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

Final Report-Volume II B Agar Solar Park (Units 4&5)

03 May 2021

Project No.: 0528741

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Document details	This is the Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) consolidated across RUMSL's 1500 MW solar park project in Madhya Pradesh, India. The deliverable is intended to summarise and document the land and natural-resource based dependence of affected communities in Agar, Shajapur and Neemuch districts of Madhya Pradesh and to provides entitlements and the proposed strategy to implement the same. The RAP and LRP is accompanied by four (4) separate annexure volumes that provide project-specific resettlement and livelihood restoration impact details.
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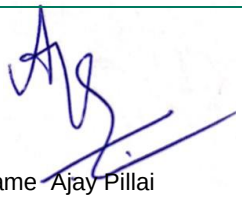

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Acronyms and Abbreviations

Name	Description
AGOL	ArcGIS Online
ASP	Agar Solar Park
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
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)
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	Sgurr Energy India
SLR	Superintendent of Land Records
SPD	Solar Project Developers
WB	World Bank

EXECUTIVE SUMMARY: AGAR SOLAR PARK

Preamble

Rewa Ultra Mega Solar Limited (RUMSL) has been authorized by the Ministry of New and Renewable Energy Development (MNRED) to develop eleven 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 550 MW Agar Solar Park in Agar and Susner Tehsil, Agar 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 Agar 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 B) is a companion document to Volume I which summarises the consolidated outcome of the resettlement surveys undertaken for Agar Solar Park in order to provide an overview of the profile of affected communities and describe involuntary resettlement impacts. The transmission line for Agar Solar Park is covered as part of Volume II-D.

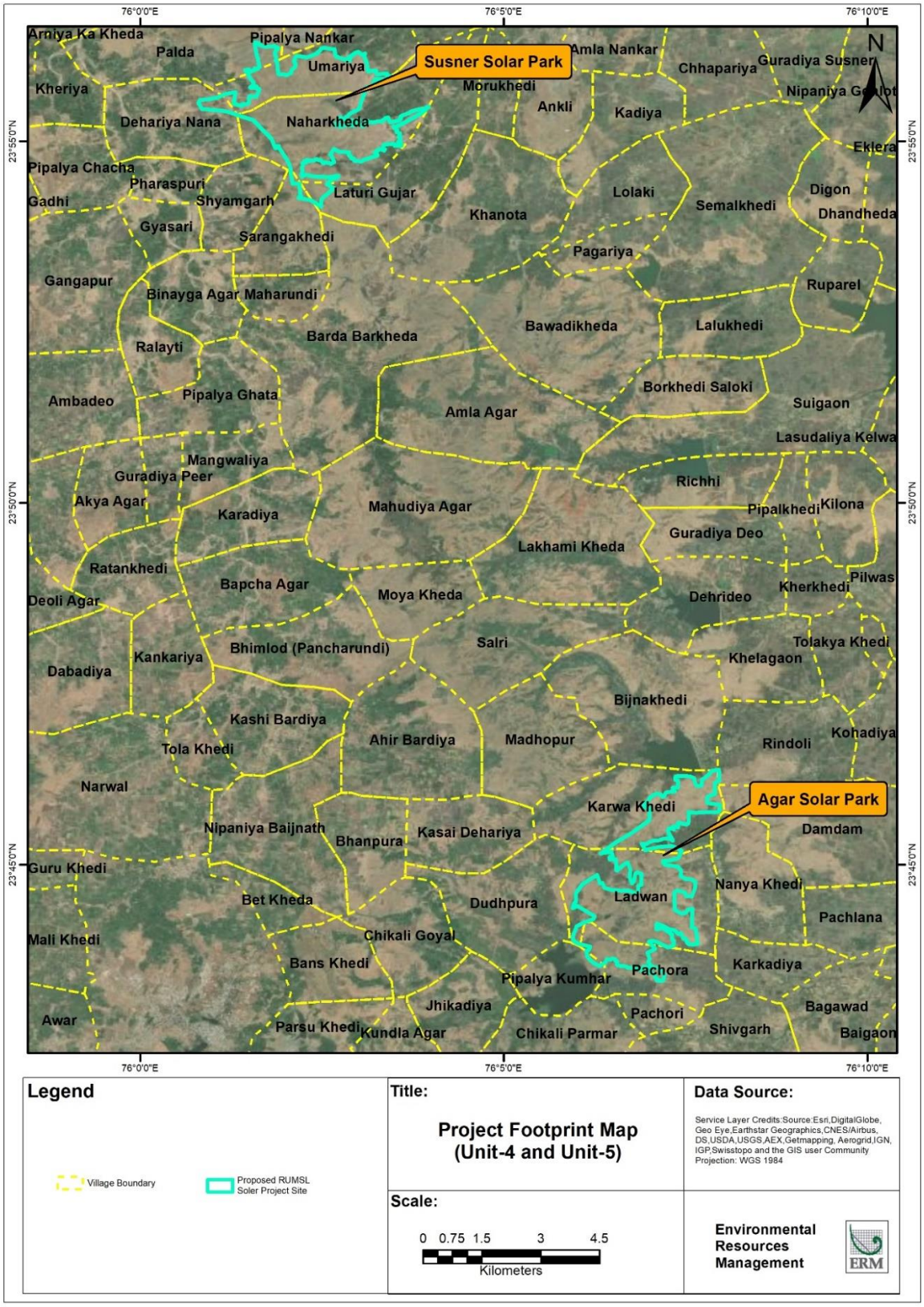
Project Overview

The following table summarises salient features of the Agar 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: Agar Solar Park: 550 MW

S. No.	Particulars	Description	
		Unit 4	Unit 5
1.	Project Village location	*Unit 4 (Agar):* Pipalya Kumar, Madhopur, Ladwan, Kesai Dehariya, Karwa Khedi, Dudhpura and Bijnakhedi;	*Unit 5 (Susner):* Palda, Naharkheda, Umariya and Pipalya Nankar
2.	Tehsil	Agar Tehsil	Susner Tehsil
3.	District Name/State	Agar, Madhya Pradesh	Agar, Madhya Pradesh
4.	Location Coordinates	Agar: 23°44'38.58"N and 76° 7'1.26"E	Susner: 23°55'28.07"N and 76° 2'21.30"E
5.	Capacity	Unit 4 (Agar): 200 MW	Unit 5 (Susner): 350 MW
6.	Pooling Stations and Power Evacuation	The evacuation from the proposed Solar Park at Agar shall be carried out through the development of 33/220 kV substation at each unit established in connection with the proposed 220/400 kV ISTS substation of PGCIL at Agar.	
9.	Site Conditions	Barren rocky surfaces, flat land, hilly at some portions	
10.	Land Area require and (Allotted) for solar park	608.09 (608.09) ha	789.99 (789.99) ha

Figure 0.1 Overview of Agar Solar Park Layout



Key Project Development Timelines

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

- ***Site Selection***: – the Agar-Malwa district was carved out of Shajapur district in 2013 with four tehsils i.e. Agar, Susner, Badod, and Nalkheda. The project was selected in Agar and Susner tehsil by Knight Frank during 2016 – 2017. Further to this 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. The scoping visit for Agar Solar Park was undertaken in September 2018 to understand the site selection, environmental and social sensitivities and identify relevant stakeholders. As part of this visit, consultations were undertaken in –Umariya, Pipalya Nankar, Ladwan and Karwa Khedi villages (these villages had been chosen based on the village with the highest proportion of land take in the project, and higher share of SC/ST population). Base on the scoping visit, an E&S scoping visit report was submitted which had identified the environmental and social sensitivities around the Project site.
- ***Environmental and Social Impact Assessment (ESIA) and Resettlement Scoping***: ERM undertook site visit during 10- 20 December, 2019 and 22-30 January 2020 to understand the site setting, review the E&S sensitivities identified during the scoping stage and to identify the relevant local stakeholders. Iterative activities during the ESIA development and resettlement scoping phase also helped to suggest avoidance and impact minimization measures;
- ***Resettlement Surveys***: The RAP related site visit was undertaken in July – August 2020, based on which a Livelihood Restoration Plan (LRP) has been created. The details of the same have been provided in the report.
- ***Bid Process for the Agar Solar Park***: To be completed;
- **Land Procurement and Land Access**: The land allotment process of government for Agar Solar Park started in May 2017. Procurement of private land is yet to be initiated
- ***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 Agar Solar Park

The following table summarises the total land footprint for Agar Solar Park across the eleven (11) affected villages as well as by type of land ownership:

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

Unit	Villages	Government Land (NRED Allotted and Newly Identified) (ha)	Private Land (ha)	Total land (ha)
Unit 4	Pipalya Kumar	34.80	5.06	**39.86**
	Madhopur	15.77	0.00	**15.77**
	Ladwan	168.32	2.80	**171.12**
	Kesai Dehariya	28.30	0.00	**28.30**
	Karwa Khedi	155.09	0.00	**155.09**
	Dudhpura	98.38	43.59	**141.97**
	Bijnakhedi	55.98	0.00	**55.98**

Unit	Villages	Government Land (NRED Allotted and Newly Identified) (ha)	Private Land (ha)	Total land (ha)
Agar Sub-total		**556.64**	**51.45**	**608.09**
Unit 5	Palda	119.69	6.48	**126.17**
	Naharkheda	86.89	62.71	**149.6**
	Umariya	328.8	13.06	**341.87**
	Pipalya Nankar	181.36	0	**181.36**
Susner Sub-total		**716.74**	**82.25**	**789.99**
Agar-Susner total (Unit 4 & 5)		**1273.38**	**133.7**	**1398.08**

Source: RUMSL, June 2020

As indicated above, of the total land requirement of 1398.08 ha; 133.7 ha or 9.5% 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 4&5 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. . As part of the allotment exercise, it has been ensured that a a minimum of 2% of total agricultural land available in the village is available for grazing of cattle, as stipulated in the MP Land Revenue Code (1959, as amended).

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 land parcels 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. The private land procurement as per the provisions of the MP Consent-based Land Policy (2014) is yet to be initiated.

Avoidance and Impact Minimization

The following table documents impact avoidance and minimization undertaken for Agar 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 46.23 ha:

Table 0.3 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			

[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

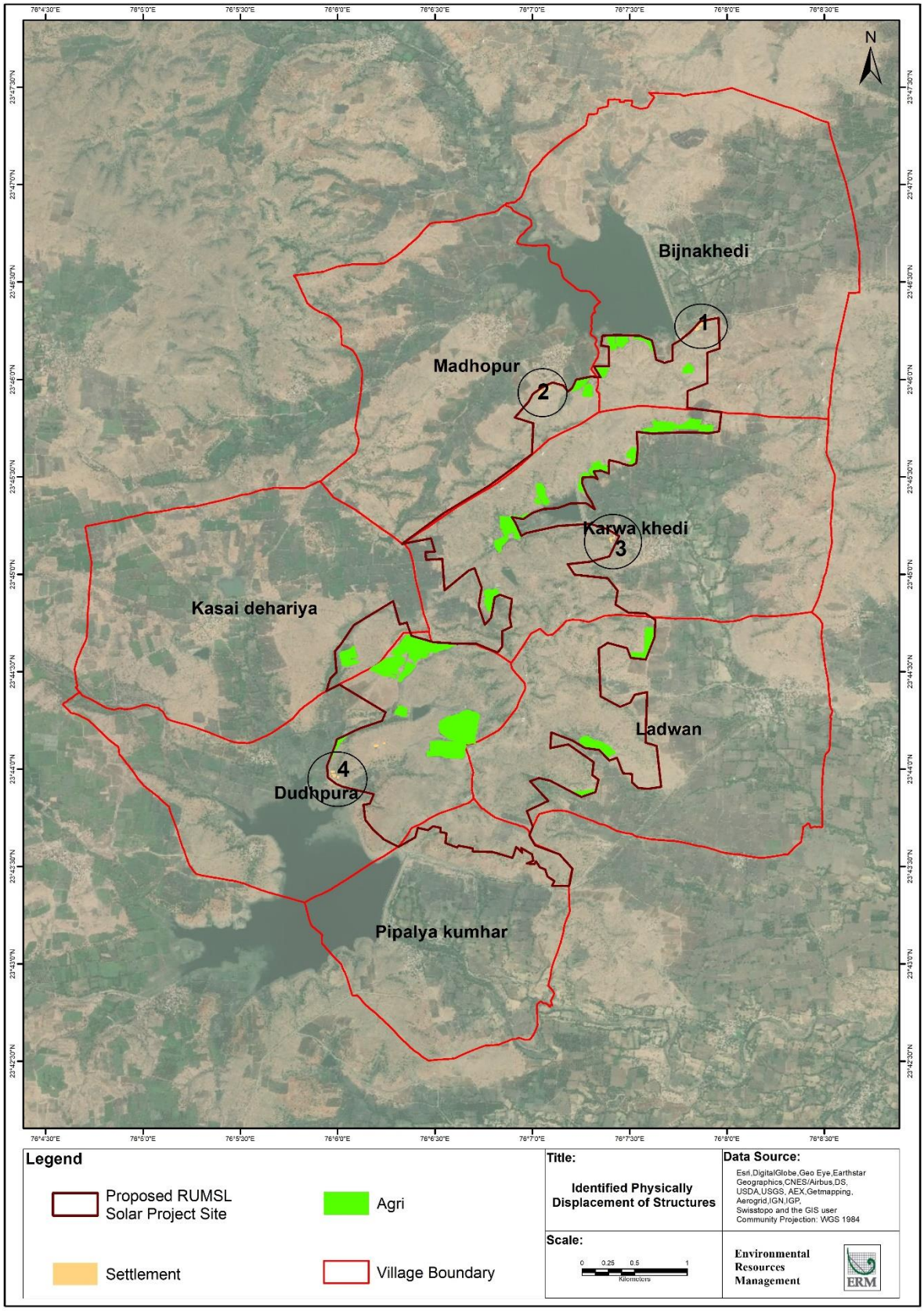
[2] Nistar Patrak for every village embodying a scheme of management of all unoccupied land in the village. The Collector may divert unoccupied land, for exercise of Nistar rights for – pasture, grass, bir or fodder reserve (clause b) subject to a minimum of two (2) percent of the total agricultural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

Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
Unit 4	Madhopur	662	Habitat Cluster of 12 Banjara households with an area 0.718 hectares excluded from project boundary including area for access road of 0.085 hectares. These households form the *Banjara Basti* of Madhopur and have been residing for 2 – 3 generations. They are connected to the village road, and have access to surface water body on Khasra no. 663
		663 & 666	Surface water body of area 0.346 hectares excluded from the project boundary
	Karwa Khedi	57 & 84 –min-1, 2, 3	Surface water body of area 1.22 hectares excluded from project boundary and access uninterrupted through existing village road
		61 & 76	A part of the larger surface water body (pond created by watershed department) of area 3.218 hectares excluded from the project boundary.
	Dudhpura	94 & 96	Surface water body of area 1.675 hectares is excluded from the usable area within the project footprint. The water body however will remain within the project boundary. Part of the water body is on private land parcel (Khasra no. 96).
	Bijnakhedi	538/2	There are four (4) households and one commercial structure who have been already physically displaced by construction of dam. The cluster is on the edge of the project boundary of area 0.247 hectares is excluded from the project boundary
Unit 5	Umariya	673, 667 & 666	Habitat Cluster of area 0.255 hectares including space for access road (0.078 ha) excluded from the project boundary
		170, 168, 166, 174, 176, 40, 39, 42, 41, z6, z1 ,167, 169, 171, 172, 173	Surface water body (pond constructed by Watershed department by creating embankment dam) of area 13.2 hectares excluded from the project boundary. Out of these khasra, Z1, and Z6 are private khasras (submerged) of 0.65 hectares as part of the water body.
		101, 117, 110, 111	Small surface water body of 0.466 hectares has been deducted from the usable area inside the project footprint. However, the water body has been retained in the project boundary
		180, 162, 38, 161,163, 164,161/ 877,161/866	The area behind the embankment dam has dense vegetation and also has a cremation ground used currently by the village. The total area of 0.85 hectares has been excluded from the project boundary. Out of the total area, 0.23 hectares is private land (161/866, and 161/877)
	Pipalya Nankar	53	Habitat cluster area of 1.255 hectares of two households excluded from the project boundary with 6 meters wide access road. There is an existing road of area 0.16 hectares which has been provided
		79, 80, 85	Two water bodies (one on 79 & 80 combined, and the other on 85) with total area of 2.19 hectares excluded from the project boundary
Khasras recommended for exclusion but not approved during avoidance exercise. These have been included in the assessment of resettlement impacts and are in RAP- subject to final confirmation of the boundary			
Unit 4	Karwa Khedi	84 – min – 4,5	There are 5 households along the village road, constructed on government land. Two (2) of these households are beneficiaries of PM Awas Yojana. This cluster is at the edge of the project boundary. Their exclusion from the project footprint could not be undertaken because of technical feasibility constraints. Access

Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
			road to these houses have to be maintained in order to preserve ease of access to agricultural land parcels
Unit 5	Umariya	297	There are seven (7) land users who have been squatting on this government Khasra for agriculture over an area of approximately 4 hectares. It was suggested to exclude the agricultural area, since it is situated at the eastern edge of the project boundary. However, the same could not be exercised due to technical constraint relating to minimum land requirement for setting up per MW of solar panels.
		748, 776, 777, 795, 800, 849, 872	There are 14 land users who have been squatting on these government Khasras for agriculture over an area of approximately 6.4 hectares. This land area lies at the south-east edge of the boundary and was suggested to be carved out from the project boundary. However, the same could not be undertaken due to technical feasibility issues.
	Pipalya Nankar	92	There are seven (7) land users who have been using the government land parcel informally for agriculture, and are at the edge of the project boundary. It was suggested that the agricultural land use area be carved out from the total khasra area included in the project footprint. However the exclusion could not be undertaken due to technical feasibility.
Unit 4	Dudhpura	54	There are four (4) households with total area of 0.806 hectares at the edge of the project boundary without existing road access. Their exclusion from the project footprint could not be undertaken.

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

Figure 0.2 Residential Clusters in Unit 4 avoided & suggested



Note: Approximately 25 households were considered for avoidance from Unit 4, of which four households in Dudhpura on Khasra no. 54 have not been excluded from the project boundary.

Overview of Project Affected Households

Project Affected Villages

The following table provides an overview of the eleven (11) project affected villages and the balance land that is available post 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 Agar solar park (ha)			Land remaining (ha)	Proportion of Land Remaining (%)
		Government land (ha)	Private land (ha)	Total		
Pipalya Kumhar	383.51	34.8	5.06	**39.86**	343.65	89.61
Madhopur	509.42	15.77	0	**15.77**	493.65	96.90
Ladwan	590.74	168.32	2.8	**171.12**	419.62	71.03
Kesai Dehariya	252.77	28.3	0	**28.3**	224.47	88.80
Karwa Khedi	587.09	155.09	0	**155.09**	432	73.58
Dudhpura	495.71	98.38	43.59	**141.972**	353.738	71.36
Bijnakhedi	709.41	55.98	0	**55.98**	653.43	92.11
Agar Sub-total	**3528.65**	**556.64**	**51.45**	**608.09**	2920.56	82.77
Palda	801.75	119.69	6.48	**126.17**	675.58	84.26
Naharkheda	837.35	86.69	62.71	**149.6**	687.75	82.13
Umariya	607.12	328.8	13.06	**341.87**	265.25	43.69
Pipalya Nankar	630.81	181.36	0	**181.36**	449.45	71.25
Susner Sub-total	**2877.03**	**716.74**	**82.25**	**789.99**	2087.04	72.54
Agar Solar Park	***6405.68***	***1273.38***	***133.7***	***1398.08***	5007.6	78.17

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)

As part of the resettlement surveys, ERM surveyed all of these eleven (11) 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 Land Parcels

The following table provides an overview of the government and private/patta land parcels 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 4	Government	126 (04)	556.64 (12.5)
	Private	21 (00)	51.45 (0.0)
Sub - total		**147 (04)**	**608.35 (12.5)**
Unit 5	Government	195 (31)	716.74 (47.78)

Unit	Type	Number of Khasras	Land Area (ha)
	Private	38 (11)	181.86 (11.2)
Sub - total		**233 (42)**	**898.6 (58.98)**

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)

As part of the resettlement surveys, ERM undertook a Land and Asset Inventory of 11.2 hectares private land parcels as well as 60.8 hectares of government land parcels in order to identify assets, impacts on titleholders and any non-titleholders as well as their intensity. These corresponded to 95 PAHs. For the remaining parcels that could not be surveyed, ERM undertook a spatial analysis of the land parcels 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 Agar 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		Non-Title Holders	
		Private	*Patta*	*Encroachers*	*Informal users*
IV	Pipalya Kumar	03	0	NA	03
	Madhopur	00	00	02	01
	Ladwan	12	00	00	00
	Kesai Dehariya	01 (00)	00	02	00
	Karwa Khedi	16 (00)	00	NA	NA
	Dudhpura	42 (00)	33 (00)	NA	NA
	Bijnakhedi	00	00	NA	NA
V	Palda	11 (03)	00	01	13
	Naharkheda	18 (04)	00	NA	11
	Umariya	17 (08)	00	03	23
	Pipliya Nankar	11 (01)	00	11	NA

Project Affected Households

Based on the above, Agar Solar Park will lead to involuntary resettlement of 263 Project Affected Households as summarised in the subsequent table:

Table 0.6: Status of Household Survey Coverage

Survey Coverage by category	Count (in numbers)	Proportion (%)
Total PAH	263	100
Households Surveyed	138	49.2

Source: HH survey 2020

Of these PAH, ERM covered 138 households through a household census survey in order to obtain a socio-economic, demographic, livelihood, vulnerability and access to infrastructure profile. 42 of the 138 were landless households that were covered as a sample for the household survey. Of the remaining 125 PAHs that could not be surveyed, Section 1.3.4 provides the reasons for the same.

Key Survey Milestones

Based on field surveys undertaken from in August 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: 8
- Survey completion meetings: 7
- Reiteration of grievance redressal mechanism in the above meetings: 7

The dates for the survey completion meeting can be considered as a cut-off date 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 private land owners : 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 confirmed through drone imagery of December 2019-January 2020 available with RUMSL, 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

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

Figure 0.3: Overview of Key Village-level Attributes: Agar

Demographics

- 7 Villages and 5 Gram Panchayat
- 34 PAH
- 181 PAPs
- 1033 sex ratio
- 52.4% literacy
- 94.9% Hindu and 5.1% Muslims

Land and Livelihoods

- 34.8% Farm based and 32.04% non-farm based
- 1.4 ha avg agricultural holding
- Key crops: soyabean, wheat, maize, channa and dal
- INR 1,48, 258 annual income
- INR 3.05,862 avg annual expense
- 11.2% of population is unemployed

Infrastructure

- 3km avg distance from hospital
- 2km avg distance to school upto 8th std and 12th std.
- 12km avg dtance to market
- 26.6% of HHs have functional toilets at HH level
- 29.4% HH have been made under Awaas Yojna
- 97.8% HHs have electricity through govt. supply

Natural Resource

Dependence on CPRs for grazing, water for livestock, firewood collection

Cultural Resources

No listed cultural resources, that are nationally or state protected are affected by the project.

Figure 0.4: Overview of Key Village-level Attributes: Susner

Demographics

- 4 Villages and 3 Gram Panchayat
- 104 PAH
- 565 PAPs
- 896 sex ratio
- 59.1% literacy
- 98.07% Hindu and 1.7% Muslims

Land and Livelihoods

- 40.3% Farm based and 24.9% non-farm based
- 2/1 ha avg agricultural holding
- Key crops: groundnut, wheat, soyabean and onion
- INR 2,38,426 annual income
- INR 4.85,705 avg annual expense
- 10.3% of population is unemployed

Infrastructure

- 5km avg distance from hospital
- 2km avg distance to school upto 8th std and 12th std.
- 12km avg dtance to market
- 13.3% of HHs have functional toilets at HH level
- 97.8% HHs have electricity through govt. supply

Natural Resource

Dependence on CPRs for grazing, water for livestock, firewood collection

Cultural Resources

No listed cultural resources, that are nationally or state protected are affected by the project.

Profile of Project Affected Households

Based on the survey of 95 Project Affected Households (coverage of 33.9% of total PAH) as well as some sample households; the following table provides a qualitative overview:

Table 0.7 Profile of Households Surveyed

Parameter	Key Observations/ Findings –Agar Solar Park
Household Level Demographic	There are 263 households to be impacted by the project of which 95 impacted were surveyed.
	Most of the community (more than 90%) is Hindu. 5% of the PAHs in Unit 4 are reported as Muslims.
	The sex ratio within this population is 1033 in Unit 4 and 896 females to 1000 males in Unit 5.
	The average family size of the surveyed households is reported to be 5.1 across both units
	The average literacy rate in Unit 4 is 52.4%, while in Unit 5 it is 59.1%
Land Ownership and Use	Average land holding size in Unit 4 is 1.4 ha and in Unit 5 is 2.1 ha. which is predominantly under agricultural use. Most of the agricultural land is under a multi-cropping system, with the key crops being soyabean, wheat, groundnut, maize, channa and onion
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, rent collection, petty businesses, etc.
Key gender disaggregated data points	There are 7 women headed households that were surveyed. They have a smaller family size as compared to male headed households. Women in women-led households reported an average annual income of INR 223,760 approximately as compared to women in male- led households who report an annual average income of INR 194,860 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 1,48,258 INR per year in Unit 4 and INR 2,38,426 in Unit 5. In terms of expenditure, the average annual expenditure reported is 3,05,862 INR in Unit 4 and 4,85,705 in Unit 5 . 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: ■ 41 percent of the housing is of kutcha type ■ 20 percent of the surveyed households have a pucca housing structure
	Asset ownership: ■ Majority of the surveyed households reported owning land less than 1ha. ■ Cows were reported to be the common livestock among all PAHs. ■ In terms of household appliances, the highest proportion of assets is of ceiling fans, mobile phones, television sets and cable connections.

