, in comparison to other land owners who typically undertake at least double cropping.

Project-specific Strategies for Implementation

Volume I of the RAP and LRP provides the overarching entitlement matrix, market valuation framework, livelihood restoration, approach to resettlement housing and the overarching implementation arrangements, roles and responsibilities as well as schedule. The following table summarises key aspects that need to be considered by RUMSL while implementing the RAP and LRP for Neemuch Solar Park:

Table 0.15 Park Specific Implementation Insights

Aspect	Description/Remarks
Pre-implementation Actions	■ Undertake the resettlement surveys with the households who could not be covered as part of the RAP and LRP ■ The project should undertake focused consultations with the impacted land owners in the context of the project impacts, and resettlement and planned livelihood restoration measures. ■ The Project shall undertake focused and dedicated engagement activities with the local community and affected households prior to the initiation of land purchase and RAP&LRP implementation in keeping with the SEP and GRM developed for the project.
Expectations on Land Rates	Anything from numbers that consented and also generic expectations

Grievance Management

Given the associated large scale grievances reported during the resettlement surveys undertaken in November and December 2020, it is suggested that regular engagement should be undertaken with all the villages in the project footprint, with specific focus on the villages who have refused to resettlement surveys. These range from Consultations with the Gram Panchayat to provide update on the land procurement process of private land in the villages to conducting workshops with specific stakeholder groups identified during the resettlement surveys to incorporate feedback and suggestions on resettlement planning.

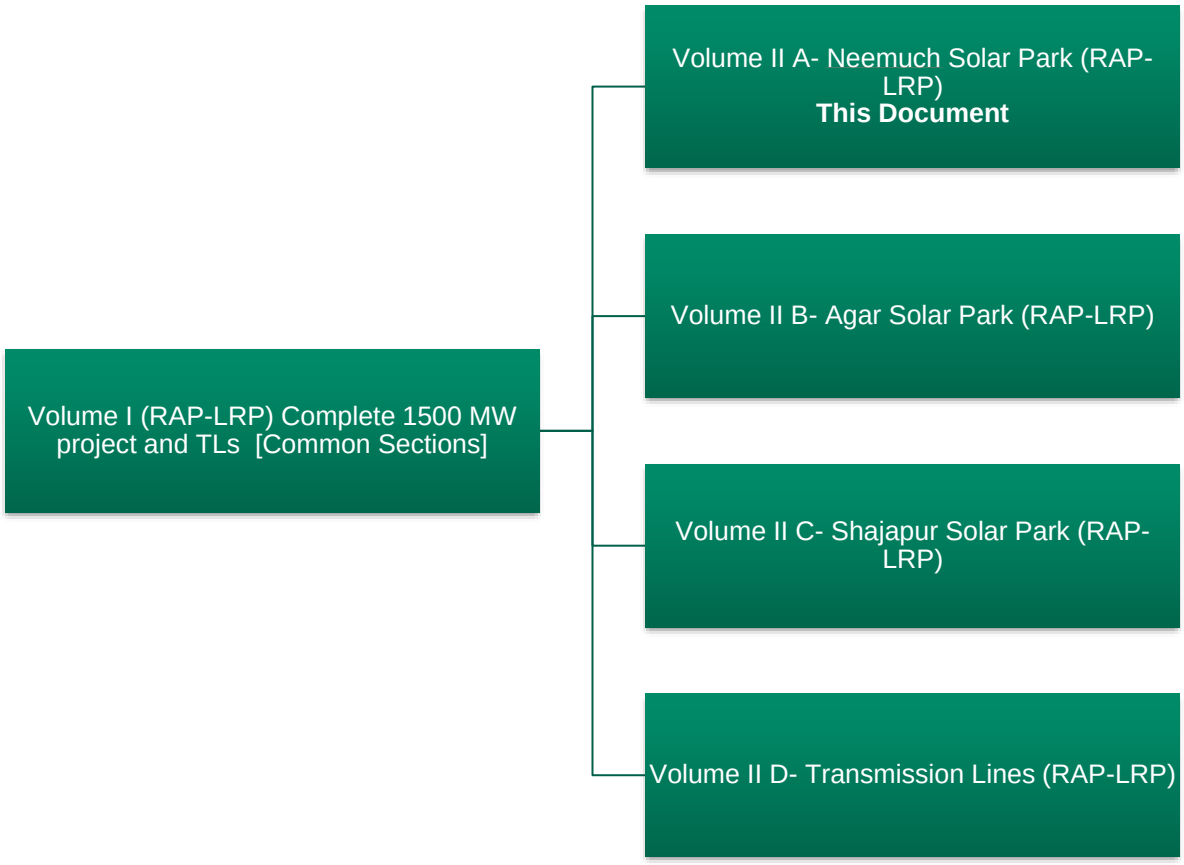
1. INTRODUCTION TO VOLUME II A

Rewa Ultra Mega Solar Limited (RUMSL) has been authorized by the Ministry of New and Renewable Energy Development (MNRED) to develop three (3) solar parks (including internal evaluation infrastructure and associated transmission lines) with an aggregate capacity of 1500 MW (hereafter referred to as the Project or the 1500 MW Project) across the districts of Neemuch, Agar and Shajapur in Madhya Pradesh, India.

ERM India Pvt. Ltd. (ERM) has engaged by Rewa Ultra Mega Solar Limited (RUMSL) to develop a Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) for the three (3) solar parks (aggregated capacity of 1500 MW) and their associated evacuation infrastructures spread across in Neemuch, Agar and Shajapur Districts of Madhya Pradesh, India (hereafter referred to 1500 MW RAP and LRP).

This Report is Volume II (A) for the Neemuch Solar Park RAP and LRP of 500 MW capacity located in Singoli Tehsil, Neemuch District, State of Madhya Pradesh.

Figure 1.1 Structure of the RAP and LRP Deliverables for 1500 MW



1.1 Brief Project Description for Neemuch Solar Park

The proposed 500 MW Neemuch Solar Park will be developed as three (3) units. Unit 1 of capacity 160 MW, Unit 2 of capacity 170 MW and Unit 3 of capacity 170 MW.

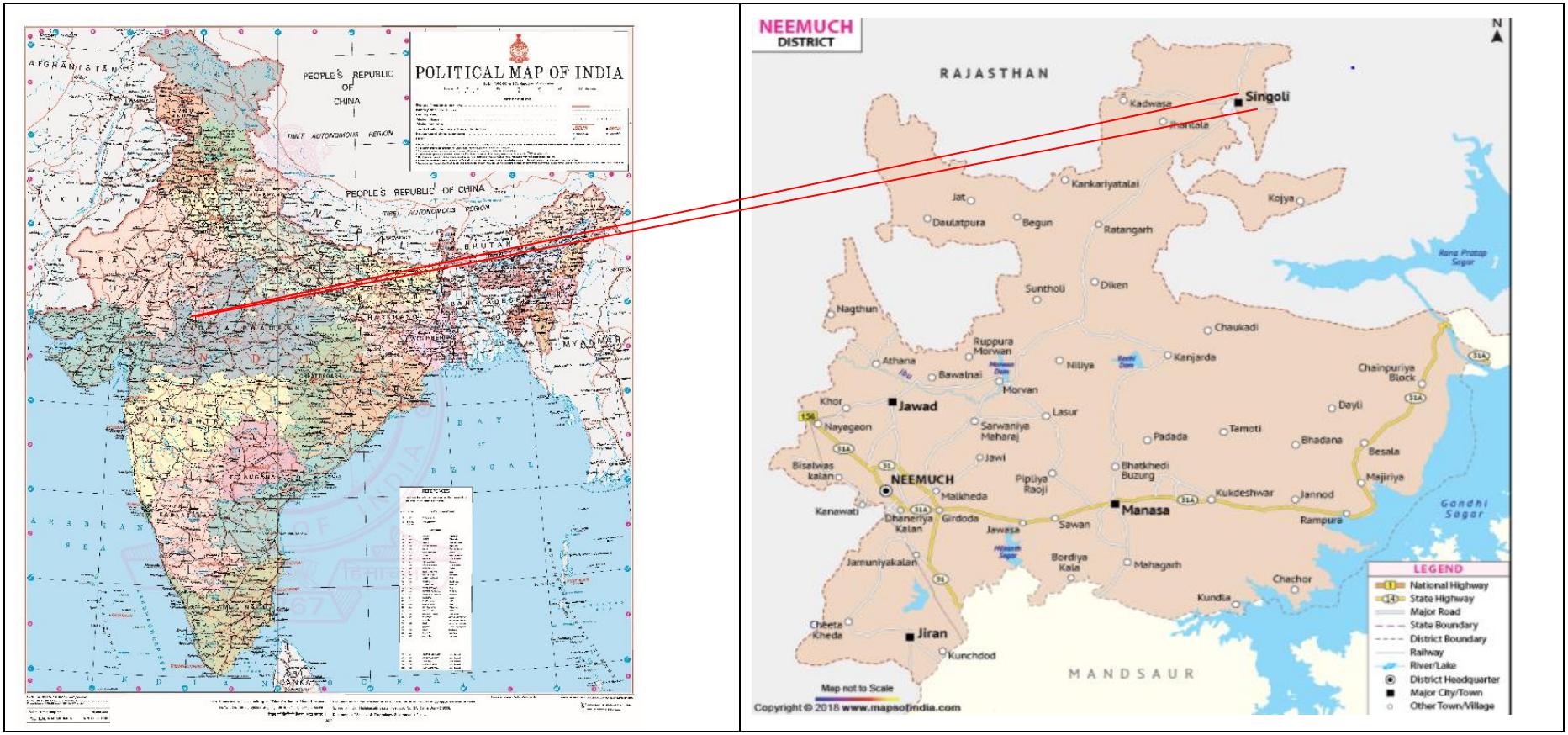
Table 1.1 Neemuch Solar Park Project Summary

S. No.	Particulars	Description for Unit 1	Description for Unit 2	Description for Unit 3
1.	Project Village Location	Bardawada and Kawai	Kawai and Badi	Badi
2.	Tehsil	Singoli tehsil		
3.	District Name/State	Neemuch, Madhya Pradesh		
4.	Location Coordinates	24°59'39.78"N and 75°13'26.82"E	$24^0$99'84.07'' N and 75°21'39.89"E	$25^0$01'06.67'' N and 75°24'44.83"E
5.	Capacity	160 MW	170 MW	170 MW
6.	Pooling State and Power Evacuation	Three Pooling substations of 33/220 kV (PSS), one in each Unit; Power evacuation through proposed 220/400 kV ISTS substation of PGCIL at Badi village located north of Project site in between Units 2 and 3.		
7.	Site Conditions	Flat land with minimal vegetation cover, rocky surface and light soil condition. There is agricultural activity in private/patta khasras and the government khasras that have been under informal use through encroachment/squatting		
8.	Land Area allotted for Solar Park	357.918 ha.	362 ha.	372.78 ha.
9.	Land Area required for Solar Park	351.50 ha	347.08 ha	367.07 ha

The resettlement and livelihood impacts linked to land requirement for the power evacuation (tower base and easement) across transmission lines between the three units and thereafter up to the PGCIL substation at Badi Village is covered in Volume II D (RAP and LRP of Transmission Lines across 1500 MW).

A more detailed description is included in the ESIA document for the Neemuch Solar Park. An overview of the Project location is provided in the subsequent figures.

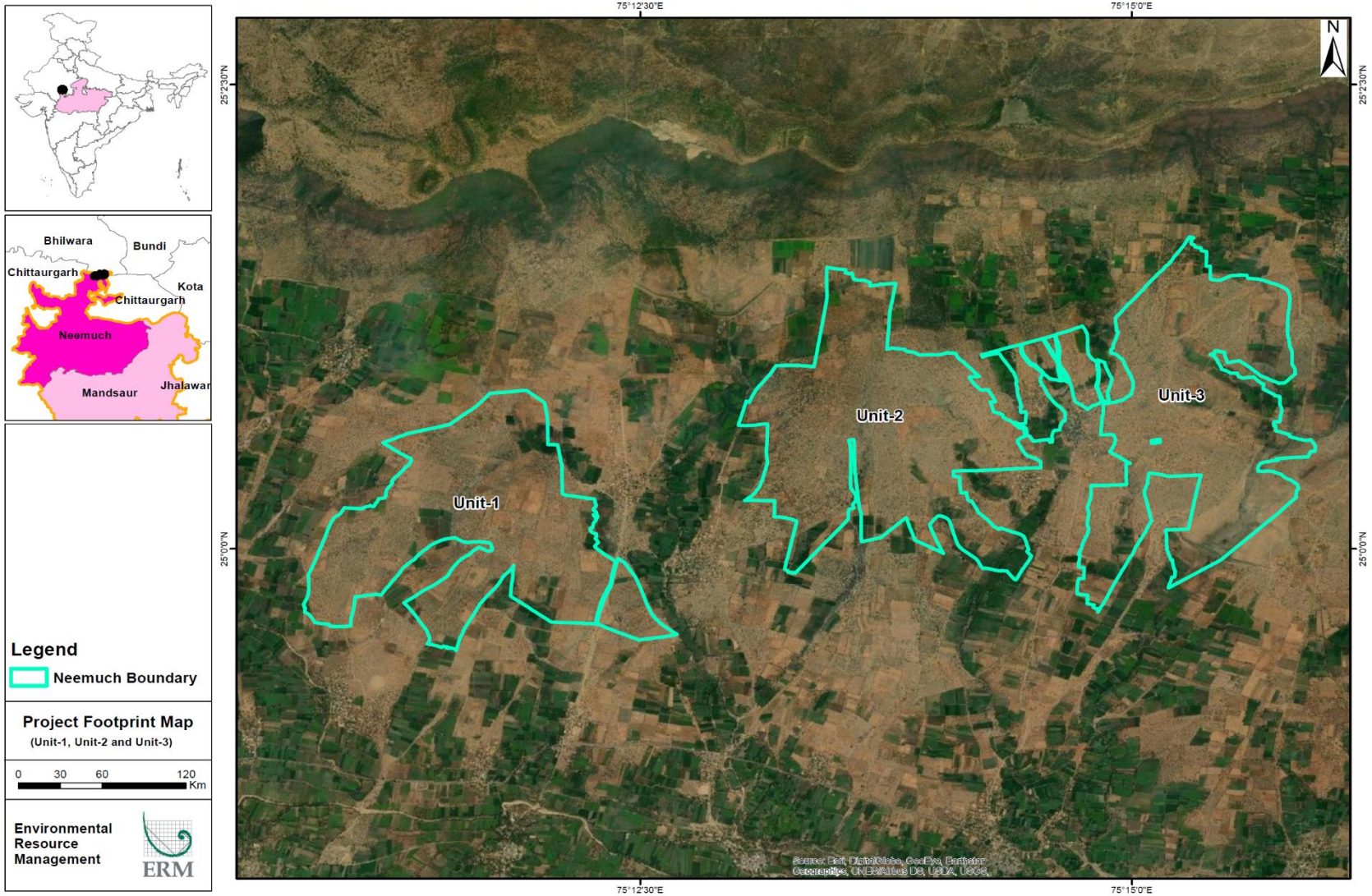
Figure 1.2 Project Location Map



Source: http://www.surveyofindia.gov.in/files/Political%20Map%20of%20India.jpg

https://www.mapsofindia.com/maps/madhyapradesh/districts/neemach.htm

Figure 1.3 Neemuch Solar Park Footprint Map (Unit 1-3)



Source: Project boundary data provided by RUMSL, June 2020

1.2 Project Development Timelines

The overall Project overview and Project progress timeline has been described in **Section 2** of Volume I the RAP-LRP. The details provided here pertain to specific activities undertaken for Neemuch Solar Park, starting from site selection up to resettlement surveys

Past activities that have led up to the current project profile and land footprint:

- ***Site Selection***: Neemuch district was carved out of erstwhile Mandsaur district in 1998. Singoli tehsil was created as a new sub-district, along with Jeeran. The Project was selected in Singoli tehsil of Neeumch District by RUMSL during 2016-2017. These potential project areas were thereafter discussed and finalised through workshops between RUMSL, potential lenders and third party consultants; further to which the process of formal land allotment was initiated based on the MP Solar Policy, 2012 and taking into account the relevant procedural provisions of the MP Land Revenue Code, 1959.
- ***Baseline at Project Footprint Identification stage***: A review was undertaken in May-June 2019 of the baseline report which was prepared in August 2017;
- **Land allotment**: the land allotment for Neemuch site started in May 2017;
- ***Scoping***: E&S Scoping visit for Neemuch Solar Park was undertaken in September 2018 to understand the site selection, environmental and social sensitivities and identify relevant stakeholders. As part of this site visit, consultations were undertaken in – Bardawada, Kawai and Badi villages. Based on the scoping visit, an E&S scoping visit report was submitted which had identified the environmental and social sensitivities around the Project site for incorporation into the DPR;
- **DPR:** the Draft Detailed Project Report was submitted in October 2019, as part of the implementation schedule. The DPR provided technical information of the Solar Park, the review of which was undertake by ERM to undertake the ESIA study. The Final DPR was provided to ERM in September 2020;
- ***Environmental and Social Impact Assessment (ESIA)***: ERM undertook site visits from 19 to 22 November and 19 to 25 December 2019 to understand the site setting, review the E&S sensitivities identified during the scoping stage and to identify the relevant local stakeholders. The activities undertaken included –
  - Identification of key social risks/receptors in the study area;
  - Understanding of prevailing community engagement processes;
  - Understanding aspects of community health and safety, if any, linked to the proposed Project;
  - Understanding land-based impacts, livelihood impacts, issues of vulnerable groups, cultural heritage issues;
  - Understanding significance of impacts on biodiversity and natural resource management; and
  - Consultations with the local communities and focused group discussions in the vicinity to understand their views and concerns of the Project

  Based on the ESIA study, the impacts identified during scoping stage were updated, stakeholders were identified and mitigation measures with relevance to displacement and resettlement were incorporated into RAP planning;
- ***Resettlement Planning***: the information collected from the ESIA study was used to undertake the planning of the resettlement activities based on identified land based impacts leading to potential economic and physical displacement of the stakeholders. The RAP related site visit was undertaken from 30th November – 10th December 2020, based on which a Resettlement Action

Plan (RAP) and Livelihood Restoration Plan (LRP) has been developed. The details of the same have been provided in this document;

- **Boundary Demarcation Process**: the boundary demarcation exercise was initiated by the revenue department in August-September 2020.
- ***Bid Process for the Neemuch Solar Park***: To be completed;
- **Land Procurement and Land Access**: The land allotment process of government for Neemuch Solar Park started in May 2017. The planning for the procurement of private land had begun in March 2020 and was resumed in September 2020 once the Covid-19 imposed lockdown was lifted;
- ***Construction work***: Timeline to be determined basis the completion of the bid process;; and
- ***Indicated Commencement of Operation Date (CoD)***: To be Decided.

1.3 Approach, Methodology and Survey Coverage

The overarching approach and methodology undertaken for resettlement planning has been discussed in **Section 1** of the Volume I of the RAP-LRP. The following section summarises the specific methodology for the Neemuch Solar Park.

1.3.1 Resettlement Scoping

The ESIA visit undertaken between November and December 2019 includes a scoping of potential involuntary resettlement impacts in order to propose an entitlement matrix as well as the approach for the resettlement surveys.

An impact assessment of potential impacts on the various environmental, ecological and social elements was identified during the ESIA study. The activities undertaken during the ESIA study included:

- Identification of key social risks/receptors in the study area;
- Understanding of prevailing community engagement processes;
- Understanding aspects of community health and safety, if any, linked to the proposed Project;
- Understanding land-based impacts, livelihood impacts, issues of vulnerability among individuals and communities, vulnerable groups, issues relating to Scheduled Tribes , and cultural heritage issues;
- Understanding the significance of impacts on biodiversity and natural resource management on local communities; and
- Consultations with the local communities and focus group discussions (FGDs) in the vicinity to understand their views and concerns of the Project.

The consultation undertaken in the Project footprint villages during this stage informed the scope of the RAP and provided an estimate of the extent of impacts. The detailed impact assessment field work was undertaken from 30th November – 10th December 2020 to assess the extent of land–based impacts, loss of livelihoods and conduct specific consultations with the impacted stakeholder group as identified and updated from the ESIA study. Data for the RAP study was collected through two (2) field tools – Household Survey (socioeconomic baseline) and Land and Asset Survey covering Project-affected assets.

1.3.2 Optimization

Prior to undertaking the RAP based field study of the Solar Park, an optimisation exercise of the Project land footprint was undertaken based on E&S sensitivities identified during the ESIA study, as well as geospatial assessment of the area. The exercise involved exclusion of khasras with presence

of physical structures, water bodies, dense vegetation and/or sites of cultural significance. This helped in reducing the extent and scale of adverse and irreversible impacts. The details of the optimisation process are provided in **Section 2.2**.

1.3.3 RAP Survey Coverage

RAP surveys were undertaken for the Neemuch site between 30th November – 10th December 2020 based on the activities discussed in Volume I **Section 1.4**. Overall, the survey coverage is outlined below:

- All three (3) Project affected villages were profiled using Village Profiling Tool covering Project affected villages for the Neemuch Solar Park;
- 150 land and asset surveys using the Land and Asset Tool were conducted based on physical assessment of the impacted khasras;
- 126 household-level socio-economic surveys were undertaken with Project Affected Households PAHs) comprising of private and patta land owners, informal land users. Of these 99 PAHs are to be impacted by land take for the solar park boundary, while 28 are to be impacted by both the Solar Park boundary and the TL RoW; and
- Six (6) qualitative discussions.

The household socio-economic survey and the Land & Asset survey was initiated from Kawai village in Neemuch of Unit 1 & 2 of the Solar Park. Of the 225 households assessed as project affected, 126 households (i.e. 56%) could be surveyed. In addition to this, one survey was completed in Badi village for a landless household. The list of surveys and consultations held across the village in Unit 1, Unit 2 and Unit 3 are presented in the table below:

Table 1.2 Field Survey Activities: Neemuch Solar Park

Unit	Village	Kick-off Meeting	Land and Asset Survey Dates	Household Survey Dates	Survey Completion Meeting	Total PAH number	Total PAHs Surveyed
1 & 2	Kawai	1/12/2020	1/12/2020 – 3/12/2020	1/12/2020 - 3/12/2020	3/12/2020	57	35
2 & 3	Badi	3/12/2020	3/12/2020 – 5/12/2020	3/12/2020 – 5/12/2020 7/12/2020 – 8/12/2020	8/12/2020	90	40
1	Bardawada	5/12/2020	5/12/2020 – 7/12/2020	5/12/2020 – 7/12/2020	7/12/2020	78	52
	Total					225	127

Source: Resettlement surveys, August 2020

Note: The discrepancy in the Total PAH number and Total PAH surveyed has been explained in Section 1.3.4.

1.3.4 Specific Limitations applicable to the RAP surveys, for Unit 1, 2 and 3

The following sections discuss key limitations due to which 99 households (of the 225 PAHs) could not be surveyed:

- Of the 99 households, 20 households (also assessed to be physically displaced in spite of boundary optimization, it is assumed that one household occupies one structure) were residents of the Gujjar settlement in Badi village (Unit 3). These structures are scattered and separete from the main Gujjar settlement (which has been avoided through boundary optimization). These households did not consent to participate in the household and LA survey as they are opposed to the project. It is understood that this Gujjar settlement in Badi village dates back to approximately 100 years and they have always occupied the government land which has been allotted to the project.

Sixty-one (61) households were assessed to be absent as they were owners but not residents in the Project affected villages. It was reported that these absentee owners have not resided in the project area for over 20 years.

Table 1.3 PAH Not Surveyed

Unit	Village	No. of Absentee PAHs	No. of PAHs who did not consent to the RAP survey
Unit 1	Bardawada	24	2
Unit 2	Kawai	19	4
Unit 3	Badi	18	31

- 17 households did not consent to be included in the household survey, which is why the potential impacts on these PAHs have been estimated based on the overall trends. However, of these 17 households; 4 households participated in the land and asset survey. These 4 households agreed to participate in the LA survey with the understanding that the same would result in a payment of compensation, albeit they were not willing to participate in the HH survey;
- In addition to project affected households, the HH surveys also attempted to collect socio-economic information of other households with a dependence on community resources which may be impacted by the project footprint. However, such households could not be identified as all households (other than the absentee households) reported some form of dependence on either private/patta land or informal use of government land;
- The 99 Project affected households that were not surveyed for the reasons above, will need to be covered before the implementation phase, to include their data on affected land and assets, and their household socioeconomic baseline.
- Villages that were common across the Solar Park footprint and were part of the Transmission Line (TL) Right of Way (RoW) (7.45 km in length) have been surveyed only once. There are 28 households (7 PAHs in Unit 1, 18 PAHs in Unit2, and 12 PAHs in Unit 3) that are expected to be impacted by the solar park project footprint as well as TL ROW, based on the land records available. The data for these households has been presented in this volume for the RAP. However, the survey conducted did not account for any incremental impacts on the land users due to combined impacts from the solar park and transmission line. The same is discussed in Volume II D: TL RAP
- While undertaking an analysis of the satellite imagery provided by MAP IT and land record data made available by RUMSL, a discrepancy has been observed between the two, in terms of the project boundary and the khasras within the same. This is understood to be an issue with the

geo-referencing of the digitized maps of the villages. For the purpose of the RAP, the data from the land records as provided by RUMSL is considered accurate. The maps with khasra boundaries have been used for the sole purpose of providing a visual reference to the project boundary and may not represent the actual project footprint (due to distortion issues). It is understood that these issues with distortion will be addressed after ground survey, at the time of boundary finalization and demarcation in coordination with the Patwari and Tehsil office, for the village.

- Disclaimer: This report has been finalized on the basis of discussions with RUMSL and feedback from World Bank and the IFC. A recommended strategy for community-level disclosure of the RAP and LRP has been suggested to RUMSL and is being currently deliberated. In view of the COVID-19 pandemic related health and safety concerns and travel restrictions (as of 30 April 2021), this report has been finalised based on the understanding that RUMSL and the Resettlement Implementation Consultant will undertake the recommended disclosure. A Hindi translation of the Volume 1 Executive Summary will be provided to the local community. Any relevant feedback from the local community can be incorporated by the RIC as a part of RAP and LRP implementation

1.4 Layout of the Volume II A

Section 1 (this section)	Introduction
Section 2	Project Footprint and Land Procurement Status
Section 3	Summary of Project Affected Entities
Section 4	Socio-Economic Baseline Profile of Affected Communities
Section 5	Stakeholder Engagement and Consultation
Section 6	Involuntary Resettlement Impacts
Section 7	Implementation Strategies for Neemuch Solar Park
Appendix A	Photo Documentation
Appendix B	Summary of Consultation
Appendix C	Summary Profile of Informal Users in Neemuch Solar Park
Appendix D	Profile of Residential Structures within Neemuch Solar Park
Appendix E	Household Level Entitlements (to be developed once an agreement on Entitlement and Valuation is achieved)

2. PROJECT FOOTPRINT AND LAND PROCUREMENT STATUS

2.1 Project Footprint

The Solar Park is spread across three (3) villages in Singoli Tehsil, Neemuch District. The land required for 500 MW Solar Park including solar fields 1065.7 hectares. The following table provides a summary of the land requirement by village and land ownership type:

Table 2.1 Village Wise Land Requirement for the Project (ha)

Unit	Village	Government land (NRED Allotted and Newly Identified)	Private Land	Patta Land	Total Land
Unit 1	Bardawada	201.83	5.1	50.7	**257.63**
	Kawai	89.62	4.25	0	**93.87**
Unit 1 Sub-Total		**291.45**	**9.35**	**50.7**	**351.5**
Unit 2	Kawai	156. 1	0	22.41	**178.51**
	Badi	163.28	1.74	3.6	**168.62**
Unit 2 Sub-Total		**319.38**	**1.74**	**26.01**	**347.13**
Unit 3	Badi	351.71	10.36	5	**367.1**
Unit 3 Sub-Total		**351.71**	**10.36**	**5**	**367.1**
Grand Total		**962.49**	**21.44**	**81.72**	**1065.73**

Source: RUMSL, June 2020

The plant area for all the three (3) units are in three (3) continuous villages, which has been based on avoidance criteria applied in the land selection and optimization process (refer to **Section 2.2**). The understanding of the land requirement in comparison to total land available per village is provided in Section 3..

Review of the Project boundary maps provided by RUMSL, after the land optimisation exercise, confirms that priority has been given to allotment of government land (~ 90.3 per cent of Solar Park land), in order to minimise impacts associated with procurement of private and patta land.

Specific avoidance included:

- Land used for habitation and access to habitation has been avoided, though a few residential structures are within the project footprint (24 residential structures);
- Exclusion of forest land;
- Avoidance of land within major natural drainage or surface water body;
- Land for religious structures or cremation has been deducted from the initially identified khasras, though a few such structures/areas remain within the project footprint; and
- Land for access to isolated structures has been avoided to the extent feasible.

2.1.1 Government Land Allotment

At the time of the RAP survey, 70.4% of the government land required had been allotted for the project. The remaining government land allotment is under process.

The allotment details are provided in the table below:

Table 2.2 Dates of Government Land Allotment for Neemuch Solar Park

Allotment Date	Allotment Letter Number	Area Allotted (ha)	Villages
30.05.2017	26/A-20(3)/2016-2017	439.52	Badi and Kawai
17.01.2018	7/A-20(3)/2017-2018	238.68	Bardawada, Kawai and Badi
Total		**678.19**	

Source: RUMSL

Note: The land allotment records are available till 2018. Data for the latest and revised allotment based on land requirement after exclusion and addition of new parcels was not available at the time of writing the report.

The government land identified in the villages across Units 1, 2 and 3 of the Solar Park comprises mostly of land classified as Charnoi, Charagah, Germumkin. These land categories are included in the Nistar Patrak[4] data of each village implying common property resources and collective dependence.

As part of the allotment exercise, RUMSL has indicated that 2% of the total agricultural land available in the village remains available for grazing of cattle as stipulated in the MP Land Revenue Code (1959, as amended).

2.1.2 Use of Government Land

The current community use of government land is characterized by open grazing, encroachment and informal use of government land by squatters for agriculture and fodder lots. While open grazing of livestock is permitted, the two types of informal use of government land are not, as noted below:

- ***Land owner encroachment on government land:*** A private land owner who has occupied part of Government Land, adjoining their private/patta lands for cultivation, or other use. These encroachers have no legal claim over the occupied government land; and
- ***Squatter on government land:*** Squatters are informal users, who have occupied government land (including charnoi/charagah/kabil kast) for agricultural use or creation of fodder lots, while their private/patta land is at a different location in the village. Squatting may also be undertaken by landless households for agriculture and/or residence.

2.1.2.1 Encroachment

Encroachment of government land adjoining existing private/patta land to cultivate larger parcels has been noted in all three villages: Bardawada, Kawai and Badi of Neemuch Solar Park.

Unit 1

In Neemuch, private land owners (in most cases those who own more than 2 hectares of land) have used encroachment as a practice to increase the area available for cultivation. Some have also occupied land for grazing their own livestock, and prohibited use by the other residents of village by making a fence around the occupied land. This practise has been in existence for more than twenty years, on an average, and in some cases, for more than forty (40) years due to which the more

[4] Nistar Patrak for every village embodying a scheme of management of all unoccupied land in the village. The Collector may divert unoccupied land, for exercise of Nistar rights for – pasture, grass, bir or fodder reserve (clause b) subject to a minimum of two (2) percent of the total agricultural land of that village.

powerful land owners have occupied large parcels for agriculture and their own pastoral activities. As a result, the available government land for grazing, for the wider community, has reduced.

Marginal and small farmers (less than 2 ha) have relied on agricultural labour work on the khasras of such medium and semi-medium land owners. Encroachment has also been influenced by the size of the household in the manner that the head of the household has had encroached on government land in the past which has then been distributed among the sons of the households, and as of today, the encroachment has increased over the years due to segmentation of land holding among smaller household units. The availability of flat land has led to uninterrupted encroachment for all the land owning households.

The LA survey covered 20.1 hectares of government land under encroachment in Unit 1 which accounts for 2.1 percent of the allotted government land for the Solar Park. This corresponded to 6 PAHs in the baseline survey who reported encroachment on government land for agriculture and private fodder lots.

The encroachment areas are demarcated with stone boundaries rising up to 4 – 5 ft. in height, to differentiate land being used by individual land owner. Consultations with the land owners, and the village community shows that they have complete information on the extent of encroachment of all the land owning households in the village, and fines are paid out to the Patwari for the extent of encroached area. However, the regularity of the fine collection is not ensured, and sometimes the fines are paid for a period of 3 – 4 years taken together. [5]

Unit 2

The extent of encroachment observed during the RAP study was the lowest in Unit 2 among the three units. This is due to two factors – the small size of Kawai village (105 households), and presence of private/patta land holding among 65 percent of the population of the village. The village is spread across both Unit 1 and Unit 2. Within the project footprint, only 24 percent of the Project Affected Households (PAHs) from Kawai village had any informal use of government land. The encroached khasras, as observed during the RAP study, were mostly barren and/or used for single cropping cycle.

The LA survey assessed 7.1 hectares of government land under encroachment in Unit 2 which accounts for 0.7 percent of the allotted government land for the Solar Park. This corresponded to 6 PAHs in the baseline surveys who reported encroachment.

Unit 3

The nature of encroachment in this Unit has similar characteristics in terms of socio-economic dynamics and land use, as observed in Unit 1 and Unit 2. The land footprint for Unit 3 has same nature of land use of encroached khasras and have been a phenomenon which has been in existence since the past 20 – 30 years on an average. Within the project footprint, 34 percent of the PAPs from Badi village had informal use of government land. Except for one Brahmin household, all the encroached khasras were withheld with households from the OBC community who are original inhabitants of the village.

In Unit 3, the LA survey could assess 15.21 hectares of government land under encroachment, accounting for 1.6 percent of the allotted government land for the Solar Park. This corresponded to 10 PAHs in the baseline survey who reported encroachment.

1.4.1.2 Informal Use of Government Land by Squatters

Informal use of government land by squatters (i.e. entities without formal claims or titles on the land or any adjoining khasra) has been in practice by the OBC, SC and ST households across the three

[5] Copies of such fines (receipts of payments) by the encroachers, could not be reviewed as the same were not shared by the households or Patwaris.

villages and is relatively lesser in terms of scale as compared to encroachment around or adjacent to their private/patta khasras.

Informal use of government land supplements income from agriculture on land owned and located elsewhere.

The LA survey covered 104.3 hectares of government land (**Section 1.1.1**) under informal use across the Solar Park. This accounts for 10.8 percent of the allotted government land of which the major proportion (61.9 percent or 49 hectares) of squatted land use has been observed in Bardawada village (Unit 1). There are 39 PAHs who reported squatting on government land out of which 58 percent (23 PAHs) are in Unit 1.

2.1.2.2 Grazing

Government land is used for open grazing of livestock (grazing on shrubs, grasses that grow in the open) and there are designated land areas (*Charnoi, Charagarh*) which are meant to be used for grazing by the village community. However, there are no physical identifiers for such khasras, and typically, grazing is undertaken on any open government khasra. The total designated grazing land available in the Project affected villages, and as a proportion of total government land in the village is as given below:

Table 2.3 Designated government grazing land

Unit	Village	Charnoi & Kadim available after Project allotment (ha)	Total Government land left after Project allotment (ha)	Total Agricullture land (Net Sown) in the Village as per Census 2011 data (in Hectare)	Share of Charnoi & Kadim to government land in the village after Project allotment (%)	Share of Charnoi & Kadim to agricultural land in the village after Project allotment (%)
Unit 1	Bardawada	0	137.31	181.06	0	0
	Kawai	NA	89.62		NA	
Unit 2	Kawai	3.97	379.96	145.89	1.04	2.72
	Badi	NA	163.28		NA	
Unit 3	Badi	0	449.6	294.59	0	0
Grand Total		**3.97**	**966.87**		**0.41**	

Source: *Nistar Patrak* data of each village, and land allotment letters

NA: Not Applicable

The above table shows the availability of designated grazing land, after the allotment of government land for the Project. While in keeping with the Land Revenue Code, a minimum of 2 percent of total agricultural land in a village needs to allocated as grazing land, the reduction in available grazing land is highest in Bardawada and Badi, where no designated grazing land will remain in the village. The available Charnoi land in Bardawada village was 8.7 hectares while the government land allotment specifies 20.8 hectares of Charnoi land allotted from this village to the Project. Similarly, the available Charnoi land in Badi village was 6.45 hectares while the allotted land from this village included 6.84 hectares of Charnoi land. This discrepancy is resultant from the allotted area stating the presence of a larger grazing land area than what is provided in the Nistar Patrak. This may be due to

the Nistar Patrak not being updated with latest data. Hence the above analysis shows there will be no designated Charnoi land (used for open grazing left) in Bardawada and Badi village.

Consultations undertaken with the community also confirmed the findings from the above data – the available open grazing land (i.e the government land) is limited, and currently, the village residents have ease of access to the same. The solar plant will lead to decrease in the availability of open grazing land and will increase the travel time (to the other land for grazing that may be allotted at a distance).. This is because, the villages are surrounded by the adjoining hill range in the North (forest land) and road in the south, thus, alternative grazing lands will be limited in these directions. According to the discussion with the locals, these hill ranges are scarcely used (if at all) due to the distance from the villages and the present availability of open government land surrounding the settlement. Also since these hill ranges are part of the designated forest area, the extraction of natural resources is restricted.

2.1.3 Private and Patta Land

The private land identified for the Solar Park is 123.2 hectares, all under agriculture/horticulture, and/or fodder crop or private fodder lots. The land use of private land has remained the same, with the intensity of agriculture increasing over the years, with multiple cropping round the year becoming a prevalent practice. With improved and reliable electricity becoming available, installation and use of irrigation systems by private land owners has led to improved productivity and cropping intensity.

Initial activities/consultations associated with the Private land procurement as per the provisions of the MP Consent-based Land Purchase Policy (2014) was initiated by the District administration, upon request by RUMSL in 2020. Due to Covid-19 imposed lockdown and restrictions on activities, the mutual consent process was put on hold and is presently in initial stages.

2.2 Impact Avoidance and Project Boundary Optimization

2.2.1 Comparison of Project Land Requirements

The initial land requirement for the Neemuch Solar Park was 1092.707 hectares. The current land requirement has been reduced to 1065.7 ha. The distribution of this current land requirement is provided in Table 2.1. The reduction is the result of the land area optimization exercise undertaken, to reduce the E&S risks, while maintaining techno-economic viability.

The exclusion of khasras was undertaken based on a review of aerial imagery, site observations by ERM, and an avoidance exercise undertaken by RUMSL's consultants, based on the land allotment details provided by RUMSL. The considerations included details of the khasras, status of land ownership and land use as per government records, the total area of each khasra and the area allotted to the Project. In addition to this RUMSL made available the village wise khasra maps through MAP IT[6] for the purpose of analysis. In parallel, the land allotment details were ground truthed to an extent by the district revenue administration to identify the correct ownership status on ground as well update of land records.

Exclusion as part of the E&S studies includes: 6.4142 hectares in Unit 1; 14.276 hectares in Unit 2; and 5.7135 hectares in Unit 3.

The details of the optimization suggested and completed are provided in **Table 2.4** below.

2.2.2 Optimization carried out and suggested

The detailed impact avoidance and boundary optimization exercise undertaken for each of the Units has been described below. This exercise was undertaken based on site visits undertaken and GIS imagery analysis of land cover, review of existing land use, and presence of residential structures.

[6] Madhya Pradesh Agency for Promotion of Information Technology (Department of Science and Technology, GoMP)

The table also contains a summary of the optimisation that were accepted and those that are recommended but have not be undertaken due to technical feasibility constraints.

Table 2.4 Impact avoidance undertaken by village

Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
Khasras for which exclusion/avoidance completed or mitigation measures agreed- therefore excluded from resettlement impacts in the RAP			
Unit 1	Bardawada	172/2	Habitat cluster with an area of 0.013 hectare excluded from project boundary.
Unit 1	Bardawada	42/1 , 42/1/2 and 42/3	Habitat cluster with an area of 0.061 hectares has been excluded from Project boundary including area for access road of 0.040 hectare.
Unit 2	Kawai	523/3	Structures including temple and community hall with an area of 0.020 hectare has been excluded from Project boundary.
Unit 2	Badi	478 (2,3)	Habitat cluster with an area of 0.091 hectares has been excluded from Project boundary including area for access road of 0.038 hectare.
Unit 3	Badi	430 and 448/2	Habitat cluster with an area of 1.560 hectare excluded from project boundary.
Unit 3	Badi	449/2	Cremation ground for dead livestock animals with an area of less than One hectare.
Unit 3	Badi	327/1/1	Habitat cluster with an area of 0.415 hectares has been excluded from Project boundary including area for access road of 0.161 hectare.
Unit 3	Badi	790/1	Habitat cluster with an area of 1.747 hectares has been excluded from Project boundary including area for access road of 0.434 hectare.
Unit 3	Badi	790/1	Cremation land with an area 0.377 hectares has been excluded from Project boundary including area for access road of 0.092 hectare.
Khasras recommended for exclusion but not yet approved. These have been included in the assessment of resettlement impacts and are in RAP- subject to final confirmation of the boundary			
Unit 3	Badi	430	There are 20 isolated residential structures (Gujjar settlement) a currently part of the Project Footprint in Badi spread over an area of 5.8 hectares. Discussions with the Patwari of Badi Panchayat revealed that a report was submitted to RUMSL recommending the avoidance of this entire Khasra along with Khasra 448/2 and 449 which is used by the habitat

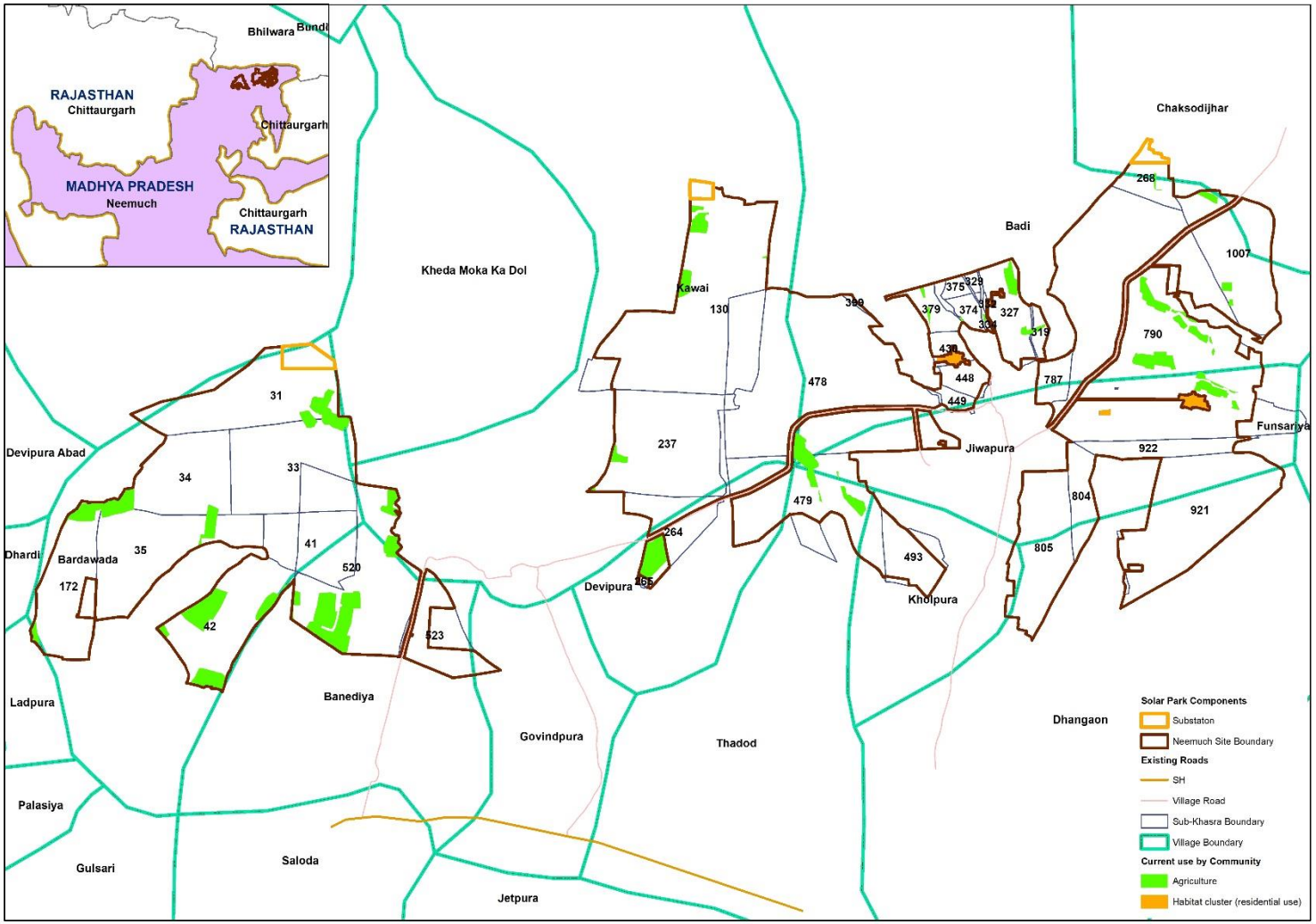
Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
			cluster (Gujjar settlement) on 430 for farming, and grazing. The total area (residence plus agriculture) is estimated at 9 hectares.
Unit 3	Badi	790/3	The Bhil settlement on this Khasra comprises 25 households. Although their physical displacement has been avoided, their physical displacement may be induced as their livelihood is land-based (dependent on the informal use of government land and private/patta land within the Khasra that is currently within the project boundary). With the loss of that land, in addition to economic displacement, they may also need to physically relocate to another area, thus also experiencing induced physical displacement.

Source: Based on site visits undertaken, review of drone imagery of land use, and land allotment details provided by RUMSL.

Figure 2.1 Photographs of residential clusters in Unit 3: Badi

Figure 2.2 Photographs of religious structures in Unit 3: Badi

Figure 2.3 Habitat Clusters in the Solar Park avoided & suggested



Source: Land Use sensitivity mapping by ERM

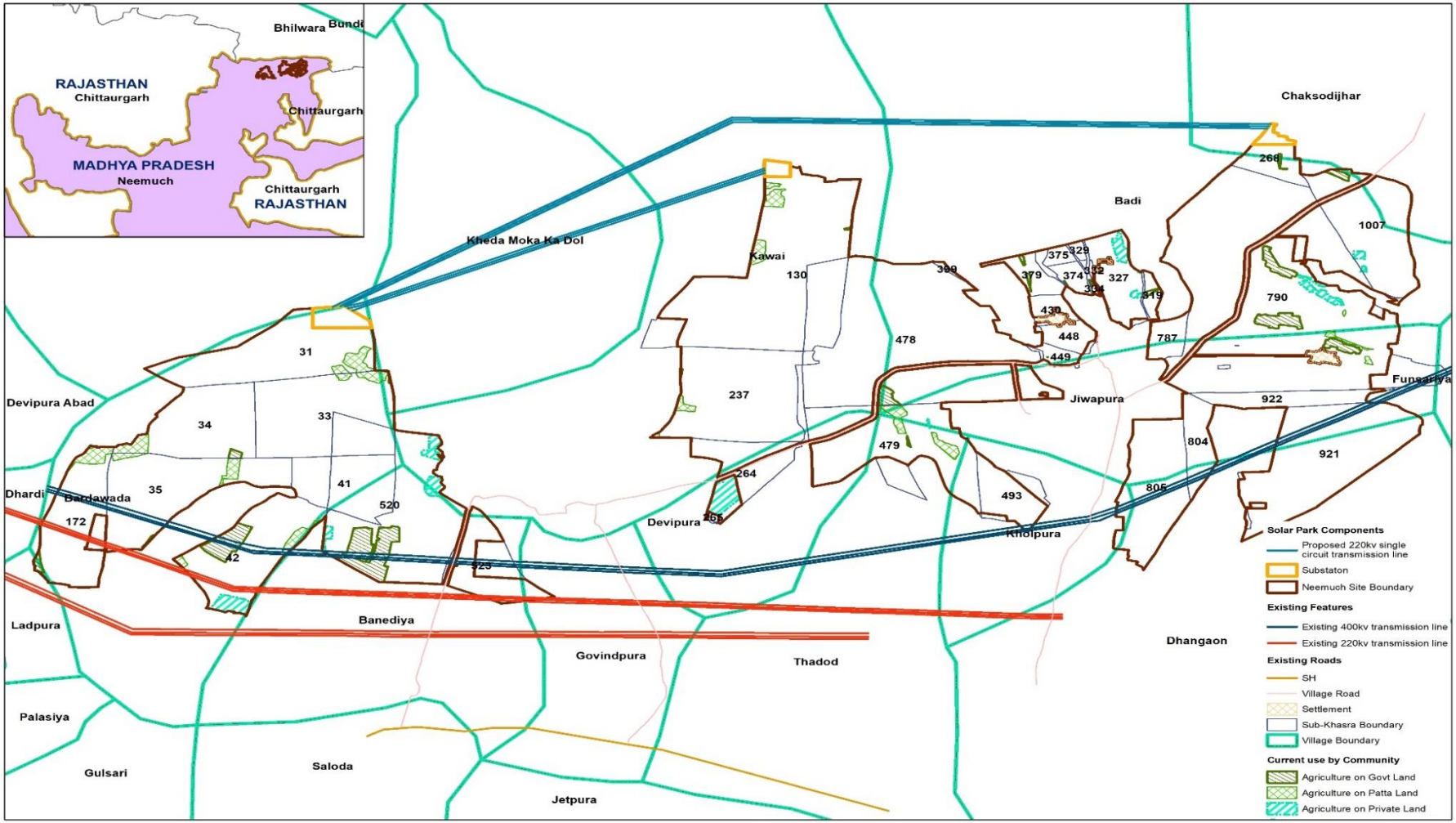
3. SUMMARY OF PROJECT AFFECTED ENTITIES

3.1 Land Use and other Sensitivities

This section provides an enumeration of the project affected entities. Project affected land use categories along with a tabular summary of project-affected entities based on different types of dependence, as identified through the RAP study have been included. The graphical representation below provides a snapshot of the land use within the project boundary identified. On the basis of the land use categories identified and the dependence reported, the RAP study presents an assessment of impacts and the PAHs.

The map below shows that current land use by the community for agricultural (green colour) and residential purposes (dark yellow colour), within the Solar Park footprint. The proposed TL routes have been described in blue, originating from the three Pooling Sub-Stations (PSS) represented by a yellow outline. Of the total land area under cultivation within the Solar Park footprint, 103.16 (9.6 %) hectares is private/patta land, and 151.51 (14.2 percent) hectares is informal use of government land for agriculture and/or fodder cultivation. The agreed/proposed exclusions to mitigate/minimize economic and physical displacement has been provided in **Table 2.4**.

Figure 3.1 Sensitivity map of Unit 1, 2 & 3



Source: Land Use sensitivity mapping based on information provided by RUMSL

3.2 Project Affected Villages

Based on the final project footprint, the following villages have been identified as impacted along with the area affected in each village. Of all the impacted villages, Bardawada has the highest impact with 54 percent of the total village land being procured for the project. By comparison, the lowest share of land take is in Badi, where the village is losing 42 percent of the land to the project. In total, the Solar Park is affecting 40 percent of the total land area across the three villages.

Table 3.1 Land Requirement by Ownership, in Project Villages

Village Name	Geographical Area of Village (ha)	Land required for the Neemuch solar park (ha)				Land remaining (ha)	Proportion of Land Remaining (%)
		Government land	Private land	Patta land	Total		
Bardawada	565.09	201.83	5.1	50.7	257.63	307.46	54.4
Kawai	826.46	245.7	4.25	22.41	272.38	554.08	67.04
Badi	1300.43	514.99	12.1	8.6	535.72	764.71	58.8
Neemuch Solar Park	***2691.98***	***962.52***	***35.5***	***87.72***	***1065.73***	***1626.25***	***60.4***

Source: Land data provided by RUMSL as on November 2020

The impact on private land holding however is relatively the highest in Badi (55 percent) among the three villages, while Bardawada has the highest proportion (62 percent) of the patta land within the project footprint.

3.3 Affected Khasras

The total number of khasras affected by the land procurement for the three Units is given below. The spatial representation of these parcels and their ownership is provided in **Figure 3.1**.

Table 3.2 Land required for Solar Park

Unit	Type	Number of Khasras	Land Area (ha)
Unit 1	Government	15	291.45
	Private	10	9.35
	Patta	43	50.71
Sub - total		**78**	**351.50**
Unit 2	Government	9	319.38
	Private	1	1.74
	Patta	22	26.01
Sub - total		**32**	**347.13**
Unit 3	Government	25	351.71
	Private	20	10.36
	Patta	3	5.0
Sub - total		**48**	**367.1**
Grand Total		**158**	**1065.73**

Source: Land data provided by RUMSL as on June 2020

3.4 Project affected area and survey coverage

Land for the Project comprises of 1065.7. hectares of which government land identified for the project from the three project villages' amounts to 962.52 hectares, which forms 90.3 percent of the total land required. About 103.16 hectares of private and patta land together has been considered for purchase, which forms 9.7 percent of the total area identified for the project.

The LA surveys were undertaken for the private/patta khasras as well as those government khasras on which agriculture through informal use was being undertaken. The LA surveys covered about 57 percent of private land and 15 percent of government land required by the project. The specific limitations have been explained in **Section 1.3.4**.

For the Neemuch Solar Park, L&A surveys were undertaken for private and patta land holders. The LA survey for private khasras was undertaken with the private khasra owners on recall basis i.e based on the reporting ability of the of the respondent, while the LA survey for patta khasras was undertaken based on physical measurements of the parcel. The proportion of survey coverage for private and patta land owners was the highest in Badi village, while the extent of LA survey undertaken for informal use of government land was the highest in Barawada village.

Table 3.3 Survey coverage

Village	Required Government Land (ha)	Government Land under informal use, surveyed (ha)	% surveyed of required govt. land under informal use	Required Private & Patta Land (ha)	Private and Patta land covered in the survey (ha)	% surveyed of required private/patta land
Bardawada	201.83	86.3	42.3	55.8	28.83	51.66
Kawai	245.72	18.1	6.5	26.66	17.84	43.9
Badi	514.99	47.11	76.4	20.7	23.6	86.5
Grand Total	**962.494**	**151.51**	**14.6**	**103.16**	**70.27**	**57.0**

Source: Land data provided by RUMSL and ERM's L&A survey 2020

Note: The difference in the survey coverage and private/patta land area is due to the absenteeism of khasra owners and/or not consenting to participate in the survey process

3.4.1 Assets affected

The assets affected due to the land procurement pertain to loss of land and access to land. The extent of these impacts on the fixed assets are further described in **Section 6.1.** This section provides the summary of such assets, including their counts and spread across the villages

- Residential structures: Twenty-four residential structures are to be impacted due to the land procurement process either directly as they were isolated structures or indirectly due to induced displacement:
  - Out of these, four (4) residential structures have been surveyed. These structures were on or associated with the agricultural khasras and were used for dwelling purposes for more than six months in a given year.
  - Apart from the surveyed residential structures impacted, 20 structures in the Gujjar settlement, spread over two clusters in Badi village are likely to be physically displaced. The total area of the habitat cluster (including homestead area of cattle shed, community religious structures, fodder lots, etc.) is approximately ~6 hectares. Each homestead unit

within this cluster is estimated to be spread over an average area of 0.3 ha, based on the analysis of the satellite imagery. The residential area associated with each homestead is estimated to be approximately 0.05 ha. This settlement could not be surveyed due to the community not providing consent for the survey, as described in **Section 1.3.4.**

- Other immovable structures: Sixty- eight (68) structures which include storage shed, cattle shed, bore well, hand pump, open wells have been covered as part of the affected entities surveyed. Out of these, 54 are fixed assets that are salvageable which includes irrigation systems like water tank, hand pump and bore well, and wire fencing with wooden poles. The data does not include information regarding the land area not surveyed during the LA survey.
- Standing crop: There are 141 private/patta khasras (these khasras correspond to 94 Khasras wherein each Khasra has one or more than one identified land user for agriculture)with farming activity and spread over an area of 103.16 hectares that are likely to be affected by the project land requirement, though the standing crop will need to be determined at the time the land procurement is planned. In addition, there are 47 government khasras with agricultural activity (informal use in the form of encroachment/squatting) spread over 151.51 ha. If land is procured after all standing crops have been harvested, this category will not apply.
- Timber and Fruit trees: 211 timber trees and 39 fruit trees, none of which were part of a planted orchard.

3.5 Project Affected Households (PAHs)

As part of RAP survey, household –level socioeconomic surveys were carried out for those who are to be directly impacted by the land procurement (private land owners and informal users of government land) for the proposed project.

The baseline (**Section 4.2**) has been developed, based on the responses received on the completed HH surveys undertaken for Neemuch Solar Park. The following table provides a summary PAH and coverage of the survey.

Similarly, 150 LA surveys were undertaken which covered 126 PAHs (out of 127 PAHs), all of which are to be economically displaced (except four households) by the project. This excludes the potentially physically displaced Gujjar households in Badi village who could not be surveyed.

Table 3.4 Status of Household Survey Coverage

Survey Coverage by category	Household Count (in numbers)	Proportion (%)
Total PAH	225	100
Physically and Economically Displaced PAHs	23	10.6
Only Economically Displaced PAHs	202	89.4
Impacted Categories Surveyed		
Households Surveyed	127	56.4
PAH Households surveyed	126	56
Physically Displaced PAHs surveyed	4	16.67
Economically Displaced PAHs (private/patta land owners) surveyed	77	38.12
Economically Displaced PAHs (squatters on govt. land) surveyed	39	19.3
Women Headed PAHs surveyed	11	5.4

Survey Coverage by category	Household Count (in numbers)	Proportion (%)
Vulnerable PAHs surveyed	15	7.42
Sample Households	1	0.4
Households that did not consent to the survey or are absentee households	98	48.5

Source: HH survey 2020

4. SOCIO-ECONOMIC BASELINE PROFILE OF AFFECTED COMMUNITIES OF NEEMUCH SOLAR PARK

A socioeconomic baseline for the project area was included in the ESIA document based on primary consultations and secondary data.

This section profiles the socio-economic baseline, covering livelihood, gender disaggregated assessment and vulnerability profile across affected communities based on information collected through the HH surveys and community consultations undertaken in December 2020.

The baseline has been presented at village level for all the three Units. The Unit boundaries include land from Kawai village in Unit 1 (100. 167 ha.) and Unit 2 (185.69 ha.); from Badi village in Unit 2 (181.16 ha.) and Unit 3 (356.72 ha) Unit

The RAP survey included:

- Coverage of three villages using a village profile checklist;
- Of a total of 225 PAHs, 126 HHs in the socioeconomic HH surveys along with 1 sample survey; and
- Six (6) discussions with key stakeholders and/or focus groups including women, youth, farmers, graziers[7].

The information provided in **Section 4.1** is based on the village profiling exercise and consultations conducted with Gram Panchayat while the household level information in **Section 4.2** is based on the primary household survey data.

4.1 Profile of Villages in the Project Footprint

The project footprint in the Neemuch District is comprised of three units, Unit 1, Unit 2 and Unit 3. The villages in Unit 1 and Unit 2 are overlapping. Unit 1 consists of 2 villages; Bardawada and Kawai, Unit 2 consists of 2 villages, as well; Kawai and Badi. Unit 3 consists of Badi village only. The detailed profile of the three units is given in the following sections.

4.1.1 Profile of Villages in Unit 1, 2 and 3[8]

4.1.1.1 Village Population

Villages in Units 1, 2 and 3 reported a total population of 5,750 persons comprising of 555 HHs, during consultations. Out of these villages, Badi has the highest population, with a relatively large average family size. It should be noted that data reported during village profiling for Badi village takes into account information on households across the different hamlets (there are four separate hamlets), while the baseline study considered two settlements/hamlets. Review of secondary data (Census of India 2011) shows that the average family size was in the range of 4.0 – 5.0 for the three village with 5.2 being the highest in Bardawada, and 4.3 for Badi. The data reported from the baseline study (**Section 0**) is similar in trend with the Census numbers, with the former being on the higher side (given that there has been in increase in number of households since the last Census).

Table 4.1 Population Profile of Villages

Villages	Total HHs	Total Population
Bardawada	105	350

[7] Those who tend to cattle for a cluster of houses for rental fee

[8] The profiling of the villages across the three Units has been analysed together due to the overlap in the land footprint, to present comparative analysis of the three villages, and thorough representation of the RAP data

Villages	Total HHs	Total Population
Kawai	125	400
Badi	325	2000
Total	555	2,750

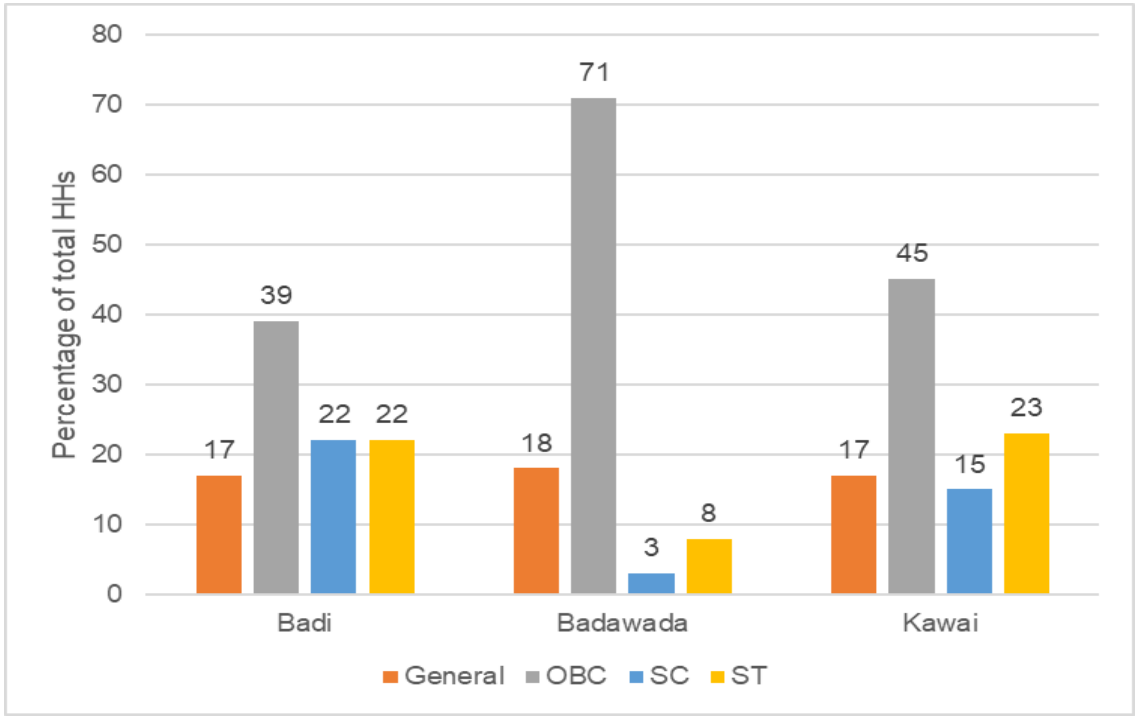
Source: Village profiling 2020

4.1.1.2 Social Stratification

While a mixed population characterises the total population in the villages in terms of religion and caste, the dominant religion is reported to be Hinduism, with 91 per cent of the population being Hindus (according to the village profile, filled in consultation with community representatives in each village).

A majority of the population in the villages belonged to the Other Backward Classes (OBC) category. The most prominent social group among the OBCs are Gujjars (56 percent of total OBC households), followed by Dhakad community (41 percent of total OBC households). The lowest proportion of households belong to Scheduled Caste (SC) which includes Balai, Chamar, Kumhar, Barait, Nai, and Dholki social groups. The number of Bhil and Bhilala households (the only Scheduled Tribes category) is the highest in Badi village which has two such ST settlements, as reported during village profiling. Among these two settlements, one settlement of 30 Bhil families had migrated from Ratlam district 20 years ago and have settled in Badi village since then. Rajput and Brahmin are the main groups in the General category. Their proportion in total households is similar across all the three villages, at about 17-18 percent.

Figure 4.1 Proportion of Social Group Households



Source: Village profiling 2020

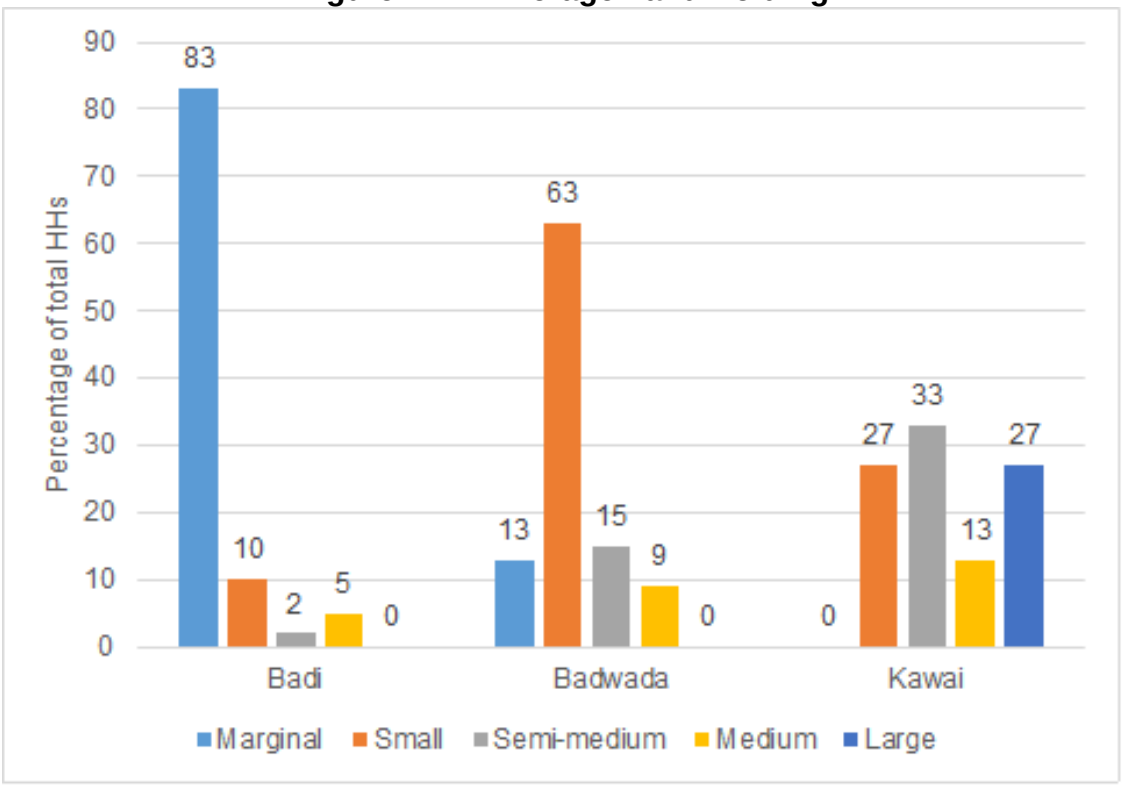
4.1.1.3 Land Ownership, Occupation, and Use

According to the consultations, the land use across the villages is characterized predominantly by agriculture () and fodder lots. Villagers have also reported informal occupation/use of government

land for agriculture as a practice for more than 20 – 25 years, where the Gujjar settlement has reported informal occupation/use of government land for agriculture for more than 100 years.

As can be seen in the figure given below, 50 percent of the households are marginal famers, that is, those owning less than one (1) hectare of land. Badi has the highest share with 83 percent of the households in the marginal land holding category. Large farmers, i.e. households owning more than 10 hectares of land were reported in Kawai village only (5 per cent of the households), and these belong to OBC (Dhakad) and General (Rajput) categories. Small farmers (1 – 2 hectares of land) constitute 25 per cent of the households with majority of them from Bardawada village. Households belonging to the SC category (16 per cent of total households) reported to having less than 2 hectares of land. Semi – medium farmers comprised of 11 per cent of the total households. Landless households were reported only in Badi village (Unit 3).

Figure 4.2 Average Land Holding



Source: Village Profiling 2020

In terms of informal use of government land for agriculture, almost all the land owning households across the villages have reported to such informal use of government land. In Badi (Unit 3), 64 percent of the land owning households surveyed (all social groups except ST community) had been using government land for the past few generations. Similarly, 88 percent of the households (Dhakad, Gujjars, Bhil, and Rajput) in Kawai (Unit 2 and 3) had been informally using government land adjoining their private land for agriculture.

Encroachment was reported to be the lowest in Bardawada (Unit 1 and 2), wherein only 33 per cent of the households had reported to using government land being undertaken by OBC households. The low figures of encroachment in Bardawada is because many of the land owning households do not practice agriculture as an economic activity and have either migrated to other Gram Panchayat (GP), or have let their khasras remain barren. It should be noted that during the village profiling exercise, it was reported that only one household in Badi Village were reportedly landless.

These encroachments or squatters are reported to be at least one generation[9] old. It has been reported that the local community deposits fines for encroachment/squatting and cultivation on Government lands; however, the fines are paid only for a smaller fraction of the actual encroachment. The payment of fines for a fraction of encroached land helps the households get their names in the Government records while avoiding the payment of actual sum of fines, which is much higher in most cases. People see benefit in remaining on this list (of squatters/encroachers), even if they have to pay a fine, as they think that this makes them eligible for future 'patta' allotments or regularisation of their claims on government land. This understanding was not confirmed by relevant government officials. However, this seems to act as an extra-legal, proxy, claims establishment system, where families and generations continue to cultivate, year after year. The khasras encroached upon are characterised by higher productivity (triple cropping and more) and access to irrigation facilities. The khasras under informal use by squatters are characterised by primarily single or double crop, with a few reporting triple cropping and mostly no irrigation facilities. The PAHs surveyed also reported to not undertaking significant investments in improving the productivity of khasras under informal use by squatting, in comparison to encroached khasras.

4.1.1.4 Livelihoods

The affected communities across the project affected villages are dependent upon agriculture in the form of either farming on their private khasras or engaged in agricultural labour work. Most of the cultivators are also engaged as agricultural labourers. The dependence on non-farm-based livelihood is 1.3 per cent of the total population with the highest proportion of persons engaged in such occupations reported in Bardawada village. As understood from consultations, non-farm occupations are limited, and the population in the youth age group (15 – 35 years) would want to engage in contractual employments within their tehsil (Sub-division of District). The higher proportion of non-farm occupation among the three villages is explained by the fact that certain household members in the village have gone into non-farm occupations for livelihood such as civil construction work, machine work, etc, as compared to the other two villages where the population continues to be dependent on traditional livelihoods.