Parameter	Key Observations/ Findings –Agar Solar Park
	■ 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.
	Participation in collectives: ■ The most common of them is an SHG for buffalo procurement, whose members are pre-dominantly male. ■ There are relatively few female SHGs in the area, most of them are non-functional the female SHGs are primarily for provision of monetary support for setting up small businesses
Dependence on Natural Resources	Community dependence on natural resources is mainly for grazing and fodder, water for livestock and firewood and dung collection
Access to Physical and Social Infrastructure	The access to primary healthcare is limited within the project footprint, and resident typically have to travel 3-5 km for a hospital. There are no doctors or clinics within the villages. The average distance for schools is 2 km. on an average, 20% of the households have a functional toilet at and almost all households are connected to the government grid supply for electricity

Source: RAP & LRP surveys 2020

Profile of Key Stakeholder Groups and Feedback

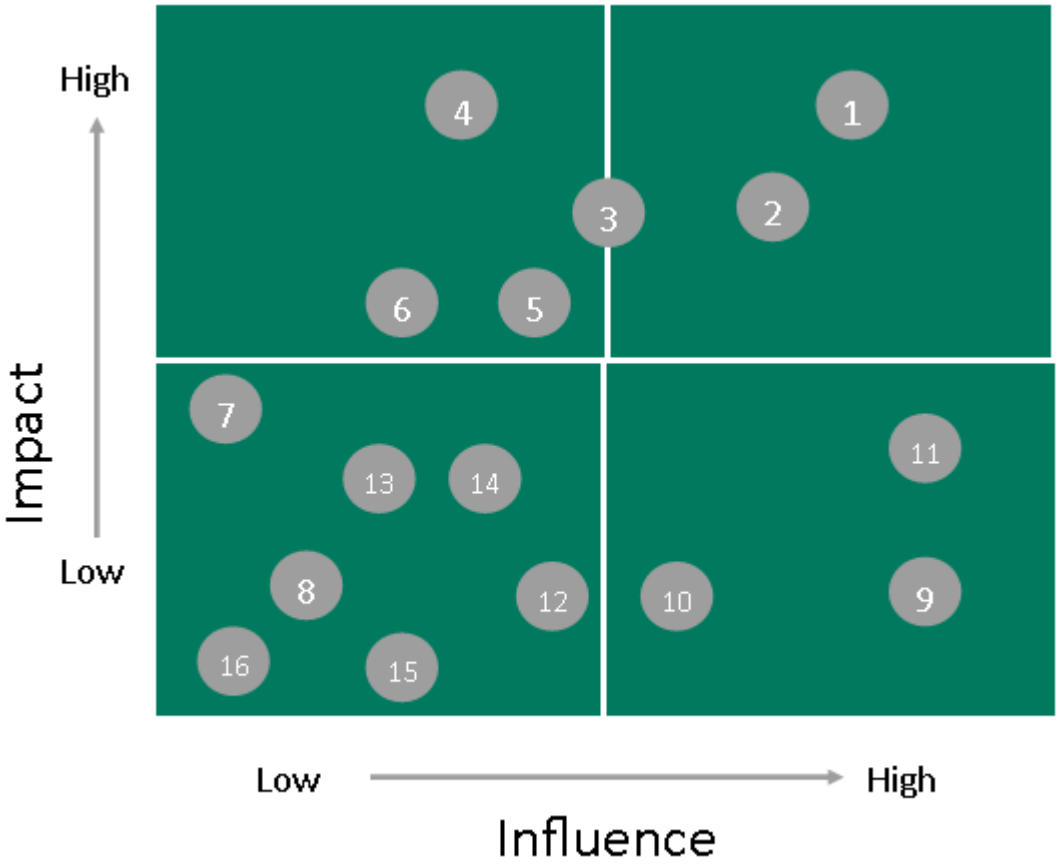
Stakeholder Identification and Analysis

Table 0.8: Stakeholder Group Categorization

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Individual and Community	■ Private land owners and Patta land holders from the Project Area villages ■ Informal land Users (Encroachers/Squatters to be impacted) ■ Agricultural labourers ■ Grazers/Livestock holding households ■ Banjara households and Bhil households ■ Women groups ■ Vulnerable groups (Landless households, 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	■ District Administration of Agar-Malwa ■ Gram Panchayats of the impacted villages	■ Civil Society/Local Non-governmental organizations (NGOs) ■ Local Media

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Institutional Stakeholders	■ Agar and Susner Tehsildars; ■ Patwaris ■ EPC Contractor ■ RUMSL	■ Local Political Groups ■ Dairy Cooperatives ■ Agriculture and Livestock Department at Agar ■ Industrial Training Institute (ITI), Agar ■ Department of Animal Husbandry, Dairy Development, Agar

Figure 0.5 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

- 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 land parcels
- Consultations were undertaken during this stage by ERM with the villages that were identified to be part of the project footprint (September 2018). During this stage, a site reconnaissance visit was undertaken based on the proposed project footprint

- The resettlement surveys were undertaken during the period July – August 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..
- It was during the kick-off meetings with Ladwan, Dudhpura, Bijnakhedi and Pipalya Kumhar (Unit 4) which provided the scope of right to refusal of the village towards to the project and its associated activities, based on the understanding of the extent of impacts on the households.
- The refusal to participate in resettlement surveys by one village created a ripple effect – the refusal by one village (the first refusal was expressed by Ladwan) spreads to other villages in terms of negative sentiments regarding the project. The concerns and reasons of refusal were recorded from the kick-off meetings and subsequent meetings held with Sarpanch, Tehsildar and the same was shared with RUMSL.

Table 0.9 Feedback Received for Incorporation into Resettlement Planning

Feedback Received	Incorporation into Resettlement Planning
Lack of engagement by the project prior to the ESIA stage of the project	As part of the Resettlement Planning, alternative grazing land has been recommended with ease of access to such grazing lands for the village
Provision of water supply infrastructure from existing dam	The community in Kasai Dehariya has raised the concern of lack of water supply infrastructure and have expressed the need for provision of pipelines to draw water from the dam to their fields to make irrigation water supply perennial in nature.
Allow grass cutting/ fodder collection within the project boundary	As part of Resettlement Planning, a Grazing Management Plan has been prepared (included in the consolidated RAP report) that includes the measures
Increase in distance to access grazing land	As part of Resettlement Planning, the loss of access to grazing land has been assessed and mitigation measures have been included in the Grazing Management Plan.
Heat Island effect leading to effect on land productivity of the remaining land parcels	As part of project disclosure and engagement activities, the communities will be informed and made aware of the mitigation measures to reduce the same, and improve farm productivity.
Loss of access to land for Open defecation	As part of the Resettlement Planning, this issue has been addressed in the Gender Action Plan (GAP).

Involuntary Resettlement Impacts

Overview of Project-Affected Land and Assets

Land Parcels

134 hectares of private agricultural land parcels (61 percent from unit 5) and 60 hectares of government land parcels used informally for agriculture and grazing, will be impacted due to project activities

Table 0.10 Land Area under Informal land Use

Unit	Village	Encroachment for agriculture (ha)	Squatter for agriculture (ha)	Squatter for Agriculture and fodder (ha)	Squatter for fodder lot (ha)	Grand Total
Unit 4	Bijnakhedi	3.4	1.5	NA	NA	4.9
	Kesai Dehariya		3.3	NA	NA	3.3
	Madhopur Kheda	2.8	1.4	NA	NA	4.2
Agar Sub-total		**6.22**	**6.22**	**6.2**		
Unit 5	Naharkheda	NA	7.5	2.7	NA	10.2
	Palada	1.1	10.1	NA	NA	11.2
	Pipalya Nankar	3.8	NA	NA	NA	3.8
	Umariya	1.2	21.5		0.16	22.8
Susner Sub-total		**6.1**	**6.1**	**39.1**	**2.7**	**0.16**
Grand Total		**12.3**	**12.3**	**45.3**	**2.7**	**0.16**

Source: LA survey 2020

Crops

Of the total 194 hectares of land under agricultural use, the LA survey assessed 71 hectares of land where the common practice was observed to be of double and triple cropping. Soyabean was observed to be the major crop cultivated in almost 45 percent of the area followed by wheat which was cultivated in 33 percent of the total area. 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)

Structures

There are three residential structures in Naharkheda and four in Dudhpura [4] that will be affected because of the project. Apart from these the project footprint is reported to impact seven (7) immovable structures in structures in Naharkheda and Umariya villages, both in Unit 5.The estimated total area to be affected by immovable assets like cattle shed, water feeding stall, fodder storage shed is 0.25 hectares. The structures within this area were visually assessed to be in use during *Rabi* cropping season. There are 27 land parcels which are occupied by other fixed and salvageable assets like sanitary arrangement, wire fencing (with cemented pillar, and wooden poles), open wells and pipelines.

[4] Identified by Geospatial assessment.

Table 0.11 Count of Immovable and Fixed Assets

Unit	Village	Agricultural shed	Storage/ Cattle shed	Sanitary asset	Open well	Other	Pipeline	Wire fencing with stone pillar	Wire fencing with wooden pole
Unit 4									
	Bijnakedhi	NA	NA	NA	NA	NA	2	NA	NA
	Madhopur	NA	NA	NA	2			NA	NA
Unit 5									
	Naharkheda	4	1	1	4	1	2	NA	NA
	Palada	NA	NA	NA	9	2	NA	NA	NA
	Pipalya Nankar	NA	NA	NA	9		2	NA	3
	Umariya	1	1	2	12			2	6
Grand Total		**5**	**2**	**3**	**36**	**3**	**6**	**2**	**9**

Source: LA survey 2020

NA: Not Applicable

Trees

The LA survey assessed 129 timber trees, spread across 10 private land parcels which are assumed to be impacted. On an average, there are 10-12 trees on a single private land parcel. Similarly, 33 fruit trees were assessed on 13 land parcels with an average of 1-3 fruit trees on one land parcel. It has been found that 72 percent of the fruit trees are in the young productive (fruit bearing) years. Majority of the fruit trees are orange (57 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, Chargah*) which are meant to be used for grazing by the village community. However, there are no physical identifiers for such land parcels, and typically, grazing is undertaken on any open government land parcel. The actual land categories are not known to the local community and thus do not provide the complete understanding of the grazing land use in the village.

Table 0.12 Designated government grazing land

Unit	Village	Charnoi & Kadim available after Project allotment (ha)	Total government land after Project allotment (ha)	Total Agriculture land in the Village as per Census 2011 data	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 4	Kasai Dehariya	0	207.07	252.36	0	0.00

Unit	Village	Charnoi & Kadim available after Project allotment (ha)	Total government land after Project allotment (ha)	Total Agriculture land in the Village as per Census 2011 data	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 (%)
	Dudhpura	63.97	161.718	66.01	39.5	96.91
	Ladwan	66.82	103.31	266	64.7	25.12
	Karwa Khedi	61.72	179.85	223	34.3	27.68
	Madhopura	138.58	231.61	171.39	59.8	80.86
	Bijnakhedi	152.67	256.57	277.62	59.5	54.99
	Pipaliya Kumhar	33.35	168.32	175.51	19.8	19.00
Agar Sub - total		**517.11**	**1308.48**	**1431.89**	**39.5**	**36.11**
Unit 5	Naharkheda	148.2	335.16	313.51	44.4	47.27
	Umariya	247.12	91.35	181.93	NA*	135.83
	Pipaliya Nankar	19.63	87.84	334.61	22.3	5.87
	Palda	27.6	287.35	368.47	9.6	7.49
Susner Sub - total		**442.77**	**801.7**	**1198.52**	**55.2**	36.94
Grand Total		**959.88**	**2110.15**	**2630.41**	**45.5**	36.49

Source: *Nistar Patrak* data of each village

*the proportion cannot be calculated for Umariya, as the Charnoi land allotted exceeds the available government land

The area under informal use for grazing is estimated at approximately 3.4 hectares. This land area use has been assessed, as separate from the use of notified and designated government grazing land (Charnoi).

Table 0.13 Households dependent on open grazing

Unit	Village	No.of HHs using government land for grazing	% of total HHs in the village
Unit 4	Ladwan	NA	NA
	Dudhpura	40	40
	Bijnakhedi	50	15
	Kesai Dehariya	25	25
	Madhopur	20	16

Unit	Village	No.of HHs using government land for grazing	% of total HHs in the village
	Pipalya Kumhar	0	0
Agar Sub-total		**135**	**21**
	Naharkheda	55	18
	Palada	0	0
	Pipalya Nankar	50	16
	Umariya	0	0
Susner sub-total		**105**	**17.5**
Grand total		**240**	**19.2**

Source: LA survey 2020

It is understood that out of the surveyed PAHs, 65 percent depend on common land for collection of firewood for cooking and grass (for livestock feed).

Intensity of Involuntary Resettlement Impacts

Table 0.14 Economic and Physical displacement of PAHs

Unit	Villages	Total PAHs	Economically displaced PAHs	Physically displaced aPAHs
Unit 4	Bijnakhedi	9	9	0
	Kesai Dehariya	3	3	0
	Madhopur	5	5	0
	Ladwan	12	12	0
	Karwa Khedi	16	16	0
	Dudhpura	75	71	4
	Pipaliya Kumhar	3	3	0
Agar Sub-total		**123**	**119**	**4**
Unit 5	Naharkheda	41	41	1
	Palada	27	35	0
	Pipalya Nankar	23	24	0
	Umariya	48	53	**0**
Susner Sub-total		**139**	**138**	**1**
Grand Total		**262**	**257**	**5**

Source: HH survey 2020

Physical Displacement

As mentioned before, the land procurement will lead to physical displacement of some structures. Three structures are on private land parcel belonging to one household, and the rest of the structures are on government land parcels belonging to four (4) households three of these structures are of seasonal use while the others are more permanent structures, constructed with lower value material. Apart from residential structures, there are eight (8) households, of which five (5) households will be impacted by loss of agricultural storage sheds, and three (3) households impacted by loss of fodder/cattle sheds, used during the farming season. 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

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. While Dudhpura (unit 4) has the highest number of PAHs impacted by loss of private/patta land, Palda (unit 5) has the highest number of PAHs who would become landless. 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.

Table 0.15: Impact on households owning private/patta land

Unit	Villages	Private land owning PAHs	Patta land owning PAHs	Total PAPs	Potential landless PAHs
Unit 4	Bijnakhedi	0	0	0	NA
	Kesai Dehariya	1	0	4	0
	Madhopur	0	0	0	NA
	Ladwan	12	0	48	0
	Karwa Khedi	16	0	240	0
	Dudhpura	42	33	450	0
	Pipalya Kumhar	3	0	15	0
Agar Sub-total		**74**	**33**	**753**	**0**
Unit 5	Naharkheda	18	0	72	0
	Palada	11	0	77	10
	Pipalya Nankar	11	0	78	5
	Umariya	17	0	59	0
Susner Sub-total		**59**	**0**	**286**	**11**

Unit	Villages	Private land owning PAHs	Patta land owning PAHs	Total PAPs	Potential landless PAHs
Grand total		**131**	**33**	**1039**	**26**

Source: LA survey & HH survey 2020

About 23 percent of private land owners have an annual earning of less than INR 1,00,000 per annum who are marginal land holders. Apart from a loss of income from agriculture, the affected land owners are also expected to lose out on land improvement expenditures that they had incurred.

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.). Moreover there is also assumed to be an impact on livelihood from livestock activities. Madhopur village in Unit 4 has nearly 10 households of the Banjara community who depend on livestock as their primary source of livelihood. The loss of income form livestock is estimated at INR 36,000 per year, excluding input costs of fodder. Although these households are not directly impacted by the land procurement for the project footprint, consultations with these communities reveal that they will be affected by the loss of land for open grazing.

Gendered livelihood impacts

There are 11 women headed households that have been identified of which 4 have been surveyed. These households are primarily dependent on agricultural labour work and supplementary income from livestock. 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. Another impact on female headed households will be the Impact due to loss of access to government grazing land that were located near their village, and are now included in the project boundary. Due to the project impact on the grazing areas close to the settlement, grazing 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 and shift in the division of labour at the household level.

Impact on Vulnerable groups

There are 12 vulnerable households, seven of which are women headed, 3 are artisanal households and 1 household is below the poverty line. The impacts on these households are similar to the impacts discussed for the rest of PAHs, and uniform.

Impacts on Indigenous Communities

The *Bhil* community in Ladwan (16 households) will be potentially economically displaced due to project activities. In terms of impact to this community, a Bhil household family shall incur the loss of INR 1,32,120.00 annually due to shift towards market purchase of fodder, ten (10) households will be economically displaced as the reported using private land and government land informally for agriculture.

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 Agar Solar Park:

Table 0.16 Park Specific Implementation Insights

Aspect	Description
Stakeholder consultations and information disclosure;	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. These engagement activities shall specifically be focused on the three villages Ladwan, Karwa Khedi and Dudhpura that had filed formal objections against the project to the District Collector.
Completion of RAP&LRP surveys	Undertake the resettlement surveys for the villages which refused to participate in the process during the RAP&LRP preparation. The completion of the RAP&LRP surveys should be undertaken only with the consent of the PAHs.

Grievance Management

Given the gap at the current stage with regards to missing information from four villages of Unit 4, and the associated large scale grievances reported during the resettlement surveys undertaken in August 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.

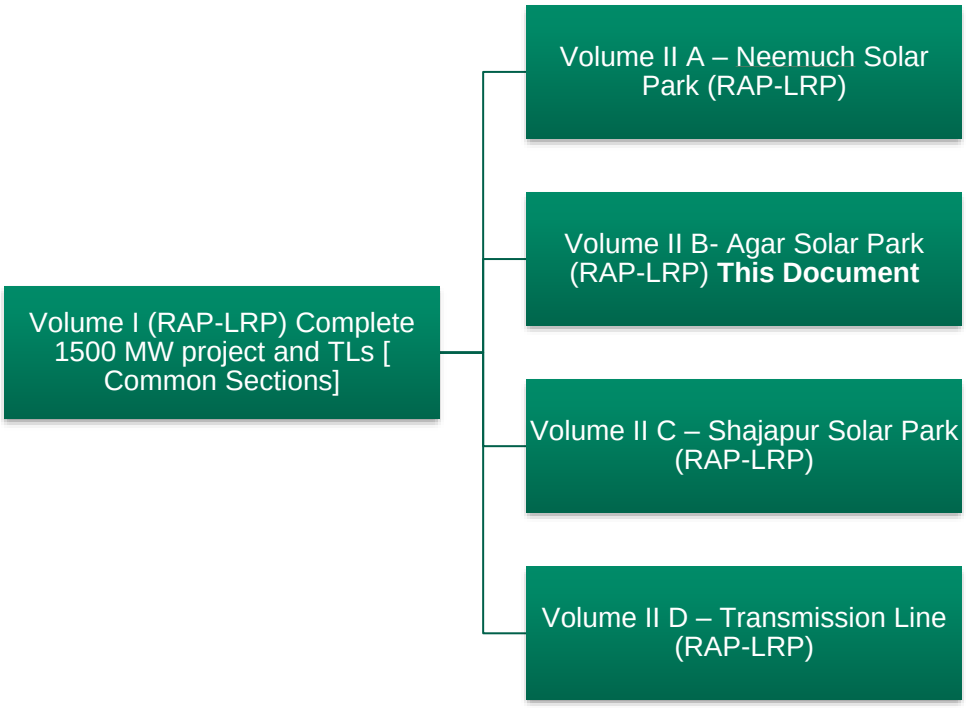
1. INTRODUCTION TO VOLUME II B

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 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 been engaged by Rewa Ultra Mega Solar Limited (RUMSL) to develop a Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) for the three solar parks (1500 MW) and their associated evacuation infrastructures.

This report is Volume II (B) for the Agar Solar Park RAP and LRP of 550 MW capacity that is located in two Tehsil i.e. Agar Tehsil (Unit 4 of 200 MW) and Susner Tehsil (Unit 5 of 350 MW).

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



1.1 Brief Project Description for Agar Solar Park

The proposed 550 MW Agar Solar Park will be developed as two units. Unit 4 of capacity 200 MW at Agar Tehsil and Unit 5 of 350 MW at Susner Tehsil.

Table 1.1 Agar Solar Park project summary

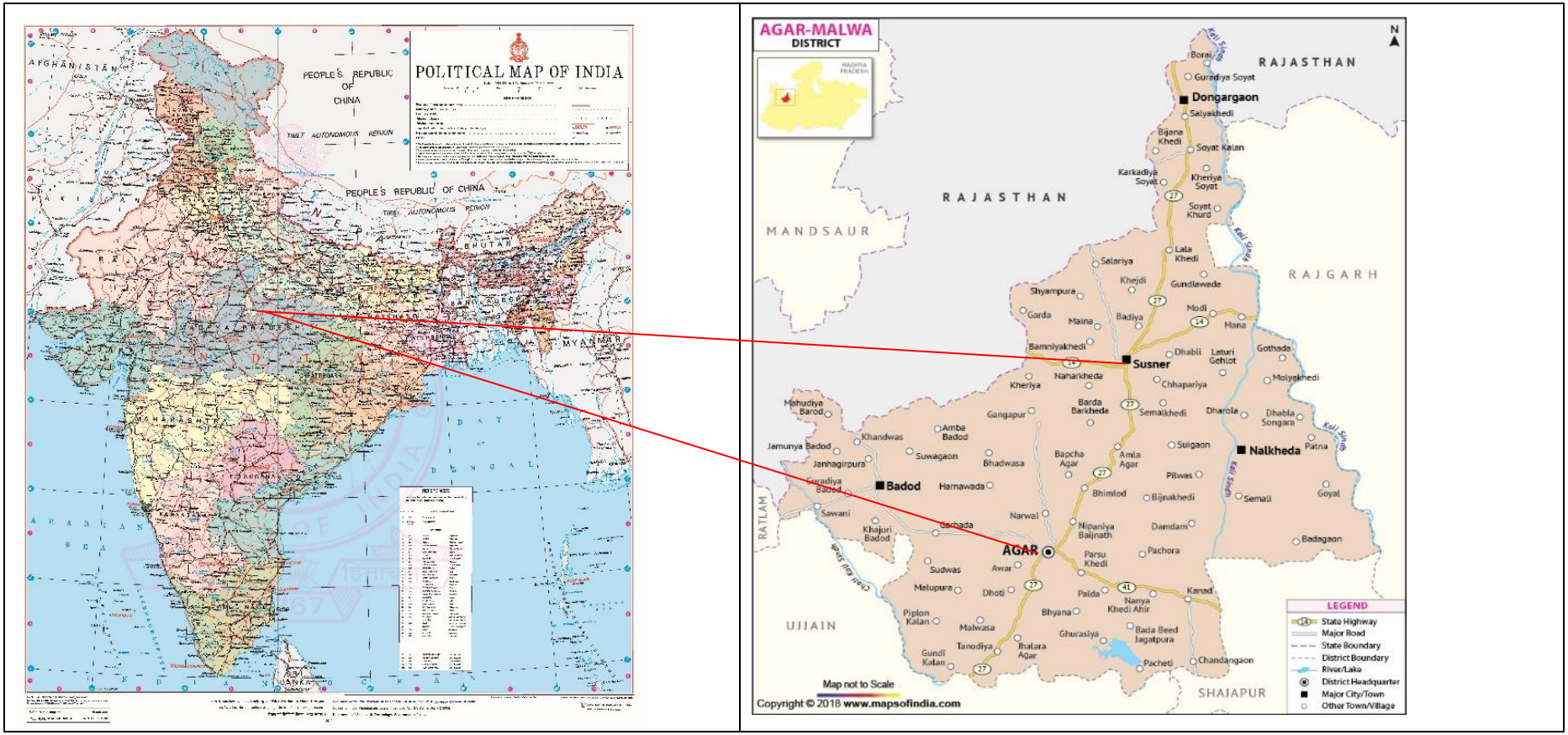
S. No.	Particulars	Description for Unit 4	Description for Unit 5
1.	Project Village location	*Unit 4 (Agar):* Pipalya Kumar, Madhopur, Ladwan, Kesai Dehariya, Karwa Khedi, Dudhpura and Bijnakhedi;	*Unit 5 (Susner):* Palda, Naharkheda, Umariya and Pipalya Nankar
2.	Tehsil	Agar Tehsil	Susner Tehsil
3.	District Name/State	Agar, Madhya Pradesh	Agar, Madhya Pradesh
4.	Location Coordinates	■ Agar: 23°44'38.58"N and 76° 7'1.26"E	■ Susner: 23°55'28.07"N and 76° 2'21.30"E
5.	Capacity	■ Unit 4 (Agar): 200 MW	■ Unit 5 (Susner): 350 MW

S. No.	Particulars	Description for Unit 4	Description for Unit 5
6.	Pooling Stations and Power Evacuation	The evacuation from the proposed Solar Park at Agar shall be carried out through the development of 33/220 kV substation at each unit established in connection with the proposed 220/400 kV ISTS substation of PGCIL at Agar.	
9.	Site Conditions	Barren rocky surfaces, flat land, hilly at some portions	
18.	Land Area Allotted	608.09 ha	789.99 ha

A more detailed description is included in the ESIA document for the Agar Solar Park.