Livestock holding has been reported by all the surveyed PAHs (Section 4.2.4.2). Less than one percent (0.6 per cent of the population) are engaged in grazing of livestock for income as graziers, and is primarily undertaken by members of the Bhil community (17 persons) in terms of livestock holdings. According to the discussions with the local community, the members of the Bhil community undertake jobs as graziers due to lack of other opportunities, smaller land holdings and weaker economic standing, in comparison to non-ST households. In terms of difference in livestock holding across social groups, the ST population of Bhils/Bhilalas have more goats in comparison to cows/buffaloes. This trend is reversed in the non-ST households in the villages.

Table 4.2 Proportion (%) of village population Livelihood Source

Village	Agriculture Cultivators	Livestock (Graziers)	Machinery / Factory Workers	Agricultural Labourers	Transport Workers	Construction Workers	Government/ Private Services
Bardawada	88.2	2	0	88.2	0	4.3	1.47
Kawai	62.5	2.5	0	62.5	0	2.5	1.25
Badi	80	0	0.4	80	0	0	0.12

Source: Village Profiling 2020

Out migration for work is limited and is of seasonal in nature across the three villages. Since majority of the population is engaged in farm based activities, migration is undertaken during the lean period of March – June when agricultural activity is low (in between Kharif and Rabi season). Badi has the

[9] A generation is defined as spanning over 25 years, as defined in Forest Rights Act (FRA) 2006

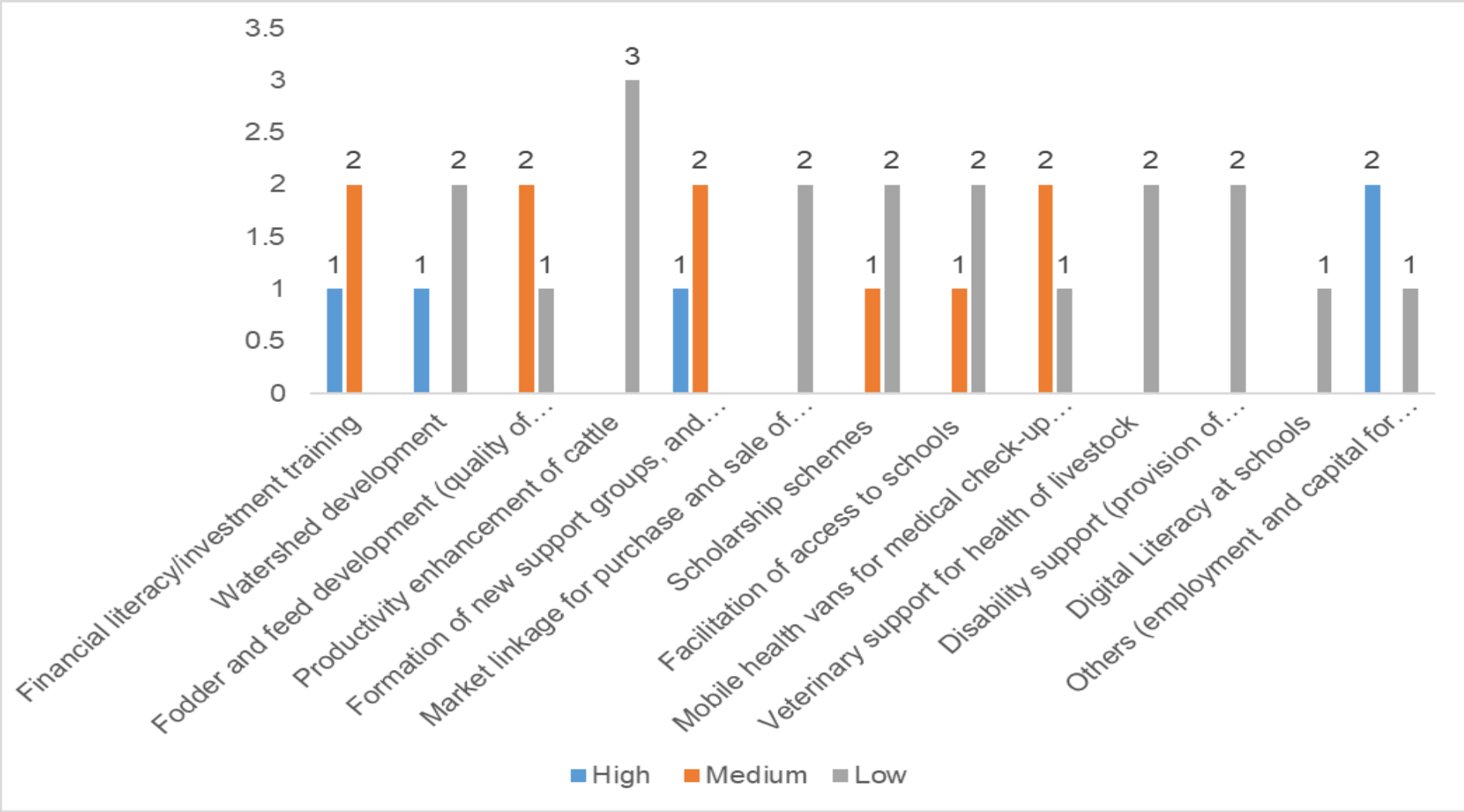
highest share of households (50 per cent of total households) from whom male members out – migrate for work in construction sector. The two other villages had 9 per cent (Bardawada), and 20 per cent (Kawai) of households reporting out – migration.

4.1.1.5 Community Development

All households in the villages have access to water for drinking, and domestic use. All households also have electricity. For education facilities, almost all the Project affected villages have school till primary level (5th standard). For higher studies, children from the villages have to travel to Singoli town, approximately 20 km away from the villages. Further, there are no medical facilities in any of the villages. The nearest medical facility is in Singoli or Tharod. Market facilities to buy and sell agricultural produce (on MSP and through bids) and for purchase of household consumables is available at Singoli, which has a dedicated farmers' market.

As part of the village profiling exercise, the villagers were asked to rank the kind of community support as High, Medium, and Low from the provided options. Based on the information collected on requirement of community development support, the highest demand across the villages is for financial literacy and investment training, and fodder and feed management for livestock (2 out of the 3 villages gave a medium rank). Education and health related support programs such as scholarship schemes, mobile health facility, and veterinary support for livestock are of low importance as the current infrastructure and services available are assessed as sufficient by the community.

Figure 4.3 Preference for R&R Support



Source: Village Profiling 2020

4.1.2 Cultural Resources

There are no listed cultural resources that are protected by national or state departments that are affected by the Project. However, there are certain religious structures that have been identified to be potentially affected in Badi village due to land procurement. There are three religious structures in the Gujjar settlement in Badi village which have been in existence over 40 – 50 years, and are of local cultural significance. These include a temple in the courtyard of the settlement, and a mazaar, as observed during the RAP surveys. . Apart from these structures, the villages have reported to worshipping, sacred trees and small shrines. All the social groups use these cultural sites with equal access. The details of cultural resources affected by the project are given below in table below.

Table 4.3 Cultural resources in the Solar Park

Unit	Village	Cultural Resource	Status of cultural resource on inside or outside the project boundary	Remarks	Categorization of the Resources as per IFC PS 8	Suggestion for RUMSL
1	Badi	Two religious structure, and one sacred stone	As per the current land footprint of the Solar Park, these are within the project boundary	These structures are part of the settlement and located in the central courtyard of the settlement	Tangible form of cultural heritage	Exclude the entire Khasra where the Gujjar settlement is residing to avoid economic and physical displacement impacts, and cultural impacts. Presently, the settlement has been included in the RAP/LRP. In case it is in the project boundary cannot be revised and the impact cannot be avoided, alternative access needs to be provided or the heritage site to be relocated in consultation with the local community

Source: Village Profiling 2020

4.2 Socioeconomic profile of the households surveyed in the Project Footprint

This section provides an overview of the socio-economic baseline of the project affected households (PAH) and sample households. The socio-economic profile is based on the primary survey and consultations conducted in the three villages in three units of Neemuch Solar Park. This section presents the socioeconomic baseline analysis by village, and covers key aspects such as education, livelihood, land and asset ownership, income and expenditure patterns, physical and social infrastructure, relevant to the PAHs. It also highlights different vulnerabilities among the population and their dependency on resources to understand the significance of involuntary resettlement impacts. Demographics

The table below provides the demographic characteristics of the 127 surveyed households (including one sample household) in the three villages.

Table 4.4 Demographic Profile of surveyed households

Village	Number of Households	Total Population	Sex Ratio[10]	Average Family Size	Dependency Ratio[11]
Bardawada	52	292	802	5.6	37.7
Kawai	35	216	895	6.1	48.9
Badi	40	228	853	5.7	60.5
Total	**127**	**736**	**844**	**5.8**	**47.4**

Source: HH survey 2020

The overall sex ratio among PAHs is lower than the sex ratio of the district (954) and country's sex ratio of 940 females per thousand males. The sex ratio across in Bardawada is the lowest among all three villages.

Badi Village has the lowest dependency ratio as compared to Kawai and Bardawada. The potential reason for low dependency can be a high proportion of people engaging in income generating activities. The dependency can only be lowered if there are better educational, vocational and employment opportunities for vulnerable groups in the society.

As shown in **Table 4.4** the average family size is 5.8. Among the surveyed households, 42.6 percent have up to five (5) members in their family while, 57.4 percent have 5 to 10 family members. The households reporting more than 5 members primarily comprised of joint families, with two or more brothers residing together in the same household along with their families, parents, unmarried siblings and other dependents. The surveyed households reported a preference of large joint families, with sons residing with their other siblings' families and their parents after marriage. The trend of nuclear families was rare but common in Bardawada, where sons reside separately from their parents in another village, after marriage. The trend of nuclear families was reported to be higher amongst the OBC families. The lowest family size was reported was of 5.6 in Bardawada.

In terms of age wise population distribution, **Figure 4.4** shows that the majority of the population in the district is in the age group of 15-35, i.e. the youth population. The sex ratio among different age groups is detailed in **Table 4.5**. The population in the age group of below 6 years shows the lowest sex ratio among all age groups. Despite of several policies and schemes to promote gender

[10] Sex ratio refers to the ratio of females to 1000 males among the PAH.

[11] Dependency ratio refers to the proportion of dependents with respect to the working population among the PAH. The formula used to calculate this ratio is PAPs below 15 years of age + PAPs above 60 years of age divided by the PAPs between 15-60 years of age.

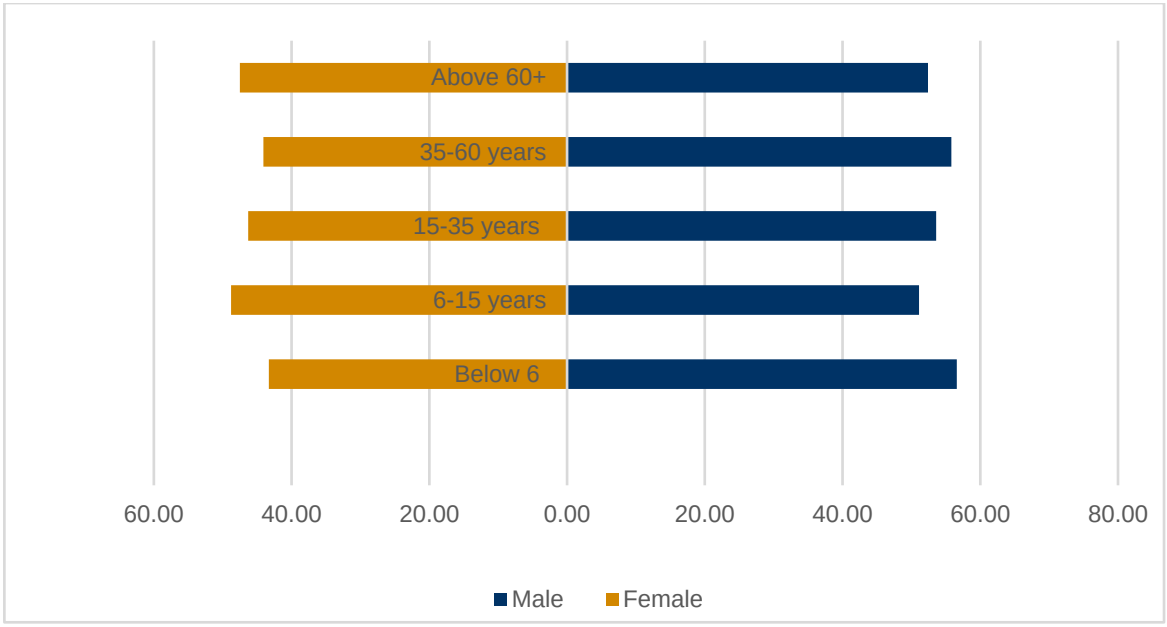
development, these figures raise serious concerns towards gender equality among children in the area.

Table 4.5 Age Structure of the population

Age group	Males	%	Females	%	Total	%	Sex Ratio
Below 6	51	12.7	39	11.1	90	12.2	765
6-15 years	44	11.02	42	12.4	86	11.6	954
15-35 years	167	41.8	144	42.7	311	42.2	862
35-60 years	105	26.3	83	24.6	188	25.5	790
Above 60+	32	8.02	29	8.6	61	8.2	906
Total	399	100	337	100	736	100	887

Source: HH survey 2020

Figure 4.4 Age Sex Pyramid



Source: HH survey 2020

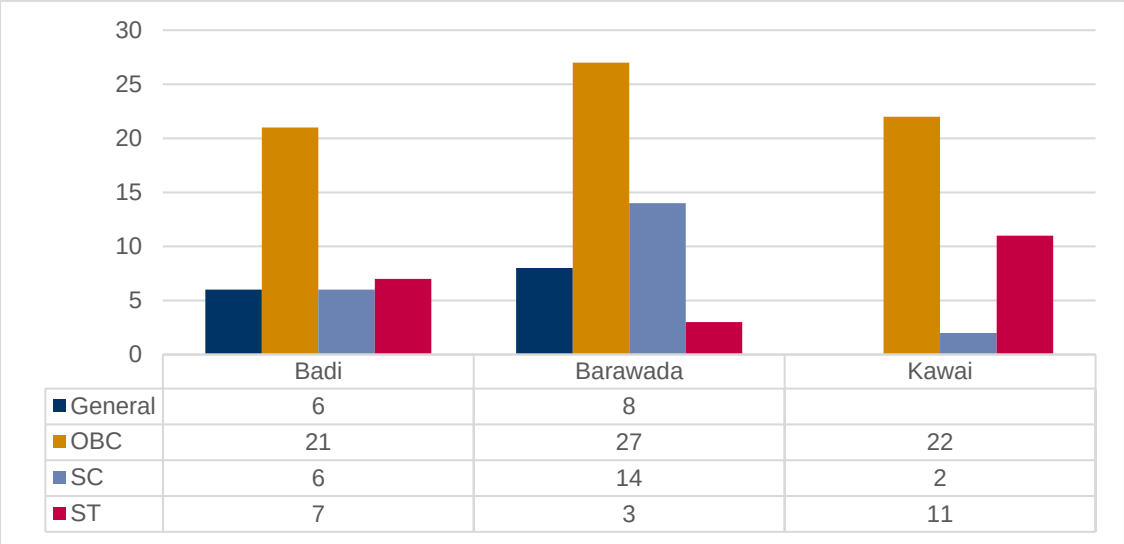
4.2.1.1 Religion, Caste and Ethnicity

More than 97 percent of the PAHs are Hindu while, the remaining 3 percent are Muslim households. The Hindu households have a higher sex ratio (889), as compared to the households in the Muslim category (666). The surveyed villages reported practice monogamy and the preferred norms of kinship are endogamous.

Social group profiling of the PAHs shows that 55.5 percent of them belong to OBC category households, and 17.4 percent belong to SC category households (out of 127 impacted households). There are no caste based differences observed in occupation/livelihood, however, landlessness has been observed only among ST category (0.7 percent of the households) across the PAPs.

The division of social groups by village is detailed in **Figure 4.5**.

Figure 4.5 Social groups by Village



	Badi	Barawada	Kawai
General	6	8	
OBC	21	27	22
SC	6	14	2
ST	7	3	11

Source: HH survey 2020

The main caste groups amongst the surveyed households comprise of the Rajputs and Brahmins in General category, Gujjars, Dhakkads and Silavats in the OBC category, Ragers and Balais in the SC category and Bhils in the ST category. Pinjaras are the dominant castes among Muslims. Among the OBC's nearly 35 percent Banjaras, followed by the Dhakkads.

4.2.1.2 Settlement Pattern

The settlement pattern in the villages have undergone a significant change over the years. The main village has grown in size and extended to a larger area. There is typically one main settlement in the village, followed by scattered multiple hamlets around the main settlement in the radius of 500 mtrs – 1 km radius. The main village is understood to be up to 300-500 years old while the emergence of these extended hamlets is a comparatively recent phenomenon (60-80 years). Caste hierarchy has spatially segregated the hamlets from the main settlement wherein the main settlement has a mixed social fabric with the dominant higher caste groups while the hamlets are resided by households from SC and ST communities. Within the main village, though there is a cohabitation of various social groups, people of the same social group reside in specific areas of the village. For example, the Gujjars in Badi, live in a street at the end of the village and the Brahmins of the village live near the access road. These extended hamlets are either called a baldi or a colony. This settlement pattern is predominant in Badi.

The overall relationship of people in the village and these extended hamlets are cordial, and there is no demarcation of areas about common natural resources, particularly surface water bodies, and grazing land.

There is however a stark difference when it comes to accessing these hamlets as compared to the villages. The access roads to all three villages is through a semi-pucca road, but accessing the extended hamlets is more challenging because of absence of roads. It takes about 20-30 mins by foot to reach the hamlets from the main village. Those living in the villages have a travelling distance of within 3 kms (less than 30 mins) to access their agricultural lands. The only exception is Bardawada, where households have to travel for about 5 kms (45 - 50 mins) to access their khasras, with some households even depending on two-wheeler transport to access their agricultural fields. In terms of accessing land for open grazing of livestock, it was understood during consultation that the residents let the livestock out for grazing for a distance of up to 1 – 3 kms from the village to access the designated grazing land or private khasras to graze.

Within these extended hamlets reside the minority population of the district such as Bhils, Suttars, Gujjars etc. Though the surveyed villages have a small proportion of these minority castes living within the main village as well, the majority of the people reside in the designated extended hamlets.

Box 4.1: Changing settlement patterns

Badi village, is reportedly a 600 year old village. The village elders are understood to be the third and fourth generation within this village. There are nearly 300 households currently within the main village. In the last 70-80 years, there are 4 small hamlets which have emerged around the main village of Badi; *baithron ki basti, sutaaron ki basti, bhil basti* and *mama bhil basti. Baithron ki basti*, situated at north-east of the main settlement of Badi is a predominantly Gujjar settlement while *Sutaaron ki basti*, at north-west of Badi is a predominantly Suttar settlement. Both these settlements, 2-3kms from the main village, are reportedly nearly 80-90 years old but their access is still through a kutcha road. The residents in the Suttar settlement reportedly were engaged in agriculture, agricultural labour and labour work.

Bhil basti, south-west of Badi, is residence to the Bhil community of Badi. Bhils are the ST community of the region who are mainly engaged in agriculture and agricultural labour. They have settled in the area more than 100 years ago but the hamlet is a more recent emergence *Mama basti* which is a farther down to the *bhil basti*, is a more recent establishment (50 years), as understood during consultations. Nearly 4-5 kms south-west, from the main village, the hamlet is understood to be inhabited by Bhils who have migrated from Ratlam district.

Source: consultations with the local community during RAP study

Most of the residential areas, were kutcha and semi- pucca. Bardawada and Badi were observed to have 1-2 market areas within their boundaries, catering to the daily needs but the people preferred to go to the nearby district headquarters to buy their supplies and monthly purchases.

The surveyed households also reported having temporary structures on their agricultural khasras. These structures acted as temporary residences for the families of the land owners during farming season or as a shelter during bad weather.

Figure 4.6 Residential Structures within the village

Source: RAP study, 2020

4.2.2 Social Group Dynamics

The district is characterised by a mixed population in terms of religion and social/caste groups; Hindus are the predominant religion-category, OBCs are the predominant caste group.

The marriages within these villages are mostly endogamous and the social set up is patriarchal. As highlighted in Section 4.2.1.2**,** in most villages, the different social categories reside in different clusters and hamlets within the village. However, the people reported having a cordial and co-dependent relationship across communities. Cultural activities are celebrated, across communities, and with participation by various groups.

In terms of decision making at the village level, there are instances where people from SC and OBC groups are the elected representatives of the village as per the 73rd amendment[12]. However, the traditionally dominant caste group members of the panchayat hold the decision making power in the villages. For example, in Badi and Kawai the Sarpanch from the Bhalai group in the SC category. However, the decision making authority in both villages continues to be with the village elders belonging to the general category who act as advisors or are informal 'committee members' and sometimes formal elected panchayat members as well.

In Badi village, the Muslims families of the village; *Pinjaras*, reside on a street next to the *Gujjars Moholla*. The Brahmins live in a cluster at the heart of the village, next to the village temple. The communal relationship within these villages among all social groups is cordial and co-dependent. Bardawada, a well-developed village which has multi storeyed houses also displayed a spatial caste segregation. The *Ragers* and *Bairagis* of the SC community live in a cluster which is distant from the *Rajputs, Dhakkads* and *Gurjjars.* All the communities, spatially spread out in their respective settlement, have freedom of access to the main temple in the main cluster (except for the Muslims, who have their dargah situated at the entrance road to Badi village). The Gujjars offer worship at the main temple, as well as the Ragers visit the main temple during religious/cultural festivals. Apart from the main temple, each settlement have created their own structures of worship.

Box 4.2: Spatial segregation by Caste Groups

Source: Consultations with the local community during RAP study

The following table provides a summary of the qualitative assessment of social group dynamics which are further elaborated with data in relevant sections:

Table 4.6 Summary of Qualitative Observation on Social Groups

Aspect	General	OBC	SC	ST
Settlement Pattern	Live in the main settlement.	A small proportion live in the main settlement in a particular cluster. Also, reside in separate extended hamlets.	A small proportion live in the main settlement in a particular cluster. Also, reside in separate extended hamlets.	Very small proportion reside in the main village Mainly reside in a separate extended hamlet.
Land Ownership	Mostly marginal and small holdings.	Mostly small and semi-medium size land holdings.	Mostly small and semi-medium holdings.	Mostly small and semi-medium holdings.
Literacy Levels	Nearly 75 percent of the population is literate with education up to secondary	Nearly 63 percent of the population is literate and are	Nearly 54 percent is educated till primary and	Nearly 38 percent of the population is educated till

[12] Accordingly, it is proposed to add a new Part relating to Panchayats in the Constitution to provide for among other things, Gram Sabha in a village or group of villages; constitution of Panchayats at village and other level or levels; direct elections to all seats in Panchayats at the village and intermediate level, if any, and to the offices of Chairpersons of Panchayats at such levels; reservation of seats for the Scheduled Castes and Scheduled Tribes in proportion to their population for membership of Panchayats and office of Chairpersons in Panchayats at each level. (http://legislative.gov.in/constitution-seventy-third-amendment-act-1992)

Aspect	General	OBC	SC	ST
	and higher secondary and in some cases, graduation. The main reason for discontinuation of education is for work and marriage.	educated till primary and secondary levels, few instances of education beyond higher secondary. The main reason for discontinuation of education is an absence of economic resources and for work.	secondary levels. Few instances of education till higher secondary. The main reason for discontinuation of education is for marriage and lack of familial support.	primary and secondary levels. Very few instances of higher secondary and graduate training. The main reason for discontinuation of education is absence of economic resources and marriage and work.
Other Skills	There is one driver and one tailor in Badi village and a couple who reported traditional skills in Bardawada.	There is one electrician and one driver in Kawai and 4 drivers and one tailor in Bardawada (2 from the same family). 3 people reported to be practicing traditional arts in Kawai.	There is one mason and one driver in Bardawada. One man reported that he practices traditional arts in Bardawada.	There is one mason in Badi and a driver is Bardawada.
Participation in the Work Force	People in the working age (15-60) mainly engage in agriculture and agriculture labour. Very few of them have a business or shop or work at a private job.	People in the working age (15-60) participate mostly in agriculture, agricultural labour and construction work. Few of them have a business or shop and only nearly 5% of this population has a government or teaching job or are engaged in livestock livelihoods.	People in the working age (15-60) participate mostly in agriculture, agriculture labour and construction work. Very few are engaged in non-farm based activities like working in a stone crusher and livestock based livelihoods.	People in the working age (15-60) participate only in agriculture and agriculture labor and only one person reported to be engaged in livestock livelihoods.
Poverty Levels	None	None	None	None
Gender Roles (**Section 4.2.11**)	Decision making authority in the household is traditionally with the male head of the family. Women are responsible for domestic work such as cooking, cleaning, taking care of the children and the elderly, washing and feeding the livestock etc. Women are responsible for fetching water from within the village for the household and are in this role from a very young age.	Decision making authority in the household is traditionally with the male head of the family, despite women being the head of household in some cases. Women are responsible for domestic chores and in very few instances are allowed to do household chores and	Decision making authority in the household is traditionally with the male head of the family, despite women being the head of household in some cases. Women are responsible for domestic chores and household work. They are responsible for	Decision making authority in the household is traditionally with the male head of the family Women are responsible for domestic chores and household work. Young girls in most cases made to quit school post primary school for

Aspect	General	OBC	SC	ST
	Young girls in most cases do not continue with education after primary school for several reasons. Men are responsible for activities outside the house, selling of market produce, going to the markets etc. Women's role pertains to household activities and supporting male members in agricultural work on the fields, as reported from consultations.	activities outside the domestic space. They are responsible for fetching water, firewood and fodder from the forest of grasslands near the village. Young girls in most cases do not continue with education after primary school for several reasons. Men are responsible for activities outside the house, going to the markets, livestock grazing etc.	fetching water, firewood and fodder from the forest of grasslands near the village. Young girls in most cases do not continue with education after primary school for several reasons. Men are responsible for activities outside the house, going to the markets, livestock grazing etc.	household chores. Very few instances of women taking livestock for grazing in the grazing lands. Men are responsible for activities outside the house, fetching firewood, going to the markets, livestock grazing etc.

4.2.3 Education

4.2.3.1 Education and Literacy

The literacy rate in the Solar Park is highlighted in **Table 4.7 .** The overall literacy rate of the surveyed population is nearly 58.1 percent. The village with the highest illiteracy rate is Bardawada (68.8 percent) while Badi has 48.2 percent of literate population.

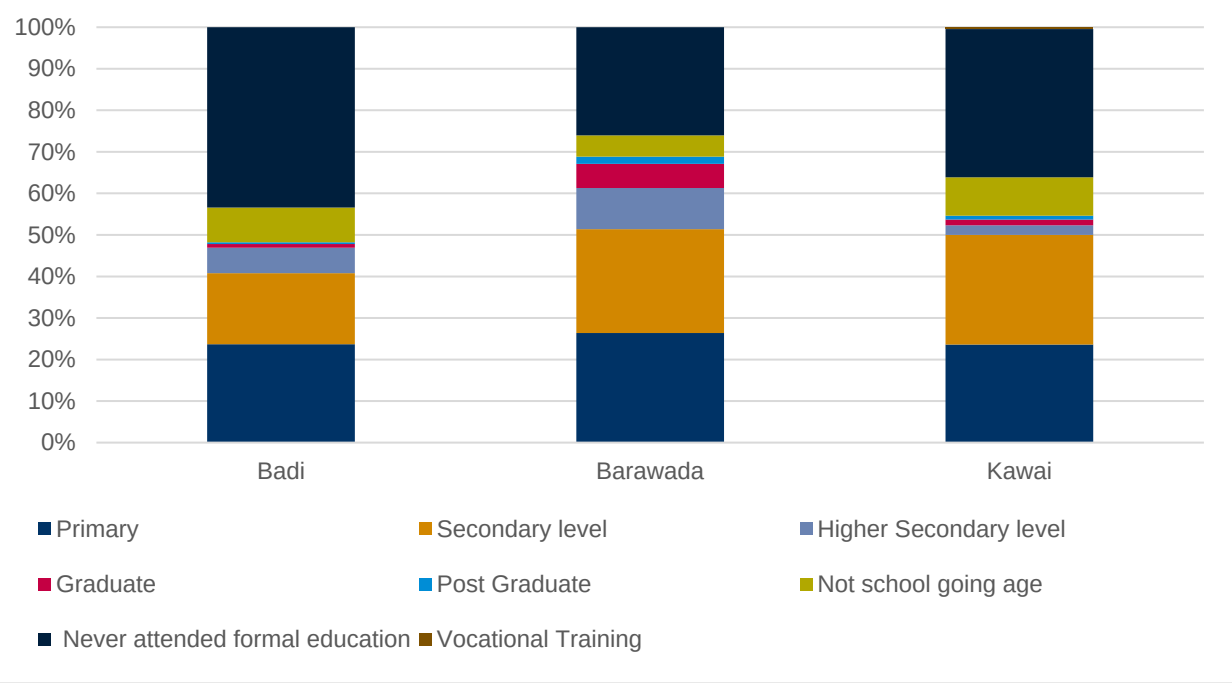
Table 4.7 Literacy amongst surveyed population

Categories	Illiterate				Literate			
Village	**Male**	**Male %**	**Female**	**Female %**	**Male**	**Male %**	**Female**	**Female %**
Bardawada	28	9.5	63	21.5	134	45.7	67	22.8
Kawai	42	19.4	57	26.3	72	33.3	45	20.8
Badi	55	24.1	63	27.6	68	29.8	42	18.4
Total Average	**125**	**17**	**183**	**24.8**	**274**	**37.2**	**154**	**20.7**

Source: HH survey 2020

It is reported that 42.2 percent of the surveyed population have completed primary education and nearly 34.1 percent have never attended formal schooling. About 50.7 percent of the literate surveyed population have studied till secondary or higher secondary but only about 7 percent have pursued graduate or post graduate courses.

Figure 4.7 Level of Education among surveyed population



Source: HH survey 2020

Looking at the educational infrastructure within and around the surveyed villages, most children attend the government schools in or near their villages. While Primary schools are reported to be relatively closer to the villages, in Tharod village, most children in these villages who are in secondary or higher secondary classes attend schools which are 10-12 kms away in Singoli, which is the nearest town. A proportion of children cover this distance by public transport or are taken by their parents. This is a contributing factor to high drop outs post primary schools in the villages. It is understood that families are not comfortable letting their children, specifically girls, travel such a distance to attend school and opt to discontinue their education after primary school.

Those studying in graduate and post-graduate degree courses, and vocational training either travel to Singoli or Chittorgarh, and in some cases, undertake residential facilities for courses in Indore, Bhopal or Rajasthan.

Table 4.8 Age wise literacy levels among surveyed Population

Age group	Literate		Illiterate	
	Male	Female	Male	Female
6-15 years	38	39	6	3
15-35 years	146	90	21	54
35-60 years	60	16	45	67
Above 60+	14	1	18	28
Total	**258**	**146**	**90**	**152**

Source: HH survey 2020

Table 4.8 indicates the learning gap between males and females in the Project footprint villages. Overall, 35.9 percent of the women are literate. Of those who are illiterate, nearly 20 percent did not get the opportunity to attend any formal educational institution due to traditional family rules and

marriage at an early age, as understood during consultation. Young girls drop out after completing primary level of learning, due to societal norms, and physical distance of higher education institutions from the village areas.

The male members of the family are encouraged to study beyond primary school but nearly 21.7 percent gave up studies due to a death in the family or an illness or disability, while 20 percent of the males left studies because of lack of interest. Around 24.7 percent of the male drop-outs are engaged in agriculture and labour work. There are a few households in Badi where children below the age of 10 who were going to school but also helping out in the fields as the family relocates to temporary sheds on their fields where all the members of the family help during agricultural seasons.

Even though, the above table shows the difference between male and female literacy levels, there also is a growing trend in the willingness to educate girls to higher education, and provide support to undertake higher education courses.

4.2.3.2 Other Skills (non-farm based)

Several skills have been reported across all three villages especially in Bardawada and Badi. Of those who reported skills (2.5 percent) about 31.6 percent of the surveyed households reported practicing traditional artisanal skills, mainly general and OBC category. These households reported practicing traditional arts and crafts such as basket weaving and the Bhils practice their traditional art of wall painting (although the custom has declined over generations). Apart from these traditional crafts, there are households who reported skills pertaining to driving, rajmistris (masonry), tailoring. These individuals reported practicing their craft as means of livelihood but have not obtained any formal certification for the same except for those who are drivers by profession. These individuals reported to have obtained a driving license.

Knowledge and skills on farm-based activities (agriculture and livestock rearing), are ubiquitous across the project affected households

4.2.4 Land and Asset Ownership[13]

Over the years, there has been negligible to no recorded change in the extent and intensity of land used for agriculture among the villages. Majority of the households undertake double cropping during a calendar year. The private/patta khasras of each household have an established boundary in the form of stone walls (stones piled over one another), wire fences and stone slabs, providing clear demarcations of land ownership as separate for each household. The use of government land informally by the households (either as encroachment by private/patta land holders, or through squatting) has been in practice for an average of 25 years. Encroachment in Badi village has been in existence for more than 35 years.

Due to fragmentation of large families into smaller household units, the second generation of sons of the household have their separate dwelling structures. The source of livelihood, however, is dependent on the khasra owned by the male patriarch of the family. This has led to informal division of large landholdings wherein the sons have divided the land holding (each parcel having separate land-based investments undertaken by each son). However, there has been no formal division of the land holding in terms of either transfer of ownership to the second generation as per official land records.

The land identified for the purpose of the project is comprised of primarily government land (90.3 percent), with a small section of private land. Approximately 9.6 percent of land is private which also includes patta land (7.6 percent is patta land). All the private land owners are residents of Singoli Tehsil. The land identified includes both, agricultural land and barren land without any farming activity

[13] This section takes into consideration the PAH with land holding only, Sample households are not considered as they are landless. .

being undertaken (land owned by absentee owners). **Table 4.9** details the proportion of PAHs across land holdings and **Table 4.10** details the same by village.