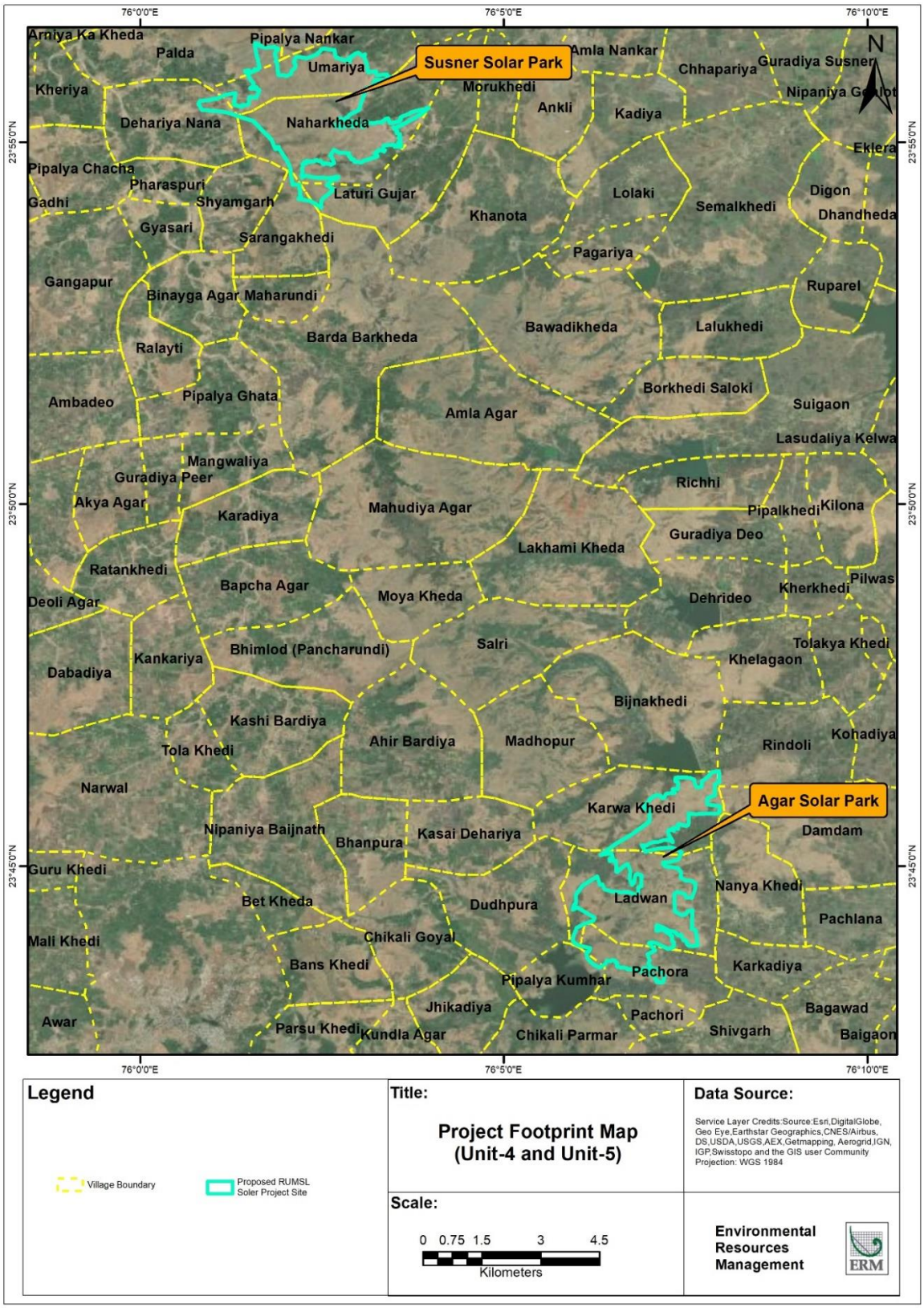
An overview of the project location is provides in the subsequent figures.

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/agar-malwa.html

Figure 1.3 Agar Solar Park Footprint Map



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 of the RAP-LRP. The details provided here pertain to specific activities undertaken for Agar Solar Park, starting from site selection to resettlement surveys.

- **Site selection** – the Agar-Malwa district was carved out of Shajapur district in 2013 with four tehsils i.e. Agar, Susner, Badod, and Nalkheda. The project was selected in Agar and Susner tehsil by Knight Frank during 2016 - 2017. The 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.
- Knight frank baseline – A review was undertaken in May – June 2019 of the baseline report which was prepared in August 2017
- Scoping – E&S scoping visit for Agar Solar Park was undertaken in September 2018 to understand the site selection, environmental and social sensitivities and identify relevant stakeholders. As part of this visit, consultations were undertaken in –Umariya, Pipalya Nankar, Ladwan and Karwa Khedi villages (these villages had been chosen based on the village with the highest proportion of land take in the project, and higher share of SC/ST population). 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.
- Environmental and Social Impact Assessment (ESIA) – ERM undertook site visit during 10- 20 December, 2019 and 22-30 January 2020 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 undertaken 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 in July – August 2020, based on which a Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) has been created. The details of the same have been provided in the subsequent sections.
- **Bid Process for Agar Solar Park** – To Be Completed

- **Land Procurement and Land Access**: The land allotment process of government for Agar Solar Park started in May 2017. Procurement of private land is yet to be initiated;
- ***Construction work***: Timeline to be determined basis the completion of the bid process;; and
- **Indicative 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 Agar Solar Park.

1.3.1 Resettlement Scoping during ESIA Consultations

Based on the screening assessment conducted by ERM in October (22 – 25) 2019, an ESIA and RAP-LRP study was proposed for the Solar Park. The ESIA visit was undertaken in December (10 – 20), 2019 and January (22 – 30) 2020 to understand the site setting, environmental and social sensitivities and to identify the relevant local stakeholders. An initial impact assessment of potential impacts on the various environmental, ecological and social elements was identified during the ESIA study.

The consultations undertaken in the project footprint villages during this stage informed the scope of the RAP and provided and estimate of the extent of impacts. The detailed impact assessment of the involuntary resettlement impacts was undertaken in the RAP study during July – August 2020 to assess the extent of land – based impacts, loss of livelihood and conduct specific consultations with the impacted stakeholder groups as identified and updated from the ESIA study. Data for the RAP study was collected through two field tools – household survey and the Land & Asset survey.

1.3.2 Optimisation Exercise

Prior to undertaking the field work pertaining to RAP, an optimization of the project land footprint was undertaken based on E&S sensitivities identified from the ESIA study, as well as geospatial assessment of the area. The exercise involved exclusion of land parcels 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 optimization process are provided in Section **2.2**.

1.3.3 RAP Survey Coverage

Resettlement surveys were conducted in parallel for Agar and Susner sites during 28th July 2020 to 28th August 2020 based on the activities discussed in Vol I **Section 1.4**. Overall, the survey coverage is outlines below:

- Ten (10) of a total of eleven Project affected villages were profiled using Village Profiling tool covering Project affected villages for the Agar Solar Park. :
- 92 Land and asset surveys using Tool (of these 13 percent were undertaken recall based);
- 138 household-level socioeconomic surveys of which 42 households (30.4 percent) formed the sample for more community-wide project impacts for grazing land reduction and effects on casual agricultural labourers;
- 19 qualitative discussions.

The household socioeconomic survey and the Land & Asset survey were initiated from Umariya village in Susner of Unit 5 of the Solar Park. Of the 263 households assessed as project affected, 96 (36.5 percent) could be surveyed. The list of surveys and consultations held across the villages in Unit 4 and Unit 5 are presented in the table below.

Table 1.2 Field survey activities: Agar Solar Park

Unit	Village	Kick Off Meeting	Land and Asset Survey Dates	Household Survey Dates	Survey Completion Meeting	Total PAH number	Total PAHs Surveyed
Unit 4	Madhopur	24-08-2020	24-08-2020	25-08-2020	26-08-2020	5	5
Unit 4	Bijnakhedi	24-08-2020	24-08-2020	25-08-2020	26-08-2020	9	9
Unit 4	Kesai Dehariya	25-08-2020	27-08-2020	25-08-2020	27-08-2020	3	2
Unit 4	Pipalya Kumhar	25-08-2020	NA	25/08/2020 (only sample households surveyed)	26-08-2020	3	0
Unit 4	Ladwan	06-08-2020	NA	NA		12	0
Unit 4	Dudhpura	25-08-2020	NA	NA		75	0
Unit 4	Karwa Khedi	24-08-2020	NA	NA		16	0
Total Unit 4						**123**	**16**
Unit 5	Umariya	06-08-2020	07/08/2020 – 08/08/2020	07/08/2020 – 08/08/2020	15-08-2020	48	30
Unit 5	Naharkheda	08-08-2020	08/08/2020 – 10/08/2020	08/08/2020 – 11/08/2020	16-08-2020	42	24
Unit 5	Pipalya Nankar	14-08-2020	15-08-2020	15/08/2020 – 17/08/2020	18-08-2020	23	10
Unit 5	Palada	15-08-2020	17-08-2020	17-08-2020	18-08-2020	27	16
Total Unit 5						**140**	**80**
Grand Total						**263**	**96**

Source: Resettlement surveys, August 2020

Note: the discrepancy in 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 Units 4&5

The limitations arising during the RAP study which were encountered, due to either protests, or absence of households, or refusals to participate in the survey exercise. The overall limitations have been included in the consolidated RAP, and the specific limitations pertaining to Agar Solar Park are listed below.

- Four villages in Agar Solar Park; Ladwan; Karwa Khedi, Dudhpura and Pipalya Kumhar refused to participate in the survey due to their opposition to the proposed project[5]. Dudhpura's opposition stemmed from their previous experience with government project (water reservoir and check dam) which had led to loss of about 60-70 percent of their land. What was once a fairly large village in the area, has now been split into three (3) hamlets around a large water body. The previous project (~ 20 years ago) had led to loss of agricultural and arable land and subsequent economic displacement. The residents of Dudhpura reported that, currently, the village is left with little or no land. Residents of Ladwan and Karwa Khedi displayed strong opposition to the current project due to the apprehension of loss of private land and associated land based livelihoods;
- 6 households though consented to LA survey did not consent to HH survey due to reluctance to provide household level information. The households are informal users of government land for agriculture and belonged to the following villages of Unit 5 –
  - Two (2) households in Umariya, and one household each in Naharkheda, Bijnakhedi, Palada, and Pipalya Nankar
- A total of 167 households were absent for either the HH or LA survey. This includes the households who did not give consent to either of the surveys. Their village wise break up is given below –

Table 1.3 Absentee PAH Not Surveyed

Unit	Village	No.of Absentee PAHs
Unit 4	Kesai Dehariya	1
Unit 4	Pipalya Kumhar	1
Unit 4	Ladwan	12
Unit 4	Karwa Khedi	16
Unit 4	Dudhpura	75
Unit 4	Pipaliya Nankar	03
Agar Sub-total		**107**
Unit 5	Naharkheda	18
Unit 5	Palada	11
Unit 5	Pipalya Nankar	13
Unit 5	Umariya	18
Susner Sub-total		**60**

- 24 households in Naharkheda, and seven (7) households in Pipalya Nankar refused permission for taking photographs during the HH survey, and thus these data points are not available

[5] Covered in 6.2.2

- 18 LA surveys were done with a representative of the impacted household and not family member or relative of the family who could not be present during the duration of the survey.

The pending surveys related to household data and data on land and asset will need to be covered in the implementation phase.

- 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 B

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 Agar Solar Park
Annexure A	Photo Documentation
Annexure B	Summary of Consultations
Annexure C	Profile of Informal Users in Agar Solar Park
Annexure D	Profile of Residential Structures within Agar Solar Park
Annexure E	Household Level Entitlements (to be developed once an agreement on Entitlements and valuation is achieved)

2. PROJECT FOOTPRINT AND LAND PROCUREMENT STATUS

2.1 Project Footprint

The Solar Park will be spread across eleven villages in Agar and Susner Tehsil, Agar-Malwa District. The land required for 550 MW Solar Park including solar fields 1398.08 hectares. The following table provides a summary of the land requirement by village and land ownership type:

Table 2.1 Village Wise Project Footprint

Unit	Villages	Government Land (NRED Allotted and Newly Identified) (ha)	Private Land (ha)	Total land (ha)
Unit 4	Pipalya Kumar	34.80	5.06	**39.86**
	Madhopur	15.77	0.00	**15.77**
	Ladwan	168.32	2.80	**171.12**
	Kesai Dehariya	28.30	0.00	**28.30**
	Karwa Khedi	155.09	0.00	**155.09**
	Dudhpura	98.38	43.59	**141.97**
	Bijnakhedi	55.98	0.00	**55.98**
Agar Sub-total		**556.64**	**51.45**	**608.09**
Unit 5	Palda	119.69	6.48	**126.17**
	Naharkheda	86.89	62.71	**149.6**
	Umariya	328.8	13.06	**341.87**
	Pipalya Nankar	181.36	0	**181.36**
Susner Sub-total		**716.74**	**82.25**	**789.99**
Agar-Susner total (Unit 4 & 5)		**1273.38**	**133.7**	**1398.08**

Source: RUMSL, January 2021

Total area for Unit 4 (Agar) is 608.09 hectares comprising of land from seven villages namely Pipalya Kumhar, Madhopur, Ladwan, Kasai Dahariya, Karwa Khedi, Dudhpura, Bijnakhedi, which fall under Agar tehsil of Agar-Malwa District. Total area for Unit 5 (Susner) is 789.99 hectares comprising of land from four villages namely Palda, Naharkheda, Umariya and Pipalya Nankar, which fall under Susner Tehsil of Agar-Malwa District. The understanding of the land requirement in comparison to total land available per village is provided in Section 3.2.

The plant area for both units is in two discontinuous Units, due to the feasible avoidance criteria applied in the selection process (refer to **Section 2.2).**

Review of the project boundary maps provided by RUMSL, after the land optimization exercise, confirms that priority has been given to allotment of government land (91 percent of Solar Park land), in order to minimize private and patta land procurement and associated impacts. Specific avoidance measures include:

- Land used for habitation and access for habitation has been avoided though seven residential structures are within the Project area;
- Exclusion of forest land;
- Avoidance of land within major natural drainage or surface water body;
- Land for religious structures or cremation land has been deducted from initially identified land parcels;
- Land for access to isolated structures has been avoided to the extent feasible.

2.1.1 Government Land Allotment

Of the total 1273.38 ha of government land identified for the project, 1271.37 (99.84 percent) has been allotted. The details of the allotted land are provided in the table below.

Table 2.2 Dates of Government Land Allotment for Agar Solar Park

Allotment Date	Allotment Letter Number	Area Allotted (ha)	Villages
28.02.2019	7/A-19(3)/2017-2018	56.33	Bijnakhedi
28.02.2019	6/A-19(3)/2017-2018	70.53	Dudhpura
21.06.2019	31/B-121/2019-20	14.95	Dudhpura
20-06-2019	5/A-19(3)/2017-18	159.25	Karwa Khedi
28.02.2019	4/A-19(3)/2017-2018	28.3	Kesai Dahariya
20.06.2019	3/B-121/2019-20	197.14	Ladwan
28.02.02019	2/A-19(3)/2017-18	16.83	Madhopur
21.01.2019	1/A-19(3)/2017-18	34.92	Pipalya Kumar
04.01.2018	9/A-19(3)/2017-18	60.2	Naharkheda
09.08.2018	9/A-19(3)/2017-18	26.69	Naharkheda
30.11.2016	48/19(3)/2015-16	55.62	Palda
02.01.2018	8/A-19(3)/2017-18	56.99	Palda
02.01.2018	11/A-19(3)/2017-18	161.16	Pipalya Nankar
06.01.2018	10/A-19(3)/2017-18	176.63	Umariya
09.08.2018	10/A-19(3)/2017-18	155.83	Umariya
Total		**1271.37**	

Source: RUMSL

Note: The land allotment records are available till 2019. Data for the latest and revised allotment based on exclusion and addition of new parcels was not available at the time of writing the report.

The government land identified in the villages across Unit 4 and Unit 5 of the Solar Park comprises of land classified as Charnoi, Chargah, and Germumkin. The land categories pertain to collective use by the village residents, and are included in the land categories in the Nistar Patrak[6] data of each village.

[6] 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.

As part of the allotment exercise, it has been ensured that a minimum of 2% of total agricultural land available in the village is 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 land use of government land is characterized by open grazing, and squatting for seasonal agriculture. The two types of informal use of government land are defined below:

- ***Land owner encroachment on government land*:** The private land owner who has occupied part of Government Land, adjoining the private/ patta lands into their agricultural land use area. There is no legal claim over those occupied government land parcels.
- ***Squatter on government land*:** Squatters are informal users, who have occupied government land (including Charnoi/Chargah/kabil kast) for agricultural use, while their private/patta land is at a different location in the village. Squatting can also be undertaken by landless households for agriculture and/or residence.

2.1.2.1 Encroachments

Encroachment of government land adjoining existing private/patta land to cultivate larger parcels has been noted in villages of Agar Tehsil (Ladwan, Karwa Khedi, Dudhpura, and Pipalya Kumhar) and in Naharkheda, and Palda village in Susner Tehsil.

Agar- Unit 4

In Agar, private land owners with large land holdings who are at a relatively higher economic position in the village, have used encroachment as a practice to increase the area under cultivation for agricultural use and also occupied land for grazing their own livestock, and hence prohibiting its use by the other residents of village. This practice has been in existence for more than ten (10) years due to which the more powerful land owners have occupied large parcels for agricultural and their own pastoral activities. As a result, the available government land for grazing, for the wider community, has reduced.

The available land for households of relatively lower economic and social status (households belonging to SC community, and women headed households, households with only livestock based income) has reduced.

Susner- Unit 5

In Susner, the trend of encroachment is different and has been undertaken by patta land holders, whose patta land is outside the project footprint. The patta land allotted to the Harijan households is of poor quality and they have encroached upon government land for seasonal farming. It should be noted that patta land has been largely avoided from the land procurement process (except Dudhpura), as part of avoidance measures undertaken, unless unavoidable, such as maintaining contiguous land footprint.

Patta land has been identified to be part of the project footprint in Dudhpura village (Unit 4), wherein 18 hectares[7] of patta land is part of the total land take for the project footprint from the village.

The LA survey of government land covered 12.3 hectares of government land under encroachment, which accounts for less than one percent (0.96) of the allotted government land for the Solar Park. This corresponded to 17 PAHs in baseline survey who reported encroachment for agriculture.

[7] The patta land holders have been identified based on the land owner listing exercise carried out during the resettlement surveys, and provided by the Patwari. The land area has been estimated from the land area statement data provided by RUMSL.

2.1.2.2 Informal Use of Government land by Squatters

Squatting is defined as separate from encroachment, wherein a household/ a group of households are informally using government land. These squatters do not have formal land titles on the occupied land but may have invested time and money to make the occupied land fertile and productive through land improvement measures (adding top soil, fertilizers) for farming, while their private land/patta land is at a different location in the village . Squatting is a more recent phenomenon as compared to encroachment and has been in existence for an average of 5 – 10 years (as reported by the PAPs during the LA survey).). The land used by squatting households is rain –fed, lacks any permanent source of irrigation, and produces lower output (mainly soyabean, and wheat if rainfall is good).

The practice of squatting is prevalent among Banjara households (Madhopur) who are spatially, and socially separated from the main village and depend on squatted-upon land for production of grains to meet household consumption needs. The LA survey assessed 48.16 hectares of government land under squatting, which accounts for 3.8 percent of the allotted government land. This corresponded to 60 PAHs in baseline survey who reported squatting on government land. Across both the Units, the extent of area under squatting is higher in Unit 5 with 87 percent of the squatting land in Susner.

2.1.2.3 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, Chargah*) which are meant to be used for grazing by the village community. However, there are no physical identifiers for such land parcels, and typically, grazing is undertaken on any open government land parcel. The actual land categories are not known to the local community and thus do not provide the complete understanding of the grazing land use in the village. Nevertheless it is important to understand the availability of designated grazing land to assess the compliance to the provisions of the MP Land Revenue Code in terms of grazing land availability (refer to Grazing Management Plan for further details) . The total designated grazing land available in the Project 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 after Project allotment (ha)	Total Agriculture land in the Village as per Census 2011 data	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 4	Kasai Dehariya	0	207.07	252.36	0	0.00
	Dudhpura	63.97	161.718	66.01	39.5	96.91
	Ladwan	66.82	103.31	266	64.7	25.12
	Karwa Khedi	61.72	179.85	223	34.3	27.68
	Madhopura	138.58	231.61	171.39	59.8	80.86
	Bijnakhedi	152.67	256.57	277.62	59.5	54.99
	Pipaliya Kumhar	33.35	168.32	175.51	19.8	19.00
Agar Sub - total		**517.11**	**1308.48**	**1431.89**	**39.5**	**36.11**

Unit	Village	Charnoi & Kadim available after Project allotment (ha)	Total government land after Project allotment (ha)	Total Agriculture land in the Village as per Census 2011 data	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 5	Naharkheda	148.2	335.16	313.51	44.4	47.27
	Umariya	247.12	91.35	181.93	NA*	135.83
	Pipaliya Nankar	19.63	87.84	334.61	22.3	5.87
	Palda	27.6	287.35	368.47	9.6	7.49
Susner Sub - total		**442.77**	**801.7**	**1198.52**	**55.2**	36.94
Grand Total		**959.88**	**2110.15**	**2630.41**	**45.5**	36.49

Source: *Nistar Patrak* data of each village

*the proportion cannot be calculated for Umariya, as the Charnoi land allotted exceeds the available government land

The above table shows the availability of designated grazing land, after the government land allotment for the Project. The reduction in available government land, post allotment is highest in Unit 5 of the Solar Park, with the highest impact in loss of government land in Umariya (21 percent left after allotment). The village is also having the highest impact due to land take (44 percent of land left after land take). Consultations undertaken with the community also confirmed the findings from the above data – the available open grazing land is limited, and currently, the village residents have ease of access to the same. The solar plant will lead to increase travel time (to the alternatively allotted land for grazing), and will be further away from the water catchment area of the village, which is used as source for drinking water for livestock.

The availability of such classified grazing land, post allotment is the highest in Ladwan and Madhopur. The latter has also reported the highest dependence of households on grazing, as an economic activity (Section **4.2**). As compared to Unit 5, villages of Unit 4 have higher share of grazing land available post land allotment, and hence face lesser impact on open grazing.

2.1.3 Private Land Procurement

Private land procurement as per the provisions of the MP Consent-based Land Policy (2014) is yet to be initiated.

2.1.4 Private Land

The private land identified for the Solar Park is 133.7 hectares, all under agriculture/horticulture, and/or fodder crop cultivation. The land use of private land has remained the same, with the intensity of agriculture increasing, with multiple cropping almost round the year; over the years. Use of irrigation systems to improve agricultural productivity has led to double and triple cropping (Section 4.2). Private agricultural land is also used for cultivation of fodder crop as livestock feed, and grazing during lean agricultural period.

2.2 Impact Avoidance and Project Boundary Optimization

2.2.1 Comparison of Project Land Requirements

The initial land requirement proposed for the Agar Solar Park was 1453.71 ha, of which 688.77 ha was proposed to be required for Unit 4, and 769.94 ha for Unit 5. The number of villages identified were seven (7) villages in Unit 4, and four villages (4) villages in Unit 5. The current land requirement has been reduced to 1398.08 ha, out of which 43.5 percent is in Unit 4, and the rest in Unit 5. The reduction is the result of land area optimization exercise undertaken, which was a result of the land optimization exercise undertaken to reduce the E&S risks, while maintaining techno-economic viability.

The exclusion of land parcels was undertaken based on a review of aerial imagery, site visits at multiple stages (scoping, ESIA) undertaken by ERM, and an avoidance exercise undertaken by RUMSL's consultants , based on the land allotment details provided by RUMSL. This included details of the land parcels, current status of land ownership, land use as per government records, the total area of each land parcel and the area allotted to the project. In addition to this, RUMSL made available the village wise land parcel maps through MAP IT[8] for the purpose of analysis.

Exclusion as part of the E&S studies includes: 7.645 Ha (Unit 4), and 45.50 Ha (Unit 5)

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

2.2.2 Optimizations carried out & suggested

The detailed impact avoidance and boundary optimisation 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.

The table also contains a summary of the optimisations that were accepted and those that that could 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			
Unit 4	Madhopur	662	Habitat Cluster of 12 Banjara households with an area 0.718 hectares excluded from project boundary including area for access road of 0.085 hectares. These households form the *Banjara Basti* of Madhopur and have been residing for 2 – 3 generations. They are connected to the village road, and have access to surface water body on Khasra no. 663 (point 2 in **Figure 2.1)**
		663 & 666	Surface water body of area 0.346 hectares excluded from the project boundary
	Karwa Khedi	57 & 84 –min-1, 2, 3	Surface water body of area 1.22 hectares excluded from project boundary and access uninterrupted through existing village road
		61 & 76	A part of the larger surface water body (pond created by watershed department) of area 3.218 hectares excluded from the project boundary.

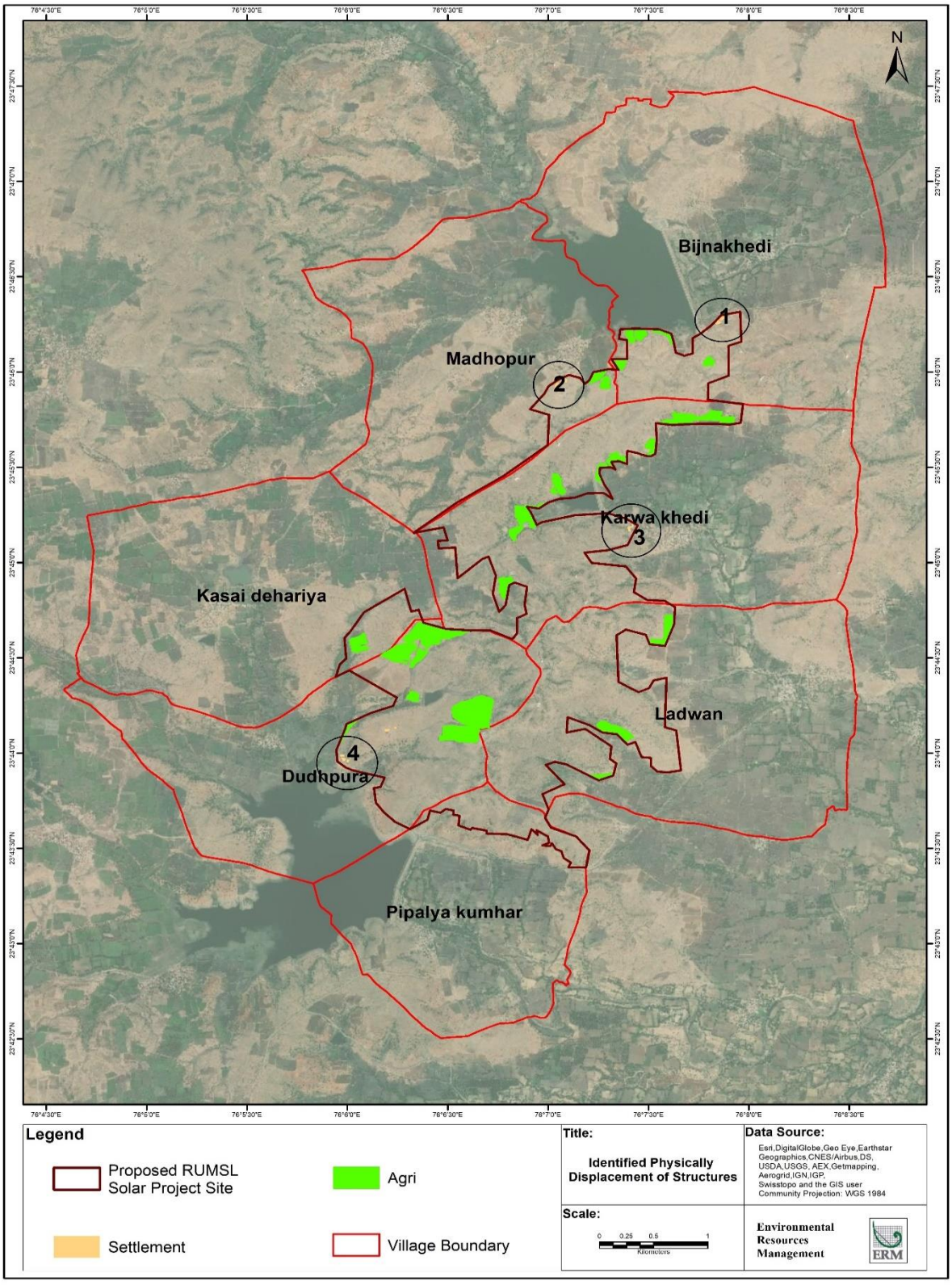
[8] Madhya Pradesh Agency for Promotion of Information Technology (Department of Science and Technology, GoMP)

Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
	Dudhpura	94 & 96	Surface water body of area 1.675 hectares is excluded from the usable area within the project footprint. The water body however will remain within the project boundary. Part of the water body is on private land parcel (Khasra no. 96).
	Bijnakhedi	538/2	There are four (4) households and one commercial structure who have been already physically displaced by construction of dam. The cluster is on the edge of the project boundary of area 0.247 hectares is excluded from the project boundary (point 1 in **Figure 2.1)**
Unit 5	Umariya	673, 667 & 666	Habitat Cluster of area 0.255 hectares including space for access road (0.078 ha) excluded from the project boundary
		170, 168, 166, 174, 176, 40, 39, 42, 41, z6, z1 ,167, 169, 171, 172, 173	Surface water body (pond constructed by Watershed department by creating embankment dam) of area 13.2 hectares excluded from the project boundary. Out of these khasra, Z1, and Z6 are private khasras (submerged) of 0.65 hectares as part of the water body.
		101, 117, 110, 111	Small surface water body of 0.466 hectares has been deducted from the usable area inside the project footprint. However, the water body has been retained in the project boundary
		180, 162, 38, 161,163, 164,161/ 877,161/866	The area behind the embankment dam has dense vegetation and also has a cremation ground used currently by the village. The total area of 0.85 hectares has been excluded from the project boundary. Out of the total area, 0.23 hectares is private land (161/866, and 161/877)
	Pipalya Nankar	53	Habitat cluster area of 1.255 hectares of two households excluded from the project boundary with 6 meters wide access road. There is an existing road of area 0.16 hectares which has been provided
		79, 80, 85	Two water bodies (one on 79 & 80 combined, and the other on 85) with total area of 2.19 hectares excluded from the project boundary
Khasras recommended for exclusion but not approved during avoidance exercise. These have been included in the assessment of resettlement impacts and are in RAP- subject to final confirmation of the boundary			
Unit 4	Karwa Khedi	84 – min – 4,5	There are 5 households along the village road, constructed on government land. Two (2) of these households are beneficiaries of PM Awas Yojana. This cluster is at the edge of the project boundary. Their exclusion from the project footprint could not be undertaken because of technical feasibility constraints. Access road to these houses have to be maintained in order to preserve ease of access to agricultural land parcels. (point 3 in **Figure 2.1)**
Unit 5	Umariya	297	There are seven (7) land users who have been squatting on this government Khasra for agriculture over an area of approximately 4 hectares. It was suggested to exclude the agricultural area, since it is situated at the eastern edge of the project boundary. However, the same could not be exercised due to technical constraint relating to minimum land requirement for setting up per MW of solar panels.

Unit	Village	Khasra Number	Summary of avoidance/exclusion exercise and status
		748, 776, 777, 795, 800, 849, 872	There are 14 land users who have been squatting on these government Khasras for agriculture over an area of approximately 6.4 hectares. This land area lies at the south-east edge of the boundary and was suggested to be carved out from the project boundary. However, the same could not be undertaken due to technical feasibility issues.
	Pipalya Nankar	92	There are seven (7) land users who have been using the government land parcel informally for agriculture, and are at the edge of the project boundary. It was suggested that the agricultural land use area be carved out from the total khasra area included in the project footprint. However the exclusion could not be undertaken due to technical feasibility.
Unit 4	Dudhpura	54	There are four (4) households with total area of 0.806 hectares at the edge of the project boundary without existing road access. Their exclusion from the project footprint could not be undertaken. (point 4 in **Figure 2.1**)

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

Figure 2.1 Residential Clusters in Unit 4 avoided & suggested



Note: Approximately 25 households were considered for avoidance from Unit 4, of which four households in Dudhpura on Khasra no. 54 have not been excluded from the project boundary.

Figure 2.2 Photographs of residential clusters on Government Landin Unit 4: Karwa Khedi (above) and Madhopur (below)

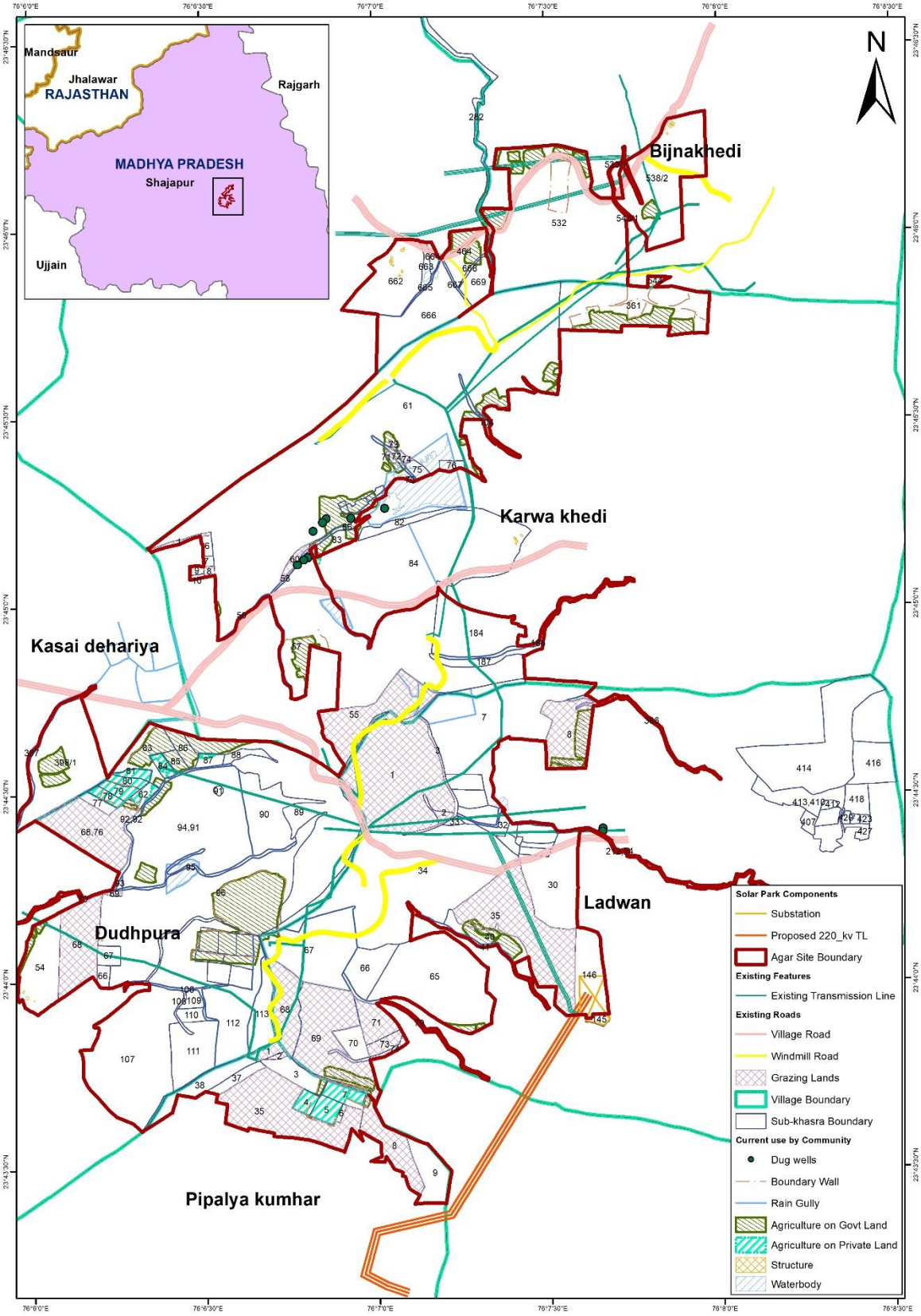
3. SUMMARY OF PROJECT AFFECTED ENTITITES

3.1 Land Use and other Sensitivities

The figures below show the spatial distribution of the different land uses of within the allotted land for the solar park. 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

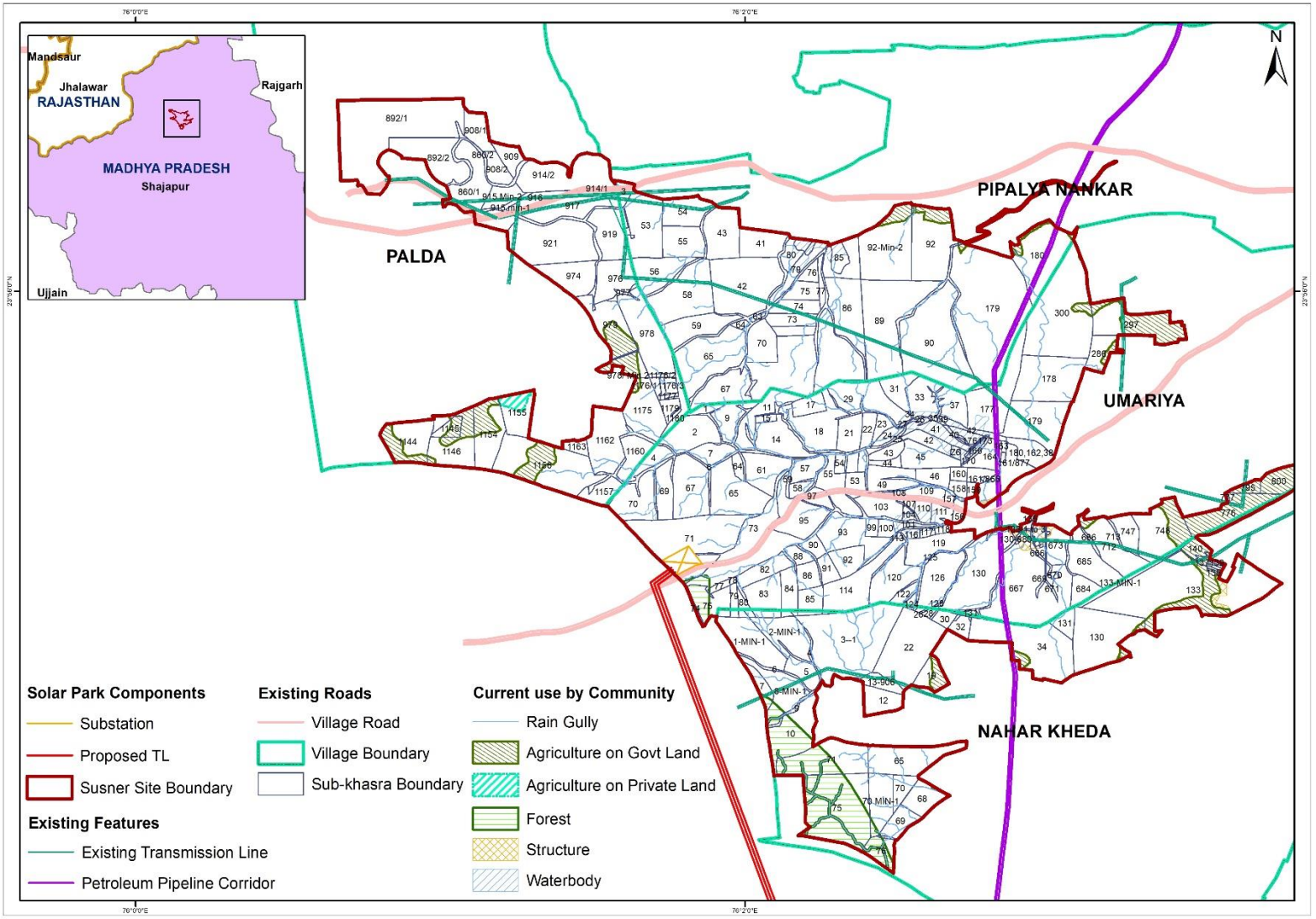
The map below shows the current land use by the community for agricultural (light yellow colour) and residential purposes (dark yellow colour) within the Solar Park footprint. Of the total land area under cultivation (123.14 ha) within the Solar Park footprint, 60.9 ha (49.45 percent) is informal use of government land. The figure below showcases the land under agriculture, with the land under informal use for agriculture differentiated from that agriculture on private/patta land.

Figure 3.1 Sensitivity map of Unit 4



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

Figure 3.2 Sensitivity map of Unit 5



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

The land use maps above shows the presence of open grazing land (Unit 4), and seasonal streams (Unit 5), across the project land footprint. A perennial water body in Umariya village which, although excluded from the project footprint (refer **Table 2.4**) is at the edge of the project boundary, and the ease of access to the same, will be hindered, due to the solar plant. Another sensitivity highlighted is the presence of forest land in Naharkheda village (Khasra numbers 10, 75, and 76), at the southern edge of the project boundary. The forest was designated to be developed under Panchvan scheme (Social Forestry Program[9]). However, according to the discussions with the Patwaris, the local community did not undertake the forest development and thus the land categorization was changed back to government land. The total area of this (erstwhile forest, but now government) land is 29.15 hectares which accounts for 4 percent of the government land procurement for Unit 5 (Susner), and 3.6 percent of the total land requirement for Unit 5. Currently, the land has been allotted to the project.

3.2 Directly Affected Villages

Based on the final project footprint, the following villages have been identified as impacted villages along with the area impacted in each village. Of all the impacted villages, Umariya has the highest impact with 56 percent of the total village land being procured for the project footprint. The lowest land impact is observed in Madhopur, where only 3 percent of the total village land is being procured. In total, the Solar Park is affecting 22 percent of the land across the impacted villages.

Table 3.1 Land requirement in Project Villages

Village Name	Geographical Area of Village (ha)	Land required for the Agar solar park (ha)			Land remaining (ha)	Proportion of Land Remaining (%)
		Government land (ha)	Private land (ha)	Total		
Pipalya Kumhar	383.51	34.8	5.06	**39.86**	343.65	89.61
Madhopur	509.42	15.77	0	**15.77**	493.65	96.90
Ladwan	590.74	168.32	2.8	**171.12**	419.62	71.03
Kesai Dehariya	252.77	28.3	0	**28.3**	224.47	88.80
Karwa Khedi	587.09	155.09	0	**155.09**	432	73.58
Dudhpura	495.71	98.38	43.59	**141.972**	353.738	71.36
Bijnakhedi	709.41	55.98	0	**55.98**	653.43	92.11
Agar Sub-total	**3528.65**	**556.64**	**51.45**	**608.09**	2920.56	82.77
Palda	801.75	119.69	6.48	**126.17**	675.58	84.26
Naharkheda	837.35	86.69	62.71	**149.6**	687.75	82.13
Umariya	607.12	328.8	13.06	**341.87**	265.25	43.69
Pipalya Nankar	630.81	181.36	0	**181.36**	449.45	71.25
Susner Sub-total	**2877.03**	**716.74**	**82.25**	**789.99**	2087.04	72.54
Agar Solar Park	***6405.68***	***1273.38***	***133.7***	***1398.08***	5007.6	78.17

Source: Land data provided by RUMSL as on June 2020

[9] Joint Forest Management Program under the provisions of M.P Lok Vaniki Rules 2002 for management of forest land allotted by the government, by Gram Panchayat.

Umariya will be left with 44 percent of the total land in the village, and has the highest land loss estimated. On an average, except for Umariya, all the villages will have 75 percent of their total land area available after the deduction of project footprint area.

3.3 Affected Land Parcels

The total number of land parcels affected by the land procurement for both the Units is given below. The spatial representation of these parcels and their ownership is provided in **Figure 3.1** and **Figure 3.2.**

Table 3.2 Land parcels required for the Solar Park

Unit	Type	Number of land parcels	Land Area (ha)
Unit 4	Government	126	556.64
	Private	21	51.45
Sub - total		**147**	**608.35**
Unit 5	Government	195	716.74
	Private	38	181.86
Sub - total		**233**	**898.6**

Source: Land data provided by RUMSL as on Jan 2021

3.3.1 Project affected area and survey coverage

Land for the Project comprises of 1398.08 hectares of which government land identified for the project from the eleven project villages' amounts to 1273.38 hectares, 90.5 percent of the total land required. About 133.7 hectares of private and patta land has been considered for purchase, which forms 9.5 percent of the total area identified for the project.

The LA surveys were undertaken for the private/patta land parcels as well as those government land parcels on which agriculture through informal use was being undertaken. The LA surveys covered 60 percent of government land and 11 percent of private land required by the project. These correspond to 95 PAH households surveyed. It should be noted that surveys were not undertaken in four villages of Unit 4 – Ladwan, Kesai Dehariya, Karwa Khedi and Pipalya Kumhar as the residents of these villages did not agree to participate, as they had reservations about the Project. The specific limitations have been explained in **Section 1.3.4**. The LA survey for private land parcels was undertaken with the private land parcel owners based on recall i.e. based on the reporting ability of the of the respondent, and hence is liable to errors.

Table 3.3 Survey coverage

Tehsil	Village	Required Government Land (ha)	Government Land under informal use, surveyed (ha)	% surveyed of required government land	Required Private Land (ha)	Surveyed Private land (ha)	% surveyed of require private land
Agar	Bijnakhedi	55.98	5.0	9	0.0	0.0	0
	Kesai Dehariya	28.3	3.3	10	0.0	0.0	0
	Madhopur Kheda	15.77	4.2	25	0.0	0.0	0
	Ladwan	168.32	0	0	2.8	0.0	0
	Karwa Khedi	155.09	0	0	0.0	0.0	0

Tehsil	Village	Required Government Land (ha)	Government Land under informal use, surveyed (ha)	% surveyed of required government land	Required Private Land (ha)	Surveyed Private land (ha)	% surveyed of require private land
	Dudhpura	98.38	0	0	43.59	0.0	0
	Pipalya Kumhar	34.8	0	0	5.06	0.0	0
Agar Sub-total		**556.64**	**12.5**	**2.2**	**51.45**	**0.0**	**0**
Susner	Naharkheda	86.89	9.9	11.4	62.71	7.36	11.7
	Palda	119.69	11.14	9.3	6.48	2.7	41.6
	Pipalya Nankar	181.36	3.86	2.1	0.5	0.2	40
	Umariya	328.80	22.88	7.0	13.06	0.94	7.2
Susner Sub-total		**716.74**	**47.78**	**6.6**	**82.75**	**11.2**	**13.5**
Grand Total		**1273.38**	**60.28**	**4.73**	**134.2**	**11.2**	**8.34**

Source: Land data provided by RUMSL and LA survey 2020

3.3.2 Assets affected

The assets affected due to the land procurement pertain to loss of access to land. The extent of these impacts on the fixed assets are further described in **Section 6.** This section provides the summary of such assets, including their counts and spread across the villages

- Residential structures: seven (7) residential structures, of which three (3) have been surveyed. These structures are typically part of one single homestead area are impacted due to the project activities
- Other immovable structures: 65 other structures which include storage shed, agricultural shed, greenhouse, cattle shed, water stall for animals, wells, etc. Out of these 20 are fixed assets that are salvageable such as toilet, wire fencing with stone/wooden poles, and pipeline.
- Standing crop: There are 135 land parcels (government and private) with agricultural activities spread over an area of 123.14 ha that are likely to be affected by project land requirement. Of these, 87 land parcels with farming activity that were surveyed which is spread over an area of 71 hectares
- Timber and Fruit trees: 450 timber trees and 54 fruit trees were surveyed. None of the fruit trees were part of a planted orchard

3.4 Project Affected Households (PAHs)

As part of resettlement surveys, 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 138 completed HH surveys undertaken for Agar solar Park, of which 68.8 percent are directly project affected households (PAHs). The following table provides a summary PAH and coverage of the survey.

Similarly, 92 LA surveys were undertaken which covered 96 PAHs (out of 263 PAHs), out of which all but five households will be both economically and physically displaced.

Table 3.4 Status of Household Surveys

Survey Coverage by category	Count (in numbers)	Proportion (%)
Total PAH	263	100
Physically Displaced PAHs	01	0.4
Economically Displaced PAHs	262	99.6
Households Surveyed	138	49.2
Physically Displaced PAH	01	0.4
Economically Displaced PAH	95	36
Sample Households	43	15.3
Households that refused survey or are absentee households	167[10]	63.49
Partial surveys conducted (Phone interviews	1	0.3

Source: HH survey 2020

[10] These include the identified PAH in Ladwan, Karwa Khedi, Dudhpura and Pipalya Kumhar.

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

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

The baseline presented in this section is based on an enumeration and survey of project affected entities (ref. **Section 3**). This section profiles the socio-economic, livelihood, gender disaggregated and vulnerability profile across affected communities on the basis of information collected through the RAP surveys and consultations.

- Nine (9) villages using a village profile checklist;
- 138 household surveys (PAH and households that were part of the sample survey); and
- 19 discussions with key stakeholders and/or focus groups.