Table 4.9 Size of land holdings

Land Holding Size	PAH	PAHs (%)
Marginal Farmer (<1 ha)	11	8.7
Small Farmer (1-2 ha)	55	44.4
Semi-medium Farmer (2-4 ha)	37	29.3
Medium Farmer (4-10 ha)	22	17.4
Large Farmer (>10 ha)	0	0

Source: HH survey 2020

Table 4.10 Land holding of the PAHs by Village

Village	Marginal Farmer (<1 ha)	Marginal Farmer (<1 ha) %	Small Farmer (1-2 ha	Small Farmer (1-2 ha) %	Semi-medium Farmer (2-4 ha)	Semi-medium Farmer (2-4 ha) %	Medium Farmer (2-4 ha)	Medium Farmer (4-10 ha) %
Bardawada	2	3.8	32	63.4	11	21.1	4	7.6
Kawai	3	8.5	6	17.1	16	45.7	10	28.5
Badi	6	15	15	37.5	10	25	8	17.5

Source: HH survey 2020

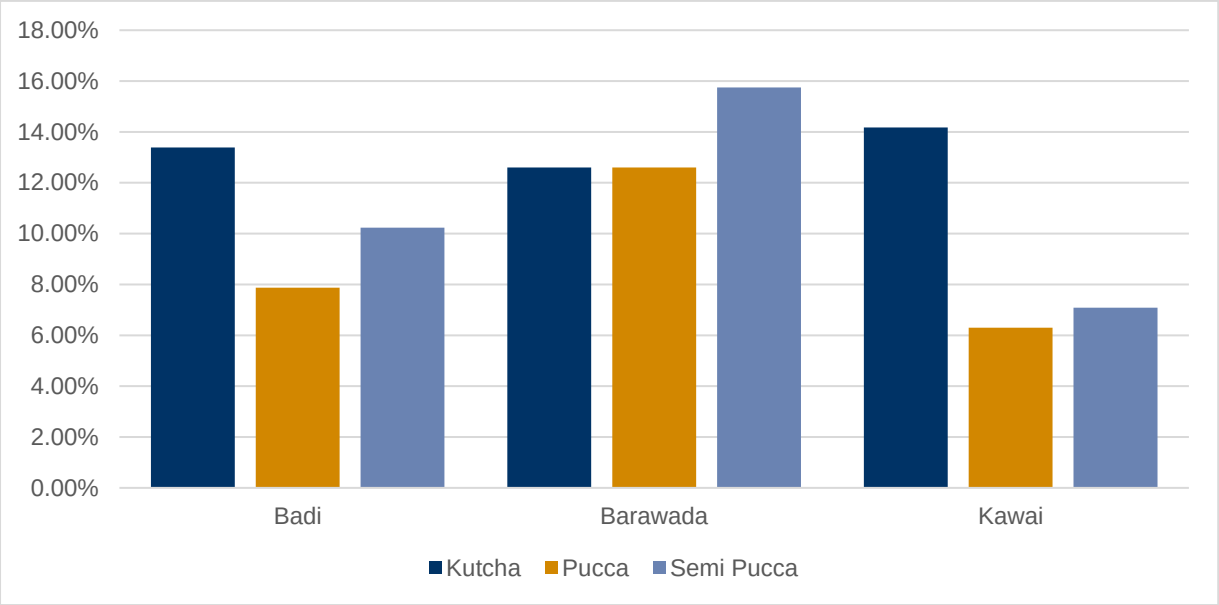
Majority of the PAHs (44 percent approx.) are categorized as small farmers, owning 1-2 hectare of land, while there are no PAHs with large land holdings (more than 10 hectares). The highest proportion of small farmers are in Bardawada. The potential impacts from the land procurement for the project in terms of change in land holdings and loss of livelihoods is discussed in the section on impacts.

A look at land holding by caste group shows that 50 percent of the small farmers and nearly 70 percent of the semi-medium farmers belong to OBC category. The Dhakad community are known to be skilled agriculturalists and belong to the OBC community. This may be a key reason for the land holding pattern reported. Analysis of land holding by gender shows that 58.3 percent of women-headed households have small land holdings and 27.2 percent of them have semi-medium land holdings.

4.2.4.1 Construction material used

Except for two (2) residential structures, all residences are owned by the surveyed households who also use it as permanent dwelling structure. About 40.1 percent of the housing is of kutcha type, and 27.5 percent of the surveyed households have a pucca housing structure.

Figure 4.8 Housing: Types of Construction

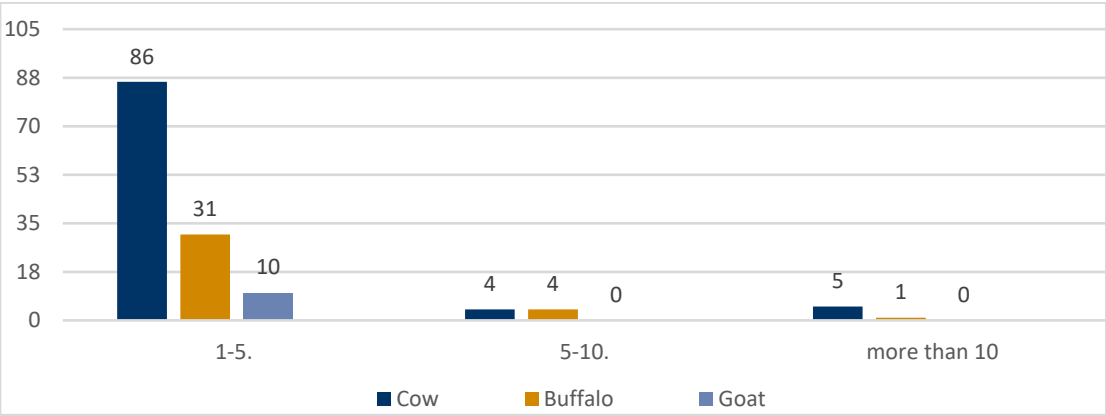


Source: HH survey 2020

4.2.4.2 Livestock Ownership

The PAHs are characterised by livestock holdings of cows, buffaloes, goats and sheep with most of the households having at least cows and goats. The dependence on livestock is mostly for household consumption along with the sale of dairy products, especially milk, being secondary in nature. **Figure 4.9** shows the number of PAH which have different varieties of livestock in the district. Cows are the most commonly owned livestock. Each household has at least one - two heads of livestock. The social group bifurcation of ownership shows no apparent difference in ownership across caste groups. The difference arise in cases of buffalo ownership, which is higher in General, and OBC social group in comparison to the SC and ST social group. The reason behind the low ownership of buffalo between the two social groups stems from their financial status. The other reasons for significantly low ownership of buffaloes are high costs of purchasing buffaloes, maintenance costs of veterinary support and fodder that makes it difficult for low-income households to purchase and maintain buffaloes.

Figure 4.9 Type of Livestock holdings



Source: HH survey 2020

4.2.4.3 Other Assets

In terms of household appliances, the highest proportion of assets is of ceiling fans, mobile phones, television sets and cable connections. In terms of vehicles, most of the PAHs reported ownership of two wheelers including bicycles and motor cycles. Amongst the agricultural implements, PAHs reported ownership mostly of implements such as tractors and water pump sets.

Table 4.11 Movable Assets amongst surveyed households by village

Village	Kitchen Appliance	Kitchen Appliance %	Household Appliance	Household Appliance%	Agricultural appliance	Agricultural appliance %	Means of Transport	Means of Transport %	Communication devices	Communication devices %
Bardawada	10	19.2	24	46.1	7	11.5	43	84.6	50	96.1
Kawai	0	0	11	31.4	1	2.8	24	71.4	24	71.4
Badi	5	12.5	12	30	5	12.5	26	65	37	92.5
Grand Total	**15**	**10.5**	**47**	**35.8**	**13**	**9**	**93**	**73.6**	**111**	**85.7**

Source: HH survey 2020

4.2.5 Livelihood Profile

Within the working age group (people who are 15-60 years of age) nearly 10.02 percent of the individuals have no current occupation. Of those who are employed in farm or non-farm based occupations in the working population, 37.07 percent of them are women. Housewives are not considered as a part of the income earning population even though they constitute nearly 25 percent of the surveyed population. The reason for the same is detailed in the below sections.

4.2.5.1 Primary Occupation

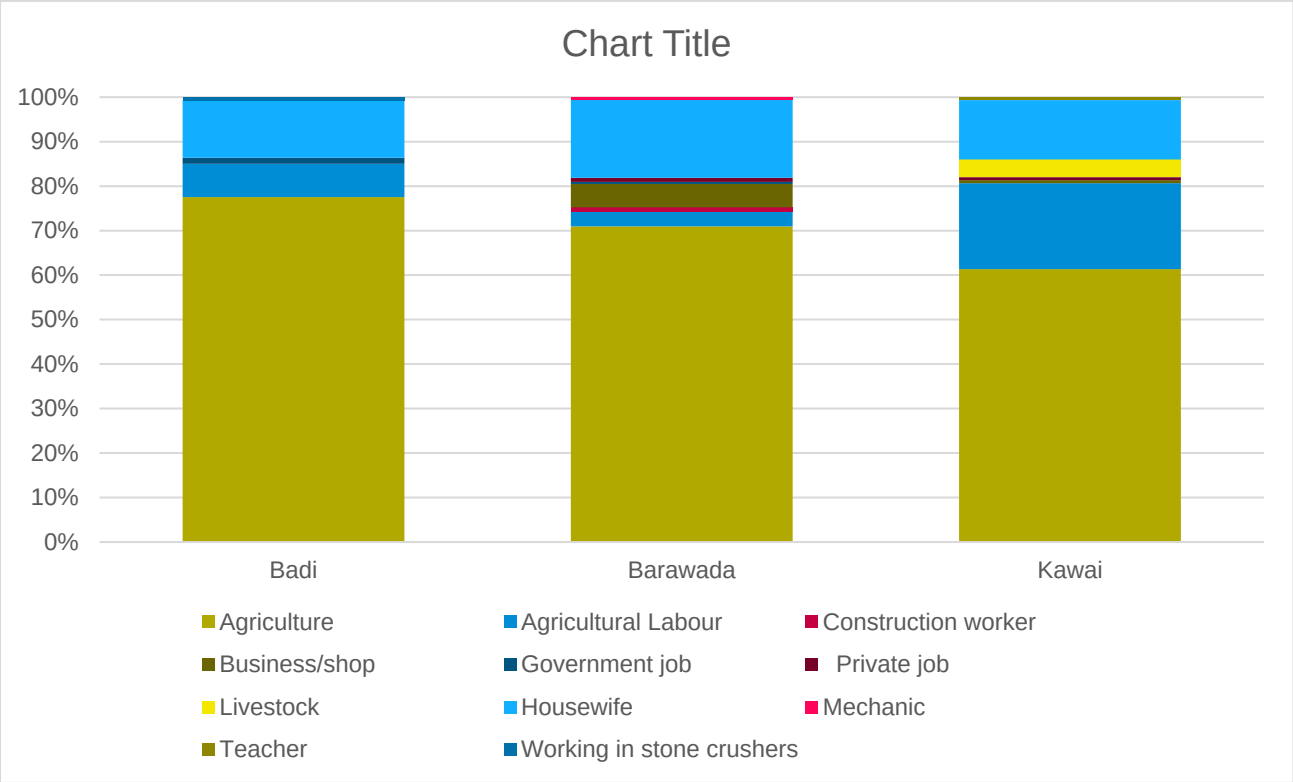
The type of primary occupations across age groups is given in **Figure 4.10.** It can be seen that among the working population (15-60 years of age) the dominant primary occupation reported is farm-based activities (35-50 years). Even though there is a mixed dependence upon farm based and non-farm based activities across age groups, it was reported that there is a greater dependence on agriculture for sustenance as compared to non-farm based activities.

Figure 4.10 Primary Livelihoods across Age grops

Source: HH survey 2020

Figure 4.11 highlights the distribution of primary occupation within the surveyed villages. It can be understood that the most common primary occupation among villages is agriculture (48.2 percent). Agricultural labour is reported as the most common secondary occupation with nearly 30 percent of the PAPs engaged in the same. Nearly one (1) percent of the surveyed households also reported working as artisans along with agricultural labour as their secondary activity. These households are residents of Badi.

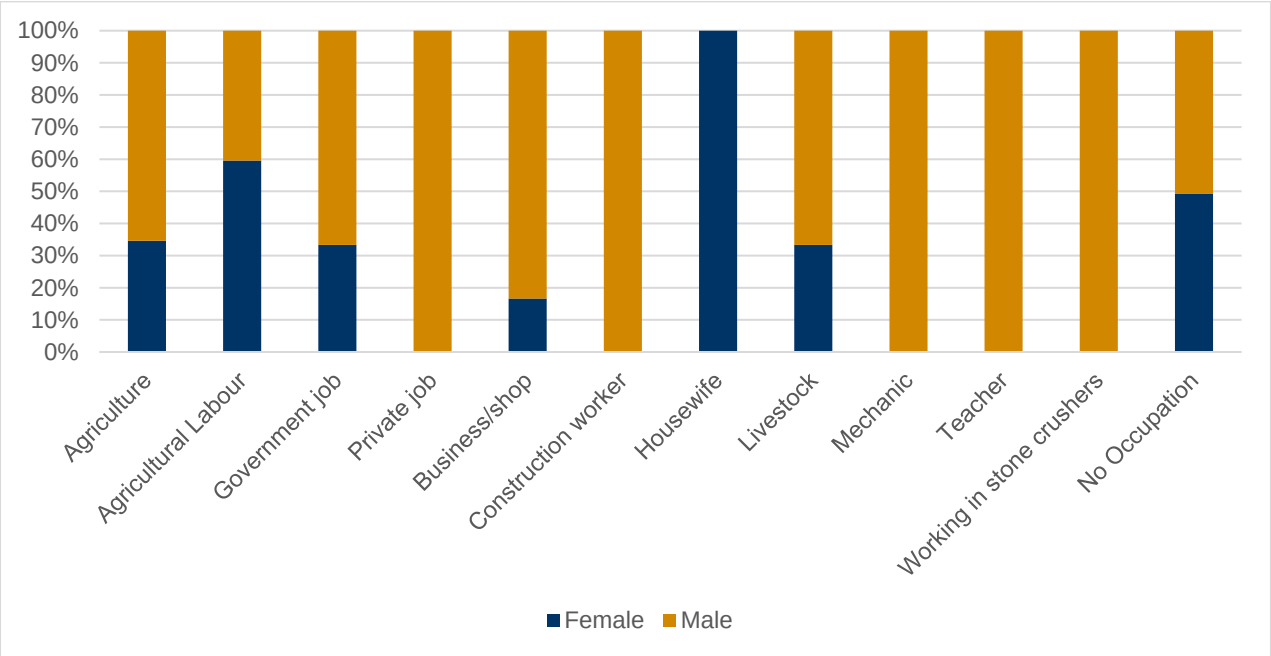
Figure 4.11 Primary Occupation Profile by village



Source: HH survey 2020

Looking at the gendered distribution of occupation among villages, there is a domination of men in almost all types of remunerative occupations. Women are most commonly engaged in unpaid domestic work, and to a smaller extent, farm based activities. The discussion of primary occupation among women is detailed in **Section 4.2.11.**

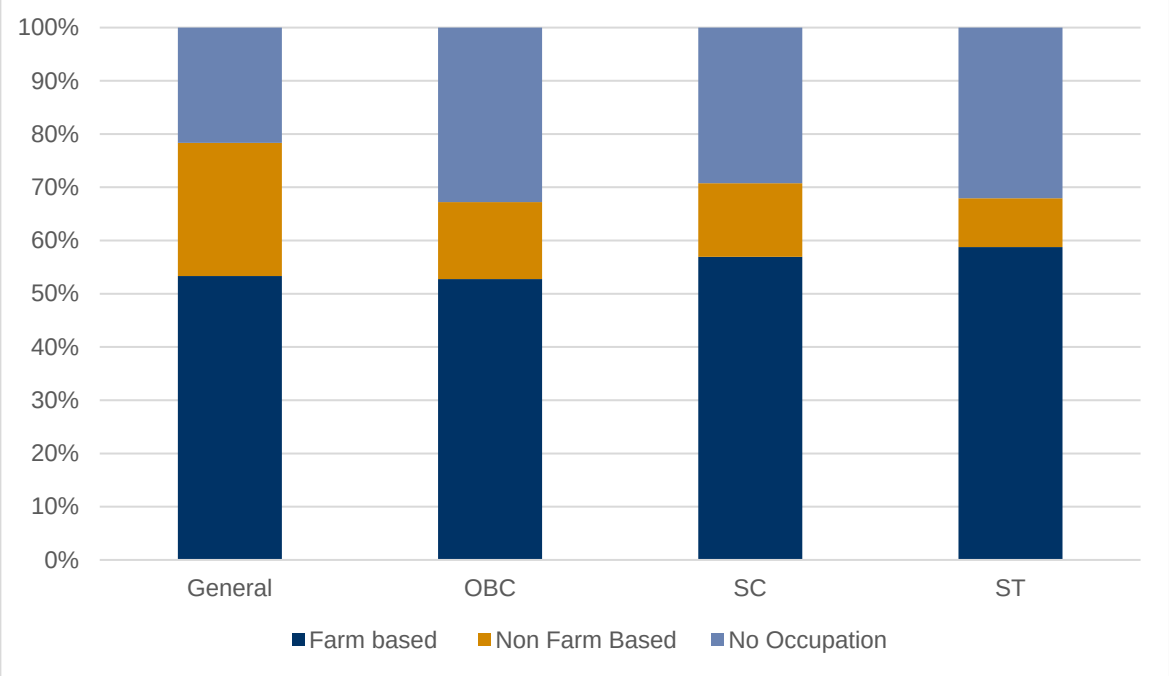
Figure 4.12 Primary Occupation Profile by Gender



Source: HH survey 2020

Lastly, the caste wise distribution of occupation in **Figure 4.13** a similar trend of preference of agriculture across different castes.

Figure 4.13 Primary occupation by Social Group



Source: HH survey 2020

4.2.5.2 Farm Based Livelihoods

As can be seen in **Section 4.2.5.1** farm based livelihoods, including agriculture and agricultural labour, is the most common livelihood among most surveyed households. The potential reason behind this choice of livelihood is the traditional familial responsibilities among the households and providing financial support. As can be seen in **Figure 4.10** a large proportion of people engaged in agriculture are between the ages of 35-60. A slightly lesser number of surveyed population between the ages of 15-35 are engaged in farm based activities. These individuals are studying and engaged in agriculture and agricultural labour to support their families, financially. During consultation it was understood that most people prefer to continue with their familial occupation of agriculture rather than venturing out to other sectors because lack of opportunities in and around the village. Another reason for this is the absence of vocational training centres, graduate and post-graduate colleges in the vicinity.

As mentioned before the engagement in farm based activities of surveyed population between the ages of 35-60 is significantly higher. As can be seen in the above tables, the potential reason for the same is the familial responsibility of providing financial support. It was understood during consultations that people in this age group were forced to quit their education to support to their family occupation. The average gross income from agriculture and horticulture reported by the PAH was approximately INR 1, 60,000[14] annually and approximately INR 30, 000 annually from agricultural labour.

4.2.5.3 Non-Farm Based Livelihoods

Non-farm based livelihoods are also reported among 15-35 year olds **(Figure 4.10)**. Nearly 5.8 percent of the surveyed households work in non-farm based occupations as their primary source of income, of which 62.08 percent are between the ages of 15-35. The most common non-farm based

[14] The reported income based on multi cropping system in the area

occupation reported is ownership of small business or shop or working as a wage laborer. 57.1 percent of the business or shop owners are in the age group of 15-35 years. The average annual income from a small business or a shop is around INR 13,000.

Gender- disaggregation of non-farm occupation shows that non-farm based occupations are also male dominated. The potential reason for the lack of women participation in non-farm based activities might be the absence of opportunities. The few number of active SHGs in the region to support livelihood and skill building programs also is a compounding factor. Women in the area are generally discouraged to engage in work outside the house. It was understood that women mostly engage in farm-based activities and that too only if a male member of the family is engaged in the same with them. When it comes to non-farm based activities, women are mainly employed as casual wage workers or in (very cases) government jobs in the area; 11 percent of wage workers are female and 6 percent of the surveyed female PAPs, held government jobs, mainly between the ages of 15-40. The average annual household income from wage work is approximately INR 23,861, annually and from government job is approximately INR 43,457 annually.

The literacy levels among the non-farm occupation related workers is high. Nearly 90 percent of those engaged in non-farm based activities are literate up to secondary and higher secondary levels.

4.2.5.4 Migration

Over the years, the dependence on non-farm based activities has increased. Nearly 7 percent of the surveyed households have family members that migrate from their village to work in another district or, state. These individuals travel to nearby districts or in some cases, they even travel to another state to work for 7-8 months of the year. Of the total, 25 percent are women-migrants. 62.5 percent of the migrants were in another state (mostly Rajasthan, Gujarat). The most common occupation for which they migrate is labour work. Only 37.8 percent of the people who migrated, secured a private job. The migrant workers send an average of INR 33, 500 annually, as remittances to their families in the village. Of the people who migrated, 37.5 percent of the workers had returned during the COVID19 imposed nationwide lockdown. While in their village, 45.5 percent of the people were unemployed. It was reported that all the migrant workers, returned to their district of migration once the lockdown was lifted.

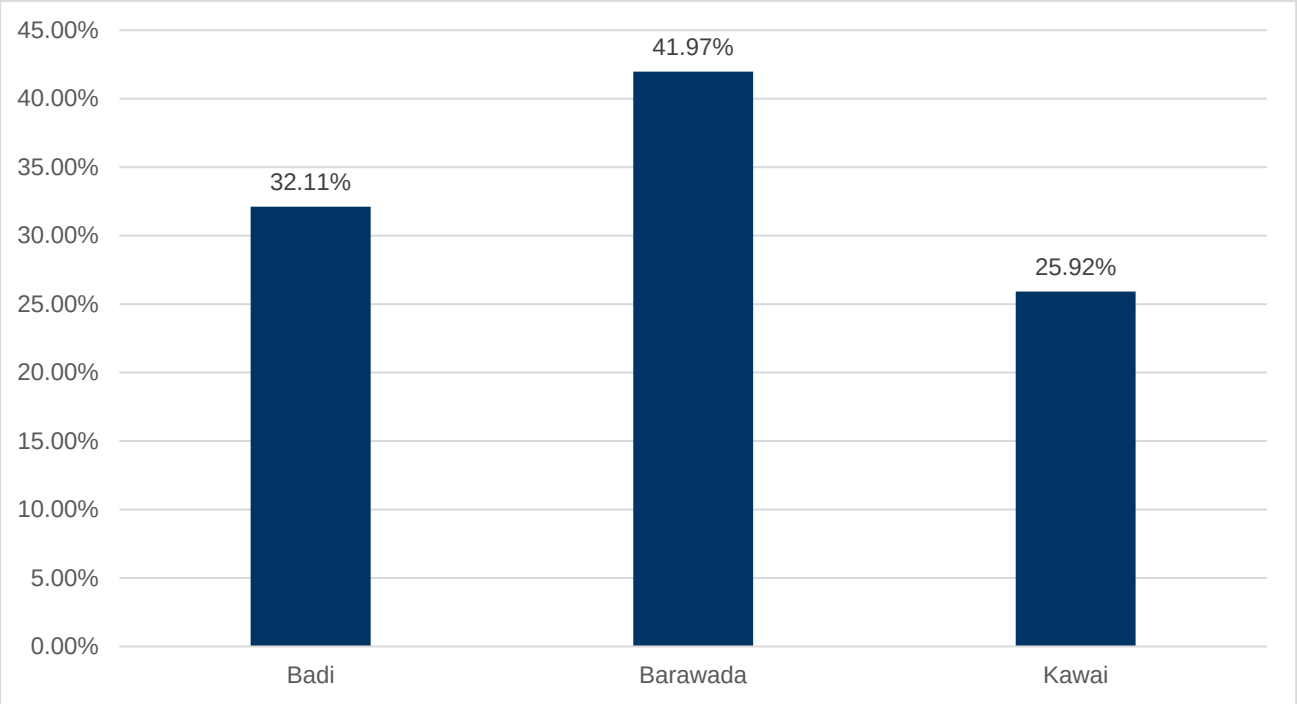
4.2.6 Agricultural Activities

Nearly 71.7 percent of the total surveyed population between 15-60 years of age are engaged in farm based activities. Of those engaged in agriculture, 34.6 percent are female and the remaining are male. The female contribute equally to the activity but are not considered the earning member of the family. The reason for the same is discussed in **Section 4.2.11.**

It was understood during consultations that the most commonly grown crops in these villages are Soyabean, Mustard, Groundnut, Maize and Dal. The cropping pattern varies from village to village depending on the type of soil and the availability of land in the area. Most surveyed households reported that they cultivate 2-3 crops in a year while some households who have more than 1.25 – 1.3 hectares of land have a variety of crops up to 8 growing in one season.

Figure 4.14 shows the proportion of surveyed households engaged in agriculture. Bardawada has the highest proportion of households who are engaged in agriculture. In Kawai, the surveyed households reported non-farm work as their source of income.

Figure 4.14 Households engaged in Agriculture by Village



Source: HH survey 2020

Table 4.12 Count of PAHs by Cropping Pattern

Unit	Single Cropping	Double cropping	Triple cropping	Four and more than four crops
Unit 1				
	20	11	11	16
Unit 2				
	9	5	11	10
Unit 3				
	4	8	10	6
Grand total	**33**	**24**	**33**	**32**
% of total PAHs	**25.9**	**18.9**	**25.9**	**25.2**

Source: LA survey 2020

Out of the 122 PAHs who undertake farming, 26 percent (31 PAHs) undertake single cropping in one agricultural cycle. Triple crop cycle or more is undertaken by 53 percent (63 PAHs) of the households. As specified above, among the PAHs undertaking farming, about 50 percent (61 PAHs) are informal land (encroachers and squatters) using households. Among these, 32 percent are those who have squatted on government land for agriculture. There is a difference in the land use between households encroaching and squatting for agriculture – as compared to encroaching households, squatting households cultivate one - two crops in a year.

4.2.6.1 Land Utilisation

As mentioned in **Section 4.2.4**, 90 percent of land in the solar park is government land and 10 percent is private/ patta land. It should be noted that the surveyed PAHs owned private/patta land as well as reported to informal use of government land (through encroachment). Considering the nature of dependence and use of land among the surveyed PAHs, about 48 percent of the impacted households are informal users of government land of which 17 percent are private land owners

encroached upon government land, and 31 percent are households that have squatted on government land for farming. The remaining 52 percent are private/patta land owners.

Among the households who are using government land informally, 91.3 percent undertake agricultural and horticulture activities, while 16.3 percent utilize such khasras as fodder lots along with agriculture. Of the 80.1 percent of the private and patta land owning households, 78.9 percent of them utilize their lands for agriculture and horticulture activities. The land use has been described in **Section 3.1**.

4.2.6.2 Irrigation Sources

The most common sources of irrigation (other than rain), are open wells, tube wells/bore wells. 24 percent of the surveyed households reported that their land was rain-fed, of which 38 percent are informal users of government land. Consultations with private/patta land owners during LA survey showed that there are notable investments undertaken in constructing irrigation systems such as dug wells and bore wells. More than 50 percent of the farming households have open wells, tube wells as their source of irrigation. Over the years there have been erratic rains in the area which has led to a change in the cropping patters. As noted in the sections below, the two major crop cycles in the area are Kharif and Rabi. During the time of the RAP study, major Rabi crops: Mustard, Chana, and Wheat, were being cultivated. Soyabean and Maize are the main Kharif crops. It has been reported that there has been persistent water shortage in the area. There exists a potential for more crops if sources of irrigation are present throughout the year.

4.2.6.3 Major crops and their productivity

Amongst the surveyed households undertaking cultivation, it was understood that almost none of these households undertake single crop cultivation. Almost all houses undertake double or triple cropping patterns. Nearly 26 percent of the PAH reported harvesting more than three (3) crops on their khasras in the last year. A similar proportion of PAHs undertake only single cropping in a calendar year. Furthermore, according to the information made available during the survey, and visual assessments it was understood that that, the number of crops grown in a year does not appear to be directly co-related to the economic position of the surveyed households. This is so because households with varying income ranges may opt for single and double crops. Earlier the major crops cultivated were channa and maize. Over time, soyabean has become more popular among farmers. This was reported to be because of the hardiness of the crop for heavy rains and dry spells. Apart from soyabean the other commonly grown crops in the district are mustard, wheat, maize and dal, of which soyabean and maize are Kharif crops and wheat, dal and channa are Rabi crops. Approximately 77.7 percent of the PAH grow soyabean and nearly 61.9 percent grow mustard. Apart from the popular crops, many households also reportedly grow vegetables; onion, potato, ladyfinger, green chillies and coriander, as intermittent crops between the major farming seasons. The seasonal calendar is given below:

Figure 4.15 Seasonal calendar for major crops of surveyed households

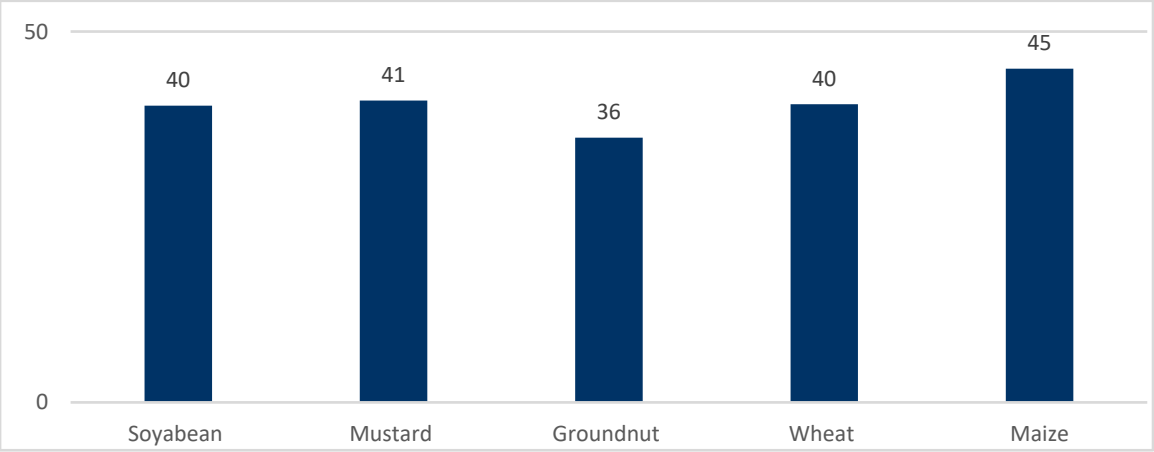
	January	February	March	April	May	June	July	August	September	October	November	December
Soyabean						■	■	■	■	■	■	
Wheat	■	■	■	■							■	■
Maize						■	■	■	■	■	■	■
Mustard	■	■	■	■						■	■	■

Dal												
Lady finger												
Green chillies												
Potato												
Garlic												
Onion												
Coriander												

Source: HH survey 2020

Apart from the major cash crops listed above, the other crops grown include onion, garlic and channa (in decreasing order of number of households reporting to cultivating these crops). Soyabean and mustard are the major cash crop for the region. Wheat is primarily grown for sustenance and is used (about 50 percent of output) for self-consumption. Apart from wheat, urad dal and til seeds are grown as intermediate crops between the two crop cycles. The Minimum Support Price (MSP) that the farmers received for soyabean in the previous year was INR 3710 per quintal and INR 1925 per quintal for wheat.

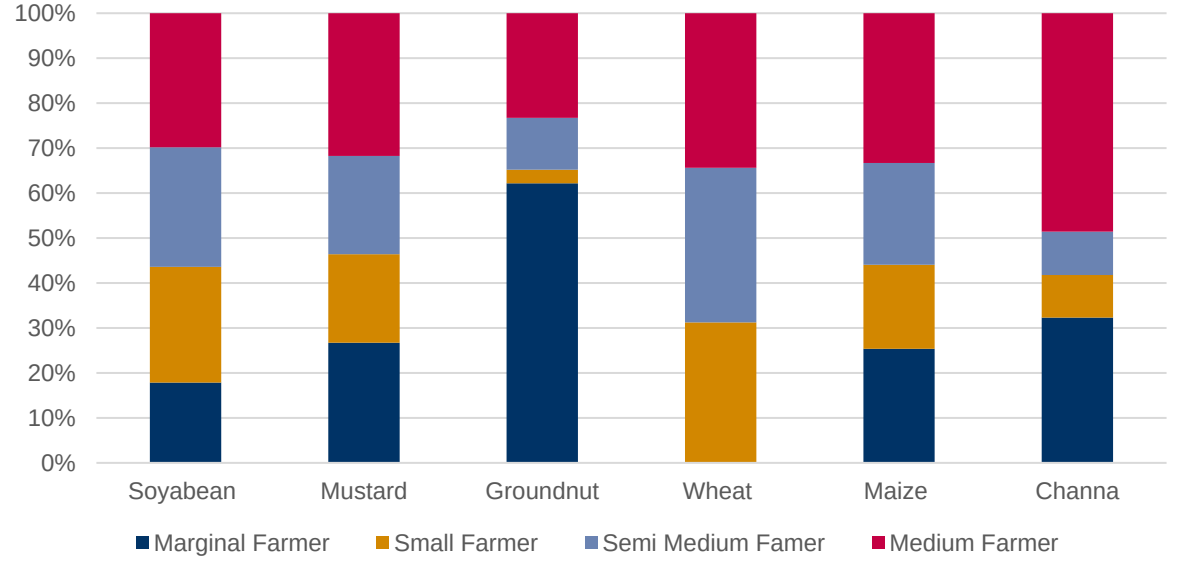
Figure 4.16 Crop Productivity per hectare (in Quintal)



Source: HH survey 2020

Looking at the crop production with respect to land holding size, **Figure 4.17** highlights the popularity of soyabean across all types of farmers. The potential reason for the same is the security that soyabean as a cash crop and the ease of sale in the market. Though groundnut is not popular among medium and semi-medium farmers, it is reportedly most popular among marginal farmers. Nearly 7-10 percent of them sell these crop rather than consuming them. The potential reason behind this higher income potential. They prefer to procure grains and vegetables from the market or through government assistance rather than lose out on their income. Nearly 35 percent of the major crops mentioned above are utilized for self-consumption and the rest are sold for income. In case of soyabean and mustard, 20-30 percent of the output is kept for self-consumption, while 50 percent of wheat is used by households for consumption. The discussion on subsistence is covered in **Section 4.2.6.4.**

Figure 4.17 Cropping pattern amongst PAH by types of Farmer



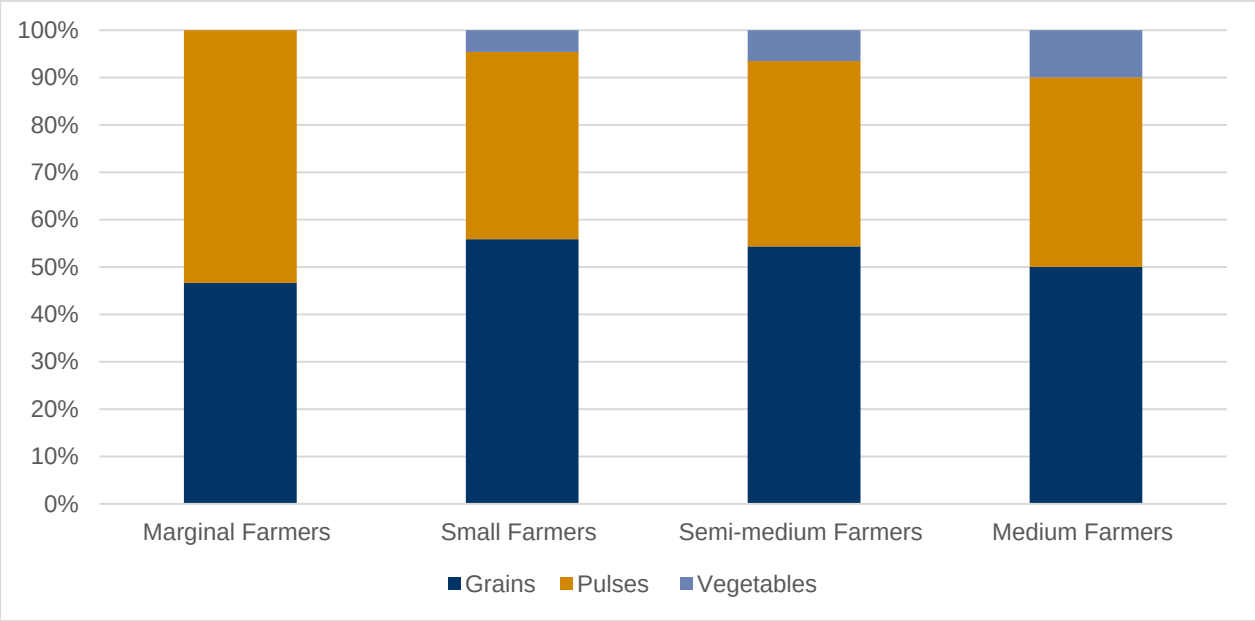
Source: HH survey 2020

4.2.6.4 Food Security

With regards to food security, the information was collected on sufficiency of production of grains, pulses, and vegetables. Across all three categories, the insufficiency reported is highest for vegetable production – 92.1 percent of the surveyed households have a shortfall in production. This is followed by pulses – 63.7 percent of the surveyed households report that the pulses they cultivate are also insufficient, and nearly 41 percent of the surveyed households report that the grains that they cultivate in their fields are insufficient. The potential reasons for insufficiency is growth of cash crops in majority of land holdings. Government assistance in the form of distribution of food ration through Public Distribution System (PDS) shops is available primarily for grains (81.8 percent) and pulses (64.5 percent) while only 6.2 percent of the surveyed households report that they receive government assistance in terms of purchase of vegetables from government run mandis. The shortfall in production is met through open market purchase, at a quarterly frequency, and sometimes, for every month in a given year.