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 Agar district is comprised of two units, Unit 4 and Unit 5. While, unit 4 consists of 7 villages; Bijnakhedi, Madhopur, Pipalya Kumhar, Kesai Dehariya, Dudhpura, Ladwan and Karwa Khedi, Unit 5 consists of 4 villages; Umariya, Naharkheda, Palda and Pipalya Nankar. The detailed profile of Unit 4: Agar and Unit 5: Susner is given in the following sections.

4.1.1 Profile of Villages in Unit 4, Agar

4.1.1.1 Village Population

Villages in unit 4 have a total population of 5,504 persons comprising of 993 households. Out of these villages, Kesai Dehariya has reported the highest population, followed by Bijnakhedi.

Table 4.1 Population Profile of Villages

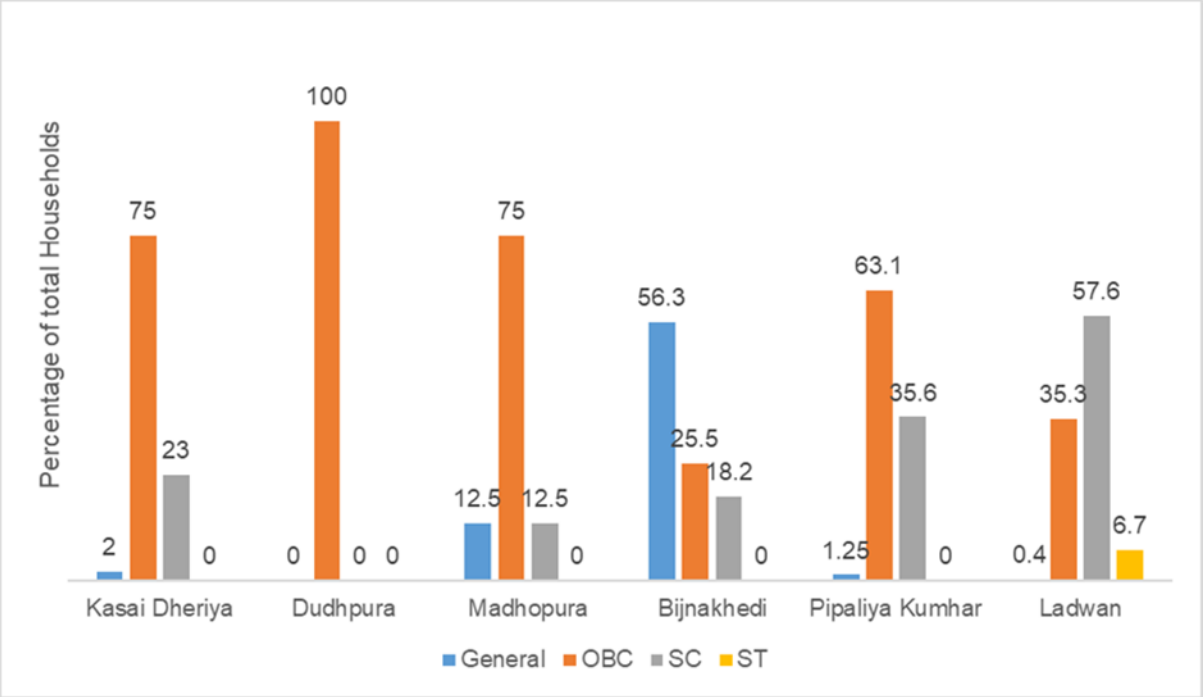
Villages	Total HHs	Total Population
Bijnakhedi	275	1,250
Dudhpura	100	600
Kesai Dehariya	100	1500
Madhopura	120	425
Pipaliya Kumhar	160	800
Ladwan	238	829

Source: Village Profiling 2020
Note: the above figures are based on the information made available by the village representatives as part of the Village Profiling. There is likely to be a discrepancy with the official numbers available in the Census, due to the fact that these numbers are based on the recall ability of the representatives (including Panchayat representatives) and the Census data is now a decade old and needs to be updated.

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 90 per cent of the population being Hindus (according to the village profile, filled in consultation with villages in each village).

Figure 4.1 Proportion of Social Group Households



Source: Village Profiling 2020

A majority of the population in the villages belonged to the Other Backward Classes (OBC) category. The villages have the lowest ST population as compared to other social groups, with only Ladwan (6.7 per cent of the total households) reporting ST population.

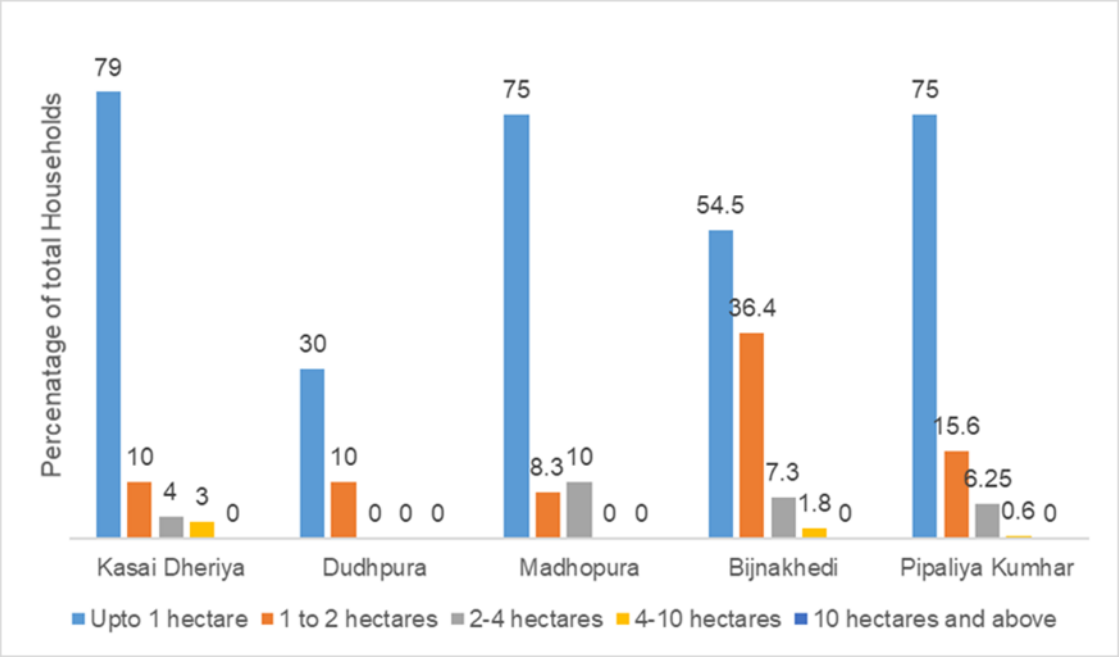
The main groups among the Hindus in unit 4 villages include Gurjars, Brahmins, Sondhiya, Rajputs, Meghwals, Chamar, Balahi, Bhil, Lohar, Nai, Banjara, Prajapati, Dhobi, Kumhar, Sonar, Sutaar and Banghi. Of these, the castes, Prajapati, Meghwals, Chamar, Balahi, and Kumhar are categorised as Scheduled Castes. According to the consultations with the villagers, Bhil community are the Scheduled Tribe (ST) category residents of Ladwan.

4.1.1.3 Land Ownership

According to the consultation, the land use in the villages in Unit 4 is characterised by a dominance of agriculture (privately owned) and grazing purpose (open government lands).

As can be seen in the figure given below, majority of the households (62.1 per cent of total households) fall under the category of marginal farmers, that is, those owning less than 1 hectare. , Kesai Dahariya has the largest number of them at 79 per cent and Dudhpura the fewest, at 30 per cent, but, as noted later, this villages also has the largest number of landless households (60 per cent). While the small farmers (owning 1 to 2 ha or more) count is around 20.5 per cent of the total households, and the semi-medium farmers (holding 2 to 4 ha or more) comprises 6.1 per cent of the total households in the villages. Only 1.2 percent are medium farmers (owing 4 to 10 ha), while there are no land owners in the large land holding category (more than 10 ha). A majority (~62 percent) are marginal farmers.

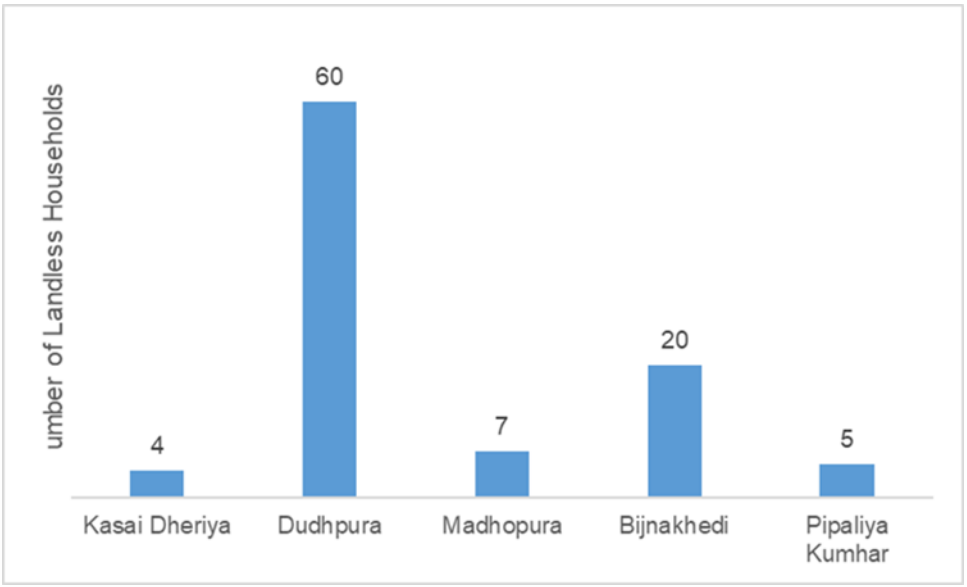
Figure 4.2 Distribution of Households by Land Holding



Source: Village Profiling 2020

As shown in the table given below, a smaller proportion of the total, 96 households (12.7 per cent) are landless. Among the villages, Dudhpura reported the highest number of landless households (around 60 per cent of the total households), followed by Bijnakhedi (7.3 per cent). Pipaliya Kumhar recorded the minimum number of landless households (around 3 per cent). The highest share of landless households in Dudhpura is a result of land loss to the previous project of Watershed department of construction of water reservoir. The project led to loss of 60 – 70 percent of total land of the village, as was reported during village profiling with this residents of the village. The previous experience of this village with a high number of landless households as a result of the previous land acquisition, has most likely caused the community of this village to oppose the current project anticipating further negative impacts and reduction in land.

Figure 4.3 Number of Landless Households



Source: Village Profiling 2020

The corollary to the above finding is the share of households with formal ownership. Pipaliya Kumhar has the highest (approx. 97 per cent) percentage of households who have Formal ownership[11] of land, followed by Kesai Dahariya (96 per cent of the total households).

The most impacted villages from the project are those who have a high percentage of households that are using government land for agriculture informally or have residence on the encroached land. Madhopura has the highest proportion of households (66.67 per cent) that have encroached on government land for agriculture, followed by Pipaliya Kumhar (50 per cent of the total households).

4.1.1.4 Livelihood Profile

People in the Project villages are dependent upon a mix of agriculture and livestock-based livelihoods, with agricultural-based livelihoods playing a critical role. The dependence on non-farm based[12] livelihood is 9.4 per cent of the total population.

Table 4.2 Proportion of village population as per Livelihood Source

Village	Agriculture Cultivators	Livestock (grazers)	Machinery/ Factory workers	Agricultural labourers	Transport workers	Construction workers	Government/Private service
Kasai Dahariya	66.7	0	13.3	13.3	0	2.7	0.2
Dudhpura	58.3	66.7	13.3	25	0	0.8	0
Madhopura	94.1	82.4	0	4.7	0	0	1.65
Bijnakhedi	96	0	0	0.6	0	2	0.96
Pipaliya Kumhar	87.5	2.5	0.6	3.8	2.5	3.8	0.25

Source: Village Profiling 2020

Majority of the people in the project affected villages are engaged in farm-based livelihood, with the dominant occupation being agriculture and livestock rearing. However, consultations show that livestock rearing is a sustenance activity for meeting household consumption needs. There is a trend of out-migration of an average of 23 per cent of the total households in the Project villages for livelihood. This out-migration is for work in as a machinery/factory workers or transport workers, who also contribute remittances to their families in the village

4.1.1.5 Community Development

All households in the villages have access to water for drinking, and household consumption. 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 Agar town, approximately an average 10 km away from the villages. Further, there are no medical facilities in any of the villages. The nearest medical facility is in Agar.

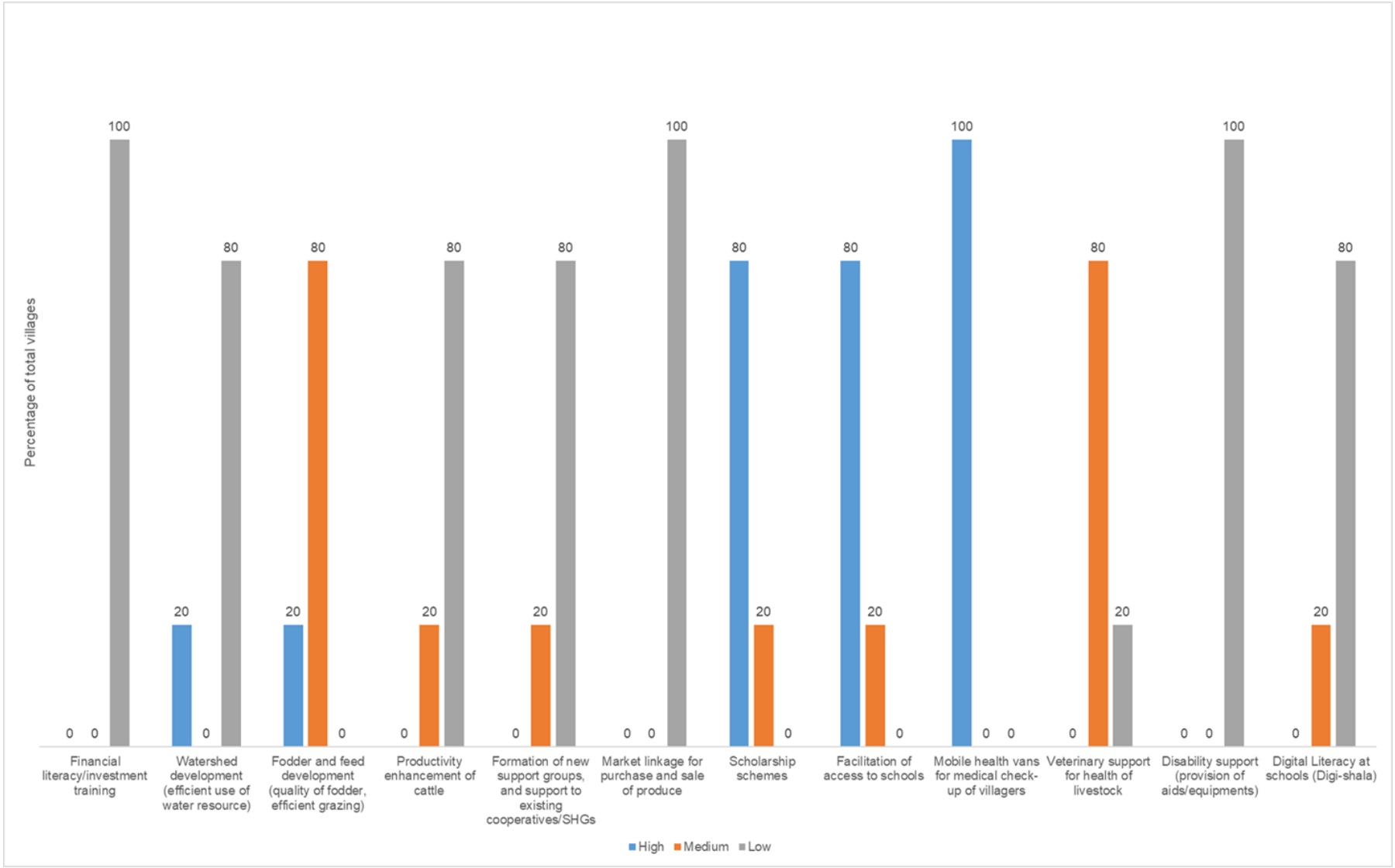
, The highest demand of the villagers is for mobile health and medical services. The villagers were asked to rank the kind of community support as High, Medium, and Low and not-interested from the provided options. The highest percentage (100 per cent of villages) of villages have given the highest

[11] Formal ownership is broadly determined by possession of a land title, a document that state such ownership. Having a clear land title protects the rights of the title-holder against other claims made by anyone else to the property.

[12] Machinery/Factory workers, transport workers, construction workers, involved in businesses and government/private services.

rank to Mobile health van, followed by fodder and feed development, and veterinary support with 80 per cent of villages giving this preference a medium rank.

Figure 4.4 Preference for R&R Support



4.1.2 Profile of Villages in Unit 5: Susner

4.1.2.1 Village Population

As can be seen in the following table, villages in unit 5 are characterised by a total population of 4,741 individuals and 945 households. Of these entire villages, Pipaliya Nankar has reported the highest population, followed by Naharkheda.

Table 4.3 Village Population

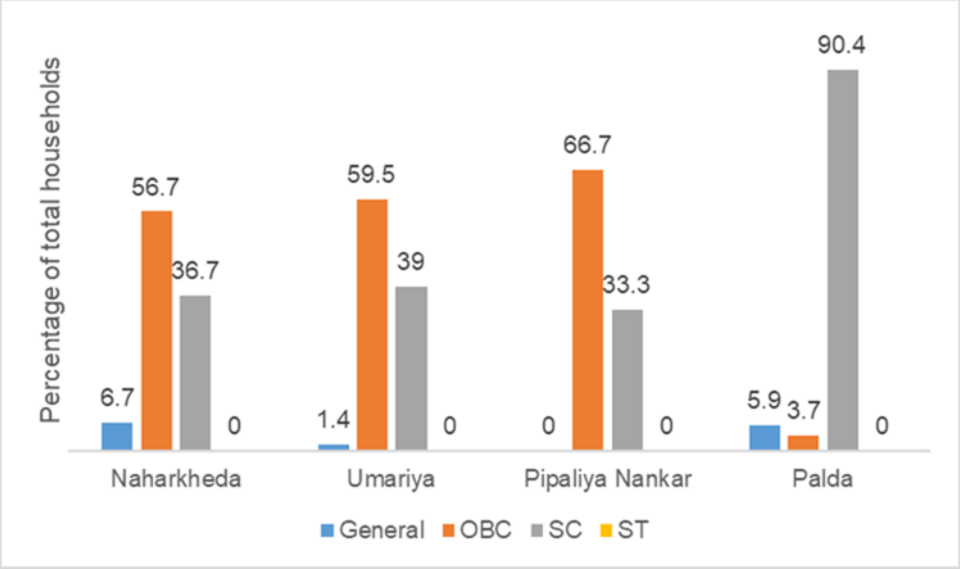
Villages	Total Households	Total Population
Naharkheda	300	1250
Palda	135	941
Pipaliya Nankar	300	1800
Umariya	210	750

Source: Village Profiling 2020

4.1.2.2 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 almost 100 per cent of the population being Hindus (according to the village profile, filled in consultation with villages in each village).

Figure 4.5 Proportion of Social Group Households



Source: Village Profiling 2020

Majority of the village population belongs to the Other Backward Classes (OBC) category. Reportedly, there is not ST population in the villages of unit 5.

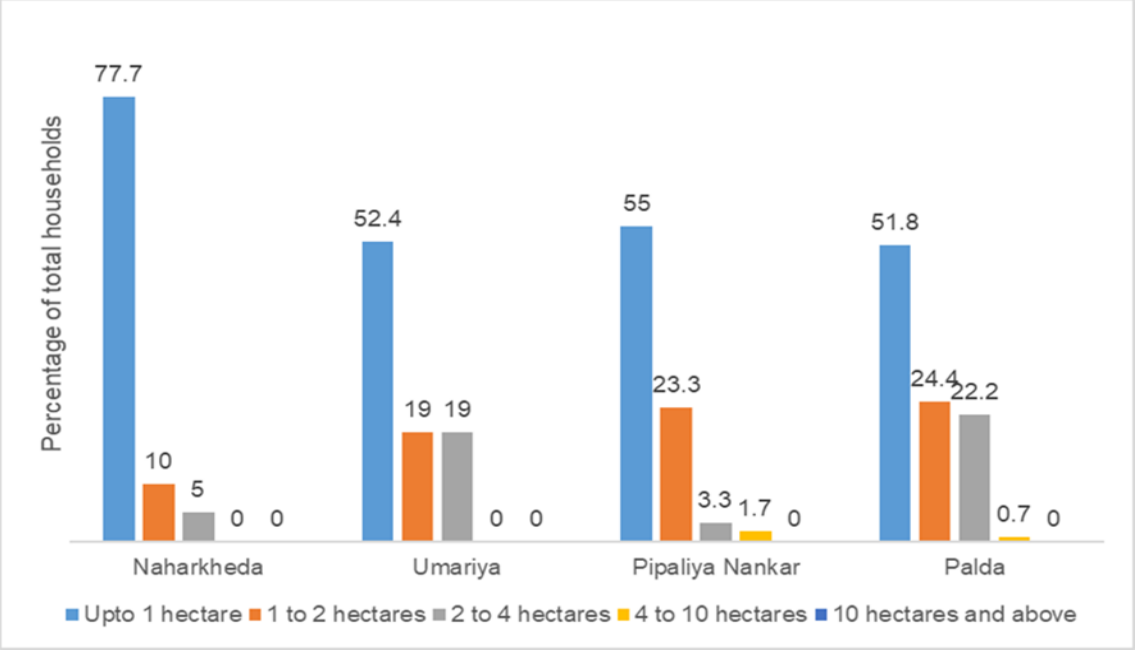
The main groups among the Hindus include Gurjars, Brahmins, Sondhiya, Rajputs, Meghwals, Chamar, Balahi, Bhil, Lohar, Nai, Banjara, Prajapati, Dhobi, Kumhar, Sonar, Sutaar and Banghi.

Out of these, the castes, Prajapati, Meghwals, Chamar, Balahi, and Kumhar are reported to be categorised as Scheduled Castes. According to the consultations with the villagers, the Scheduled Tribe found in the villages include, Bhil.

4.1.2.3 Land Ownership and Land Holding

Major proportion of the households (61.2 per cent) are marginal farmers. Households within the category of small land holding is18.3 per cent of the total households, and the semi-medium land holders comprise of 10.1 per cent of the total households in the villages. While only 0.64 percent are medium land holders, there are no households with more than 10 ha of land holding. Of all the villages, Naharkheda is the most vulnerable village in terms of landholding, as 77.7 per cent of the total households' falls under the category of marginal farmers.

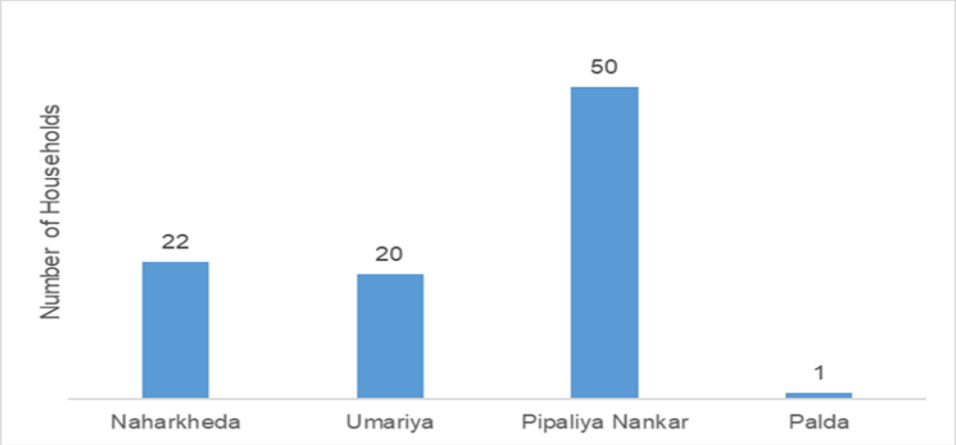
Figure 4.6 Distribution of Households by Land Holding



Source: Village Profiling 2020

In Unit 5, there is a small proportion (9.8 per cent of the total households) of landless households. Among the villages, Pipaliya Nankar has the highest number of landless household (around 16.7 per cent), followed by Umariya (9.5 per cent). Palada village recorded the minimum number of landless households (0.7 per cent of the total households).

Figure 4.7 Number of Landless Households



On the other hand, Palada village is having highest (96.3 per cent of the total households) percentage of households who have formal ownership of land, followed by Umariya (95.2 per cent of the total households).

The most impacted villages from the project are those who have a high percentage of households that are using government land informally for agriculture or have residence on the encroached land. Naharkheda has highest share of households (50.7 per cent) using government land for agriculture, followed by Pipaliya Nankar (33.3 per cent of the total households). Additionally, in Naharkheda 18.3 percent of the total households have encroached government land for residential purpose.

4.1.2.4 Livelihood Profile

As can be seen from the below table, the villagers are dependent upon a mix of agriculture and livestock-based livelihoods, with agricultural-based livelihoods playing a critical role. A sizeable share of households (85.2 per cent of total population in the villages) are engaged agricultural activity while 22.6 per cent of total population are involved in livestock based livelihood activities and approx. 9.1 per cent of total population are involved as agricultural labour work. The dependence on non-farm based[13] livelihood is 8.7 per cent of the total population.

Table 4.4 Percentage of population as per Livelihood Sources

Village	Agriculture	Livestock (grazers/herders/etc.)	Craft and Trade/Artisanal workers	Machinery/Factory workers	Agricultural	Transport workers	Construction workers	Businesses	Government/Private service
Naharkheda	84	1.6	0	8	16	0	0.6	0.2	0.24
Umariya	98.7	100	0	0	0	0	1.3	0	0
Pipaliya Nankar	83.3	11.1	0	11.1	8.3	0	2.8	0	0.44
Palda	79.8	10.6	0.4	0	8.5	2.1	1.1	0.3	0.11

Source: Village Profiling 2020

Out-migration has been reported by 9 per cent of the total households in the Project villages for livelihood, mostly this out-migration is for work in as a machinery/factory workers or transport workers.

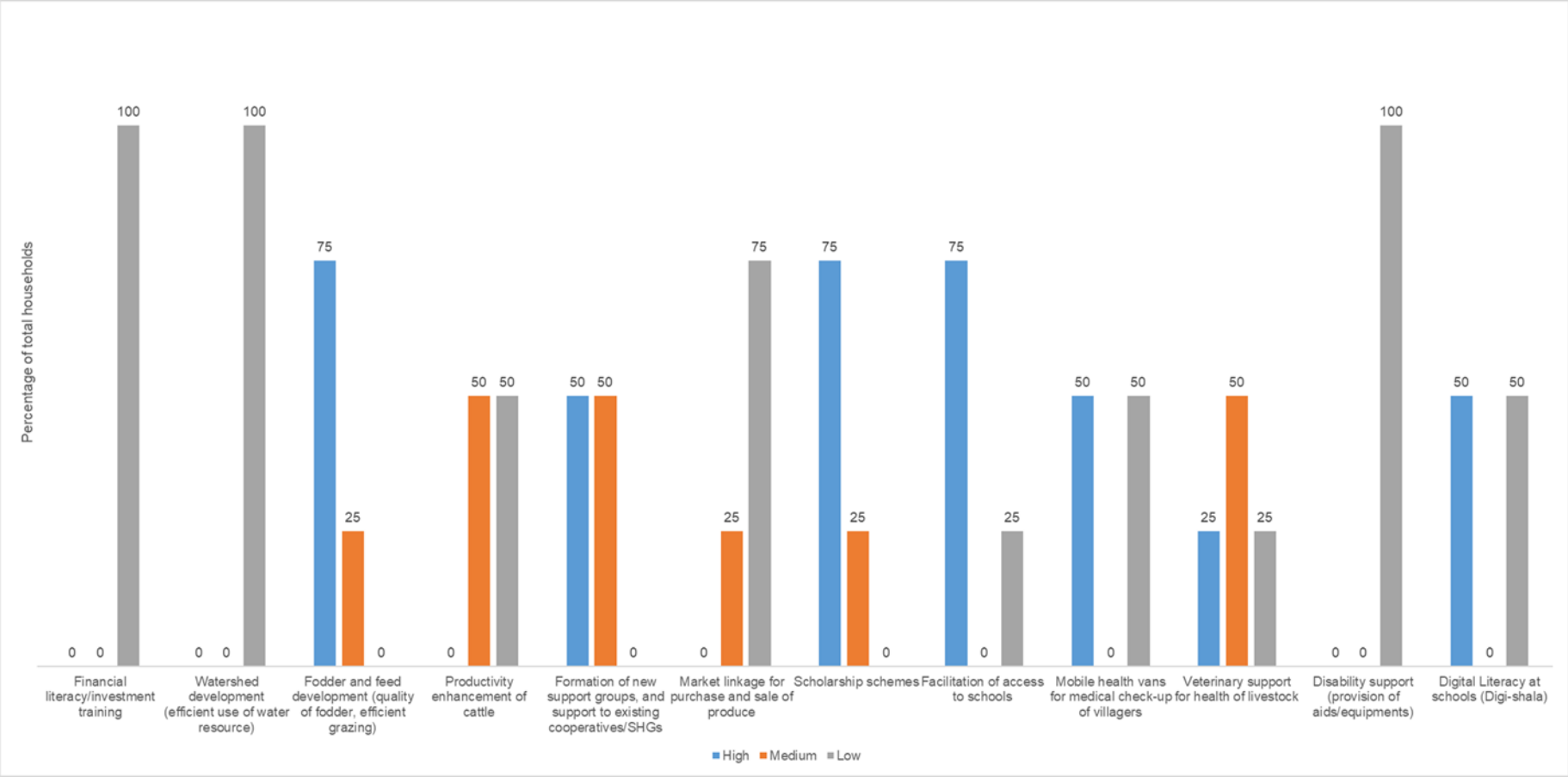
4.1.2.5 Community Development

Per the village profile, 100 per cent of the households in the village have access to water for drinking, household consumptions and irrigation purpose as well as access to electricity through grid supply. For education facilities, almost all the Project affected villages have school till primary level (5th standard). For further studies, children from the villages have to travel to Susner town, which is at approximately average 10 km away from the villages. Further, there are no medical facilities in any of the villages. The nearest medical facility is in Susner.

Findings from the village profile regarding the expected community support from the Project are presented in the figure given above. Based on this ranking exercise for community support programs, 75 per cent of households have given high rank to Fodder and Feed development, Scholarship Scheme, and Facilitation of access to school. Productivity enhancement of cattle, Formation of new SHGs and support to existing ones and veterinary support has received medium rank from 50 per cent of households.

[13] Machinery/Factory workers, transport workers, construction workers, involved in businesses and government/private services.

Figure 4.8 Preference for R&R Support (Unit 5)



4.1.3 Cultural Resources

There are no listed cultural resources, that are nationally or state-protected, are affected by the Project. The cultural resource in the area are primarily religious structures such as temples. Although none of these was noted to be within the proposed solar park boundary based on the aerial survey imagery, a final check for some locations, after adjustments to the boundary are made, will need to be confirmed, on-ground. There are small shrines of local deities and *Chhatris* (elevated dome shaped pavilions used as element of honouring a site of religious prominence) in the area. The details of cultural resources are given below in table

Table 4.5: 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	Recommendation for RUMSL
	Ladwan	Local Deity	As per the consultation with villages, the local deity is outside the Project Footprint, however, the physical verification was not done by the ERM site team	The ST community of the village worship the local deities (*Gwal* and *Nagdevta*) regularly and during festival season. Though the deities are worshipped primarily by the ST community, the people from other communities visit the shrine as well. The shrine of these deities are adjacent to the new colony on the outskirt of the village.	Tangible form of Cultural Resources	To be confirmed on ground-whether this is inside or outside the boundary. In case it is in the project boundary and cannot be avoided, alternative access needs to be provided or the heritage site to be relocated in consultation with the local community

4.2 Socioeconomic profile of the households surveyed in the Project Footprint

This section provides an overview of the socio-economic baseline of the surveyed project affected households (PAH) and sample households. The socio-economic profile is entirely based on the primary survey and consultations conducted in the 8 villages in all two units across Agar Solar Park in Madhya Pradesh. The villages surveyed in Agar have a distinct profile with different socio-economic characteristics. This section of report discusses the aspects related to education, livelihood, land and asset ownership, financial conditions, physical and social infrastructure amongst the PAHs. It also attempts to highlight different vulnerabilities amongst the population and their dependency on resources to understand involuntary resettlement impacts.

4.2.1 Demographics

The table below provides the demographic characteristics of the 138 PAH in the 11 villages.

Table 4.6 Demographic Profile of surveyed households

Village	Number of Households	Total Population	Sex Ratio[14]	Average Family Size	Dependency Ratio[15]
Unit 4					
Bijnakhedi	15	70	1158	5.1	72.7
Madhopur	11	65	1104	5.6	72.7
Kesai Dehariya	5	24	714	4.8	50
Pipalya Kumhar	3	15	875	5	66.6
Ladwan	NA	NA	NA	NA	NA
Karwa Khedi	NA	NA	NA	NA	NA
Dudhpura	NA	NA	NA	NA	NA
Unit 4 Sub-total	**34**	**181**	**1033**	**5.1**	**65.5**
Unit 5					
Umariya	36	186	823	5.2	66.07
Naharkheda	30	178	854	5.9	67.2
Pipalya Nankar	16	76	809	4.7	42.8
Palada	22	128	969	5.8	32
Unit 5 Sub-total	**104**	**568**	**862**	**5.4**	**52.01**
Grand Total	**138**	**749**	**896**	**5.1**	**58.7**

Source: HH survey 2020

The overall sex ratio among PAHs in Unit 4 and 5 is lower than the sex ratio of the district (949) and country's sex ratio of 940 females per thousand males. However unit 4 shows a positive sex ratio as compared to unit 5.

Looking at the dependency ratio, Unit 5 has a lower dependency ratio as compared to Unit 4. The potential reason for low dependency can be a high proportion of people engaging in income

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

[15] 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.

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 4.6** the average family size is 5.1. Among the surveyed households, 58.6 percent have up to 5 members in their family while, 41.3 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 nuclear families, with sons usually separating to set up their own household after marriage. This trend of nuclear families was understood to be higher among the younger generation who choose to live away from their parents. However, a variation across social groups also plays a role in the family sizes. Five (5) out of the seven (7) Muslim households have a preference of joint families. The lowest family size was reported was of 4.7 in Pipalya Nankar.

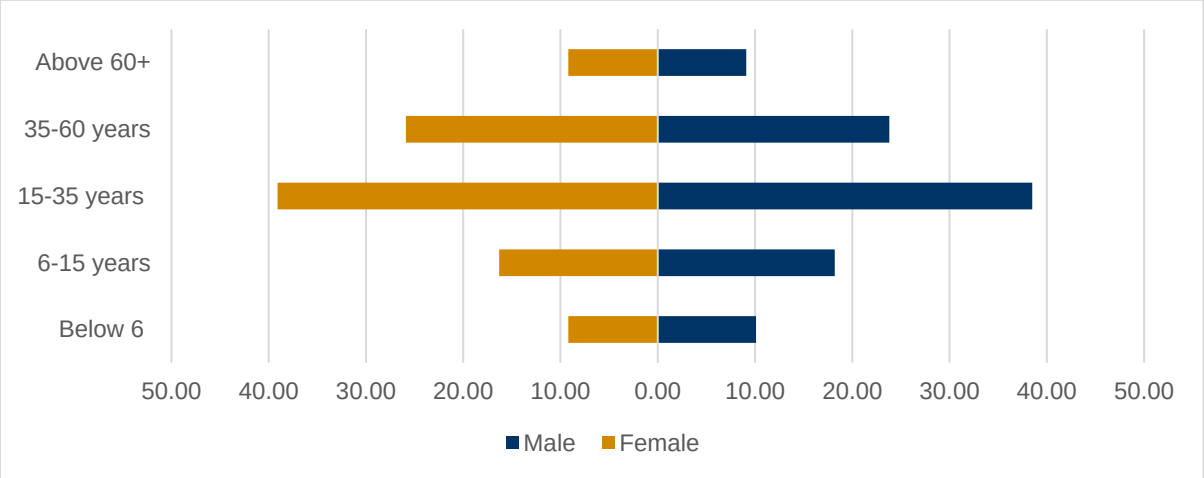
In terms of age wise population distribution, **Figure 4.9** shows that the majority of the population in the district is in the age group of 15-35, i.e. the youth population. The sex ratio among different age groups is detailed in **Table 4.7.** The population between the ages of 6-15 shows the lowest sex ratio among all age groups. As can be seen in the table, the sex ratio of children below the age of 6 and between the ages of 6-15 is relatively lower than those who are 35 years and above. Despite of several policies and schemes to promote gender development, these figures raise serious concerns towards gender equality in the area.

Table 4.7 Age structure of the population

Age group	Males	%	Females	%	Total	%	Sex Ratio
Below 6	40	10.1	33	9.2	73	9.7	825
6-15 years	72	18.2	58	16.3	130	17.3	805
15-35 years	152	38.5	139	39.1	291	38.8	914
35-60 years	94	23.8	92	25.9	186	24.8	978
Above 60+	36	9.1	33	9.2	69	27.7	916
Total	**394**	**100**	**355**	**100**	**749**	**100**	**887**

Source: HH survey 2020

Figure 4.9 Age-Sex Pyramid



Source: HH survey 2020

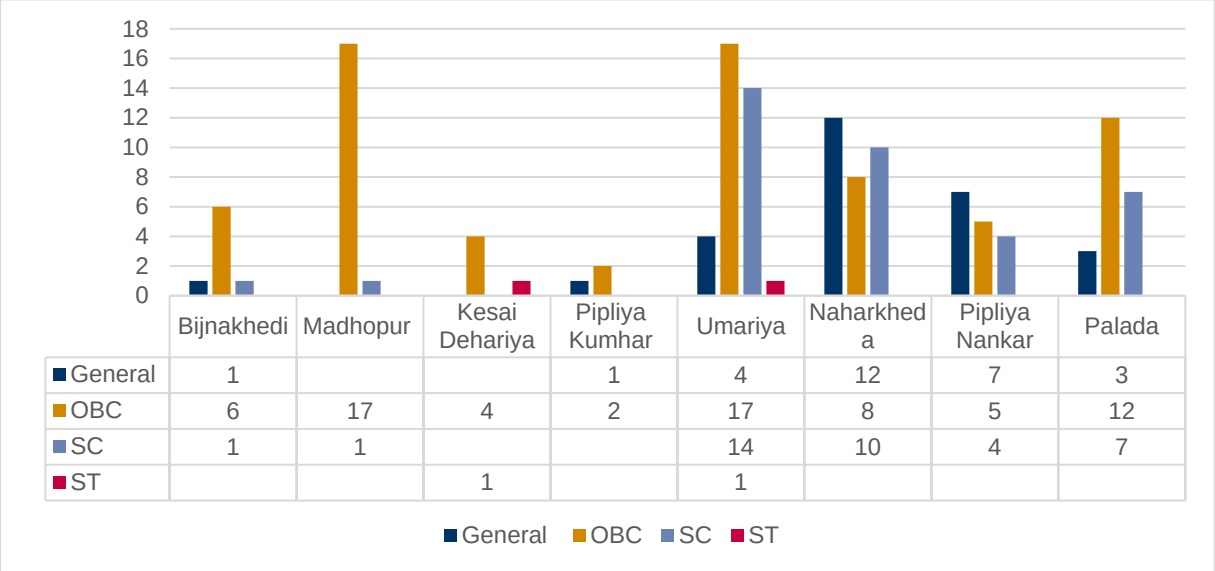
4.2.1.1 Religion, Caste and Ethnicity

Nearly 95 percent of the PAHs are Hindu while, the remaining 5 percent are Muslim households. The Hindu households have a higher sex ratio (902), as compared to the households in the Muslim category (869). The surveyed villages reported practice monogamy and the preferred norms of kinship are endogamous.

Social group profiling of the PAEs shows that 45 percent of them belong to OBC category households, and 29 percent belong to SC category households (out of 92 impacted households). There are no caste based differences observed in occupation/livelihood, however, landlessness has been observed to be highest among the OBC households (42 percent of the households) across the PAEs.

The division of social groups by village is detailed in **Figure 4.10.**

Figure 4.10 Social groups by Village



	Bijnakhedi	Madhopur	Kesai Dehariya	Pipliya Kumhar	Umariya	Naharkheda	Pipliya Nankar	Palada
General	1			1	4	12	7	3
OBC	6	17	4	2	17	8	5	12
SC	1	1			14	10	4	7
ST			1		1			

Source: HH survey 2020

Though the surveyed villages have a mixed population from various social groups, the majority of the surveyed population belonged to the Other Backward Classes (OBC) category (51.4 percent) followed by Schedule Castes (SC) category (26.08 percent). The Solar Park has the lowest ST population (1.4 percent) as compared to other social groups, as can be seen in the **Figure 4.10**. As reported during the survey, ST households are present in Umariya (Unit 5) and Kesai Dahariya (Unit 4) only. The main caste groups amongst the surveyed households comprise of the Rajputs in General category, Banjaras and Sondhiyas in the OBC category, Malviyas and Meghwals in the SC category. Pinjaras, Fakirs, Multans and Mansuris are the dominant castes among Muslims. Among the OBC's nearly 24 percent Banjaras, followed by the Sondhiyas.

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. These extended hamlets are spatially segregated by caste hierarchy wherein the main settlement has dominant higher caste groups. . These extended hamlets are either called a baldi or a colony. There is no apparent in the livelihood profile, and regular life in the extended hamlets as compared to the main settlement.

The overall relationship of people in the village and these extended hamlets are cordial, but people residing in the hamlets have clearly demarcated areas with regards to common natural resources, particularly surface water bodies, and grazing land. The residents in the extended hamlets have separate areas for procurement of water and fodder. The residents' main village has an upper hand on such matters, as understood through consultations and their resources are closer to the village as compared to the resources of the residents of the extended hamlets.

Within these extended hamlets reside the minority population of the district such as Muslims, Harijans etc. Though some villages did have some geographical demarcation in the form of designated residential clusters on the basis of caste, Madhopur, Kesai Dehariya and Bijnakhedi had a mixed arrangement of clusters within the village itself where different castes resided.

, Umariya, Naharkheda and Pipalya Nankar in unit 5 have a semi-pucca road which connects the villages while Palda is located right next to the main road. However, the villages in Unit 4 are all located right next to a main road. Those living in the villages in Unit 5 travel up to 2-3kms (30-45 mins) to access their agricultural lands while those in Unit 4 take significantly lesser travel time to access their agricultural plots due to proximity to residential areas. With regards to grazing land for livestock, it was understood during consultation that residents travel up to 1-3 km from their village to access the designated grazing land to feed their livestock.

Figure 4.11 Residential structure in the villages

Source: RAP study, 2020

Most of the residential areas, including the villages 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 land parcels. These structures acted as temporary residences for the families of the land owners during farming season or as a shelter during bad weather.

Box 4.1: Changing settlement patterns

The profile of Dudhpura has changed over time due to construction of water reservoir and can be divided into pre-development of the dam, and post that period. The dam was constructed 15 years ago, prior to which Dudhpura had a large residential main village cluster of 900-1000 residents. Majority of the people had 1 – 2 ha of land with good agricultural productivity, as reported. The residents were economically well-off from their agricultural livelihood and were self-sufficient in food production. Nearly 15 years ago, it was reported that the village was approached by private sector developers, who were planning to make a dam in the area. These developers met the villagers and discussed their motive. People recall that over the following months, the main village of Dudhpura was vacated and the ancestral agricultural plots of the village residents were purchased at the market rates.
What once used to be the main village settlement is now a large reservoir. To cope with the loss of land the village split into three small hamlets around the reservoir, overlooking it. The villagers now

live in semi-pucca houses with approximately 0.01 - 0.2 ha of land holding. Their livelihoods were reported to be dependent on non-farm based sectors and their food sufficiency has also significantly reduced.

Source: consultations with the local community during RAP study

4.2.2 Social Group Dynamics

The district is characterised by a mixed population in terms of religion and social/caste groups, while Hindus are the predominant religion, 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 relationship across communities. Cultural activities are celebrated, across communities, and with participation by various groups.

In terms of decision making at the village level, even where people from "lower castes" are the elected representatives of the village as per the 73rd amendment[16], However, the traditionally dominant caste group members of the panchayat hold the decision making power in the villages. For example, in Naharkheda in Unit 5 had a sarpanch who is a Dalit in the SC category and the previous sarpanch of Bijnakhedi, for the past 7-10 years, has been a Muslim woman. However the decision making authority in both villages continue to be the village elders belonging to the general category who act as advisors or 'committee members'.

Box 4.2: Spatial segregation by Caste Groups

Umariya Village in Susner tehsil, has one temple in the heart of the village. The festivities in the temple are attended by everyone in the village, regardless of their caste group.
The Harijans (SCs) in the village live on one street, about a kilometre from the main village, called the "*Harijan Mohalla*". The houses on this street are *semi-pucca* and *kutcha* and in dilapidated state, compared to those in the main settlement, and belonging to households of the dominant caste groups.
Harijans of the village are expected to fetch their water from a source which is distant from the main source of water of the village. Though the interactions between the villages does not highlight this societal divide, the infrastructure and the separation of houses makes evident the caste, and associated economic differences.

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 4.8 Summary of Qualitative Observation on Social groups

Aspect	General	OBC	SC	ST
Settlement Pattern	Live in the main settlement.	Live in the main settlement but in the outskirts of the village on a particular street.	Live in a particular street in the outskirts of the settlement.	Live in the outskirts of the village.

[16] 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
Land Ownership	Mostly marginal holdings.	Mostly small and medium size land holdings.	Mostly small holdings.	Have marginal land holdings.
Literacy Levels	Nearly 40 percent of the population is literate with education up to higher secondary and in some cases, vocational training. The main reason for discontinuation of education is for household chores.	Nearly 35 percent of the population is literate and are educated till primary levels, few instances of education beyond secondary or higher secondary. The main reason for discontinuation of education is for household chores and work.	Nearly 40 percent is educated till primary and secondary levels. Few instances of vocational training. The main reason for discontinuation of education is for household chores.	Nearly 30 percent of the population is educated till primary levels. A few instances of vocational training. The main reason for discontinuation of education is for household chores or illness and disability.
Skill Levels	There are 2 persons, a couple who are masons (Rajmistris) in Umariya village.	There are 3 persons; a couple in Umariya and a 22 year old man in Palda who are artisans practicing weaving.	A 35 year old man in Naharkheda is an artisan who practices weaving.	None
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.	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 2% of this population has a government or teaching job.	People in the working age (15-60) participate mostly in agriculture, agriculture labour and construction work. Very few are engaged in government jobs, as drivers or have a business or shop.	People in the working age (15-60) participate only in agriculture and agriculture labour
Poverty Levels[17]	None[18]	Low (5.07 percent)	Low (0.7 percent)	Low (0.7 percent)
Gender Roles	Decision making authority in the household are the male head and the male members of the family.			Decision making authority in the household are the male

[17] Defined with respect to annual income reported by surveyed households.

[18] Low poverty levels- less than 25 percent of the population is below poverty line
Medium poverty levels- less than 50 percent of the population is below poverty line
High Poverty levels- more than 50 percent of the population is below poverty line

Aspect	General	OBC	SC	ST
(**Section 4.2.11**)	Women are responsible for domestic activities like cooking, cleaning, taking care of the children, washing and feeding the livestock etc. women are responsible for fetching water for the household and are anointed this role from a very young age. Young girls in most cases made to quit school post primary school for household chores. Men are responsible for activities outside the house, fetching firewood, going to the markets etc. Decision making authority in the household are the male head and the male members 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 outside the domestic space. Young girls in most cases made to quit school post primary school for household chores. Men are responsible for activities outside the house, fetching firewood, going to the markets, livestock grazing etc. Decision making authority in the household are the male head and the male members of the family , despite women being the head of household in some cases. Women are responsible for domestic chores and household work. Young girls in most cases made to quit school post primary school for household chores. Men are responsible for activities outside the house, fetching firewood, going to the markets, livestock grazing etc.			head and the male members of the family , despite women being the head of household in some cases. Women are responsible for domestic chores and household work. Young girls in most cases made to quit school post primary school for household chores. Some 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 4.9.** The overall literacy rate of the surveyed population is nearly 57.6 percent. The village with the highest illiteracy rate is Madhopur (55.4 percent) while Kesai Dehariya has 37.5 percent of literate population.