Looking at food sufficiency with respect to land holding sizes (**Figure 4.17**), it can be seen that despite land holding size, there is limited sufficiency of vegetables and the procurement is mainly through purchase or via government assistance. Small, semi-medium and medium are most secure in terms of sustenance of grains, pulses and vegetables as compared to marginal farmers.

Figure 4.18 Food Security amongst PAH by Types of Farmers



Source: HH survey 2020

4.2.7 Livestock Rearing

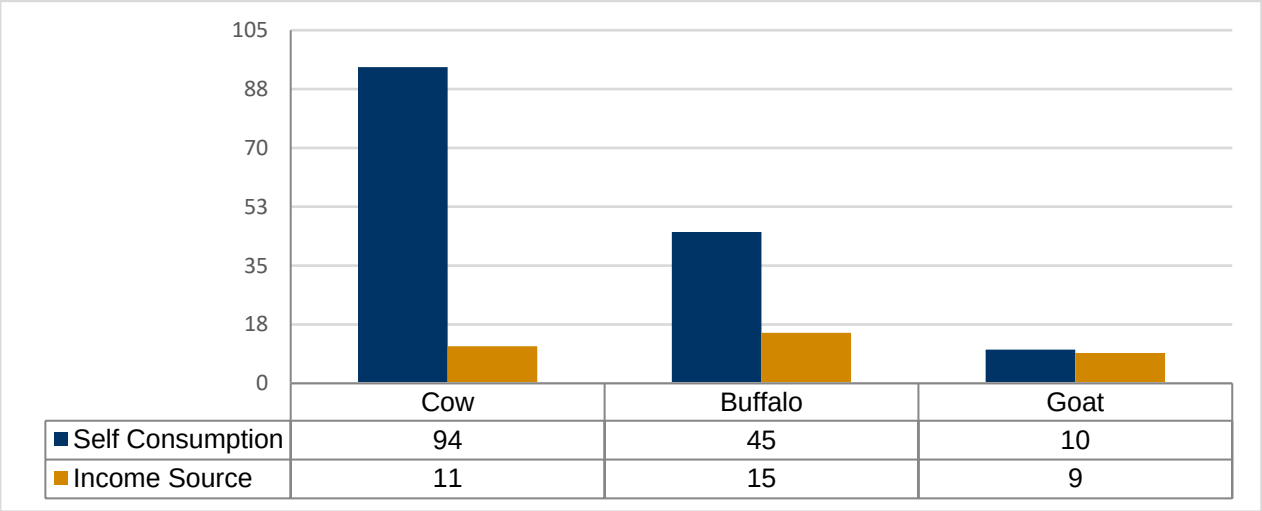
All the surveyed PAHs reported to owning at least one head of livestock. Most households own cows. The breed of cows in the villages are Malvi[15] , an indigenous breed of cow, local to Madhya Pradesh. They are a breed of the Zeebu cattle from the Malwa region of Madhya Pradesh. The potential reason behind the high number of cow in the region are:

- They are traditionally owned by household in the area.
- The other reason is for draught- the cow here basically being the mother of bullocks that helped farmers to plough the field, and pull their cart.

Figure 4.19 show the use of livestock for self-consumption and for income across the PAHs. The PAH that use livestock for self also use this livestock as income sources. The most common uses of livestock are for milk production. The men of the household are responsible for selling the produce and for decisions regarding purchase and sale of livestock. Majority of the cows graze on private lands, and/or available grazing land without any direct supervision.

[15] http://afs.okstate.edu/breeds/cattle/malvi/index.html/

Figure 4.19 Uses of Livestock



	Cow	Buffalo	Goat
Self Consumption	94	45	10
Income Source	11	15	9

Source: HH survey 2020

Observations and information reported from the surveyed PAHs show that grazing is undertaken on Charnoi land, as well as any available free land (either government or private) in the region. Villagers reported that grazing does not require supervision for the livestock. The grazing paths have been established and have been unchanged over the past 30 – 40 years. Fodder for livestock is thus available from open government land and private fodder lots (which are demarcated with boundary walls). The extent of dependence on government land has been described in **Section 1.1.1.**

Discussions undertaken as part of the RAP study with PAHs, and information collected on source of open grazing from LA surveys shows that all the three villages have had a history of open grazing dating back to more than a 100 years

There is abundant availability of such land, and the households have a nominal dependence on purchased fodder from the market. The use of private/patta land as fodder lot is used in the manner such that the natural grass growth on the khasras during non-agricultural period of the year is used for fodder. Typically, the households undertake two cropping cycles in a year, and for the remaining months (4 - 5 months) leave the khasras unutilised for natural grass growth that is then cut as a fodder grass source.

The most common practice for feeding is open grazing with a combination of either crop residue or market purchased fodder. Of the households that have livestock, 25.2 percent purchase fodder from markets to feed their animals, specifically for cows and buffaloes. 95.1 percent practice grazing on open government lands and 30.01 percent allow their livestock to graze on private parcels. Though the common grazing practices are in open grazing lands, the surveyed households reported that this is possible only for a few months of the year (monsoon season) for cows and buffaloes. The reason behind this was reported to be the poor quality of grass and the low availability of grass in in the dry seasons. Another reason was reported to be the shrinking in area of available grazing lands due to encroachment or squatting. The surveyed households reported that they now prefer to purchase fodder from markets and charging a fee for better quality grazing areas and availability of fodder. Details the on dependence on different sources of grazing for livestock throughout a typical year is given in table below.

Table 4.13 Month wise dependence on Grazing land and Fodder

Livestock	Dependence on Grazing land and Fodders	
	Charnoi/Chargah	**Agricultural parcels used as fodder Parcels**
Cow	January to December	June - October
Buffalo	January to December	June - October
Goats/Sheep	January to December	June - October

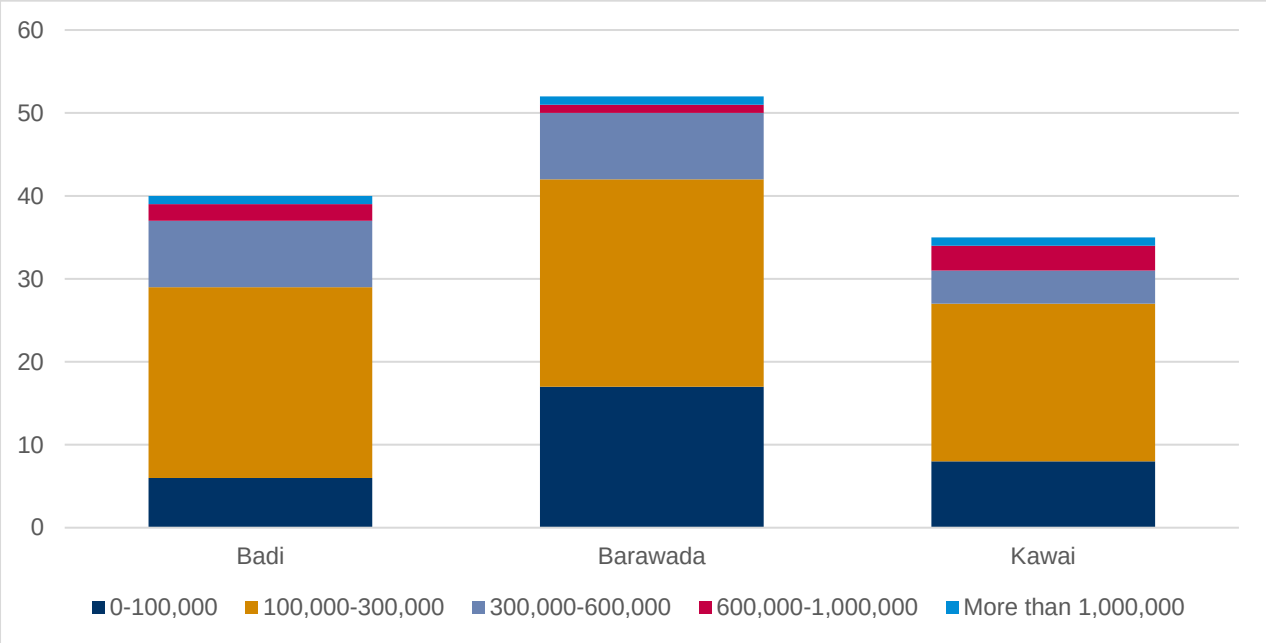
Source: Village Profiling and FGDs with Graziers

It was reported that the livestock did not need to be taken for grazing and they travel to and from grazing parcels, independently. Women were mostly reported to be responsible for the care of livestock within the household which includes feeding cleaning the stalls, washing the animals and mixing/cooking their feed (silage). Information collected from village level consultations (village profiling exercise) reported that there are no government dairy cooperatives operating at the Tehsil level. The households, who have surplus milk after household consumption, sell the milk at Singholi to private milk storage units. There is no cooperative functioning at the village level.

4.2.8 Income and Expenditure

An analysis of household income, expenditure and the overall trends are covered in this section. The Village wise distribution of gross income is given in the figure below. It must be noted that the income is assumed to be gross annual income.

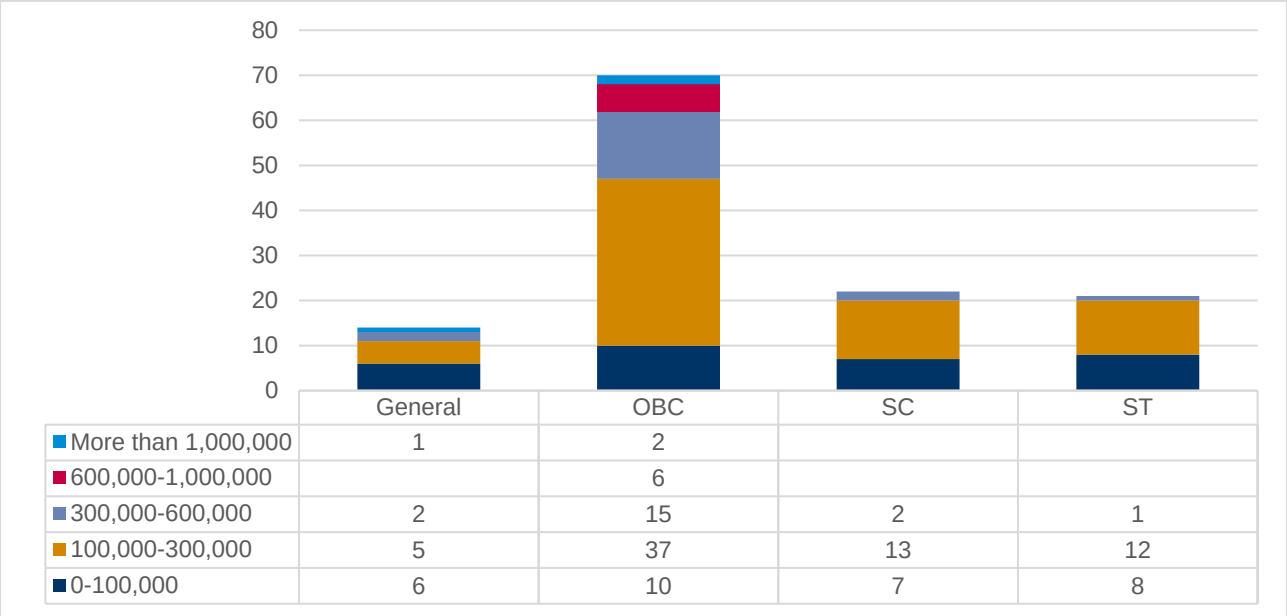
Figure 4.20 Annual Income of the Surveyed Households (INR)



Source: HH survey 2020

The income across different social categories among surveyed households are detailed in **Figure 4.21**.

Figure 4.21 Annual Income of surveyed households by social group (INR)



Source: HH survey 2020

The average annual gross income reported from agriculture is INR 1,58,617, while that from the government or private job was reported to be INR 44,000 and INR 23,832 from wage labour. The average income from livestock activities was reported as INR 17,986. Another source of income for the PAHs is business activities, with an average annual income of INR 14,790. Apart from these, the other sources of income reported by the surveyed households include old age pension and assistance received from government.

In terms of expenditure, the major heads were reported to be for the basic household provisions (ration), education, cultural expenses, agricultural inputs and health care. The households reported maximum expenditure on loan repayment (INR 83, 966).

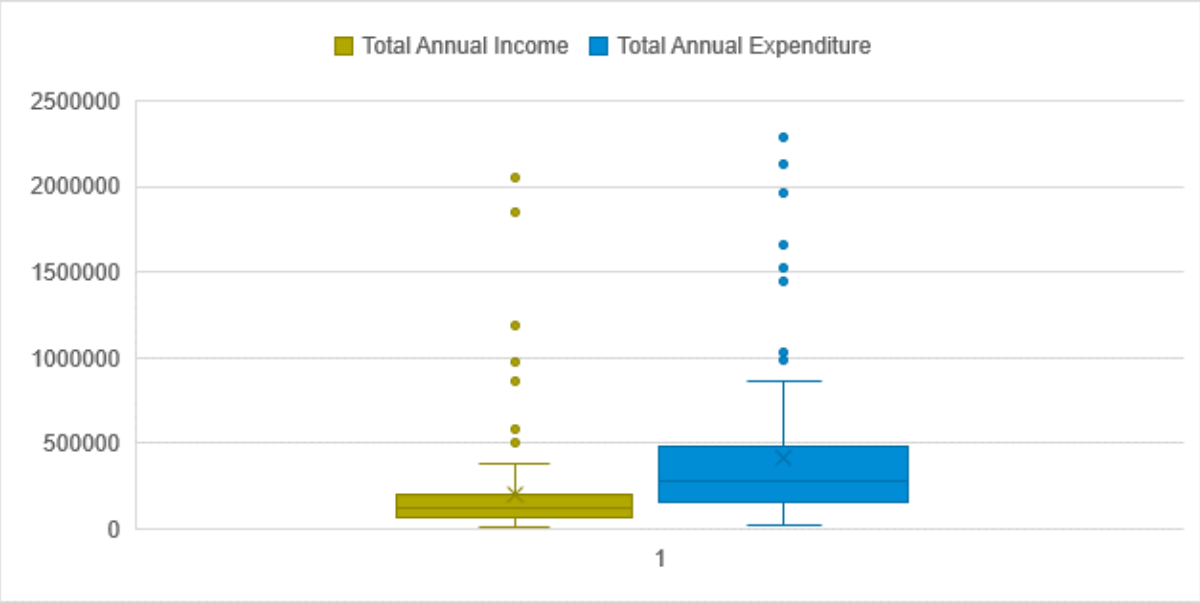
Table 4.14 shows the correlation between income and expenditure among the households. The table and figure highlight that the surveyed households report higher expense as compared to income. one potential cause of this trend is the respondent's estimates based on recall, where there is likely to be a tendency to over- estimate the expenses incurred in comparison to the income.

Table 4.14 Average Annual Expenditure by Income Group (INR)

Income Range	Average Annual Household Expenditure (INR)	Lowest Annual Household Expenditure (INR)	Median Annual Household Expenditure (INR)	Highest Annual Household Expenditure (INR)
Below 100,000	218,981	53,464	1,39,278	181,376
100,000-300,000	425,468	228,313	400,288	806,021
300,000-600,000	661,611	614,301	716,668	1,055,180
600,000-1,000,000	1,415,975	1,294,516	1,544,511	1,630,228
More than 1,000,000	2,380,446	2,051,902	2,525,586	2,563,851

Source: HH survey 2020

Figure 4.22 Income-Expenditure Comparison

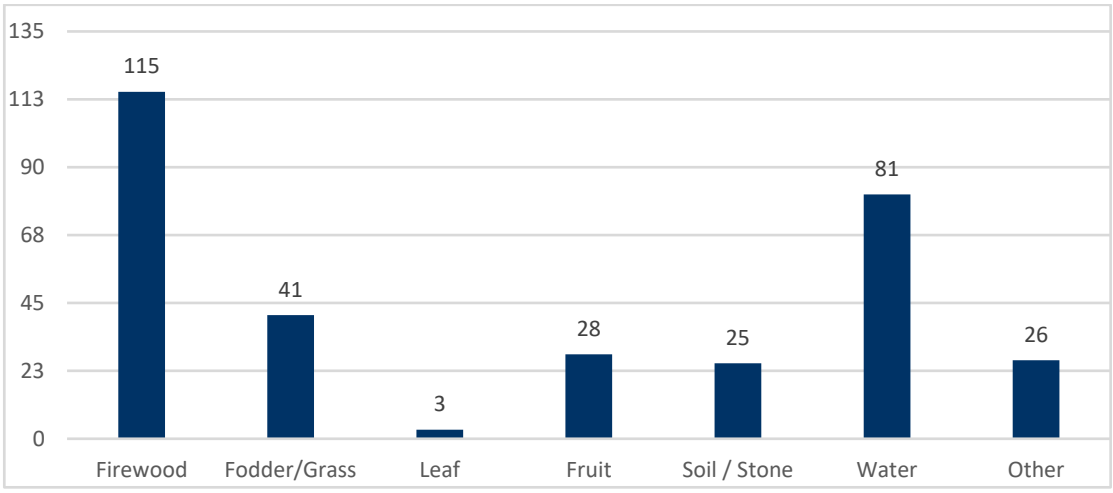


Source: HH survey 2020

4.2.9 Community Dependence on Natural Resources

One of the main forms of dependence on natural resources is the community's dependence on firewood as a cooking fuel. The primary reason for this dependence was reported to be the costs of refilling LPG. The other household natural resource dependents are given in **Figure 4.23**.

Figure 4.23 Dependence of surveyed households on Natural Resources



Source: HH survey 2020

Among the surveyed households, firewood is the most commonly gathered natural resource. The most preferred areas from where these resources are collected are the common land (73.2 percent) and the nearby forest (45.4). The small percentage of households that collect leaf are ST households who use dried leaf as fuel in the kitchen, as reported during consultation. The average amount of firewood collected is 170 kgs/month. The firewood is collected from the fodder lots, as well as Reserve forests in the proximate vicinity (within 5 kms) from the project area. The villagers can collect dry firewood around the year on head load basis. The access to the Reserve forest is utilized by residents of Badi village who also have a Van Samiti, which looks after forestry management. The Van Samiti is also active in Chaksodijhar, and Kheda Moka ka Dhol.

The gender dynamics play a key role in collection of natural resource products (firewood, fodder etc.). The responsibility of the women of the household to fetch water, especially the young women of the house, the responsibility of collecting firewood is with both men and women. They travel up to one (1) km to collect water and up to two (2) kms for firewood.

Figure 4.24 Collection of Natural resources for Household Consumption

Source: RAP study, 2020

4.2.9.1 Trees within Project Footprint

The table below gives the details of trees identified within the project footprint through the LA survey.

Table 4.15 Types of Tree plantations

Unit	Type of tree	Count
Unit 1	Fruit tree saplings	4
	Fruit Tree Young Productive	0
	Fruit Tree Mature	0
	Timber Tree Above 45 Cm DBH	77
Unit 2	Fruit Tree Saplings	
	Fruit Tree Young Productive	7
	Fruit Tree Mature	0
	Timber Tree Above 45 Cm DBH	71
Unit 3	Fruit Tree Saplings	6
	Fruit Tree Young Productive	10
	Fruit Tree Mature	0
	Timber Tree Above 45 Cm DBH	89
Grand total		**264**

Source: LA survey 2020

The tables below describe the type of tree species surveyed on the private khasras.

Table 4.16 Tree species by use[16]

Tree Type	Fodder	Fuelwood	NTFP	Other	Timber	Grand Total
Khejdi	NA	46	NA	NA	34	**80**
Palash	NA	45	NA	NA		**45**
Babul	2	44	NA	NA	10	**56**
Neem	NA	NA	NA	NA	40	**40**
Peepal	NA	NA	NA	NA	16	**16**
Grand Total	**2**	**135**	**NA**	**NA**	**100**	**237**

Source: LA survey 2020

Table 4.17 Fruit species by productivity

Fruit Type	Sapling	Young Non Productive	Young Productive
Tamarind	NA	NA	1
Jujube	NA	NA	5
Mango	10	NA	11
Grand Total	**10**	**NA**	**17**

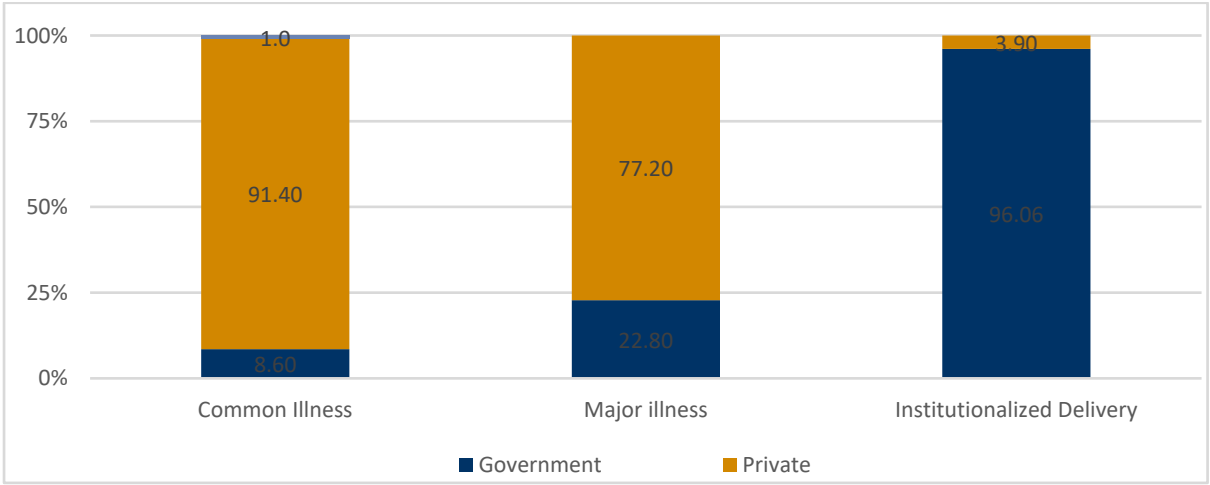
Source: LA survey 2020

4.2.10 Physical and Social Infrastructure

This section provides an understanding of the surveyed households' access to basic social and physical infrastructure including access to water for drinking and household purposes, sanitation facilities, electricity, health facilities and credit and market facilities.

4.2.10.1 Healthcare and Health Infrastructure

Figure 4.25 Preference of Health care facility



Source: HH survey 2020

[16] The tree count by species includes 17 trees with DBH below 45 cms

Amongst the surveyed households, more than 80 percent reported a preference for private facilities for medical treatment, in both common complaints and complex cases. This trend is because of the distance of private facilities to the village and the availability of better treatment at a lower cost. This dependence upon private facilities is also facilitated by the availability of these facilities in close proximity to the area of residence of the households.

Among the social groups, 71.4 percent of OBC and nearly 60 percent of ST prefer to go to a private hospital for treatment of small illnesses. Government hospitals are the choice of institution in cases of childbirth across the solar park. They prefer to travel to a government hospital even if there is considerable distance from their village. Only 12.05 percent of OBC prefer to go to a private institution among those who go to a private facility for child birth.

The most common chronic health condition reported by the surveyed population in the last year include common asthma, blood pressure, diabetes and stomach and intestine related problems. Common disabilities which many reported were related to eye sight and physical disability.

4.2.10.2 Access to Electricity

94.4 percent of the surveyed households reported that they have access to electricity. The table below highlights the sources of electricity.

Table 4.18 Sources of Electricity

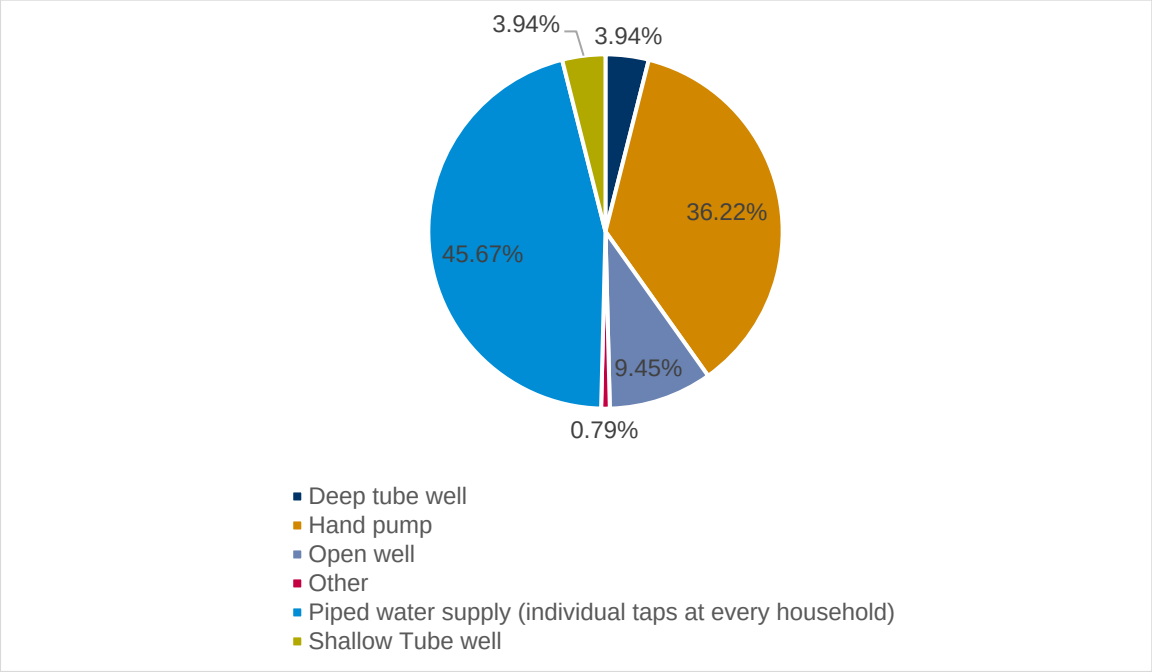
Type of access	PAHs	Proportion (%)
Government supply	120	94.4
Solar Panel	1	0.07
None	7	5.5
Total	**127**	**100**

Source: HH survey 2020

There was one household that use solar panels for their electricity in Kawai. Those who reported having no electricity were residents of the Bhil Basti in Badi and Kawai Village. The reasons for lack of complete access to all the households is understood to be from the absence of metering connection installation across all the households.

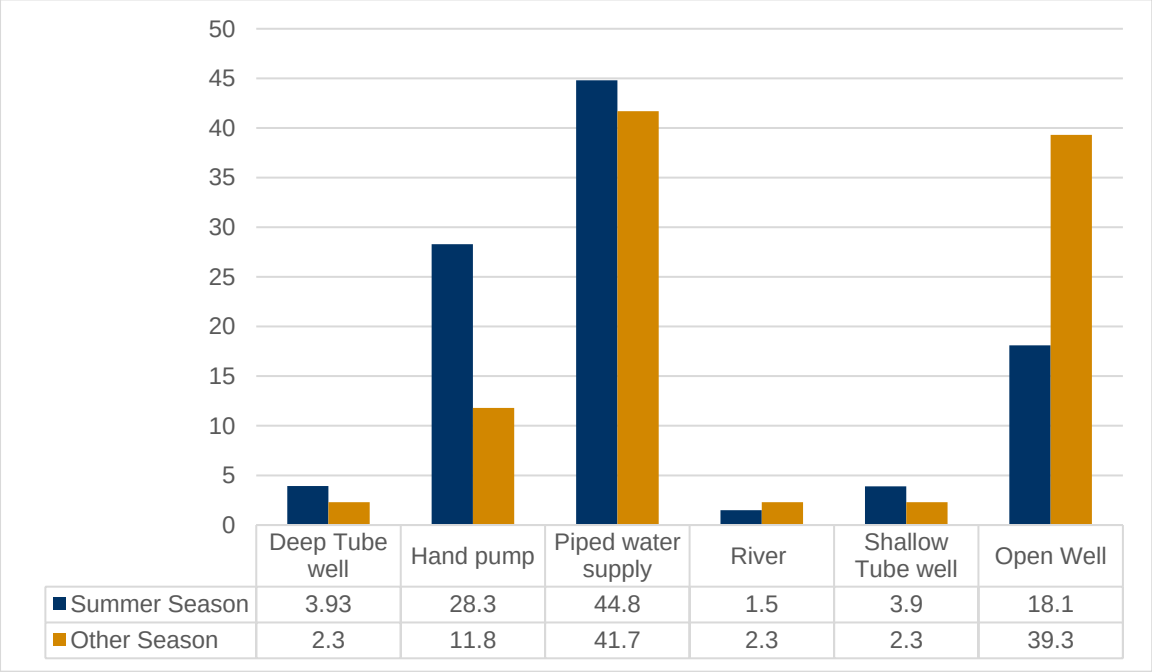
4.2.10.3 Drinking water and Water for household consumption

Figure 4.26 Source of Drinking Water



Source: HH survey 2020

Figure 4.27 Source of Water for household use



	Deep Tube well	Hand pump	Piped water supply	River	Shallow Tube well	Open Well
Summer Season	3.93	28.3	44.8	1.5	3.9	18.1
Other Season	2.3	11.8	41.7	2.3	2.3	39.3

Source: HH survey 2020

As seen in the graphs above, the source for both drinking water and water for daily use varied in summer and other seasons. Overall, approximately 96.06 percent of the households experienced good water while 3.9 percent complained of water being of poor quality.

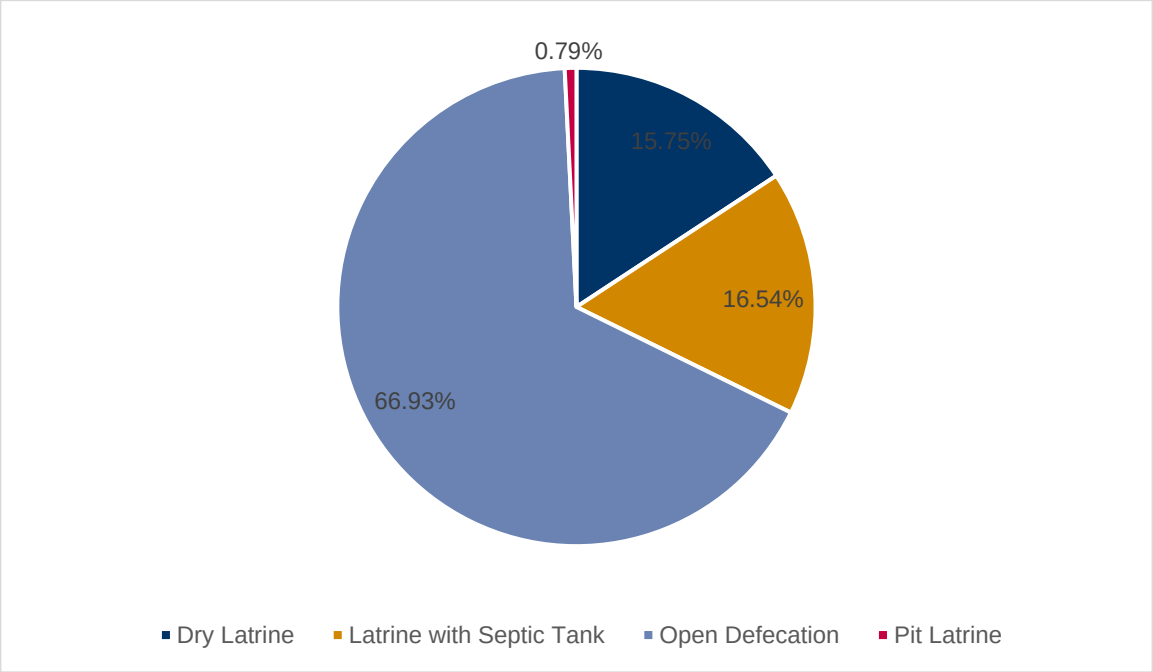
Of the total households surveyed, 60 percent reported having access to drinking water purposes and 25 percent reported to have access to water for household purposes at a distance of more than 100 metres. These comprise of those households dependent upon tube wells and hand pumps.

When it comes to scarcity of water, 68.5 percent of the households reported that they do not face any severe scarcity of drinking water for household. The remaining proportion of surveyed households reported that they face shortage of water for a period of 3-4 months during the summer season.

4.2.10.4 Sanitation and Wastewater Disposal

In terms of access to sanitation facilities, 41.7 percent of the surveyed households reported access to private toilets. Among these the details about the type of facility is given in the graph below.

Figure 4.28 Sanitation Facilities in Households



Source: HH survey 2020

Of those who have latrine with septic tanks, 22.7 percent are in the general category and 81.8 percent are in the OBC category. Nearly 51.1 percent of those who practice open defecation are OBC.

The practice of open defecation has reduced over the years but the fall in numbers has been minimal, The government's scheme of Swach Bharat Abhiyan, which led to the initiative of creating latrines in all houses, was implemented in the Project villages in all three villages. . During consultation it was understood that though almost every house has a toilet, most people prefer to practice open defecation. . 20 percent of those who have a toilet facility within their house practice open defecation. The women of the households were the most ardent practitioners of this practice. The potential reasons for this practice were the taboo of the toilets being unhygienic and smelly and the lack of water in the facility. The absence of a septic tank under dry latrines made it difficult to clean, as understood during consultation.

The loss of land around their village has created a threat in the loss of land for open defecation round these project affected villages and was communicated during consultations specifically in Kawai and Badi.

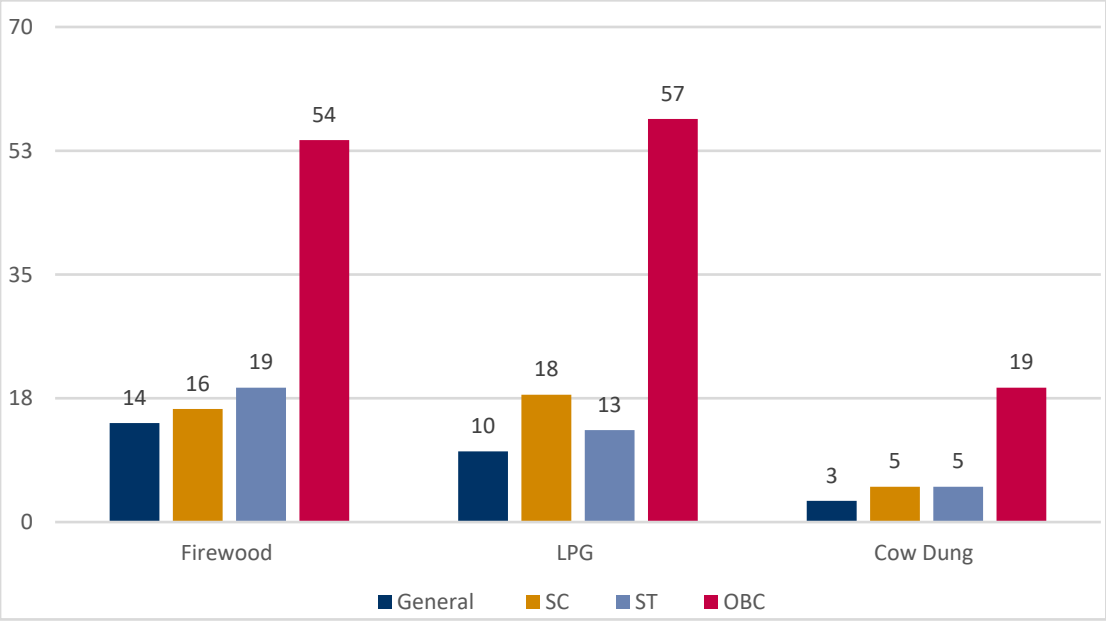
Box 4.6: Swachch Bharat Abhiyan in Neemuch

As a part of the *swach bharat mission,* mass construction of toilets were undertaken for each household (who did not have a toilet within the household premises). However, people do not prefer to use the toilets, primarily, because the toilets constructed are single pit latrines. This pit overflows fast and requires manual or machine excavation. Another reason that toilet usage has not gained the expected momentum in these villages is the absence of piped water facility for these toilets. The toilets are now defunct, and damaged without maintenance. The sanitation system of these toilets have made them unusable in most houses, which has led to the continued practice of open defecation.