Table 4.9 Literacy amongst surveyed population

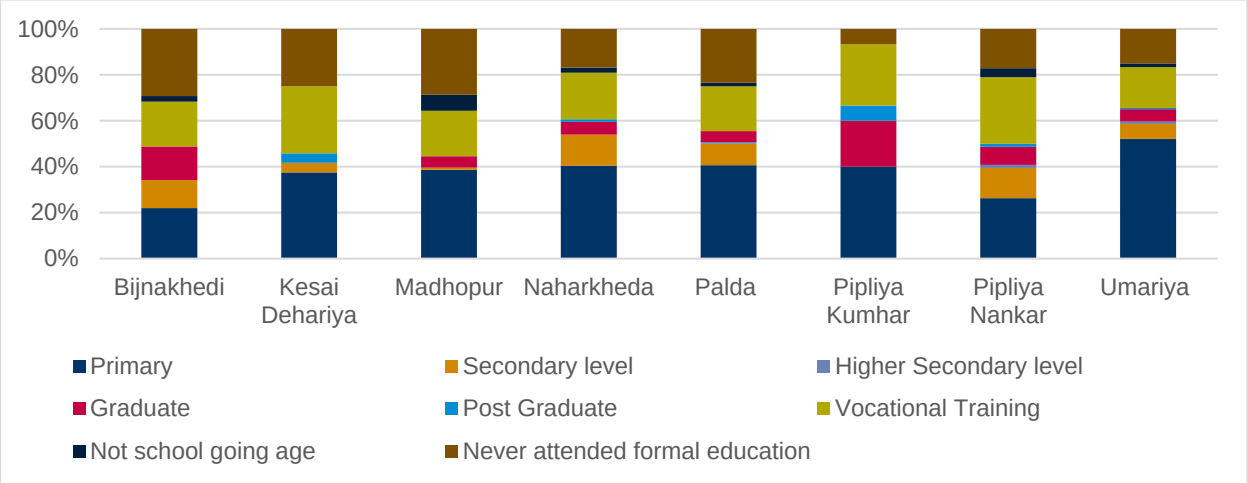
Categories	Illiterate				Literate			
Village	**Male**	**Male (%)**	**Female**	**Female (%)**	**Male**	**Male (%)**	**Female**	**Female (%)**
Unit 4 (Agar)								
Bijnakhedi	5	12.2	11	26.8	14	34.1	11	26.8
Madhopur	19	18.8	38	37.6	29	28.7	15	14.8
Kesai Dehariya	3	12.5	6	25	11	45.8	4	16.6
Pipalya Kumhar	2	13.4	2	13.3	6	40	5	33.3

Categories	Illiterate				Literate			
Unit 4: Average %	**29**	**14.2**	**57**	**25.6**	**60**	**37.1**	**35**	**22.8**
Unit 5 (Susner)								
Umariya	38	20.4	51	27.4	64	33.9	33	17.7
Naharkheda	22	12.3	34	19.1	74	41.5	48	26.9
Pipalya Nankar	14	18.4	16	21.05	28	36.8	18	23.6
Palada	23	17.9	33	25.7	42	32.8	30	23.4
Unit 5: Average	**97**	**17.2**	**134**	**23.3**	**208**	**36.2**	**129**	**22.9**
Total Average	**126**	**16.8**	**191**	**25.4**	**268**	**35.2**	**164**	**21.9**

Source: HH survey 2020

It is reported that 40.7 percent of the surveyed population have completed primary education and nearly 19.9 percent have never attended formal schooling. Only about 9.3 percent of the surveyed population have studied till secondary or higher secondary and only about 7 percent have pursued graduate or post graduate courses. A popular field of education among the surveyed households are informal vocational training. Nearly 20 percent of surveyed people reported pursuing vocational programmes.

Figure 4.12 Level of Education among surveyed population



Source: HH survey 2020

Looking at the educational infrastructure within and around the surveyed villages, while most children attend the government schools in or near their villages, there are a growing number of households who prefer sending their children to private schools rather than government schools. While Primary schools are reported to be relatively closer to the villages most children in Susner who are in secondary or higher secondary classes attend schools which are 5-6 kms away. Children cover this distance by foot, or in some case, use public transport. 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 Nalkheda, Shajapur, Susner, and in some cases, undertake residential facilities for courses in Indore or Bhopal.

Table 4.10: Age wise literacy levels among Surveyed households

Age group	Literate		Illiterate	
	Male	Female	Male	Female
6-15 years	63	55	9	4
15-35 years	132	85	20	54
35-60 years	53	14	41	78
Above 60+	13	5	23	28
Total	**261**	**159**	**93**	**164**

Source: HH survey 2020

Table 4.10**Table 4.10** indicates the learning gap between males and females in the Project footprint villages. Overall, 51.5 percent of the women are illiterate and of them, 78.3 percent did not get the opportunity to attend any formal educational institution due to household chores or traditional family rules, 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 allowed to study beyond primary school but nearly 22.2 percent gave up studies due to a death in the family or an illness or disability, while 16.5 percent of them left studies because of lack of interest. 22.7 percent of the male drop-outs are engaged in agriculture and labour work. A few households in Umariya, Palada and Madhopur had children below the age of 10 who were going to school but also helping out in the fields.
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 villages in both the Units, specifically Umariya, Naharkheda, and Kesai Dehariya. Only about 0.9 percent of the PAPs reported practicing traditional artisanal skills, mainly practiced by the older population in the village and women in the OBC category. These traditional crafts mostly relate to weaving. Apart from the traditional crafts, there are welders and *Rajmistris* (masons) who practice their craft as means of livelihood but have not obtained any formal certification for the same.

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[21]

Over the years, there has been a change in agriculture and cropping patterns in the area with regards to increase in multiple cropping (highlighted in **Section 6)** per land parcel due to reduction in available area for agriculture. The available land has reduced due to pressure of increasing hamlets/settlements and land procurement for development projects.

[21] This section takes into consideration the PAH with land holding only, the sample households mentioned in 4are not taken into consideration as they are landless.

Box 4.3: Prior experience with displacement due to an infrastructure project

In Kesai Dehariya, Unit 4, a private sector dam has been built near the village a few years back. The dam was built for energy generation and irrigation. The dam led to the acquisition of agricultural land of the village residents. In lieu of construction project, the village community was promised direct water access from the dam which however, did not happen.

The water has been directed to other industrial areas and has not been sourced to the village. It's been nearly 7 years and the residents of the village are required to travel up to one (1) km to fetch water for their household from the nearby pond. The loss of their ancestral land not only impacted their livelihood but also led to the loss of grazing land for many residents in the village. The residents of the village are now more dependent on seasonal migrant livelihoods and also have been forced to significantly reduce their livestock holding,

Source: Consultations with the local community during RAP study

The other villages in Agar tehsil who were surveyed expressed similar apprehensions of loss of land for grazing for their livestock and loss of livelihood overall.
As has been stated above, the land identified for the purpose of the project is comprised of primarily government land (90.5 percent), with a small sections of private land. Approximately 9.5 percent of land is private which also includes patta land (the extent is not known currently). All the private land owners are residents of Agar Tehsil. The land identified is comprised mainly of agricultural land and grazing land. **Table 4.11** details the proportion of PAHs across land holdings and **Table 4.12** details the same by village.

Table 4.11 Size of land holdings

Land Holding Size	PAH	PAHs (%)
Marginal Farmer (<1 ha)	33	35
Small Farmer (1-2 ha)	28	27
Semi-medium Farmer (2-4 ha)	24	26
Medium Farmer (4-10 ha)	8	9
Large Farmer (>10 ha)	3	3

Source: HH survey 2020

Note: the total number of PAHs with land are 96.

Table 4.12 Land holding amongst the PAHs by Village

Village	Marginal Farmer	Marginal Farmer	Small Farmer (1	Small Farmer (1	Semi-medium	Semi-medium Farmer (2-	Medium Farmer (4-10 ha)	Medium Farmer (4-10 ha) %	Large Farmer (>10 ha)	Large Farmer
Unit 4										
Bijnakhedi	1	50			1	50				
Madhopur			1	30	4	80	1	10		
Kesai Dehariya	1	50	1	50						
Pipalya Kumhar										

Village	Marginal Farmer	Marginal Farmer	Small Farmer (1	Small Farmer (1	Semi-medium	Semi-medium Farmer (2-	Medium Farmer (4-10 ha)	Medium Farmer (4-10 ha) %	Large Farmer (>10 ha)	Large Farmer
Unit 4 total	**2**	**13**	**2**	**25**	**5**	**56**	**1**	**s6**		
Unit 5										
Umariya	11	41	5	19	7	26	4	15		
Naharkheda	10	42	1	33	2	8	2	8	2	8
Pipalya Nankar	5	50	4	40	1	10				
Palada	5	31	4	25	5	31	1	6	1	6
Unit 4 total	**31**	**40**	**14**	**27**	**15**	**19**	**7**	**9**	**3**	**4**

Source: HH survey 2020

Majority of the PAHs (34.7 percent approx.) are categorised as marginal farmers, owning less than one (1) hectare of land, while the PAHs with large land holdings (more than 10 hectares) are comprised of about 3 percent of the total PAHs. The large farmers are reported to be only in Unit 5 while marginal and small farmers are across both units. 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 among the marginal farmers, 45.4 percent of the PAHs belong to SC category in Unit 5 while all of the large farmers (with more than 10 hectares of land holding) belong to General category. Among the land owners with semi-medium land holding (2 – 4 hectares), 66.6 percent of them belong to OBC category. Analysis of land holding by gender shows that 6.06 percent of marginal landholding is by women headed households. Only one (1) woman reported to medium size of land holding in Madhopur.

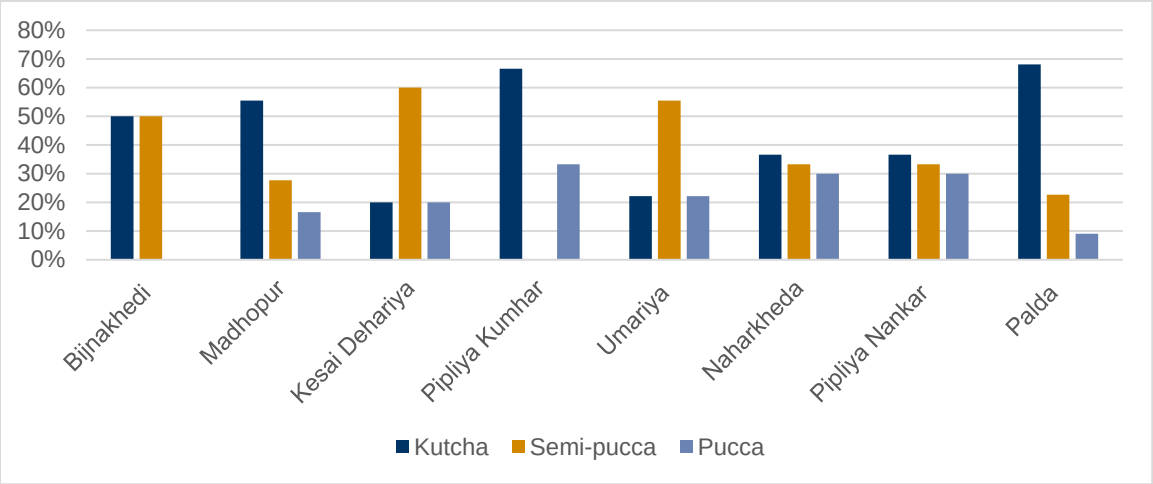
As mentioned before, the land holdings of PAHs, specifically in Unit 4, have reduced in size due to developmental projects in the area. 3 villages who were surveyed, for this reason, had reservations about this project. The residents of Dudhpura reported that they had lost nearly 60-70 percent of their ancestral land to the dam that was built in the place where their village once used to be. They were displaced from their village and now live in small hamlets around the dam with no benefits from the project. This has been accompanied by a reduction in the land used for cultivation and for grazing. This trend is expected to continue in the future.

This change in size of land holdings has also led to a gradual shift in primary occupation among people. The Banjaras in Madhopur and Bijnakhedi have reduced their dependence on land and land based livelihoods. Their main source of livelihood has shifted to being labour work in non-farm enterprises (casual labour work in cities, stone crushing quarries in other states) and business. The men in the Banjara community migrate to another state (Haryana, and then to Tamil Nadu) for major part of the year for work.

4.2.4.1 Nature of Primary Residence

Except for 3 residential structures, all residences are owned by the PAHs who also reside there. About 41 percent of the housing is of *kutcha* type, and 20 percent of PAHs have a *pucca* housing structure. There are 10 PAHs who have been allocated housing by the Gram Panchayat as part of the Pradhan Mantri Awas Yojna scheme. Of these, six (6) are in Madhopur and the remaining in Kesai Dahariya.

Figure 4.13 Types of Housing



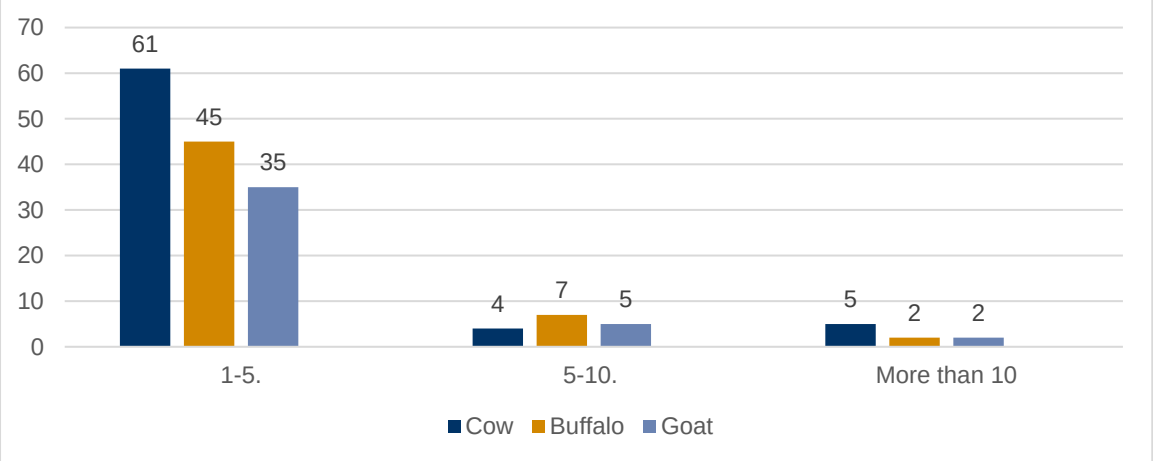
Source: HH survey 2020

4.2.4.2 Livestock Ownership

The PAHs are characterised by livestock holdings of cows, buffaloes, goats and sheep with the most common being cows and buffaloes. The dependence on livestock is mostly for household consumption along with the sale of dairy products, especially milk. Cows, buffaloes, and goats are the milk animals. **Figure 4.14** 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 head of livestock. The social group bifurcation of ownership shows no apparent difference in ownership. 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. Households from general and OBC categories are also better off and have more land. The other reasons for significantly low ownership of buffaloes are:

- the purchasing cost of buffalo is very high, reportedly the cost of a buffalo varies from INR 70,000 to 100,000;
- the cost of veterinary support is high for buffalo;
- buffalo need more fodder as compare to cow and goat, therefore in the dry season it is very difficult for low income earning household to purchase fodder for buffalo

Figure 4.14 Type of Livestock holdings amongst the surveyed households



Source: HH survey 2020

4.2.4.3 Poultry Ownership

Some, 5 households own poultry, all of whom have 5-10 poultry. 2 of these households are in Palda while 3 are in Madhopur and 80 percent of them are in the OBC category.

4.2.4.4 Other Movable 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 4.13 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%
Unit 4										
Bijnakhedi		0	4	50%		0	3	37.5%	7	87.5%
Madhopur	1	5.5%	1	5.5%	2	11.1%	14	77.7%	11	100%
Kesai Dehariya		0	1	20%		0	2	40%	4	80%
Pipalya Kumhar		0	1	33.3%		0	1	33.3%	2	66.6%
Ladwan		NA		NA		NA		NA		NA
Karwa Khedi		NA		NA		NA		NA		NA
Dudhpura		NA		NA		NA		NA		NA
Agar Sub-total	**1**	**5.5%**	**7**	**27.2%**	**2**	**11.1%**	**20**	**47.1%**	**24**	**83.2%**
Unit 5										
Umariya	8	22.2%	18	50%	2	5.5%	18	50%	32	88.8%
Naharkheda	8	26.6%	10	33.3%	3	10%	12	40%	30	100%
Pipalya Nankar	3	18.7%	5	31.2%	2	12.5%	7	43.7%	16	100%
Palda	2	9.09%	8	36.3%	2	9.09%	16	72.7%	21	95.4%
Susner Sub-total	**21**	**19.1%**	**41**	**37.7%**	**9**	**9.2%**	**53**	**51.6%**	**99**	**96.5%**
Grand Total	**22**	**12.3%**	**48**	**32.4%**	**48**	**10.1%**	**73**	**49.3%**	**123**	**89.5%**

Source: HH survey 2020

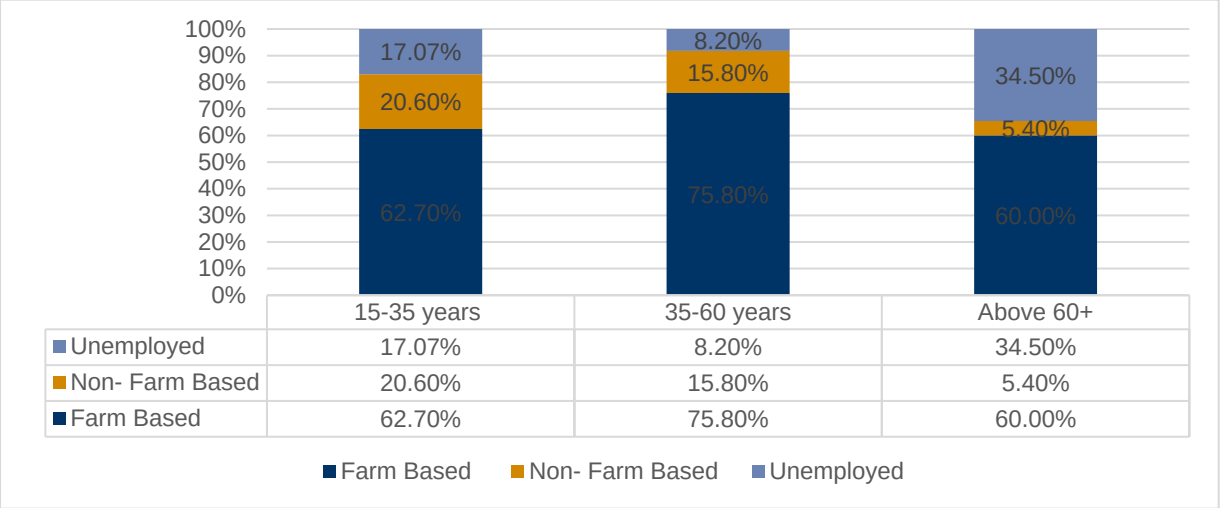
4.2.5 Livelihood Profile

Out of the 749 PAPs, 34.3 percent of the individuals have no current occupation. Out of these individuals 49.2 percent are below the age of 10 and about 7.02 percent are above the age of 60 and are thus, dependents. Apart from them, 48.8 percent of the PAPs are working of which, females constitute 30 percent. Housewives are not considered as a part of the income earning population even though they constitute nearly 35 percent of the surveyed population. The reason for the same is detailed in the below sections.

4.2.5.1 Primary Occupation

Looking at the primary occupation amongst the surveyed household, livelihoods across various age groups is given in **Figure 4.15.** 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 4.15 Primary livelihoods across Age groups

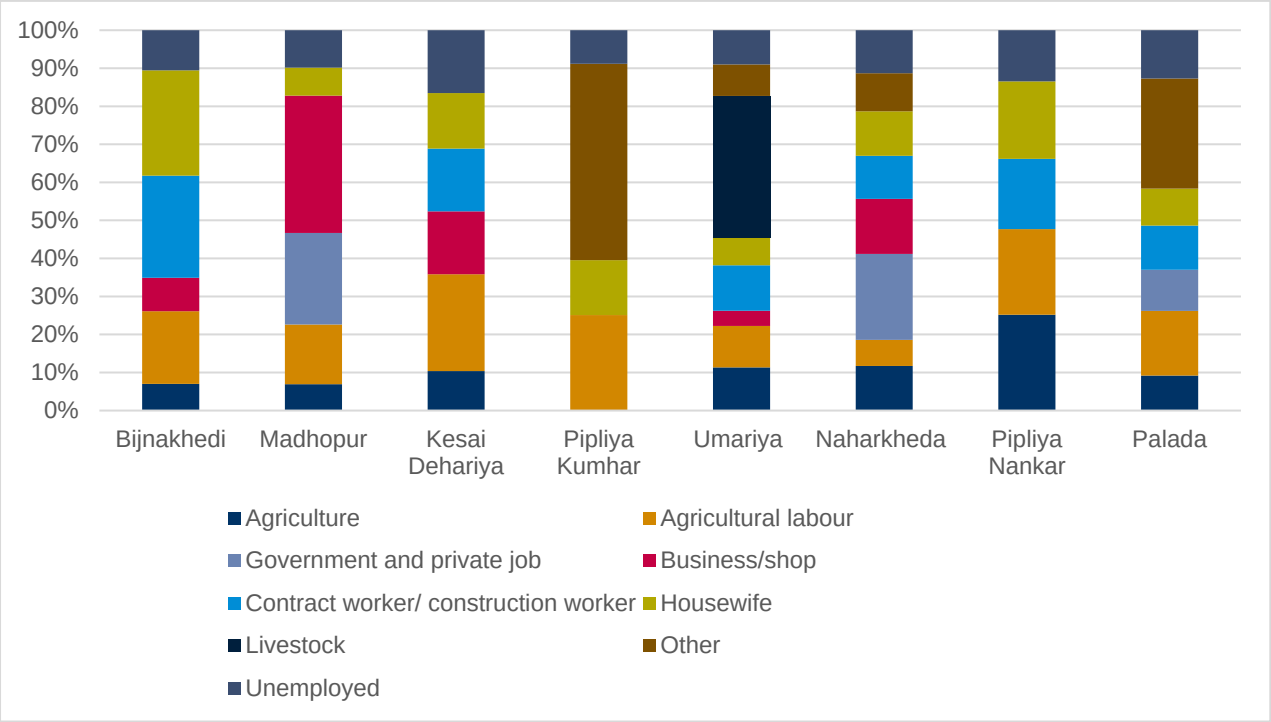


	15-35 years	35-60 years	Above 60+
Unemployed	17.07%	8.20%	34.50%
Non- Farm Based	20.60%	15.80%	5.40%
Farm Based	62.70%	75.80%	60.00%

Source: HH survey 2020

Figure 4.16 highlights the segregation of primary occupation within the surveyed villages. It can be understood that the most common primary occupation among villages is agriculture (23.6 percent), except for Pipalya Kumhar. Agricultural labour and livestock rearing is reported as the most common secondary occupation with nearly 14 percent of the PAPs engaged in the same.

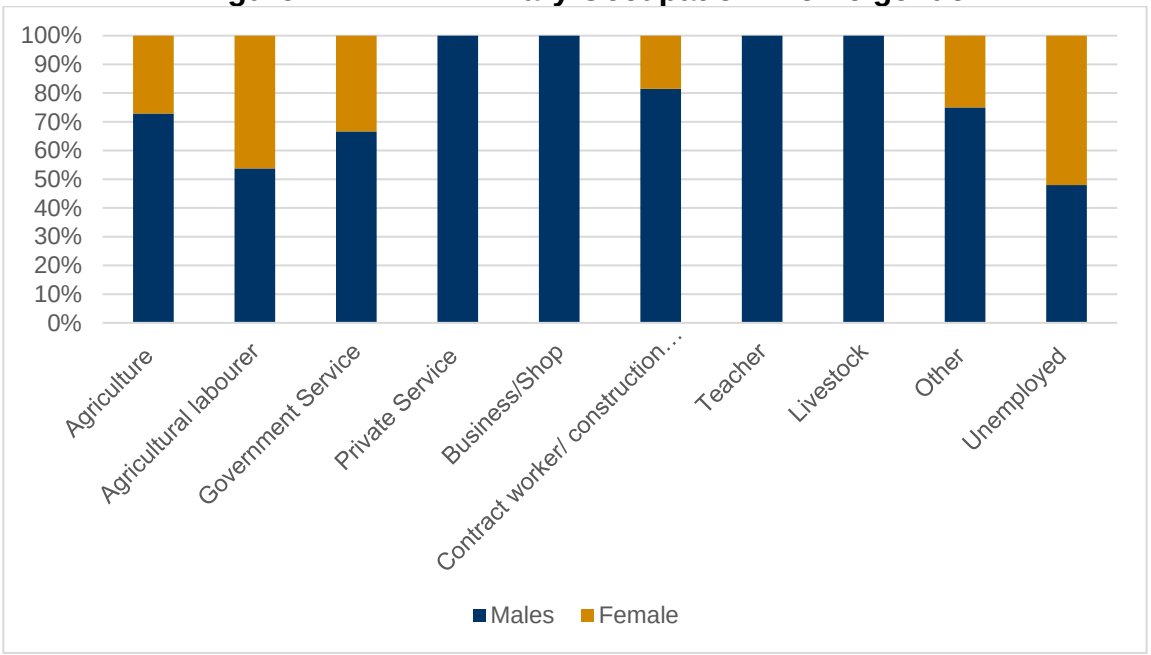
Figure 4.16 Primary Occupation Profile by village



Source: HH survey 2020

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

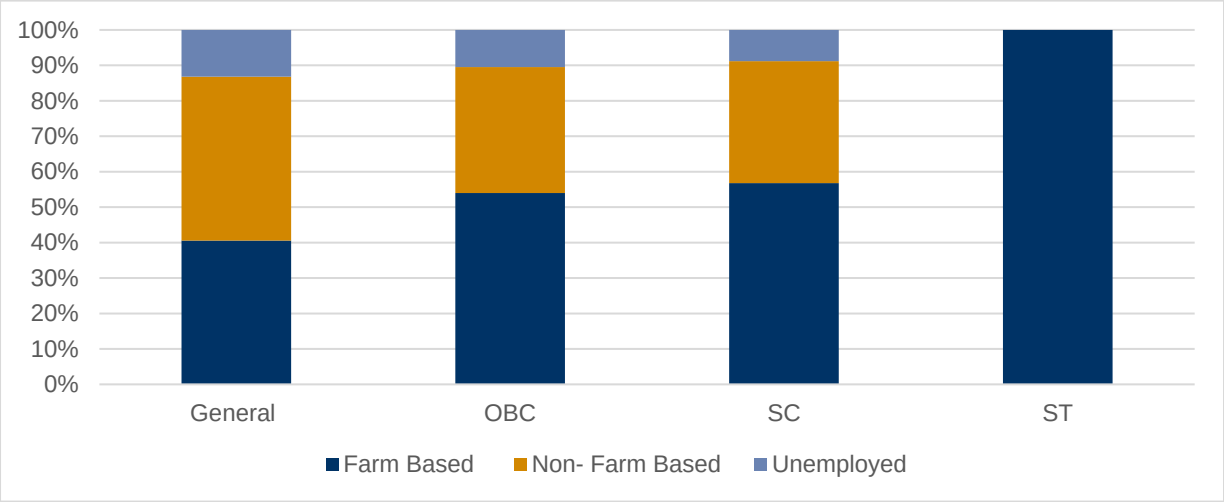
Figure 4.17: Primary Occupation Profile gender



Source: HH survey 2020

Lastly, the caste wise distribution of occupation in **Figure 4.18** a similar trend of preference of agriculture across different castes. It can also be seen that non-farm based activities are not very common among the ST households in the area.