Source: consultations with the local community during RAP study

4.2.10.5 Energy

Figure 4.29 Cooking Fuel Usage across Social Groups



Source: HH survey 2020

The graph shows the fuel requirement across surveyed households. It must be noted that 20.6 percent of the households use two sources of fuel and less than 1 percent of the households use three sources of fuel. These households use a combination of LPG, firewood and cow dung. While LPG gas remains an unviable option, due to the high cost, for a substantial proportion of the surveyed households, there are growing concerns associated with the dependence upon firewood as a cooking fuel. These concerns are due to the decreasing availability of agricultural and forest land and increasing market rates for firewood. This can be seen in the fact that more than 30 percent of the surveyed households reported having to traverse a distance of more than 3 km for the procurement of fire wood. It is important to note that the land allotted for the Project would involve reduction in agricultural land that also provides fodder and dry firewood for cooking fuel (from trees on it). There is thus likely to be a negative impact on supply of firewood as it would lead to further reduction in available agricultural land, and higher dependence on other government land, surrounding forest land and/or market purchase.

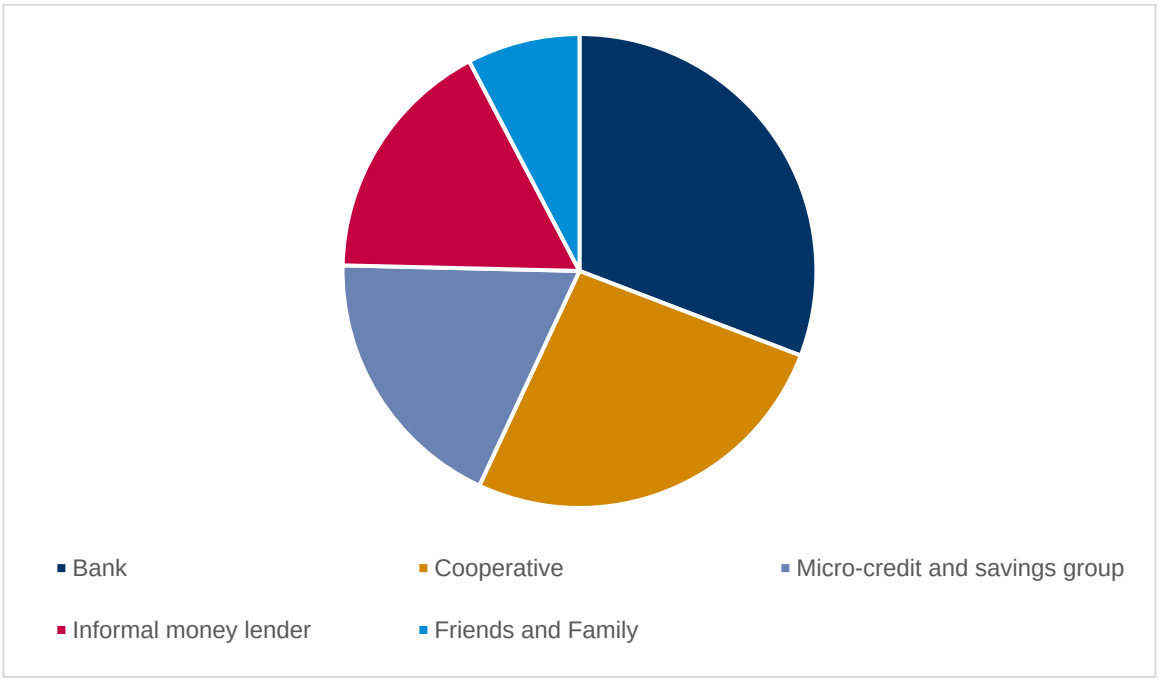
4.2.10.6 Markets and Market Linkage

Among the surveyed households, nearly 38.5 percent of the households have taken a loan in the past year. Among these households there are some who took loan from multiple credit sources. The most

common reason for taking a loan was for investment in agriculture (46.9 percent). Those who took loan for home construction (5.2 percent) also took loans for household needs and 20 percent of those who took loans for medical treatment also took loans for household needs and to pay off another loan.

The most common sources of loan are from banks (40.8 percent). The other common source of loans is cooperative groups, with nearly 34.6 percent of the surveyed households sourced loans from a cooperative group. Those who took a bank loan also had additional loans sourced from cooperatives, informal money lenders and micro-credit and savings groups too. The potential reason which came up during consultations for having multiple sources of loans is the interest rate, collateral in some cases and the process of taking a bank loan. Women headed households prefer taking loans from cooperatives, informal money lender or family and friends.

Figure 4.30 Sources of Credit



Source: HH survey 2020

In terms of access to market facilities, nearly 40 percent of the surveyed households reported that they have a village level market facility within 500m for their daily needs. 23.9 percent of those PAH who do not have a market within their village or a market which is more than 500ms, travel 10-20km for their daily needs. These households are mainly in Bardawada. When it comes to the market for buying and selling agricultural products, the population within the surveyed household have to travel a minimum of 5kms. 30.6 percent of those who require to buy or sell agricultural products have to travel 10-20kms for the same. The PAH who need to buy and sell livestock and livestock products have the markets within 500m. The preferred market in the district is in Singoli or Tharod.

4.2.10.7 Memberships of Groups

Among the villages in the solar park, there are a few self- help groups (SHG). The most common of them are the women SHGs that are present in all villages. The women SHGs were primarily for provision of monetary support for women who need loans for household needs. However most of these SHGs are non-functional or have diminishing participating members. The potential reason for the non-functionality of these female led SHGs is the lack of coordination and support for management.

The *Van Samiti* is another committee in Badi and Kawai. It has been active for the past 12-15 years approximately. The awareness about this *samitii* is low in the village. On consultation with the head of the *samiti* in Badi village it was understood that the *samiti is* only responsible for regulation of the

collection of dry firewood from the forest by the villagers. Apart from this, it was understood that the *samiti* does not engage in any other activities and has not engaged in the past as well. However the *samiti* does not conduct any community engagement programs for forestry management or non-timber forest products in the forest. The management of the committee is under the forest department, primarily the forest guard of the area. On consultation with the forest guard, it was understood that the committee allows the collection of firewood throughout the year on a 'head-load' basis and not via any transportation or trolleys. This firewood collection is generally undertaken by the women in the village.

Box 4.5: Jai Mahalaxmi: SHG

The Jai Mahalaxmi SHG was started in 2002 and is headed by an elderly woman, who has been the head since the committee's inception. This group of women used to meet every month and donate a small amount that was saved in a bank account, which they had set up in Tharod. This saved up money was used for providing need-based assistance loan to the women of the SHG. The women in the committee also cooked mid-day meals for primary school near the village and were responsible for cooking the offerings during festival in the temple. The group also discussed ways to motivate girl child education in the village. The SHG, however has become non-functional over the years. There is scant savings in the bank and the participant numbers have reduced. The reasons is unclear from the consultation. However, there is still small group of women that meet every quarter or bi-annually and discuss how they can participate in helping women who need money.

Source: Consultations with the local community during RAP study

4.2.11 Gender Profile

. This section presents the gender profile for the PAHs based on the gender disaggregated responses received and qualitative information made available during the FGDs. From the discussions it is understood that the decision making authority is with the men of the household. The men are considered to be the main earning member of the family even though the women contribute but usually undertaking unpaid work. Only 9.4 percent of households are headed by women. These households have the eldest women as the head of household (mostly widows). Within these households as well, the eldest son, is reported to be the economic and subsequently social power holder in the family.

Consultations with women groups revealed that girl children do not study beyond middle school (till 8th standard), and are engaged in household chores after dropping out of formal education**.** The women headed households, too do not encourage females to study beyond middle school. The illiteracy rate among the project affected people is 41.8 percent and women constitute 87.9 percent of this proportion. The low literacy rate among women is due to a number of reasons; 25.8 percent dropped out to help out in household chores followed by 16.3 percent of the women reported dropping out of formal education due to marriage at an early age and traditional family norms of not permitting women to study.

As mentioned earlier, Bardawada and Kawai have higher proportion of women headed households. These households have marginally smaller family sizes (5.5) as compared to male headed households. While the head of the household and the decision making authority is held by the eldest male members, the women are the decision makers when the male head is away. The demographic characteristics of the women headed households are provided in the table below.

Table 4.19 Demography of women led households among surveyed PAH

Village/town	Number		Sex Ratio		Average family size	
	Women HoH	Male HoH	Women HoH	Male HoH	Women HoH	Male HoH
Bardwada	5	47	1200	800	5.2	5.6

Village/town	Number		Sex Ratio		Average family size	
Kawai	5	29	1105	880	6.3	6
Badi	1	39	500	860	3	5.5
Grand Total	**11**	**115**	**935**	**847**	**5.5**	**5.7**

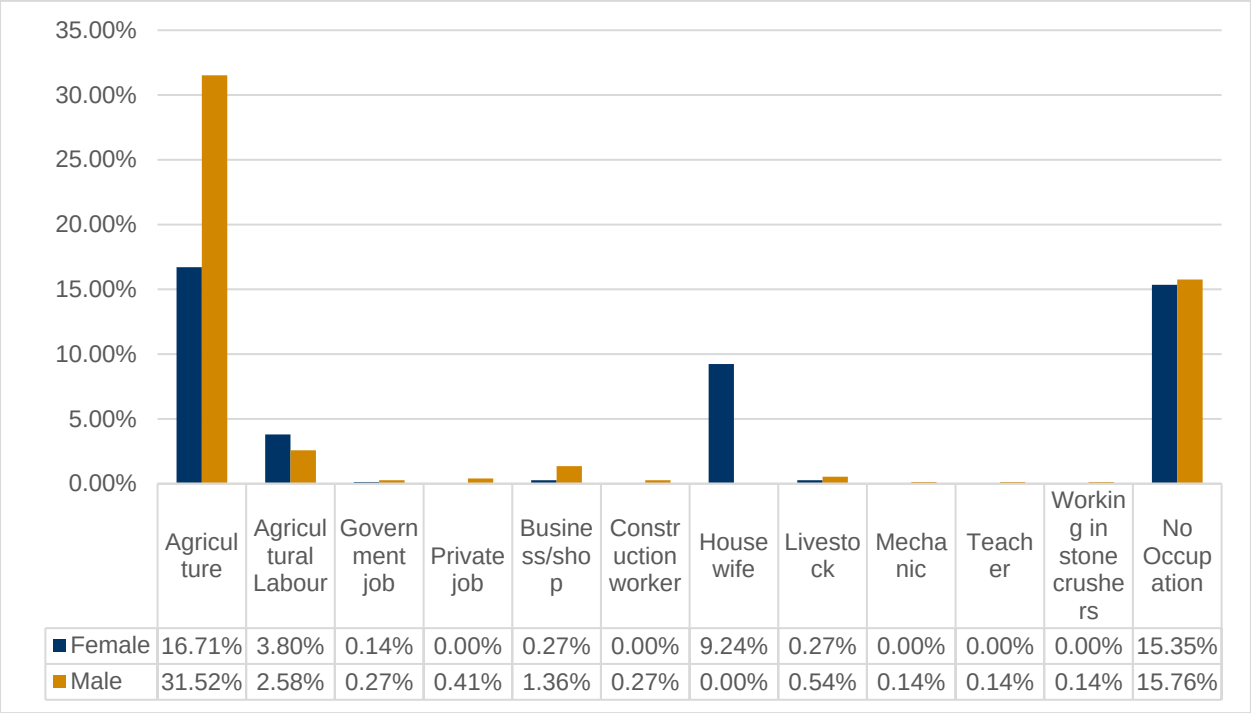
Source: HH survey 2020

Nearly 44.7 percent of the women reported that their primary occupation as farm based activities and 30.4 percent of them reported being housewives as their secondary occupation (**Section 4.1.1.4**). These women are either employed on their own fields or as labour on other fields. In the former scenario, women contribute equally to the household income as compared to the male members and in the latter scenario, they are paid a lower daily wage as compared to their male counter parts working along with them. In both cases, working women do not consider themselves to be the earning members of their household. This is because women engaged in agriculture do not perceive this to be an economic activity even though they contribute to the household income or receive wage. Discussions with women members of the household during survey shows that they consider the men of the household as the sole earning member, even though they make almost equal monetary contributions to the household. Even through there were women who were engaged in farm-based occupations, they reported their primary occupation as housewives during surveys (31.48 percent). Those who have reported an income earning activity, had an average annual income of INR 204,790 approximately. This is lower than the average annual income of women in the women-led households where it was reported to be INR 250,750 approximately.

With regards to land ownership, daughters are legally registered as co-land owners but do not have any decision making authority on access to and control of the sale of land, or say in any land sale/purchase related activity. However, functionally, all decisions are made by the male members of the household. In some cases the land is also registered in the name of under aged (below 18 years) girls as the head of the family divides the land among all their children. In these cases, though the women remain the legal owners, the users of the land are the male members of the family. Even if the women get married and move to another village, district or city, the users of the land remain the same and there is no specific sharing of proceeds from any crops cultivated and/or income generated with these co-owners.

Figure 4.31 details the primary occupation among men and women. As reported the predominant occupations reported by women were home maker and agricultural activities.

Figure 4.31 Primary Employment among Women



Source: HH Survey 2020

Discussions with women stakeholders revealed that the living conditions and the economic environment at the village level has marginally improved over the last decades, owing to advancements in provision of social infrastructure and increased mobility for women to access other villages, nearby markets and freedom to work. Girl children are tasked with fetching water, and collecting firewood from as far as one (1) km away and also undertake a share in responsibility of almost all household chores from a young age. The average age of marriage has slowly but gradually risen but is still low as compared to the legal marriage age in India (18 years).

The following table provides a qualitative assessment between male and female headed households which are further elaborated with data in relevant sections:

Table 4.20 Qualitative Observations on Female headed and Male headed households

Aspect	Male Headed Households	Women Headed Household
Land Ownership	Dominantly male owners of land and main decision makers for land related information. Females who own land or are co-owners have limited say in decisions related to land. A significant proportion of male headed households are engaged in agricultural activities through private and patta land primarily.	Women legally own and co-own land and responsible for decisions relating to land too. Family members of women headed households are engaged in agricultural activities through informal use of government land primarily
Literacy Levels	Majority of members of male headed households are literate and educated till higher secondary level. There are also significant instances of	Majority of members of a female headed household are literate and are educated till primary and secondary level. Drop outs are

Aspect	Male Headed Households	Women Headed Household
	gradates and post graduates in these households. Drop outs are due to work and marriage.	due to death in the family, marriage and household chores
Skill Levels	Limited to negligible There is one driver and one tailor in Badi village and a couple who reported traditional skills in Bardawada. There is one electrician and one driver in Kawai and 4 drivers and one tailor in Bardawada (2 from the same family). 3 people reported to be practicing traditional arts in Kawai. There is one mason and one driver in Bardawada. One man reported that he practices traditional skills in Bardawada. There is one mason in Badi and a driver is Bardawada.	Limited to negligible One family in Kawai practices traditional skills
Participation in the Work Force	Working age people (15-60) are mostly engaged in farm based livelihoods and as construction workers. Relatively larger number engaged in business or shop ownership as compared to women headed households.	Working age people (15-60) are mainly engaged in farm based livelihoods.
Infrastructure access	Mostly Semi-pucca and pucca houses. Majority of the households have a dry pit latrine, with high proportion of houses practicing open defecation. A combination of firewood and LPG is used as source of cooking.	Mostly kutcha and semi-pucca housing. Majority of these households practice open defecation. All women headed households use a combination of firewood and cow dung as their source of cooking.

Source: HH Survey 2020 and consultation with women groups

4.2.12 Vulnerability

This section discusses the socio-economic vulnerabilities amongst the project affected households. Considering the socio-economic context of the region, five main vulnerabilities have been identified amongst the project affected households. These are below poverty line, female headed households, households with only elderly persons, landless households and village artisans. This identification of vulnerable groups has been guided by the Environmental and Social Management framework (ESMF) for solar parks by World Bank. The vulnerabilities amongst the PAH has been discussed below:

- **Below poverty line households:** It is noted that more than half of the population reported having a Below Poverty Card. The purpose of having of having a BPL may or may not be related to financial stability since the BPLs are commonly used for public distribution system. In Madhya Pradesh, 83 % of rural households and overall, 80% of the households own ration card while only 1.3 percent of ration card holders owns an Antodaya card which is for the poorest of the poor[17].

[17] State Planning Commission. (2016). Report on socio-economic Disparities in Madhya Pradesh (Working Paper I). http://mpplanningcommission.gov.in/international-aided-projects/pmpsu/Report%20on%20Socio-Econonic%20Disparities%20in%20Madhya%20Pradesh.pdf

The report utilizes the Niti Ayog method[18] of determination of poverty levels, which is based on per capita expenditure, as calculated from information reported in the HH survey. This method determines the poverty levels on actual spending, as compared to using a blanket approach of identifying BPL cardholder households. According to the Niti Ayog method, none of the project affected households qualify as being below the poverty line.

- **Female headed households:** Gender related norms and related constraints on women are very apparent in the villages putting a female household into the category of vulnerability. Cultural norms do not allow women sitting on charpaayi (wooden-jute bed) next to male member of house and are required to cover their faces in the presence of men and not talk to people outside the house..
- **Households with only elderly persons:** An elderly person living alone or only with spouse are vulnerable to social, financial and physical security. Furthermore, it is also noted that households with only elderly have multiple vulnerabilities. Being poor in old age and without the support of other family member put such households in a severe vulnerable position. They also lack social and financial assistance from the state. Firstly, not all elderly are beneficiaries of social security schemes and secondly even if they receive a pension or any assistance, the amount of pension is meagre and not sufficient for self-sustenance.
- **Village artisans**: This vulnerable group has been identified in keeping with the ESMF applicable for the project. In regards to artisans identified, based on the information, these primarily include the Bhil artisans in the local community. These aritsans are understood to be dependent upon agricultural labour and artisanal crafts for their livelihoods. Furthermore, lack on data on artisan have hampered the required assistance or security from the state.
- Uneducated youth without skills. The total number of individuals in this category are 75, of which 30 (40 percent) belong to the OBC category, whereas 3 are in the general category, 10 are SC and 32 are ST. This trend in terms of social groups is in keeping with the overall trend of social group composition in the villages, with OBC and ST groups being the dominant category. This is thus reflective of the overall low levels of literacy in the PAHs and the status of educational infrastructure in the villages. The vulnerability for this group stems from the trend of the youth population moving towards non-farm based livelihoods, in comparison to illiterate population without skills in other age categories. This shift is primarily due to the reducing size of land holdings; due to growing families; higher risk in agriculture etc. however, while overall the youth is moving towards non-farm based livelihoods, the lack of literacy and skills restricts the opportunities available for such individuals in terms of livelihood opportunities. the lack of literacy and appropriate skills is also likely to restrict the ability of these individuals to partake in the employment opportunities created by the project

[18] As per the Planning commission method, the poverty line is determined by the ability of individual to spend INR 32 per day per person for rural areas. The poverty level was calculated based on total annual per capita expenditure. The values has been adjusted against inflation rate in 2020. https://www.prsindia.org/theprsblog/poverty-estimation-india

Box 4.3: Unemployment in Kawai

Nearly 70 percent of the youth in Kawai is mainly engaged in the traditional agricultural activities. Apart from a small proportion of those engaged in non-farm activities, the remaining are unemployed. Consultations with this group indicated low literacy and skill levels as well as lack of any employment opportunities in the wider region. It was understood that livelihood opportunities in the village are very limited and traditionally land-based. Though boys are encouraged to study beyond primary school, their livelihood opportunities are limited to agriculture or traditional familial occupations. It was reported that there is very limited scope to venture out to any non-farm occupations because of absence of opportunities in and around the district. The people in the village need to migrate to another state or district in search of private or government job or even to set up a business. The school dropout rate in the village is also high because of lack of interest or avenues of work. Youth tend to leave schooling and associate with existing livelihood profile of the household, rather than continuing higher education without any job prospects.

Source: Consultations with the local community during RAP study

Women headed households constitute 9.4 percent of the PAH and there are 1.5 percent artisans and 0.7 elderly households each.

Table 4.21 Types of Vulnerability among PAHs

Village	BPL	Women HoH	Artisan	Elderly Households	Uneducated youth without skills
Bardawada	-	5	1	1	17
Kawai	-	5	1		34
Badi	-	1	2		26
Grand Total	-	**11**	**2**	**1**	**75**

Source: HH survey 2020

50 percent of the women headed households are OBC and 33.3 percent are in the SC category, while only 8.3 percent are in the ST category.

5. STAKEHOLDER ENGAGEMENT AND CONSULTATION

This section provides the stakeholder identification and mapping for the project based on the understanding developed during RAP study. The broader stakeholder mapping was undertaken in the ESIA stage. In the current stage of the project, the profiling has been developed for the stakeholders linked to RAP study, and subsequently their engagement has been mapped. The impact/influence of each stakeholder is dynamic throughout the project lifecycle, and hence the Stakeholder Engagement Plan (SEP) is a live document and will be updated from time to time, so as to make it comprehensive for any given period of time.

5.1 Stakeholder Identification and Analysis

The table below presents the key stakeholders identified at the RAP stage of the Project, and have been categorized as primary and secondary stakeholders.

Table 5.1 Stakeholder Group Categorization

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Individual and Community	■ Private land owners and Patta land owners from the Project Area villages ■ Informal land users (encroachers/squatters to be impacted) ■ Agricultural labourers ■ ST households ■ Women groups ■ Vulnerable groups (Below Poverty Line households, women headed households) ■ Owners of land required for temporary occupation or use during construction phase	■ Fence line community
Government Bodies and Institutional Stakeholders	■ District administration of Neemuch ■ Gram panchayat of impacted villages ■ Tehsildar of Singoli and Patwaris ■ EPC Contractor ■ RUMSL	■ Civil society/Local Non-governmental organizations (NGOs) ■ Local media ■ Local political groups ■ Forest Department, Singoli Agriculture and Livestock Department at Neemuch ■ Industrial Training Institute (ITI), Neemuch ■ Department of Animal Husbandry, Dairy Development, Neemuch

The subsequent analysis has mapped the significance of the identified stakeholders based on specific parameters and their characteristics. The significance of each stakeholder has been assessed considering four parameters:

- Impact on the project/ power to Influence the project;

- Dependence on the project, and
- Perception/ Expectation level

Table 5.2 Assessment parameters and characteristics

Parameters	Characteristics
Influence/Power to Impact	■ Affecting the reputation of the project ■ Ability to cause delay in project activities ■ As pool of available labour for the project, can impact construction activities ■ Source of early warning signals for emerging concerns
Impacted by the Project	■ Direct Impact – Land intake ■ Indirect Impact – Impact on livelihoods ■ Vulnerability criteria*
Perception/ Expectation Level	■ Awareness amongst a few but no real concern ■ Broader awareness, but little concern ■ Considerable concern influencing a few ■ Considerable concern influencing many

Table 5.3 Characterization and Assessment of Stakeholders Significance

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
	Primary Stakeholders				
1	Private and Patta land owners	Private Land Owners comprise of those households, whose khasras are falling within land footprint of the Solar Park. Patta holders comprises of households that were assigned land (Patta), because of their landlessness (or other vulnerabilities), in 1950s- 60s to 80s, under various schemes. The criteria and terms for allotting Patta land were different as this was done at different times, for different purposes. The Tehsil office reported that these documents were lost over time and are not available; This group is dependent on their khasras for their livelihood needs; Among the communities in the villages of PFA, majority of the land holding is with the Gujjars, Dhakad, Balai, Rajput, Bhil, Rajputs. The average land holding size is 1.5 – 2 ha. The highest land holding has been reported with the Rajputs in the	The stakeholder consent to sell land can impact the project development Their support is key for the smooth functioning of the project related activities in the area, even after land purchase, in the operations phase	The dependence on land for agriculture in the area is high, as understood through household survey, The purchase of land for the project development activities will affect the livelihood of this stakeholder group due to reduction/loss in land holdings; Additionally, if this stakeholder group is provided with alternate khasra, the quality of alternate khasras and the effort and investment required to make it fit for cultivation, is also of key concern, as these holdings have been in use for around 20 years, and investments have been undertaken on boundary wall, irrigation systems, and soil fertility. As reported during the household survey, the land owners also work as agricultural labourers, particularly owners with marginal land holding (less than 1 ha.).The impact on livelihood will be therefore two-fold – loss of income from reduced land holding of self,	■ The major concern of the landowners from the project is to get adequate payment as per the MP Mutual Consent Policy, (twice the market rate established by the collector office) and get timely payment of the amount; ■ Concerns regarding land being procured by the Project, because there has been significant cost and effort expended in the preparation of the land for making it cultivable; ■ ■ Potential employment opportunities that the project will generate

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		General category and some Gujjars (OBC).		and loss of income from agricultural labour	
2	Informal Land Users (encroachers/squatters (for agriculture)	This stakeholder group comprises of households that have encroached/ informally occupied Government Land, which was lying unused, in the project area and around Encroachment in Neemuch project area pertains to private land owners informally farming on government khasras for an average of more than a few generations It has been reported that the practice of encroachment is usually undertaken by the relatively well-off households, that already own land; The encroached khasras are used for farming throughout the year. The land owners are well aware of the encroached portion and have reported to using the encroached parcel across generations. When the encroachment related practices are identified by the Government officials, this group is willing to pay fines against the use of Government land; however, in such scenario, the Encroachers do not disclose the exact encroachment and only declare a fraction of the	The power of this stakeholder group to impact is moderate, considering they do not have legal rights on the land. However they have influence in the village by virtue of their economic power (they are all land owners and employers of agricultural labour). They have previously held agitations and protests as they do not want to part with their encroached khasras, given that they have made several improvements to it and made this land productive. The squatting households have limited power to influence the perception of the larger community as the decision making power in the impacted villages is reserved with the private land owning households.	The project would lead to disruption of economic activities and incomes of these households. The significance of economic displacement of this group is medium considering the extent of the occupied land that is affected (42.41 ha which is equivalent to ~40% of the private/patta land to be impacted The project would be set up on the encroached land and would lead to disruption of economic activities and incomes to these households, and those employed by them on these lands (usually seasonally).	Awareness among the few but also an acknowledgement of the status. Their preference would be for the project to not come but they expect to be compensated for their inputs in the land to make it cultivable. Some expectation of employment.

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		actual encroached land to, in tier understanding, get some sort of sanction to continue to informally occupy and use the land. This practice helps them to make official records of their dependence on the land, simultaneously saving the fines for the actually encroached land, which would be significantly higher. To make it productive, most occupiers have made improvements to the land, including installing bore wells and improving the soli quality through use of manure and repeated cultivation and tilling. Squatting for agriculture has a similar trend . The type of land used for squatting is similar w.r.t soil condition and fertility.			
3	Agricultural labourers	As reported during consultations, agricultural work is undertaken by all of the land owning and informal land using household. There is high dependence on farm labour work as non-farm labour work opportunities are limited and provide less income earning potential compared to farm work.	The influence of this group on the project is minimal, considering they are a subset of the private land owning group.	Both men and women derive income from agricultural labour; The project would lead loss of income for this stakeholder group, and also force them to shift to non-farm labour which is sparsely available in the villages and would require short – term (seasonal)	Awareness amongst a few but no real concern ■ Concerns over lack of other employment opportunities due loss of land access; ■ Provision of skill training by the project for non-farm livelihoods

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		Almost all private land owners work as farm and non-farm labourers. This labour work is undertaken by all land owning households, regardless of the size of land holding. However, the share of farm labourers among marginal and small land owning households is high. The prevalence has also been reported to be higher among the patta land holders who reportedly cannot utilize the patta lands for farming due to poor soil condition and lack of irrigation systems.		migration to neighbouring towns/cities.	
4	Indigenous People (Bhil and Bhilala community)	While the project area does not fall under Schedule V area; however, the ST community of Bhils and Bhilalas were identified in Badi village as being potentially adversely impacted by the project. The Bhil community (46 individuals) are patta land owners as well as informal users within the park footprint. Based on their socio-economic profile and characteristics, this community has been assessed to trigger FPIC in accordance to IFC PS 7 due to the impacts on their traditional livelihoods	The overall impact on Bhil households is anticipated to be of similar in nature with the overall project impacted households. However, since majority of the households are patta land owners and/or informal users of government land, the impact of economic displacement are to be treated separately. Their power to impact the project is limited but crucial as according to the requirements of IFC PS 7, prior informed consent from the IP households is required to be undertaken by the project.	The dependence on the project is the potential loss of agricultural land, and loss of access to government notified grazing land.	■ Priority in economic benefits and development opportunities created by the project ■ Minimal disturbance to their current dependence on current grazing management and access to forest land for firewood ■ As per the FPIC Approach Note, it is recommended that a ST committee be formed with representation from the habitation which includes a youth, women and a traditional leader from the community. The committee will help in capacity building and provide recommendations on the IPP.

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		associated with livestock rearing and grazing. The Bhils are part of the main community and are original residents of the PF villages. They have similar farm based occupation and customs as with other communities in the village.			
5	Vulnerable households with marginal land holding, BPL households, Women headed households	This stakeholder group is comprised of /households that are vulnerable due to their social, or economic status in the villages	This stakeholder group should be provided with adequate provisions in the RAP and LRP for the differential impacts expected on this group, as part of the larger community. The vulnerable group has limited ability to impact the project activities, due to their marginalization in the village community, and unequal access to natural resources	The influence of project on this group is similar in nature as the entire project affected villages, as it is a subset of the same however, the impact is higher in magnitude owing their nature of vulnerability	Awareness amongst a few but no real concern
	Local community engaged in stone crushing				
6	Gram Panchayats	This stakeholder group is comprised of Sarpanch, ward members of Panchayats of Badi (includes Kawai village), and Dhardi village (which includes Bardawada) in Singhoi Teshil.	This group has the ability to influence the perception of the community in regards to the Project and its activities	The impact of project on this stakeholder group is minimal due to limited control that the project can exert on the functioning of this group.	Awareness amongst a few but no real concern
7	Revenue Administration of Singoli Tehsil of Kawai and Badi, and Bardawada	This group is comprised of the regulatory authorities at the tehsil level that are	The Tehsildars are responsible for executing the land demarcation exercise, and the	The impact of the project is limited on this stakeholder	Broader awareness, responsible for implementing the Land

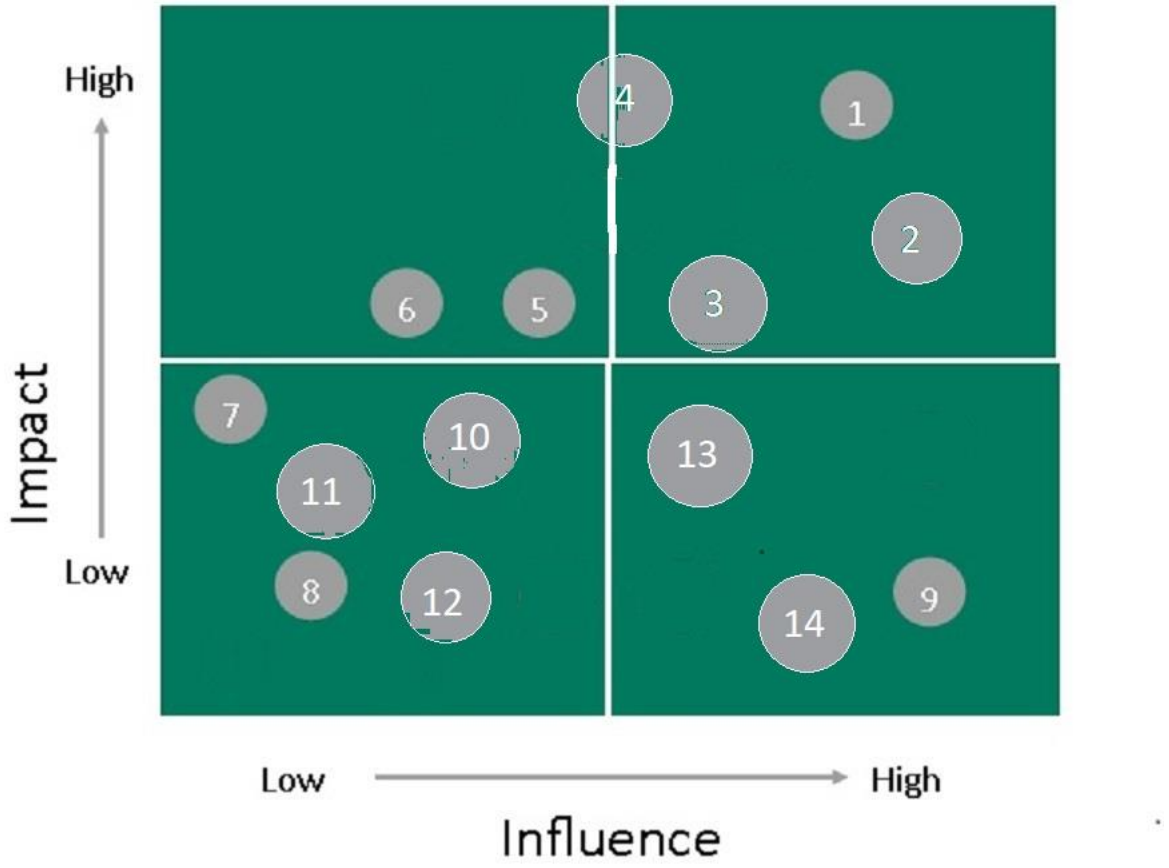
Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		responsible for land demarcation for the project, assessment of extent of encroachment and squatting on government land and providing information on exclusion of khasras and/or inclusion of alternative parcels depending on current land use. The tehsil administration is also important as the residents submit their grievances and concerns at the tehsil office. The residents of Bardawada village have previously voiced their protest and dissent to the land demarcation and allotment in the form of written complaint at the Tehsil office	extent of encroachment on government land within the project boundary. Allotment of khasras based on their current use, and ownership. Noncompliance to conditions laid down in permits issued by this group stakeholders group can result in penalties and fines being levied on the Project.	group, and is limited to permitting requirements.	procurement through the Mutual consent policy
8	Patwaris	This stakeholder group is critical because the physical verification of the allotted khasras, verification of encroachment area, extent of squatting on the allotted government khasras is carried out by this stakeholder group	This group has critical role in impacting the project because of their role determining the khasras, and also guiding village opinion on the project activities and the land take process	No impact	Broader awareness
9	District Administration	The DC is important as all land-related issues, in terms of their regulatory role in approval of land allotment, and deciding on the compensation valuation for private land owners.	The District Administration is a high influence stakeholder due to their pivotal role in land allotment approval, oversight on private land purchase, and acting as the decision making authority on award of	No impact	Broader awareness,

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
			compensation, price for private land purchase, and for other land based impacts, as decided by the project		
	Secondary Stakeholders				
10	Fence Line Community	This stakeholder group is comprised of the local population in the three villages, coming under the project boundaries, and have been using the land identified by the Project for grazing, accessing the agricultural land, etc.	This stakeholder group shall play a critical role in the smooth functioning of the Project	The project will use land which is currently being used by this stakeholder group in accessing their farms, ponds and other common areas, grazing their cattle, etc. there is also the potential impact on agricultural use of land in the immediate project vicinity. These activities will be disrupted after the project related activities commence on the identified land	Awareness amongst a few but no real concern
11	Local Political Groups	This stakeholder group is comprised of the political parties and local politicians active in the region; This group might be active in the area and may play an important role in the polarisation of public opinion towards the Project	This group can influence the project life cycle by polarising public opinion of the local communities (within impacted villages and Fenceline community); The political groups can capitalize on the existing adverse sentiments regarding the project site/construction activities and make it a tool of propaganda against the project	No impact	Awareness amongst a few but no real concern
12	Civil Society/Local NGOs	NGOs and Civil Society Organizations at local level who may be active in the area. Most of the NGOs and	The influence of this stakeholder group is potentially limited as currently, there are no active NGOs working in this region	No impact	NA

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		CSOs working in the region are district level NGOs. However, currently there are no active NGOs working in the region in the project affected villages, and hence no consultation could be undertaken			
13	Agriculture and Livestock Department; Dairy Development Board	To increase agricultural production in the district To increase livestock and increase milk production in the district. Promote small/marginal and landless farmers to undertake animal husbandry	The stakeholder group can provide assistance to the project and help the project in implementing the Grazing Management Plan (GMP), developed as part of the mitigation measures for the villagers in the affected areas; They can influence the impact mitigation measures to be adopted by the Project during the construction and operation stage	No impact	Awareness amongst a few but no real concern
14	Industrial Training Institute (ITI)	To provide training in industrial trades to men and women and develop the capacity for securing employment in industrial establishments	The stakeholder group can provide assistance to the project and help the project in creating a goodwill among by providing skill training specific to the project requirements. They can influence the impact mitigation measures to be adopted by the Project during the construction and operation stage	No impact	Awareness amongst a few but no real concern

- Based on impact influence analysis framework of above, the stakeholders have been ranked on impact-influence matrix, as shown in the figure below.

Figure 5.1 Position of Stakeholders as per stakeholder assessment



The Table 5.4 provides the ranking of all the stakeholders, relevant to Neemuch Solar Park, based on their power to impact the project, and influence of the project.

Table 5.4 Stakeholder Positioning

S. No	Stakeholder	S. No	Stakeholder
1	Private and Patta land owners	7	Gram Panchayat
2	Informal land users	8	Tehsil administration
3	Agricultural labourers	9	District administration
4	Bhil households	10	Fenceline community
5	Vulnerable households	11	Local Political Groups
6	Owners of land required during construction phase	12	Civil Society/NGOs
		13	Industrial Training Institute (ITI)
		14	Agricultural and Dairy Development Board

5.2 Overview of the Engagement Process as Part of Resettlement Planning

5.2.1 Government Land Allotment

The land allotment process was initiated in 2017 for the government khasras. For Neemuch Solar Park, government land allotment process was undertaken in a span of two years (2017 – 2018).

As part of the land allotment process, consultations were undertaken by the following agencies with the land owners in particular.

- RUMSL is responsible for overall coordination across various stakeholders including the district administration, and the administration at the tehsil level. A District Renewable Energy Officer (DREO) has been appointed by RUMSL to undertake the initial meetings with the Tehsil office, and guide the land allotment process.
- District Collector is the key officer contacted by RUMSL for any land related matters. The DC is the authority for final communication on the decisions made on the land. He has the authority to approve or reject allotment requests for any khasras required for development projects. The DC also holds consultations with the individual land owners regarding the land procurement of private land, and the benefits/impact from project activities on the private khasra owners.
- Tehsil Administration was responsible for executing the tarmeem process (revision of land records based on updated land use, land occupancy, and involves revision of land maps for subdivisions in khasras. As part of the tarmeem process, the patwaris held consultations with the Gram Panchayat on encroachment and squatting in the impacted villages in the Solar Park, and with individual land owners who have been using government khasras informally on the duration of encroachment, and use of such encroached parcels.
- it should be noted that despite the fact that the government land required is already allotted to the project, a continuous process of optimization is being undertaken considering the environmental and social sensitivities identified.

5.2.2 ESIA

The ERM team undertook the ESIA study related site visits during November and December 2019 to develop the socio-economic baseline of the villages in the project footprint, and held consultations across all the three villages in the Solar Park. These consultations were focused on understanding the key social and environmental risks in the Solar Park, understand the existing community engagement process prevailing at the Gram Panchayat level, caste wise land holding pattern, presence of vulnerable groups and their specific issues relating to access to resources and livelihood sources, and gender differences in division of labour, livelihood profile, etc. This understanding was used to develop the stakeholder profile and potential primary and secondary impacts, which has been updated based on the RAP study.

5.2.3 Private and Patta Land Procurement

As understood from consultations with the Sarpanch of Badi (which includes Kawai), Patwari of Badi and Kawai, the procurement of private and patta land (on the basis of the Land Procurement Process through Mutual Consent Policy, 2014) was at an initial stage of commencement at the time of the resettlement surveys. As part of this process, RUMSL through the Patwari and Tehsil department is understood to be reaching out to the concerned land owners for the purpose of land purchase. As part of this engagement an understanding is being provided of the proposed project and potential impact on the land owners. However, no documentation of such consultations is reportedly being maintained.

5.2.4 Resettlement Surveys

The resettlement surveys were undertaken in December 2020, and as part of this exercise consultations were undertaken through household surveys, Land and Asset surveys and focus group discussions with potentially impacted stakeholder categories as listed in **Table 5.1**. Through these consultations, information was collected on the nature of land use of private land and patta land, the extent of informal use of government land, livelihood profile, caste differences in land use, dependence on farm and non-farm economic activities, and gender role in land based livelihood. The information collected was utilized to update the impact significance of each stakeholder group.

An important part of the resettlement surveys was the approach followed towards each village community for undertaking HH and LA surveys. Kick-off meetings were scheduled for each of the project footprint villages, in which the project was explained and the purpose of the resettlement surveys was described. The kick-off meetings were used to understand the existing level of information about the project available with the community and incorporate any feedback received from the community on the concerns regarding involuntary impacts, and feedback for project planning.

Across the three villages, there was some resistance to participate in the survey from the residents of Bardawada and Badi village.

ERM team faced a level of reluctance from the residents of Bardawada village in undertaking RAP study in their village. They showed initial reluctance to participate in resettlement surveys stating that their previous experience with the tehsil level administration regarding the land demarcation process. The community stated that there was no engagement process undertaken regarding information disclosure on the project, the land demarcation process was undertaken without providing them any scope for engagement and suggestions on the land take, and moreover, there has been a lack of transparency regarding the land purchase and guidance on the valuation of land. The residents had submitted a written letter to the Tehsil office regarding their grievance on the extent of land being utilized for the project three years ago. However, there was no action or course of redressal undertaken thereafter. However, the residents of the Bardawada village eventually agreed to participate in the survey process, upon being explained the purpose of the survey and its use.

Discussion with the Tehsildar of Singoli revealed that such issues and grievances of the villagers are few and not formally raised. Since the project has proceeded in terms of land procurement, and purchase of private land across the villages was underway, such issues would be addressed in the course of land procurement. They did not acknowledge the receipt of any formal complaint from the community.

5.3 Incorporation of Stakeholder Feedback into Project Decision Making

Through the consultations and information collection undertaken from the resettlement surveys, the following key feedback relevant to the resettlement planning was received for Neemuch Solar Park.

Table 5.5 Feedback Received for Incorporation into Resettlement Planning

Feedback Received	Incorporation into Resettlement Planning
Lack of information disclosure and absence of	As understood from the consultations undertaken with the general community across the three villages, there has been a lack of engagement by the Project with the potentially impacted households, and the village community.

Feedback Received	Incorporation into Resettlement Planning
engagement process as part of land procurement	Information currently available is based on incomplete disclosure by the Patwari and the Project proponents during the land demarcation stage and initial stages of land procurement process. The requirement is to identify personnel from the Tehsil administration (preferably the Patwari) and ensure all information is shared through the Patwari with the village community in the form of group discussions. The SEP for the project and the implementation plan for the RAP incorporates specific requirements for engagement with the concerned stakeholder groups
Provision of water supply infrastructure	Currently, the major source of irrigation is ground water, sourced through dug wells, or bore wells. All the villages have raised their concern on the absence of surface water supply infrastructure, in the form of canals. Lack of canal system has led to high dependence on ground water that has witnessed depletion in the last ten years. The ground water table has further depleted, leading to additional boring/digging in recent years to pump water. It is suggested that the Project take into consideration providing water supply infrastructure for agriculture, as part of community level resettlement program.
Increase in distance to access grazing land	The cattle ownership in the Project villages is higher amongst Gujjar community (Cows and Buffaloes), while the Bhil households rely on goats and sheep for consumption of livestock products. All the communities rely on the traditional practice of leaving cattle to graze during the day at designated fodder lots (private or open designated fodder lots) while sheep and goats are fed with fodder within the households premises. The villagers have raised concerns that the Solar Park will disrupt the traditional land routes used by cattle for grazing, as well as increase the travel time for the animals. The project development will alter the current practice of grazing – Graziers/herders will be required to tend to cattle to guide them on new paths for grazing. As part of Resettlement Planning, the disruption in current mode of accessing grazing land and loss of private fodder lots has been assessed. The specific mitigation measures have been included in the Grazing Management Plan.
Concerns of loss of informal land use of government land	Villagers across the three villages of the Solar Park are well aware of the extent of encroached/squatted area, and duration of such use. The villagers were cognizant of their respective informally used khasras, and expressed concerns of the loss of such khasras in terms of whether there will be any compensatory measures for such land loss, apart from the price to be paid for private khasras.

6. INVOLUNTARY RESETTLEMENT IMPACTS

This section presents the involuntary resettlement impacts linked to land procurement (for the project boundaries of Unit 1,2 and 3) associated with the Neemuch Solar Park. The impacts have been identified and categorised based on the analysis of the information collected from the following sources:

- Project Information as described in **Section 2.1**
- Project affected entities as described in **Section 3**
- Socio-economic baseline of the Project Affected Households as described in **Section 4.2**
- Spatial assessment of all (100 percent) khasras within the solar park area, using aerial imagery data and khasra related information from the official land records.

This section is in two parts, the first describes the affected assets (immovable and movable) in Section 6.2 . and covers the extent and scale of loss of land and change in land use, loss of assets on all such khasras that are falling within the project footprint.

The second part, Section 6.3 provides an assessment of project-affected households, under each impact category, based on their dependence on the project affected land and assets.

This section provides an analysis of the magnitude of such impacts due to land loss of the PAHs, particularly loss of land – based livelihood, and potential landlessness.

6.1 Summary of Key Impacts

The analysis of the magnitude of such impacts due to land procurement for the solar park is summarized below and detailed in the following section. These losses/impacts have been categorized into the physical and economic displacement impact-types noted below:

- Removal of residential structures which are located within the project footprint area
- Removal of other immovable assets on the private/patta khasras within the project footprint area
- Removal of other immovable assets constructed on government land which is encroached/squatted upon
- Loss of agricultural land leading to loss of livelihood that was dependent on private and patta agricultural land within the project footprint and government land that is used ((occupied-encroached/squatted upon) for agriculture;
- Economic losses to cultivators from the clearing of standing crops on private, patta or occupied land;
- Economic loss to owners/users from the clearing of trees (fruit or timber) on private and patta land or occupied land
- Loss of access to grazing land due to use restrictions within the project boundary

The table below summarises the aggregate numbers of project affected households, assessed across the project footprint.

Table 6.1 Summary of Impacts for the TL RoW

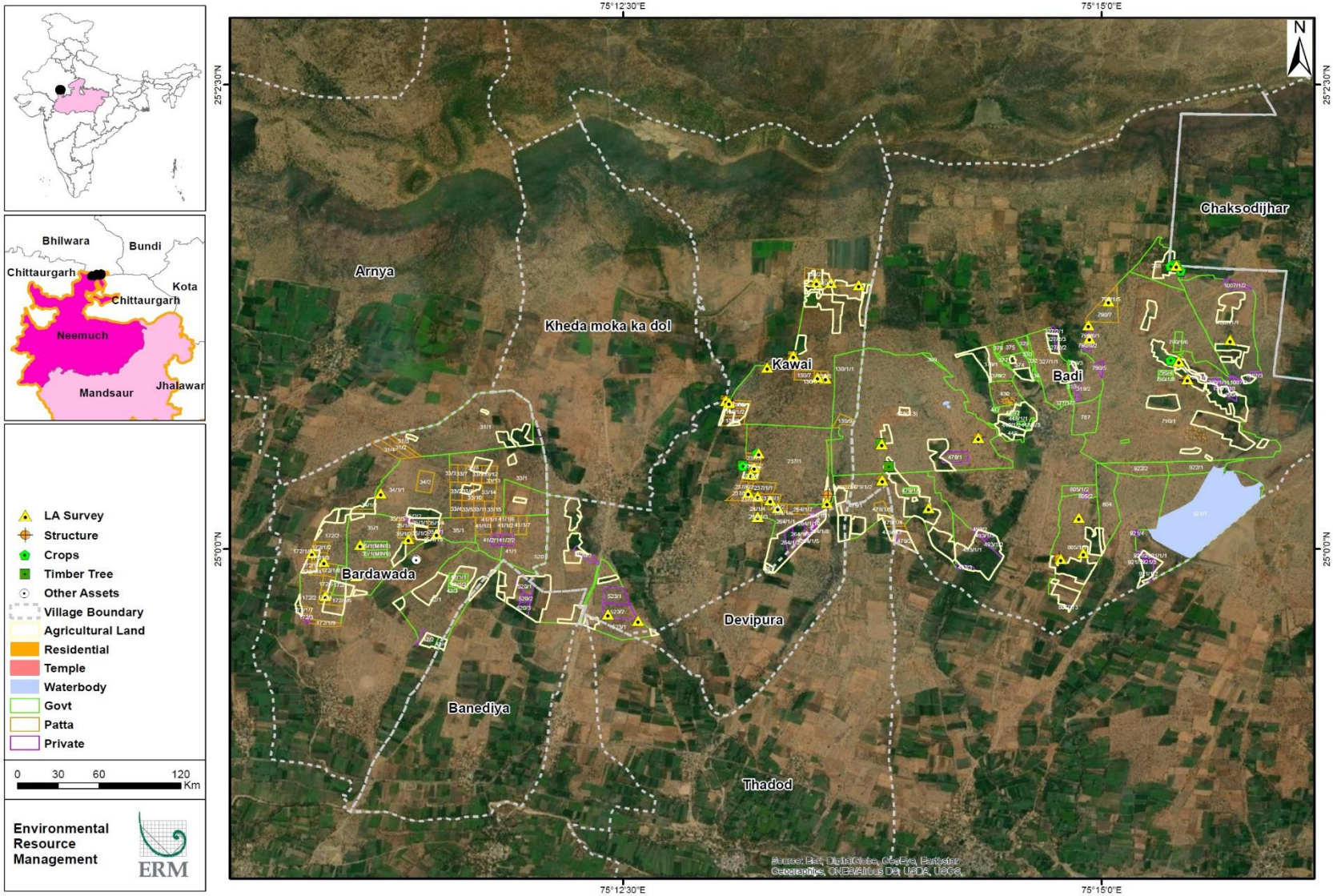
Category of Impact	Summary of Impact
Impact on Residential Structures leading to physical displacement	■ The present project footprint will affect 24 residential structures in the 3 units. These structures are associated with 23 PAHs. The total homestead area to be impacted is 6.03 ha. ■ These impacts are likely to have an overall medium magnitude due to the number of structures to be impacted. However, if the 2 clusters with 20 structures in Badi are excluded in keeping with the Patwari recommendation, this magnitude is may be reduced to low.
Impact on Immovable Assets	■ The project will result in an impact on 52 immovable structures such as cattle shed, water stall and other agricultural structures ■ The project will also result in an impact on 62 fixed and salvageable assets including wire fencing with wooden poles and open well ■ Based on the data available, 105 PAHs are expected to be impacted by the loss of immovable structures ■ The impact on other salvageable assets and structures are spread across the 3 units. The magnitude of this impact however is likely to be low, as the material from the structures can be salvaged and moved to an alternate khasra.
Impact on Private and Patta Agricultural Khasras with Project Footprint	■ As part of the project footprint optimization, an attempt was made to reduce the number of private khasras for the reduction of E&S risks. However, due to restrictions on land availability and technical constraints, the present project footprint will affect 68 patta khasras (khasras) and 31 private khasras (khasras). These parcels have a cumulative area of 103.16 ha (9.67 percent of the total land requirement); ■ These khasras are associated with 204 PAHs across the 3 Units ■ All these khasras will be affected by a permanent change in land use and ownership (farm based to non-farm based) and loss of standing crop during the land clearing phase. The impact of land use and ownership change will be permanent, while the loss of standing crop will be a one-time impact, on those khasras which are under cultivation at the time of land clearing; ■ These impacts are likely to have a high magnitude due to the permanent nature of impact, high dependence of the local community on agriculture as a source of livelihood.
Impact on Government Land Used/occupied for Agriculture (squatters/encroachers)	■ Of the total 962.49 ha of government land, 151.51 (15.7 percent) is occupied (encroached/ squatted) for agriculture or fodder cultivation (for private consumption). Of the total area under informal use, 77.8 percent is under squatting for agriculture. ■ There are 82 PAHs who will be impacted by loss of livelihood arising from informal use of government land for agriculture and fodder cultivation for private consumption, due to project land allotment. ■ The loss of this land under informal use is likely to overall have a low magnitude of impact, due to the small proportion of total required government land being under cultivation (by squatters and encroachers).
Impact due to Clearing of Crops	■ A total of 254.67 ha of land is under agricultural use (private/patta and government, including non-surveyed private land under farming). ■ Cultivators of this agricultural land would be impacted by loss of standing crop at the time of land clearing, depending on the season. ■ The khasras under multi-cropping would be more likely to be impacted by loss of standing crops. Thus, a reduction in overall land under agriculture per household may, in some cases also impact the food security of the household, thereby increasing the expenditure on food grains. ■ The loss to farmers, from clearing standing crops will depend on when the possession of the land required for the project will be taken by the Solar Park Developer (SPD). The more favourable option would be to allow standing crops to be harvested before taking possession and thus not needing to clear standing crops. This will reduce the extent of economic displacement (economic loss of produce).

Category of Impact	Summary of Impact
	■ The magnitude of impact is assessed as high, due to the importance of agricultural activities in the household income as well as food security for the household
Change of land use on government land used for grazing	■ Of the total government land identified for the project footprint, 105.6 ha is designated as grazing land (Charnoi) land in government records. ■ Open grazing is the preferred form of livestock feeding in most villages. This is supplemented by fodder from private and/or patta khasras- fodder crops and crop residue. ■ 97 PAHs are assessed to be dependent upon common land for collection of firewood for cooking and grass (for livestock feed), ■ While livestock holdings are not the primary source of income for the household, it does form an important sustenance source. As understood from the Household surveys, major dependence on livestock is for self-consumption of products (88 percent of milk production of cows is for household consumption). ■ The overall magnitude of the impact is assessed as medium for most of the villages in the project footprint. This is in keeping with the understanding that while alternative grazing land will be available within the village after Project related land procurement, the location in terms of distance from settlement and suitability of the land for fodder or grazing is presently unknown. The loss of grazing land or common land may thus result in an increased travel time for grazing purposes or collection of natural resources as well as increased pressure on the remaining government land in the village.
Impact on Timber and/or Fruit Trees	■ A total of 264 trees (timber and fruit) have been identified across 42 khasras in the project footprint. ■ A total of 237 timber trees have been identified in the project footprint. These trees are primarily used for fuelwood (50.18 percent) followed closely by timber/construction related use (49 percent). On an average, there are 5 - 10 trees on a single private khasra. ■ Similarly, 27 fruit trees were assessed on 13 khasras with an average of two (2) fruit trees on one khasra. ■ Fifty two (52) PAHs are assessed to be impacted by the loss of timber trees and thirteen (13) PAHs have reported and have been assessed for fruit trees ■ The project land take will require the felling/clearing of these trees as part of the land clearing process. This will result in a significant economic impact or loss of assets for the owners.
Gendered Livelihood Impact	■ Based on the information available, 20 female headed households are expected to be impacted by the project ■ The women headed households identified through the households survey will be economically displaced by the project and will be also be impacted due to lack of any other source of earning to supplement agricultural income. ■ Apart from these impacts, women as a group are also likely to be impacted by increased responsibilities for livestock rearing due to potential shift towards stall feeding and lack of lack of access to the economic opportunities/ livelihood restoration programs by the project, due to lower literacy levels and socio-cultural norms and restrictions on women engaging in income generating activities.
Impact on Vulnerable Group	■ 29 households are likely to fall in the vulnerable group category due to baseline conditions ■ The impacts of these households are similar in nature to the involuntary economic displacement related impacts, discussed earlier.

6.2 Project-Affected Land and Assets

The overview of the impacted land within the project footprint and assets impacted and is shown on a map in the following figures. The figures depict the distribution of assets impacted (crops, structures), for the surveyed khasras. The following subsections provide an understanding of the assets that are likely to be impacted by the project

Figure 6.1 Overview of impacted assets surveyed in Unit 1, 2 and 3



6.2.1 GrazierGrazier

6.2.1 Grazier

6.2.1 Project-Affected Residential Structures

While the aim has been to minimize impacting residential structures, due to restrictions on land availability and technical constraints, the present project footprint will affect twenty four (24) residential structures. Of these, 22 structures are located in Badi village (Unit 2 and 3) while 2 structures are located in Bardawada village (Unit 1). The 22 structures in Badi village are spread across 2 clusters.

- While the LA survey for 20 structures in Badi village could not be undertaken, the analysis of satellite imagery and visual observations indicates that the structures are all RBC in construction, spread over a typical area of 0.05 ha, the overall homestead area is spread over 6 ha. In an attempt to avoid impacting these structures, the Patwari has recommended carving out the entire khasra number (Khasra 430) from the project footprint area. However, the decision regarding the same is pending with the Tehsildaar and RUMSL.
- The LA survey was undertaken for 2 residential structures in Badi village. These structures had a land area of 120 and 9 m^2 respectively. These structures are built on private land, approx. 10 years ago. These two structures were kutcha structures, with mud walls and tin roof.
- Lastly, two structures were identified in Bardawada village. Based on the LA survey, these structures had a land area of 80 and 52 m^2 respectively. These two structures are RCC with tin roof and were constructed 30 years ago. However, these are understood to be temporary residences during the farming season.
- The impact from the land procurement for the project on these structures will be permanent as these structures will be removed during the land clearing activities
- These impacts are likely to have an overall medium magnitude due to the number of structures to be impacted. However, if the 2 clusters with 20 structures in Badi are excluded in keeping with the Patwari recommendation, this magnitude is may be reduced to low. The magnitude of impact will be lower in Bardawada as the structures are used as temporary residences and the primary residential structures for these households are not being impacted by the project

6.2.2 Affected immovable assets

Immovable assets include bore well, cattle shed, water stall and any other agricultural structures,

- The project will result in an impact on fifty two (52) such structures across the three units. The estimated total area of all these structures taken together is 0.02.
- Cattle shed: Sheds as observed during the LA survey are temporary structures with plastic/thatch roof, and wooden structure with mud flooring. These are used as temporary resting and crop residue storage structure during farming.

Figure 6.2 Cattle shed structure on agricultural parcels

- Visual observations of these structure during the LA survey showed that these structures are currently in use during the *Rabi* cropping season and also have yearlong use during *Kharif* season.

Other fixed (and *salvageable)* assets surveyed across the khasras included wire fencing with wooden poles, water tanks and hand pumps. There are 62 such assets.

- Dug wells: Majority of the khasras surveyed (private and/or patta) had dug wells that were constructed more than 20 years ago, and have been renovated in successive years. These wells are more than 40 – 50 ft in depth and are used as source of water for irrigation, drawing water from shallow aquifers. The wells are lined with cement from the outside with brick structure from the inside. There are 50 open wells, of which 60 percent is on private/patta khasras.
- Wire fencing (with wooden poles): The boundary walls constituted of wire fencing, held together by wooden pillars (it is easier to replace, and incurs less cost compared to cement pillars).

The counts of all such immovable and fixed assets are as given below:

Table 6.2 Count of Immovable and Fixed Assets

nit	Number of PAHs	Open Wlell	Cattle shed	Bore well	Hand pump	Water stall	Water tank	Wire fencing with wooden pole
Unit 1	16	10	6	12	6	NA	1	NA
Unit 2	22	19	3	8	1	1	NA	1
Unit 3	21	21	3	19	3	NA	NA	NA
Grand Total	**59**	**50**	**12**	**39**	**10**	**1**	**1**	**1**

Source: LA survey 2020

NA: Not Applicable

Figure 6.3 Dug Well on agricultural parcels

- The impact on other salvageable assets and structures are spread across the 3 units. The magnitude of this impact however is likely to be low, as the material from the structures can be salvaged and moved to an alternate khasra.

6.2.3 Private/Patta agricultural khasras

The selection of private parcels has been undertaken following avoidance criteria (**Section 2.2**) wherein, the private and patta khasras within the final project boundary were selected after the government land allotment, by taking into consideration optimization exercise for reduction of E&S risks.

- As part of the project footprint optimization, an attempt was made to reduce the number of private and patta khasras, for reduction of E&S risks. Post the optimization exercise, the project will result in an impact on 68 patta khasras (khasras) and 31 private khasras (khasras). These parcels have a cumulative area of 103.16 ha (9.67 percent of the total land requirement);
- Of these 99 khasras, 53 (53.53 percent) are located in Unit 1, while the remaining are equally divided in Unit 2 & 3. Within this, the lowest impact on Patta land is in Unit 3, with only 3 khasras

being impacted. Similarly the lowest impact on private land is in Unit 2, with only 1 khasra being impacted. In terms of villages, 49 percent of the private/patta land requirement is being procured from Bardawada village in Unit 1. The average area under holding per household is 0.5 – 1 ha.

- All these khasras will be affected by a permanent change in land use and ownership (farm based to non-farm based) and loss of standing crop during the land clearing phase. The impact of land use and ownership change will be permanent, while the loss of standing crop will be a one-time impact, on those khasras which are under cultivation at the time of land clearing.
- These impacts are likely to have a high magnitude due to the permanent nature of impact and high dependence of the local community on agriculture as a source of livelihood. Within the project footprint, the village Bardawada is likely to be most impacted, as the highest proportion of private and patta land (area and number of parcels) is from this village, comprising of 58 percent of the total private/patta land requirement for the solar park.

6.2.4 Extent of Government Land under informal use

- Of the total 962.49 ha of government land, 151.51 (15.7 percent) is occupied (encroached/ squatted) for agriculture or fodder cultivation (for private consumption). Of the total area under informal use, 77.8 percent is under squatting for agriculture. The table below provides details on the extent of informal use of government land.

Table 6.3 Land Area under Informal land Use

Unit	Village	Encroachment for agriculture (ha)	Squatter for agriculture (ha)	Encroachment for Fodder lot (ha)	Squatter for fodder lot (ha)	Grand Total
Unit 1	Bardawada	16.7	44.4	3.4	5	69.5
Unit 2	Badi and Kawai	3.8	30	3.3	0	37.1
Unit 3	Badi	5.26	22.5	9.95	7.2	44.91
Grand total		**25.76**	**92.1**	**16.65**	**12.2**	**151.51**

Source: LA survey 2020

The informal use (squatting/encroachment) of government land for agriculture has the following patterns in Unit 4 and Unit 5:

- The general trend has been towards squatting of barren land. Squatting has been in practice for more than a few generations while encroachment is relatively more dated phenomenon.
- Encroachment of government land adjacent to existing owned land to cultivate larger parcels or plots in villages across the 3 units. Land owners of large khasras who are relatively economically well-off in the village, have used encroachment as a practice to increase the area under private control, and used for agricultural, livestock practices. Majority of land ownership is vested among the Rajputs (General) and Dhakad (OBC) community, while, Gujjars (OBC) and Bhils (ST) has relatively less land holding. . This practice has been in existence for a few generations due to which the land owning class has amassed large parcels for farm-related use.
- Squatting was relatively a later practice, compared to encroachment, but has exceeded encroachment in the extent of area under squatting. This is a result of availability of flat terrain without encumbrance, and non-availability of private/patta land in the village (patta land allocation had ceased to exist after 2003). While there has been increase in the population of the village, there had no simultaneous allocation of new patta khasras for the new households. Squatting is the highest in Bardawada, where households of the SC community have relied on this practice, for sustaining farm-based livelihood.
- The general trend among encroachers/squatters, is to utilize government notified kabil kast land (land suitable for farming) for agriculture.

- Across the Units, Unit 1 (Bardawada and Kawai) has the highest area under informal use (69.5 hectares)
- When compared with private/patta khasras in terms of crop being cultivated, it is understood that the government land under agriculture is primarily used for cultivation during the Kharif season, when the rainfall is abundant. Although Rabi crops are also grown, the area under productivity is low, as reported by the farmers.
- The major difference between land under informal use for agriculture through squatting and encroached land is in the presence of irrigation systems and investments undertaken to improve soil fertility for the encroached khasras. The private khasras are replenished with top soil periodically (almost every two years) to improve fertility for each crop cycle. On an average, INR 21,000 is invested annually to improve top soil. In comparison, the squatted khasras do not receive similar investment for improving their soil fertility in terms of adding top soil, and the investments are undertaken primarily for land clearing and removal stones. The squatted parcels are used for one – two crops in a year, and has relatively lower grade of top soil than private khasras.
- The loss of this land under informal use is likely to overall have a low magnitude of impact, due to the small proportion of total required government land being under cultivation (by squatters and encroachers).

6.2.5 Clearing of Standing crops

A total of 254.67 ha of land is under agricultural use (private/patta and government, including non-surveyed private land under farming). Cultivators of this agricultural land would be impacted by loss of standing crop at the time of land clearing, depending on the season. Within this agricultural land, there is not a significant difference between private/patta land and government khasras in terms of number of crops in a given year, as both reported 2-3 crops, despite the investments made on private khasras for productivity improvement. However, households who have more than 1.25 – 1.3 ha of land reported up to 8 crops growing in one year. Thus, given the trend to multi crop in the area, the likelihood of impacts to standing crops increases. The khasras under multi-cropping would be more likely to be impacted by loss of standing crops. The loss to farmers, from clearing standing crops will depend on when the possession of the land required for the project will be taken by the Solar Park Developer (SPD). The more favourable option would be to allow standing crops to be harvested before taking possession and thus not needing to clear standing crops. This will reduce the extent of economic displacement (economic loss of produce).

6.2.6 Change of land use on government land used for grazing

Of the total government land identified for the project footprint, 105.6 ha is designated as grazing land (Charnoi) land in government records. As discussed in Section 4.2.7, open grazing is the preferred form of livestock feeding in most villages. This is supplemented by the fodder lots on private and/or patta khasras. The dependence on government land for grazing has been assessed through village profiling and consultations

Table 6.7 Population dependent on grazing for livelihood

Village	No. of persons	% of total population
Bardawada	7	2.05
Badi	NA	NA
Kawai	10	2.5

Source: Village Profiling 2020

As reported in Section 4.2.7, grazing is undertaken by the livestock animals on their own, without any dedicated Grazier associated to tend to cattle, with only 17 out of 126 households (13.49 percent)_surveyed reported to be engaged as Graziers as a supplementary source of income, which

may be extrapolated to 30 PAHs in total. The village Kawai has the highest dependence on grazing as a source of livelihood. 35 surveyed PAHs across the Units reported an income from livestock products as compared to all PAHs reporting household consumption, indicating that most of the surveyed PAHs use livestock products for household consumption.

The overall magnitude of the impact is assessed as medium for most of the villages in the project footprint. This is in keeping with the understanding that while alternative grazing land will be available within the village after Project related land procurement, the location in terms of distance from settlement and suitability of the land for fodder or grazing is presently unknown. The loss of grazing land may thus result in an increased travel time for grazing purposes as well as increased pressure on the remaining grazing land in the village. The impact will be highest in Bardawada and Badi as presently no grazing land will remain after project land take, unless additional land is identified as designated grazing land.

6.2.7 Clearing of privately owned fruit and timber trees

- A total of 264 trees (timber and fruit) have been identified across 42 khasras in the project footprint.
- A total of 237 timber trees have been identified in the project footprint. These trees are primarily used for fuelwood (50.18 percent) followed closely by timber/construction related use (49 percent). On an average, there are 5 - 10 trees on a single private khasra.
- Among the timber trees assessed, 83 percent of them have an average diameter of more than 45 cms at breast height.
- Similarly, 27 fruit trees were assessed on 13 khasras with an average of two (2) fruit trees on one khasra. It has been found that 62 percent of the fruit trees are in the young productive (fruit bearing) years. Majority of the fruit trees are mango (77 percent). It should be noted that there were no dedicated mango orchards observed during the LA survey.
- The project land take will require the felling/clearing of these trees as part of the land clearing process. This will result in a significant economic impact or loss of assets for the owners.
- In terms of magnitude, the impact is likely to be most significant in Unit 3, specially Badi village with 40 percent of the trees impacted being located in Unit 3.

6.2.8 Affected Collective Assets

There are three cultural structures, in Badi village (Unit 3) which are likely to be displaced by the land procurement. The structures belong to the Gujjar settlement (described in **Section 4.1.2**) and have been in use since the time of existence of the settlement, approximately more than 50 years. The magnitude of this impact will be low if this khasra is avoided as discussed in Section 6.1.1.

6.3 Involuntary Resettlement Impacts

This section discusses the effect of the impact on land and assets on the PAHs. The impacts due to the Project can be categorized as impacts on livelihood (economic displacement) and/or impacts on structures for residential uses (physical displacement). These involuntary impacts will lead to economic and/or physical displacement of 225 PAHs, of which 126 PAHs (55 percent) were covered through the HH survey.

There are approximately 23 households who will be displaced due to loss of physical structure (24 structures), and hence are likely to physically displaced over and above their economic displacement due to loss of land to the Project.

Table 6.4 Economic and Physical displacement of PAHs

Unit	Total PAHs	Only Economically displaced PAHs	Physically and Economically displaced PAHs
Unit 1	78	76	2
Unit 2	57	57	0
Unit 3	90	68	21
Grand Total	**225**	**202**	**23**

Source: HH survey 2020

6.3.1 Physical displacement

A key impact due to the land procurement for the project is the loss of residential structures located within the project footprint. 23 PAHs will be impacted by the loss of residential structures across Unit 1 and 3. No physical displacement has been identified for Unit 2.

Of the 24 total structures, 22 structures are on government land, belonging to 21 households and 2 structures are on private land belonging to 2 households. While the 2 households in Bardawada will be impacted by loss of temporary residential structure, the 21 households in Badi will be impacted by loss of permanent residential structure.

Thus the magnitude of impact will be higher for the households in Badi village. Furthermore, the loss of such physical assets is concurrent with the loss of livelihood due to economic displacement, and hence the impacts are to be considered in totality for such PAHs.

6.3.2 Economic displacement

6.3.2.1 Households impacted due to loss of private and patta land

A key impact is the loss of private and patta land due to the land procurement for the project and the overall reduction in land holding amongst the PAHs. As can be seen from the table below, a total of 204 households are to be impacted by the loss of private/patta land. Based on the survey analysis, 58 percent of the PAHs are patta land owners (131 PAHs), while the remaining 94 are private land owning PAHs.

Table 6.5 Impact on households Surveyed owning private/patta land

Unit	Private land owning PAHs	Patta land owning PAHs	Total PAPs	Potential landless PAHs
Unit 1	6	57	353	11
Unit 2	35	39	396	1
Unit 3	58	9	380	9
Grand Total	99	105	1129	21

Source LA survey and: HH survey 2020

These 204 PAHs will be impacted by a permanent loss of asset and livelihoods, in terms of agricultural livelihoods. Amongst these PAHs, the impact magnitude is likely to be high, whereas it is assessed to be most severe for the 21 households (16.6 percent, extrapolated to 38 PAHs in total) who would become landless due to the project land take. The highest number of impacted PAHs is reported in Badi (Unit 3) in terms of both highest number of PAHs. There are 81 PAHs who will be impacted by loss of private/patta land in Badi village. Badi (unit 3) also has the highest proportion of PAHs (45 percent of total private/patta owning PAH in the village) who would become landless due to the project.

6.3.2.2 Households impacted due to change of land use of government land

There are 82 PAHs who will be impacted by loss of livelihood arising from informal use of government land for agriculture and fodder cultivation for private consumption, due to project land allotment. Each of these PAH have an average area of two (2) hectares under agricultural use. Of these 82 PAHs. Among the surveyed PAHs, 39 (47 percent) of the PAHs are squatters, and the remaining are private land owners who have encroached upon adjacent government land for agriculture. Of the 61 PAHs surveyed, 14 PAHs reported to informal use of occupied government land for fodder crop cultivation.

Table 6.6 Informal Occupiers/Users (encroachment/squatting)

Unit	Squatting households	Encroacher households	Total
Unit 1	23	6	29
Unit 2	7	6	13
Unit 3	30	10	40
Grand Total	60	22	82

Source: HH survey 2020

Across the three Units, Bardawada (Unit 1) has the highest area under informal use (86 ha) with 29 PAHs. Five (5) of these households also reported owning private agricultural land (outside the project footprint) apart from the land under informal use. The magnitude of impact on these informal users will be high due to a loss of livelihood associated with the land allotment and change in land use. Amongst the PAHs, the impact on squatters (apart from the 5 households mentioned above) is likely to be more severe as they are either landless or own land that is less productive in comparison; as in the case of patta owners;

6.3.2.3 Households impacted due to loss of other structures

Among the surveyed PAHs, 59 PAHs (extrapolated to 105 PAHs) will be impacted by loss of immovable structures. Out of these PAHs, 22 households have constructed these structures on their private land holdings, and 21 PAHs have utilized their patta land for building such structures. One private land owning household has utilized the encroached parcel for construction of the cattle shed, apart from having another cattle shed on private agricultural khasras. Sixteen households are using their squatted khasras for the immovable structure, along with agricultural land use. While the overall impact magnitude is low, the highest impact is likely to result from loss of access to open wells which are used for irrigation of land outside the project footprint. In such cases, the project should consider allowing continued access to such wells by other households during project construction and operation.

6.3.2.4 Households impacted due to loss of income from agricultural activities

- As discussed in Section 1.1.1 and Section 4.2, the primary occupation amongst the PAHs is farm based activities (~78 percent across the age group 35-60 years) and a total of 151.51 ha of government land, and 103.16 hectares of private land in the solar park is under agricultural use presently. On an average, ~3 percent of the PAHs in the 3 Units also engage in agricultural labour work. On an average, agricultural income comprises 67 percent of the total household income
- The project land take will result in an impact on the agricultural income for the PAHs in terms of loss of standing crop at the time of land clearing as well as opportunity cost of the cultivation that would have been undertaken on the khasra in the next season. This is assuming that the PAHs will likely take one more agricultural season to procure replacement land and make it productive, or participate in the Livelihood Restoration opportunities made available by the project.
- Agricultural activities also contribute towards the food security of the household. Thus, a reduction in overall land under agriculture per household may, in some cases also impact the food security of the household, thereby increasing the dependence on the Government PDS schemes or increasing the expenditure on food grains. This is likely to be significant for households left with

sub-optimal land after the land procurement; whose land holdings get reduced significantly or patta land owners who had encroached on government land due to low productivity of allotted land);

- The magnitude of impact is assessed as high, due to the importance of agricultural activities in the household income as well as food security for the household

6.3.2.5 Households impacted due to loss of timber and fruit trees

- Fifty two (52) PAHs are assessed to be impacted by the loss of timber trees. Of these, 21 PAHs are private khasra holders, 19 PAHs are patta land holders, and the rest are households informally using government land for tree plantations.
- Thirteen (13) PAHs have reported and have been assessed for fruit trees on the land under agricultural use. All of these PAHs are private/patta land-holders with land for agricultural use.

Table 6.7 PAH impacted by loss of timber trees

Village	PAH	Count of Trees								
Village	PAH	Khejdi	Palash	Babul	Bakain	Neem	Khajur	Kumtha	Peepal	Others (Mahua, Gular)
Bardawada	20	70	35	9	1	15	NA	4	NA	2
Kawai	12	NA	15	47	NA	5	3	NA	NA	1
Badi	20	14	25	5	NA	42	NA	NA	3	NA
Grand total	**52**	**84**	**75**	**61**	**1**	**62**	**3**	**4**	**3**	**3**

Source: LA survey 2020

- Of the total timber trees reported, 20 percent (59 out of 296 trees) have been grown cultivated on government khasras being informally used for agriculture. All the households (12 PAHs) who have planted trees on government khasra use it on an ongoing basis for fodder, or twigs for use as fuelwood or for construction of temporary sheds.
- According to the discussion with the encroachers/squatters these trees have been grown by the individuals for their personal use, and are differentiated from the naturally growing trees on government land;
- On an average a typical households has about 5 timber trees on the khasra under agricultural use, being used as timber. The difference among private land owners and those who are cultivating government land informally is in the type of trees grown. The private and patta land holders grow *Neem*, *Babul* and *Palash* as the major timber trees, while informal land users depend on *Kheji*, *Babul* and *Neem* to meet firewood and timber requirements. *Palash* and *Babul* trees which have a higher price in the market (420/cubic meter) as compared neem (14/cubic meter) as reported by the khasra owners and informal land users during consultations.
- The impact from the loss of these trees would be medium, due to the impact on overall asset holding as well as livelihoods of these households. The highest impact will be in the Badi Village (Unit 2 and 3)

6.3.3 Community based livelihood impacts

The primary impact at the community level arises due to reduction in available land for open grazing, due to land use change, i.e. loss of livelihood and sustenance linked to use of government land for open grazing of livestock. Open grazing of livestock reduces the input costs linked to grazing which otherwise would be market purchased fodder, and/or paying for stall feeding, which would increase

the input costs of livestock management. Based on the data collected from the Household Survey, it is understood that out of the surveyed PAHs, 43 percent (55 PAHs out of 126 surveyed) depend on common land for collection of firewood for cooking and grass (for livestock feed), this may be extrapolated to 97 PAHs in total. Dependence on government forest land was reported by 22 percent (23 PAHs) for collection of grass, extrapolated to 50 PAHs in total.

Table 6.8 Dependence of households on grazing land

Village	No.of HHs using government land for grazing	% of total HHs in the village
Bardawada	~300-320	90
Kawai	~65-70	50
Badi	~250	77
Grand Total	**~615-640**	**~77.8**

Source: Village Profiling 2020

- Open grazing of livestock is the most preferred option, as against stall feeding, reported during consultations with livestock grazing households.
- While livestock holdings do not comprise of a significant source of income for the household, it does comprise of an important sustenance source. As understood from the Household surveys, major use of livestock is for self-consumption (88 percent of milk production of cows is for household consumption).
- Livestock is a crucial source of livelihood for the marginal and small farmers, especially those households engaged as graziers-– who tend to cattle for a cluster of houses for a fee.
- Due to loss of access to grazing lands, these households may have to rely on market purchase for fodder which would increase input costs, and affect the income of the graziers.
- Secondly, the reduction in such common land for grazing could also lead to reduction in count of livestock held by these households, as input costs increase (creation of stall-shed, feeding stalls, etc.). Thus, the total income earning capacity for the household from livestock may reduce.
-
- In keeping with this, the impact magnitude is assessed as high, especially for Bardawada, as it has reported the highest proportion of population dependent upon government land for grazing

6.3.4 Gendered livelihood impacts

The Section 4.2.12 assesses the Female headed households as a vulnerable group. based on the information available, eleven (11) such households have been identified, based on the extrapolated data for the entire PAH, there are estimated to be 20 female headed households. These households have reported to primarily depend on income from farm produce on their own khasras, supplemented by agricultural labour work.

Out of these eleven PAHs, only one is private land owner, while nine are patta land owners. Three PAHs are to be impacted for their squatting on government khasras, of which two PAHs are also to be impacted for their loss of patta land to the project. The average land holding size of the private and patta land holders is 1- 2 hectares (small land holders), with the highest land holding reported to be of 3 hectares. The average annual income of the these Women PAHs is observed at around INR 1,85,000 with 80 percent of the household income derived from agriculture.

Table 6.9 Women headed households among PAH

Village	No.of Women HoH	Women PAP
Bardawada	5	12

Village	No.of Women HoH	Women PAP
Kawai	5	13
Badi	1	1
Grand Total	**11**	**26**

Source: HH survey 2020

The women headed households identified through the households survey are likely to be economically displaced by the project and did not report any other source of income other than their agricultural income as part of the household survey. Thus the magnitude of impact from loss of agricultural income and loss of land may be more severe for women headed households.

Another impact on female headed households will be the Impact due to loss of access to government grazing land and land used for firewood collection that were located near their village, and are now included in the project boundary. This is based on the understanding that the grazing/firewood collection activities by women were primarily undertaken close to the village settlement, with men taking livestock to grazing land that was located further away. Due to the project impact on the grazing areas close to the settlement, grazing and firewood collection areas may be available at further distances, the alternative is to access the parcels which are at greater distance and will thus have higher time cost implications. This in turn may have an opportunity cost of time lost that was earlier used for other agricultural labour work activities.

Apart from the impacts on female headed households, there are also likely to be certain impacts which differentially impact women in the project affected population. Most of the women land owners are joint owners. If not managed well, there is a risk of women in joint land ownerships not getting their fair share, or access to their share of the compensation amount. This may be further compounded by the lack of access to the economic opportunities/ livelihood restoration programs by the project, due to lower literacy levels and socio-cultural norms and restrictions on women engaging in income generating activities.

Furthermore, reduction in available government land for open grazing is likely to lead to a shift towards stall feeding in the short term. In the current practice of livestock management, the responsibilities are shared equally by men and women, with women undertaking feeding of the animals in stalls, cleaning, washing, mulching, while men undertake grazing, and help in collection of fodder. The shift towards stall feeding could increase the work load and responsibilities of women of the households without any remuneration attached for the same. Men on the other hand, may have lesser work share as they were responsible for open grazing livestock and to a lesser degree, in stall-feeding activities.

6.3.5 Impact on Vulnerable groups

The vulnerability profiling (**Section 4.2.12)** of impacted households shows that there are 16 vulnerable households, extrapolated to 29 PAHs in total. Of the surveyed PAHs 11 of which are women headed, one household resided by only elderly members, four households dependent on artisan income. The impacts on these households are uniform in nature to the involuntary economic displacement related impacts, discussed earlier \

In addition to the vulnerable PAHs identified based on the HH survey, the Bhil settlement in Badi village will be physically and economically displaced due to land procurement.

- Majority of the Bhils are patta land-holders (55 percent of the PAHs) and undertake single-cropping on their khasras, in comparison to other land owners who typically undertake at least double cropping.
- All the Bhil households undertake agricultural labour work (average annual income of INR 17,200 from labour work) to supplement farm income.

- Livestock management is the most important economic activity for most of the Bhil families. Village commons, or the common grazing areas on government land are the source of fodder for these families. 60 percent of these PAHs own livestock (cows, and goats only) primarily to meet household consumption.
- The land procurement will lead to economic displacement due to loss of agricultural land as well as grazing land
- As explained in FPIC approach process, a ST committee will be formed which will disclose the mitigation measures as part of the Indigenous Peoples Plan (IPP) to the community. A workshop will be organized to explain the range and extent of impacts, particular to the community, and incorporate their suggestions into resettlement planning. The extent of impacts on the community will be further identified through the consultations between the committee, and RUMSL. These inputs will be incorporated into the IPP as well as in the Restoration Planning.

7. IMPLEMENTATION STRATEGIES FOR NEEMUCH SOLAR PARK

This section discusses the Solar Park specific implementation strategies that have been identified based on the resettlement surveys undertaken, as distinct from the overall implementation plan presented in Volume I of the RAP-LRP. This section provides the implementation strategies, the necessary stakeholder engagement activities, and the RAP budget for Neemuch Solar Park.

7.1 Completion of pending activities prior to Implementation

Based on the entitlement matrix and measures of compensation, rehabilitation and livelihood restoration, the following table summarizes specific mechanisms that will need to be incorporated as part of the RAP and LRP implementation, prior to the implementation of RAP-LRP:

Table 7.1 Pre-implementation actions

Aspects	Description
Completion of RAP & LRP surveys	Undertake the resettlement surveys with the households who could not be covered as part of the RAP and LRP surveys in order to complete the understanding of the socio-economic profile and its impacts.
Information disclosure with the impacted community	As understood from discussions with the potentially impacted land owners across the villages as part of the RAP surveys, they have incomplete information regarding the project. The project should undertake focused consultations with the impacted land owners in the context of the project impacts, and resettlement and planned livelihood restoration measures. The Project shall undertake focused and dedicated engagement activities with the local community and affected households prior to the initiation of land purchase and RAP&LRP implementation in keeping with the SEP and GRM developed for the project. This shall be focused on providing the local community an understanding of the Project context and the potential impacts from the same, with a focus on the measures taken for avoidance of impacts, land procurement process and provisions for protection of Nistar rights. These engagement activities shall specifically be focused on the Badi village where there is high proportionate of Schedule Tribe (Bhil) community. This will be covered as key actions under the FPIC process which include disclosure of the Decision Making Framework (DMF), followed by formation of a committee from the impacted group. The process also stipulates workshops to disclose the impacts and thereafter to incorporate their suggestions in the Final IPP.
Consultations with the land owners to be impacted by the procurement process	

7.2 Stakeholder Engagement and Grievance Management

Given the gap in the stakeholder engagement and grievance redressal management, it is suggested that regular engagement should be undertaken with all the villages in the Project footprint, with specific focus on Badi village, where the ST population is higher and a specific focus on those who refused surveys.

As understood from consultation with Patwaris, and government officials at the Tehsil level, there is a need to implement a process of grievance management and consultation activities for the villages. These includes:

- Consultations with the Gram Panchayat to provide update on the land procurement process of private land in the villages including the steps undertaken thus far and the next steps going forward;
- Sharing of timeline of Project activities with the Tehsil office and sensitisation on the same with the Tehsildar;
- Regular meetings with the private and patta land holders to be impacted by land take should be held by the DREA, in association with the Tehsildar, and Patwari to make them aware of the potential land based impacts as well as share information on the livelihood restoration measures;
- Conduct workshops with specific stakeholder groups identified during the resettlement surveys to incorporate feedback and suggestions on resettlement planning such that the specific needs of vulnerable groups are included in the implementation plan.
- The current state of stakeholder engagement requires improvement in terms of record keeping of grievances, identifying community representatives to ensure sustained engagement, and involvement of local government authorities' record keeping and resolution platform.

7.3 RAP Implementation schedule for Neemuch Solar Park

The overall implementation schedule in Volume I of the RAP-LRP contains the key Project timelines, including the disclosure of RAP and LRP as well as regular engagement activities. Neemuch Solar Park level implementation schedule will be prepared in keeping with the Volume I schedule.

APPENDIX A PHOTO DOCUMENTATION

Photo 1: Boundary walls in Project Footprint Kawai Village

Photo 2: Boundary Walls in Kawai Village

Photo 3: Residential structure in Kawai Village

Photo 4: Village Consultations in Kawai Village

Photo 5: Residential structure and cattle area with residence in Kawai Village

Photo 6: Outdoor primary school in Kawai Village

	
Photo 7: Mazar in the outskirts of Badi Village	Photo 8: Temple in the outskirts of Badi Village
	
Photo 9: Area within Project Boundary in Badi Village	Photo 10: Area within Project Boundary in Badi Village

Photo 11: Women in hamlets of Badi Village

Photo 12: Suttaron ki Basti in Badi Village

Photo 13: Ration Centre in Badi Village

Photo 14: Livestock in Badi Village

Phot 15: Cattle returning from grazing in Badi Village

Photo 16: Area within Project Footprint in Badi Village

Photo 17: Residences in Gurjar Basti in Badi village

Photo 18: Close out meeting in Badi Village

Photo 19: Kick off meeting in Bardawada Village

Photo 20: Residences in Bardawada Village

Photo 21: Goat and Sheep grazing in Badi village

Photo 22: Cattle grazing in Badi Village

	
Photo 23: Women in Badi village carrying fodder.	Photo 24: Local deity temple within Project Footprint in Badi Village

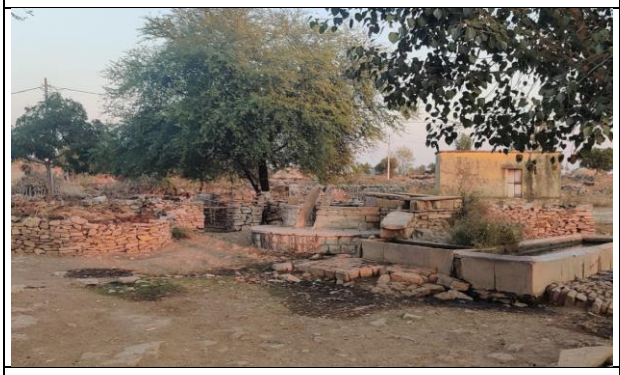



Photo 25: Well structure and fodder lot structure in Badi Village	

APPENDIX B SUMMARY OF CONSULTATIONS

Village	Date	Type of Consultations	Brief about discussions
Kawai	1.12.2020	Village Profiling	General discussion with the elders of the village to understand the presence of different caste groups and their livelihood and land holding profile of the village. The consultations were used as guidance to inform the villagers about the resettlement surveys, their scope and objective.
	1.12.2020	Consultations with Graziers	Based on the understanding developed through village profiling on livestock holding and grazing pattern, consultations were held with members of the village who undertake grazing activity to understand the grazing area, routes and times of grazing, and overall livestock management.
	1.12.2020	Consultation with women's groups	Based on the identification of Self-Help-Groups (SHGs) through village profiling exercise, consultations were undertaken with SHG members to understand the concerns, issues from a gender lens. The discussion was also used to understand the current state of functioning of SHGs in the village.
	2.12.2020	Consultation with youth group	Consultation with youth group was undertaken to discuss specific issues on livelihood opportunities, current dependence on land – based livelihood of the youth, and availability of skill-based training infrastructure in the Tehsil.
Badi	3.12.2020	Village Profiling	General discussion with the elders of the village to understand the presence of different caste groups and their livelihood and land holding profile of the village. The consultations were used as guidance to inform the villagers about the resettlement surveys, their scope and objective.
	3.12.2020	Consultations with Graziers	Based on the understanding developed through village profiling on livestock holding and grazing pattern, consultations were held with members of the village who undertake grazing activity to understand the grazing area, routes and times of grazing, and overall livestock management.
	5.12.2020	Consultation with women's groups	Based on the identification of Self-Help-Groups (SHGs) through village profiling exercise, consultations were undertaken with SHG members to understand the concerns, issues from a gender lens. The discussion was also used to understand the current state of functioning of SHGs in the village.
Bardawada	6.12.2020	Village Profiling	General discussion with the elders of the village to understand the presence of different caste groups and their livelihood and land holding profile of the village. The consultations were used as guidance to inform the villagers about the resettlement surveys, their scope and objective.
	7.12.2020	Consultation with women's groups	Based on the identification of Self-Help-Groups (SHGs) through village profiling exercise, consultations were undertaken with SHG members to understand the concerns, issues from a gender lens. The discussion was also used to understand the current state of functioning of SHGs in the village.

APPENDIX C PROFILE OF INFORMAL USERS IN NEEMUCH SOLAR PARK

The tables below provides the details on PAE and PAH wise informal users of government land who will be economically displaced due to the land procurement for the project footprint, or can be potentially displaced based on the field assessments undertaken as part of the resettlement surveys.

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Badi	479/1/Min-2 and 479/min3	352035	30315267006	OBC	Encroacher	1.7	Agriculture	No	40	Yes	NA
Badi	479/1/Min-3 and 479/min3	352036	30315267007	OBC	Encroacher	2.1	Agriculture	No	40	Yes	NA
Badi	479/1/Min-5 and 479/1	352034	30315267005	OBC	Encroacher	1	Agriculture	No	40	Yes	NA
Badi	790/1/Min-9 and 790/1/min8	352015	Refused HH survey	OBC	Encroacher	5	Agriculture	No	18	Yes	NA
Badi	790/1/Min-9 and 790/1/min8	352016	Refused HH survey	OBC	Encroacher	0.2	Agriculture	No	20	Yes	NA
Badi	790/1/Min-9 and 790/1/min8	352017	Refused HH survey	OBC	Encroacher	2	Agriculture	No	20	Yes	NA
Badi	790/1/min8	352049	Refused HH survey	OBC	Squatter	2	Agriculture	No	20	No	NA
Badi	478/Min-1 and 268	352010	30315265010	OBC	Encroacher	2	Agriculture	No	45	Yes	NA
Badi	478/Min-1 and 268	352009	30315265009	OBC	Encroacher	1	Grazing	No	10	Yes	NA
Badi	478/Min-1 and 268	352008	30315265011	OBC	Encroacher	2	Agriculture	No	10	Yes	NA

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Badi	478/Min-1 and 268	352023	30315265008	OBC	Encroacher	1	Grazing	No	4	Yes	NA
Badi	790/1/min8	352018	Refused HH survey	ST	Squatter	1.5	Agriculture	Yes	40	No	NA
Badi	790/1/min8	352019	Refused HH survey	ST	Squatter	2	Grazing	Yes	20	No	NA
Badi	790/1/min8	352020	Refused HH survey	ST	Squatter	1	Agriculture	Yes	50	No	NA
Badi	790/1/min8		Absentee	OBC	Squatter	2.4	Agriculture	Yes	20	No	NA
Badi	379/1		Deceased	OBC	Squatter	3.2	Agriculture	Yes	50	No	NA
Badi	790/6/Min-1 and 790/1/min8		Absentee	General	Encroacher	2	Agriculture	No	50	Yes	NA
Badi	790/6/Min-2 and 790/1/min8		Deceased	General	Encroacher	3.8	Agriculture	No	12	Yes	NA
Badi	921/3 and 921/5 and 805/1/min1	352048	30315276090	OBC	Encroacher	13.5	Agriculture	No	45	Yes	NA
Badi	1007/1/Min-2 and 1007/1/min1	352030	Absentee	OBC	Encroacher	7.4	Agriculture	No	35	Yes	NA
Badi	1007/1/Min-2 and 1007/1/min1	352031	Absentee	OBC	Encroacher	6.1	Agriculture	No	45	Yes	NA

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Badi	1007/1/Min-2 and 1007/1/min1	352032	Absentee	OBC	Encroacher	3.1	Agriculture	No	15	Yes	NA
Badi	1007/1/min1	352029	Refused HH survey	SC	Squatter	13.5	Agriculture	Yes	15	No	NA
Badi	268	352024	Refused HH survey	SC	Squatter	2.4	Agriculture	Yes	15	No	NA
Badi	268	352025	Refused HH survey	SC	Squatter	2.4	Agriculture	Yes	50	No	NA
Badi	268	352026	Refused HH survey	SC	Squatter	1	Agriculture	Yes	50	No	NA
Badi	268	352027	Refused HH survey	SC	Squatter	0.7	Agriculture	Yes	60	No	NA
Badi	268	352028	Refused HH survey	SC	Squatter	1.4	Agriculture	Yes	12	No	NA
Badi	805/1/min1	352046	30315267017	SC	Squatter	1.5	Agriculture	Yes	12	No	NA
Badi	805/1/min1	352063	30315267018	SC	Squatter	2.9	Agriculture	Yes	65	No	NA
Badi	805/1/min1	352045	Not available	OBC	Squatter	2.5	Grazing	Yes	30	No	NA
Badi	479/min/3	352037	Refused HH survey	SC	Squatter	4.1	Grazing	Yes	16	No	NA
Badi	479/min/3	352038	30315265040	SC	Squatter	3.2	Agriculture	Yes	50	No	NA
Badi	479/min/3	352039	Refused HH survey	SC	Squatter	0.6	Agriculture		50		NA

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Kawai	130-1-min-2 and 130-3	351016	30315164019	ST	Encroacher	4.5	Grazing	Yes	35	Yes	NA
Kawai	130-2	Inaccessible khasra	30315167025	ST	Encroacher	1.7	Agriculture	No	50	Yes	NA
Kawai	130-4	351011	30315164007	ST	Encroacher	0.6	Agriculture	No	50	Yes	NA
Kawai	130-5	351003	30315164005	OBC	Encroacher	0.7	Agriculture	Yes	50	Yes	NA
Kawai	130-6	351004	30315164006	OBC	Encroacher	0.8	Grazing	Yes	40	Yes	NA
Kawai	237-2-min-1	351009	30315176024	SC	Encroacher	2.3	Grazing	Yes	60	Yes	NA
Kawai	237-3	351013	30315176027	SC	Encroacher	2.3	Agriculture	No	50	Yes	NA
Kawai	237-4	351007	30315164004	SC	Encroacher	2	Grazing	No	40	Yes	NA
Kawai	264-1-min-11	351028	30315164022	OBC	Encroacher	0.8	Agriculture	No	60	Yes	NA
Kawai	520-1-min-2	351001	30315164001	OBC	Squatter	3.5	Agriculture	Yes	60	No	NA
Kawai	520-1-min-2		30315176012	OBC	Squatter	2.1	Agriculture	Yes	60	No	NA
Kawai	520-1-min-2	Absentee	Absentee	SC	Squatter	2.5	Agriculture	Yes	20	No	NA
Kawai	520-1-min-2	Absentee	Absentee	OBC	Squatter	4.5	Agriculture	Yes	60	No	NA
Kawai	520-1-min-2	Absentee	Absentee	OBC	Squatter	2.4	Agriculture	Yes	40	No	NA
Kawai	520-1-min-2	Absentee	Absentee	OBC	Squatter	0.55	Agriculture	Yes	50	No	NA
Kawai	520-1-min-2	Absentee	Absentee	SC	Squatter	2.5	Agriculture	Yes	50	No	NA
Kawai	520-1-min-2	Absentee	Absentee	SC	Squatter	2.5	Agriculture	Yes	40	No	NA

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Kawai	520-1-min-2	Absentee	Absentee	OBC	Squatter	0.7	Agriculture	Yes	40	No	NA
Kawai	520-1-min-2	Absentee	Absentee	SC	Squatter	3.8	Agriculture	Yes	26	No	NA
Kawai	130-1-min-1	351020	30315164020	OBC	Squatter	0.36	Grazing	Yes	26	No	NA
Kawai	130-1-min-1	351021	30315164021	OBC	Squatter	1	Grazing	Yes	28	No	NA
Kawai	130-1-min-1	351022	30315164008	OBC	Squatter	7.2	Agriculture	Yes	32	No	NA
Kawai	130-1-min-1		Deceased	OBC	Squatter	1.7	Grazing	Yes	60	No	NA
Kawai	237/1	351031	30315176028	OBC	Squatter	2.1	Agriculture	Yes	30	No	NA
Kawai	237/1	351032	Absentee	OBC	Squatter	1	Agriculture	Yes	30	No	NA
Kawai	237-3	351032	30315167030	SC	Squatter	5	Agriculture	Yes	50	No	NA
Kawai	237-3	351033	30315167032	SC	Squatter	0.2	Grazing	Yes	40	No	Women HoH
Kawai	479/1/Min-2 and 479/min3	352035	30315267006	OBC	Encroacher	2	Grazing	No	40	Yes	NA
Kawai	479/1/Min-3 and 479/min3	352036	30315267007	OBC	Encroacher	2	Agriculture	No	50	Yes	NA
Kawai	479/1/Min-5 and 479/1	352034	30315267005	OBC	Encroacher	2	Agriculture	No	60	Yes	NA
Kawai	790/1/Min-9 and 790/1/min8	352015	Refused HH	OBC	Encroacher	1	Agriculture	No	60	Yes	NA
Kawai	790/1/Min-9 and 790/1/min8	352016	Refused HH	OBC	Encroacher	2	Agriculture	No	60	Yes	NA

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Kawai	790/1/Min-9 and 790/1/min8	352017	Refused HH	OBC	Encroacher	1	Agriculture	No	70	Yes	NA
Kawai	790/1/min8	352049	Refused HH	OBC	Squatter	1.5	Agriculture		80	No	NA
Kawai	478/Min-1 and 268	352010	30315265010	OBC	Encroacher	2	Agriculture	No	60	Yes	NA
Kawai	478/Min-1 and 268	352009	30315265009	OBC	Encroacher	1	Agriculture	No	60	Yes	NA
Kawai	478/Min-1 and 268	352008	30315265011	OBC	Encroacher	2.4	Agriculture	No	60	Yes	NA
Kawai	478/Min-1 and 268	352023	30315265008	OBC	Encroacher	3.2	Grazing	No	15	Yes	NA
Kawai	790/1/min8	352018	Refused HH	ST	Squatter	2	Agriculture	Yes	60	No	NA
Kawai	790/1/min8	352019	Refused HH	ST	Squatter	3.8	Agriculture	Yes	60	No	NA
Kawai	790/1/min8	352020	Refused HH	ST	Squatter	13.5	Grazing	Yes	60	No	NA
Kawai	790/1/min8		Absentee	OBC	Squatter	7.4	Agriculture	Yes	60	No	NA
Kawai	379/1		Deceased	OBC	Squatter	6.1	Agriculture	Yes	28	No	NA
Kawai	790/6/Min-1 and 790/1/min8		Absentee	General	Encroacher	3.1	Agriculture	Yes	25	Yes	NA
Kawai	790/6/Min-2 and 790/1/min8		Deceased	General	Encroacher	13.5	Grazing	No	35	Yes	NA

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Kawai	921/3 and 921/5 and 805/1/min1	352048	30315276090	OBC	Encroacher	2.4	Grazing	No	30	Yes	NA
Kawai	1007/1/Min-2 and 1007/1/min1	352030	Not available	OBC	Encroacher	2.4	Grazing	No	30	Yes	NA
Kawai	1007/1/Min-2 and 1007/1/min1	352031	Absentee	OBC	Encroacher	1	Grazing	No	30	Yes	NA
Kawai	1007/1/Min-2 and 1007/1/min1	352032	Absentee	OBC	Encroacher	0.7	Grazing	No	30	Yes	NA
Kawai	1007/1/min1	352029	Absentee	SC	Squatter	1.4	Grazing	Yes	30	No	NA
Kawai	268	352024	Refused HH	SC	Squatter	1.5	Agriculture	Yes	70	No	NA
Kawai	268	352025	Refused HH	SC	Squatter	2.9	Agriculture	Yes	50	No	NA
Kawai	268	352026	Refused HH	SC	Squatter	2.5	Agriculture	Yes	60	No	NA
Kawai	268	352027	Refused HH	SC	Squatter	4.1	Grazing	Yes	60	No	NA
Kawai	268	352028	Refused HH	SC	Squatter	3.2	Agriculture	Yes	40	No	NA
Kawai	805/1/min1	352046	30315267017	SC	Squatter	0.6	Agriculture	Yes	40	No	NA
Kawai	805/1/min1	352063	30315267018	SC	Squatter	4.5	Agriculture	Yes	40	No	NA
Kawai	805/1/min1	352045	Not available	OBC	Squatter	1.7	Agriculture	Yes	18	No	NA

Village	Khasra Number	PAE Number	PAH Number	Caste	Encroacher/ Squatter	Area Encroached/ Squatted (ha.)	Nature of Dependence (Agriculture/ Grazing/firewood etc.)	Dependence on land for primary livelihood (Yes/No)	Years of Land Use	Any other Land Available	Assessment of Vulnerability * (NA denotes not applicable)
Kawai	479/min/3	352037	Refused HH	SC	Squatter	0.6	Agriculture	Yes	20	No	NA
Kawai	479/min/3	352038	30315265040	SC	Squatter	0.7	Agriculture	Yes	20	No	NA
Kawai	479/min/3	352039	Refused HH	SC	Squatter	0.8	Agriculture	Yes	20	No	NA
Kawai	479/1/Min-2 and 479/min3	352035	30315267006	OBC	Encroacher	2.3	Agriculture	No	45	Yes	NA

APPENDIX D PROFILE OF RESIDENTIAL STRUCTURES WITHIN NEEMUCH SOLAR PARK

The table below provides the details on PAE wise use of the residential structures that will be directly impacted due to the land procurement for the project footprint, or can be potentially displaced (induced due to proximity to the project boundary) based on the field assessments undertaken as part of the resettlement surveys.

S. No	Unit	Village	Khasra No.	Direct/ Induced Displacement	Ownership Status of Land	PAH ID	PAE ID	Area of Structure (sq.m)	Description of Structure	Status of Use (temporary/ permanent)	Vulnerability Status of PAH	Approx Value of Structure
1	Unit 1	Barawada	35/2/1	Direct	Squatter on government land	30315364012	352049	80	Constructed in 1990; RBC structure with RCC roofing (RBC)	Permanent	None	3,86,000
2	Unit 1	Barawada	35/2/1	Direct	Squatter on government land	30315364015	353056	52.5	Constructed in 2017; RBC structure on cemented flooring and RCC roofing (RBC)	Permanent	None	2,36,250
3	Unit 3	Badi	493/2	Direct	Private Land Owner	30315264012	352060	120	Constructed in 2010; Mud structure with CGI sheet roofing (Kutcha)	Permanent	None	18,00,000

S. No	Unit	Village	Khasra No.	Direct/ Induced Displacement	Ownership Status of Land	PAH ID	PAE ID	Area of Structure (sq.m)	Description of Structure	Status of Use (temporary/ permanent)	Vulnerability Status of PAH	Approx Value of Structure
4	Unit 3	Badi	430	Direct	Squatter on government land for residence and agriculture	Refused LA and HH survey	NA	20 structures admeasuring ~400 sq. m	RBC structure	Permanent	Not Available	

APPENDIX E HOUSEHOLD LEVEL ENTITLEMENTS

ERM has over 160 offices across the following countries and territories worldwide

Argentina
Australia
Belgium
Brazil
Canada
Chile
China
Colombia
France
Germany
Ghana
Guyana
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
Myanmar
The Netherlands
New Zealand
Norway
Panama
Peru
Poland
Portugal
Puerto Rico
Romania
Russia
Senegal
Singapore
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Tanzania
Thailand
UAE
UK
US
Vietnam

ERM India Private Limited

3rd Floor, Building 10 B

DLF Cyber city,

Gurgaon - 122 002

Tel:-0124-4170300

www.erm.com

The business of sustainability

ERM