Figure 4.18 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 4.15,** a large proportion of people engaged in agriculture are between the ages of 35-60. A comparatively 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 the village and the absence of monetary resources to pursue the same. Another reason for this is the absence of vocational training centres, graduate and post-graduate colleges in the area.

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 mentioned tables and as understood during consultations, the potential reasons 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 [22]annually and approximately INR 60, 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 4.15)**. Nearly 11.7 percent of the surveyed households work in non-farm based occupations as their primary source of income, of which 61.6 percent are between the ages of 15-35. The most common non-farm based occupation reported is small business or shop and working as a construction worker. The average annual income from a small business or a shop is INR 2, 17, 244.

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

Gender- disaggregation of non-farm occupation shows that non-farm based occupations are also male dominated. Among these, 42.8 percent of the business or shop owners are in the age group of 15-35 years. The potential reason for the lack of women participation in non-farm based activities might be the absence of opportunities. 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 in construction work: 17.8 percent of construction workers are female, mainly between the ages of 30-40 and 15-25. The average annual household income from construction work is approximately INR 60,780, annually.

The literacy levels among the non-farm occupation related workers is high. 64.2 percent of people who are construction workers are literate and have completed some form of graduate or vocational level of education. Similarly, 82.1 percent of business and shop owners are literate and have completed vocational level of education.

4.2.5.4 Migration

Over the years, the dependence on non-farm based activities has increased. It was understood that migrant labour has become a popular choice in the past decade. The Banjaras in Agar tehsil have shifted their dependence from agriculture to migrant labour and business. They travel to other states (Kerala, Tamil Nadu Maharashtra, and Gujrat) for up to 8-9 months of the year for their occupation. It was understood during consultations that the trend to migrate and work was a recent phenomenon. Even though the numbers of people who migrate are low, this trend is growing. The potential reason for the same is the lack of growth in agriculture and the need to venture out for money.

Nearly 16 percent of the PAHs have family members that migrate from their village to work in another district or state. Of the 16 percent, 31.8 percent are women. 86.3 percent of those of migrate, migrate outside their district. The most common occupation which they migrate for is labour work. Only 4.5 percent of the people who migrated, left their villages for a private job. The migrant workers send an average of INR 22,500 annually, as remittances to their families in the village. Of the people who migrated, only 50 percent of the workers returned during the COVID19 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 52.4 percent of the total surveyed population between 15-60 years of age are engaged in farm based activities. Of those engaged in agriculture, 52.6 percent are male and the rest are female. 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, Wheat, Maize, Kabuli Channa and Urad 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.

It was reported that during the previous year, due to high rainfall in the area, the entire district of Agar suffered significant losses of Soyabean productivity. This can be a potential reason for the above mentioned cropping pattern; uncertainty of weather. The damage has been seen in the picture below.

Picture 1: Soyabean cropping in the PF

Picture 2: Pests on soyabean crop

Source: RAP Study, August 2020

Figure 4.19, shows the proportion of surveyed households engaged in agriculture. Umariya and Naharkheda have the highest proportion of households who are engaged in agriculture. In Pipalya Kumhar, the surveyed households reported to agricultural labour work as their primary source of earning, supplemented by seasonal non-farm work on the other hand, have no households who are engaged in agriculture as their primary source of livelihood.

Figure 4.19 Households engaged in Agriculture by Village

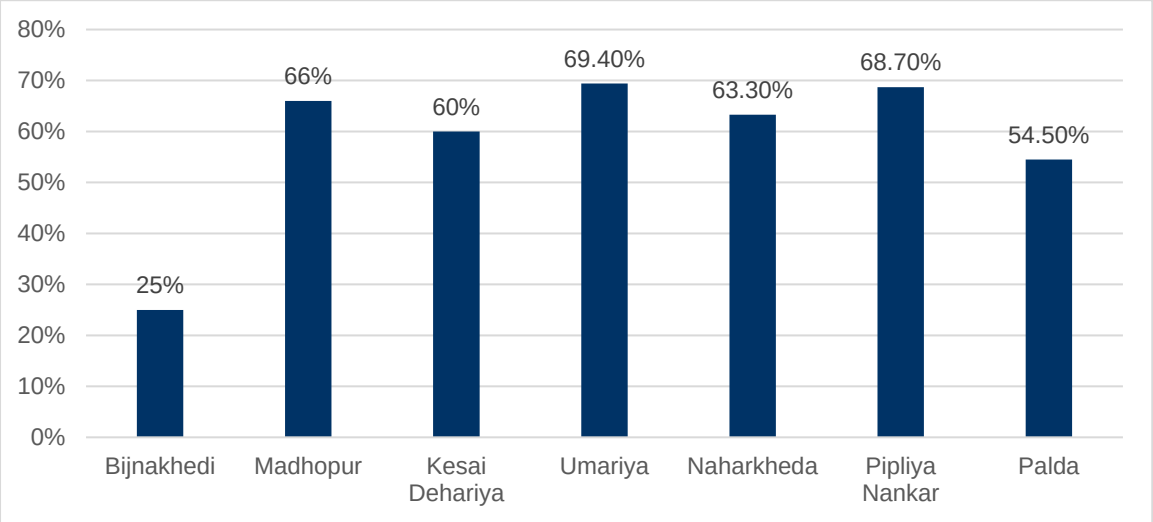


Table 4.14 Count of PAHs by cropping pattern

Unit	Village	Single Cropping	Double cropping	Triple cropping	Four, more than four crops
Unit 4	Bijnakhedi	6	6	NA	NA
	Kesai Dehariya	2	2	2	NA

Unit	Village	Single Cropping	Double cropping	Triple cropping	Four, more than four crops
	Madhopur Kheda	3	3		NA
Agar Sub total		**11**	**11**	**2**	
Unit 5	Naharkheda	11	10	5	5
	Palada	16	9	5	7
	Pipalya Nankar	12	12	5	5
	Umariya	25	17	8	9
Susner Sub total		**64**	**48**	**23**	**26**
% of total PAHs		**100**	**78**	**41**	**34**

Source: LA survey 2020

The table above, gives the detail of cropping pattern among households surveyed. Out of the 75 PAHs who undertake farming, 78 percent undertake double cropping in one agricultural cycle. Triple crop cycle or more is undertaken by 76 percent of the PAHs. Of the 75 PAHs, 20 percent are encroaching households who have higher number of crops (average of four crops), as compared to squatting households who cultivate maximum of 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 land. When we discuss the land utilisation among surveyed households who have land holdings, nearly 58.7 percent of the impacted households are informal users of government land and the rest are households owning either private or patta land. Among the households who are using government land informally, 91.3 percent undertake agricultural and horticulture activities, while 16.04 percent utilize such land parcels for both grazing along with agriculture. Of the 41.3 percent of the private and patta land owning households, 11.6 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 are rain water, open well, tube well, check dam and canal water. 43 percent of the surveyed households use rain water for 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 2 major crop cycles in the area are soyabean and wheat as 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. When there is less rainfall during the year, water from open wells are shared among surveyed in exchange for crop, i.e. water demand is shared in exchange for crop output.

4.2.6.3 Major crops and their productivity

Amongst the surveyed households undertaking cultivation 61 reported harvesting more than three (3) crops on their land parcels in the last year and only 8 reported harvesting single crops. 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 in the *Rabi* season. 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. However, due to excessive rainfall the entire standing crop was infested by insects causing excessive damage in the past year. Apart from soyabean, the other commonly grown crops in the district are wheat, maize, channa and dal, of which soyabean and maize are kharif crops and wheat, dal and channa are rabi crops. Approximately 97 percent of the PAH grow soyabean and nearly 76.5 percent grow wheat. Apart from the popular crops, many households also reportedly grow vegetables; onion, potato, ladyfinger, green chillies and coriander. The seasonal calendar is given below:

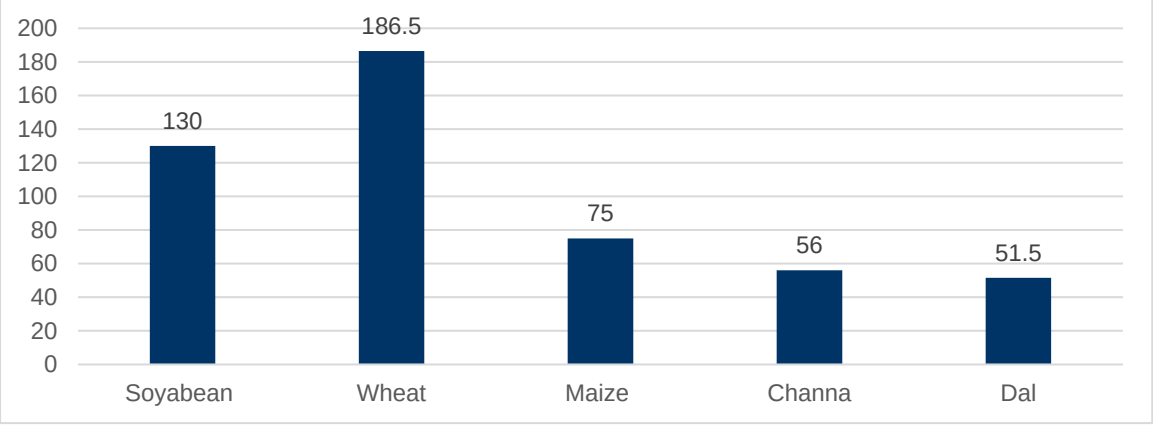
Figure 4.20 Seasonal calendar for major crops of surveyed households

	January	February	March	April	May	June	July	August	September	October	November	December
Soyabean						■	■	■	■	■	■	
Wheat	■	■	■	■						■	■	■
Maize						■	■	■	■	■	■	■
Channa	■	■	■	■						■	■	■
Dal	■	■	■	■						■	■	■
Lady finger				■	■	■	■	■	■	■		
Green chillies	■							■	■	■	■	■
Potato	■	■	■					■	■	■	■	■
Garlic	■	■	■	■	■	■	■	■	■	■	■	■
Onion	■	■	■	■	■	■	■	■	■	■	■	■
Coriander	■	■	■	■						■	■	■

Source: HH survey 2020

Apart from the four major crops listed above, the other crops grown include Maize, Mustard, Onion and Groundnut (in decreasing order of number of households reporting to cultivating these crops). Soyabean is the *Kharif* crop and acts as 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 kabuli channa 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.

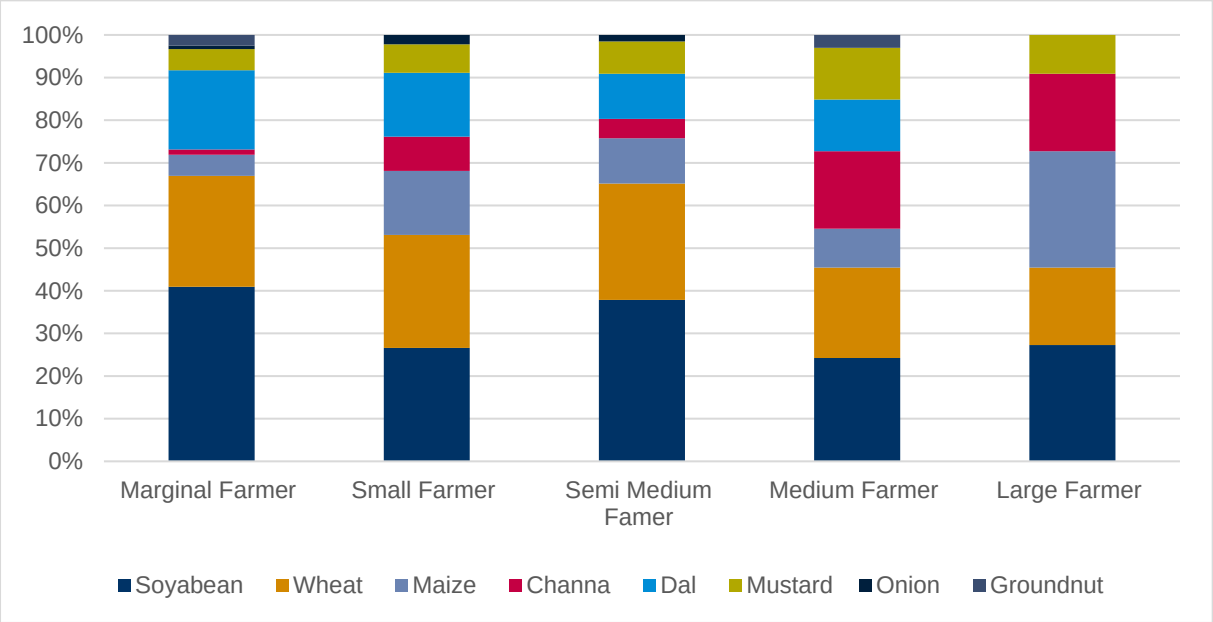
Figure 4.21 Crop Productivity per hectare (in Quintal)



Source: HH survey 2020

Looking at the crop production with respect to land holding size, **Figure 4.22** 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. Small and marginal farmers, despite their land holding size, grow multiple crops, which include vegetables. Nearly 7-10 percent of them sell these less commonly cultivated crops 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 50 percent of the major crops mentioned above are utilized for self-consumption and the rest are sold for income. Apart from soyabean, of which 20-30 percent of the output is kept for self-consumption, up to 50 percent of wheat is reportedly kept by many households for themselves. The discussion on subsistence is covered in **Section 4.2.6.4**

Figure 4.22 Cropping pattern amongst PAH by types of Farmer



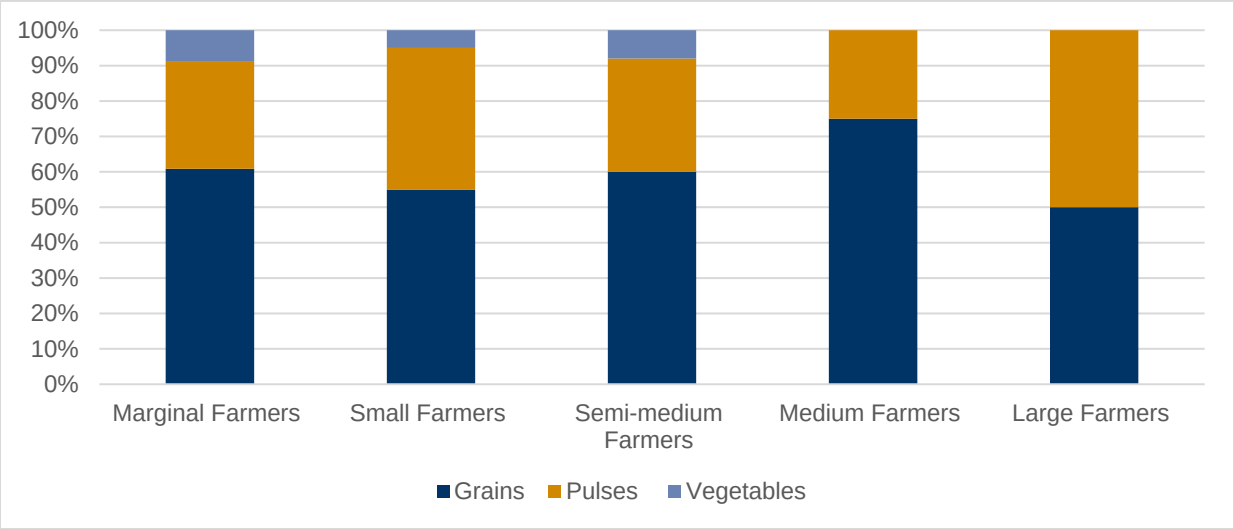
Source: HH survey 2020

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 – 84.05 percent of the surveyed households have a shortfall in production. This is followed by pulses - 76.8 percent of the surveyed households report that the pulses they cultivate are also insufficient, and nearly 61.6 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 (74 percent) and pulses (59.4 percent) while only 6.5 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 4.23**), 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. Semi-medium, medium and large farmers are most secure in terms of sustenance of grains and pulses as compared to marginal and small farmers.

Figure 4.23 Food security amongst PAH by Types of farmers



Source: HH survey 2020

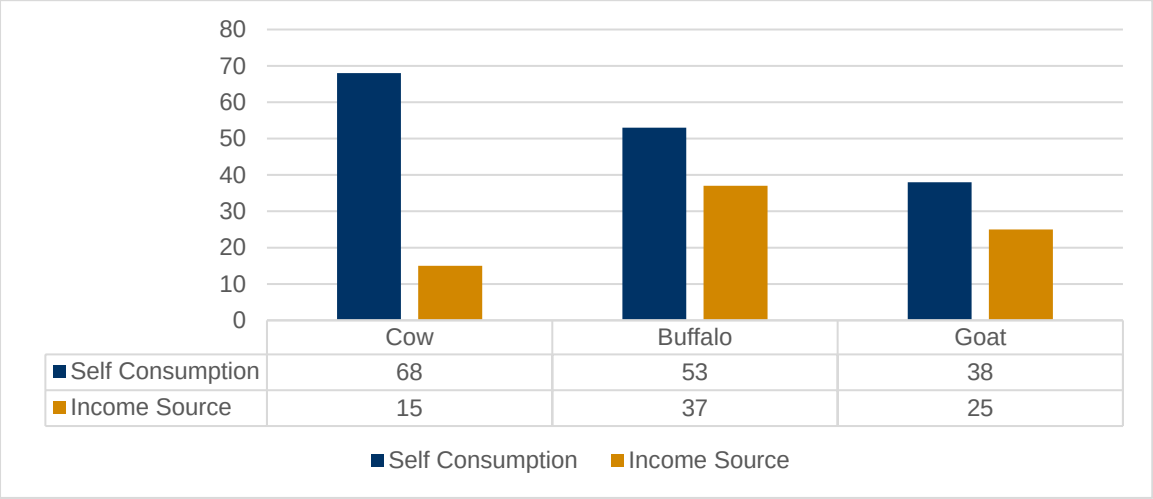
4.2.7 Livestock Rearing

Most households own cows. The breed of cows in the villages are Malvi[23] , 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 4.24 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.

Figure 4.24 Uses of livestock



Source: HH survey 2020

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

There has reportedly been a reduction in the number of cows, and buffaloes purchased for livestock due to reduction in grazing land, the cattle market becoming inactive and increasing dependence on market purchase of fodder (expenditure item). Another reason reported by the local community in lack of cattle and livestock trade is due to the emergence of *gau rakshaks* and incidences of violence against people that were transporting cattle. In Madhya Pradesh, there are cow protection laws which prohibit the slaughter and illegal transportation of cows. There have been cases there have been arrests made of people in the district for "illegally smuggling" cows under the NSA and Prevention of Cruelty to Animals Act[24]. This has also resulted in local communities transporting cattle in the middle of the night and abandoning them in nearby villages as well as along roads and highways. This has led to unintended consequences that include: an increase in *awara gai* (stray cows); collision with vehicles for cattle left astray on roads and highways and also increased instances of crop damage in villages that are made to receive these cattle. Majority of the cows graze on private lands, and/or available grazing land without any direct supervision. Abandoned cows are usually found on government land and may be tended to by some people from the village, although without any claim of ownership or responsibility. There have been reports of destruction of agricultural fields by groups of abandoned cows in some villages in Susner, especially in the last few years.

Box 4.4: The Case of Abandoned Cows

Stray cows are a common sight in villages in Unit 4 and Unit 5. . Large herds of cows amble around aimlessly, unclaimed. An increasing number of farmers have started setting their cows astray because of diminishing resources to feed them. These unprotected stray cattle, which once used to sell at a premium value are now an unproductive asset and a nuisance to farmers and villagers. Farmers are now forced to spend more money to protect their farm against these stray cattle which have damaged crops. They create a threat to farmers as they wander into agricultural plots and eat the crops. These stray cattle are a road hazard too. There are a number of government funded cow sheds but they are not a preferred by the farmers because the cattle are reportedly not ill-fed and improperly cared for.

A unique case has been observed in Umariya. The village has come up with a solution to this stray/abandoned cattle problem. The residents of the village pooled their resources and funded a *gaushala* for the stray cows. The cows are kept in a confined unit where they are fed and taken care of by the villagers all together. The cattle are taken for grazing by one person in the open fields nearby and in some seasons the residents purchase fodder for the cattle too. The dung are used by some households in the village as fuel. This development has led to lower crop damage by theses stray cattle and also reduced number of road accidents and near-misses.

Source: consultations with the local community during RAP study

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, 62.4 percent purchase fodder from markets to feed their animals, specifically for cows and buffaloes. 94.2 percent practice grazing on open government lands and 27.1 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 and increasing number of development projects in the area (**Section 4.2.4**). 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.

[24] https://www.newindianexpress.com/nation/2019/feb/08/nsa-against-2-for-cow-smuggling-in-mp-1935998.html

Table 4.15 Month wise dependence on Grazing land and Fodders

Livestock	Dependence on Grazing land and Fodders			
	Charnoi/Chargah	**Cultivate Fodder Parcels**	**Self-Grown crop residue**	**Purchased Fodder**
Cow	July to December	July to November	December to January and March to April	February and May to June
Buffalo	July to November	July to November	December to January and March to April	February and May to June
Goats/Sheep	January to December	July to December	December to January and March to April	February and May to June

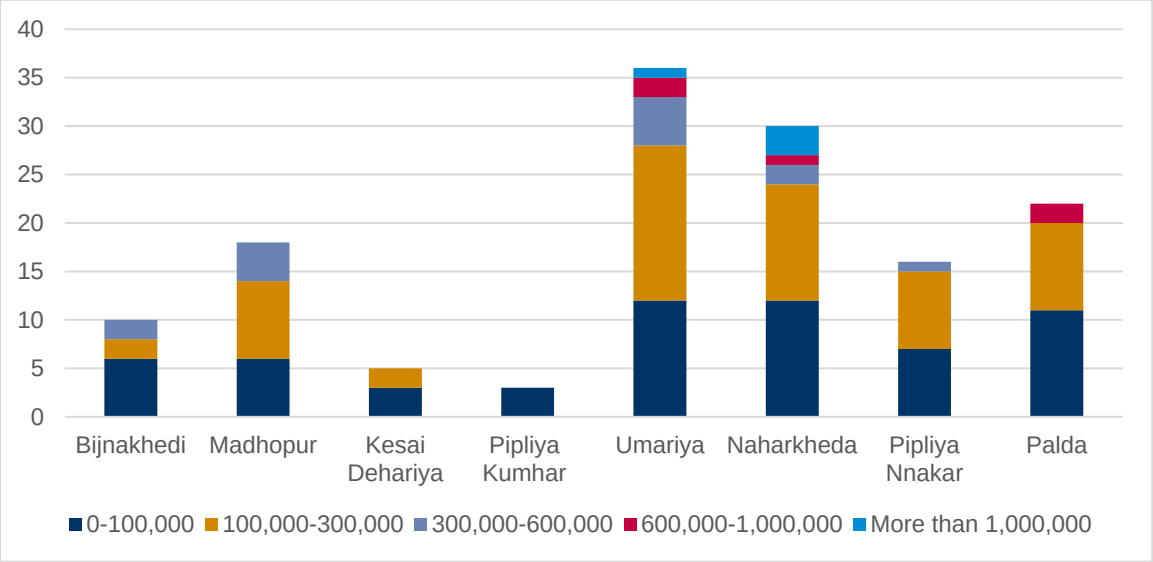
Source: Village Profiling and FGDs with Graziers

It was reported that male members of the households take livestock for open grazing. 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). Grazing is also undertaken by hired graziers, who are paid a fee per cow, and are responsible for tending to livestock of several households. This trend has become more prominent with increase in size of livestock per household. Men of the household have more time to invest in agriculture and/or agricultural labour work. On the other hand, women of the household are responsible for management of health and hygiene of the livestock, and invest time on stall feeding, washing, over and above to the time dedicated to agricultural labour work.

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 income.

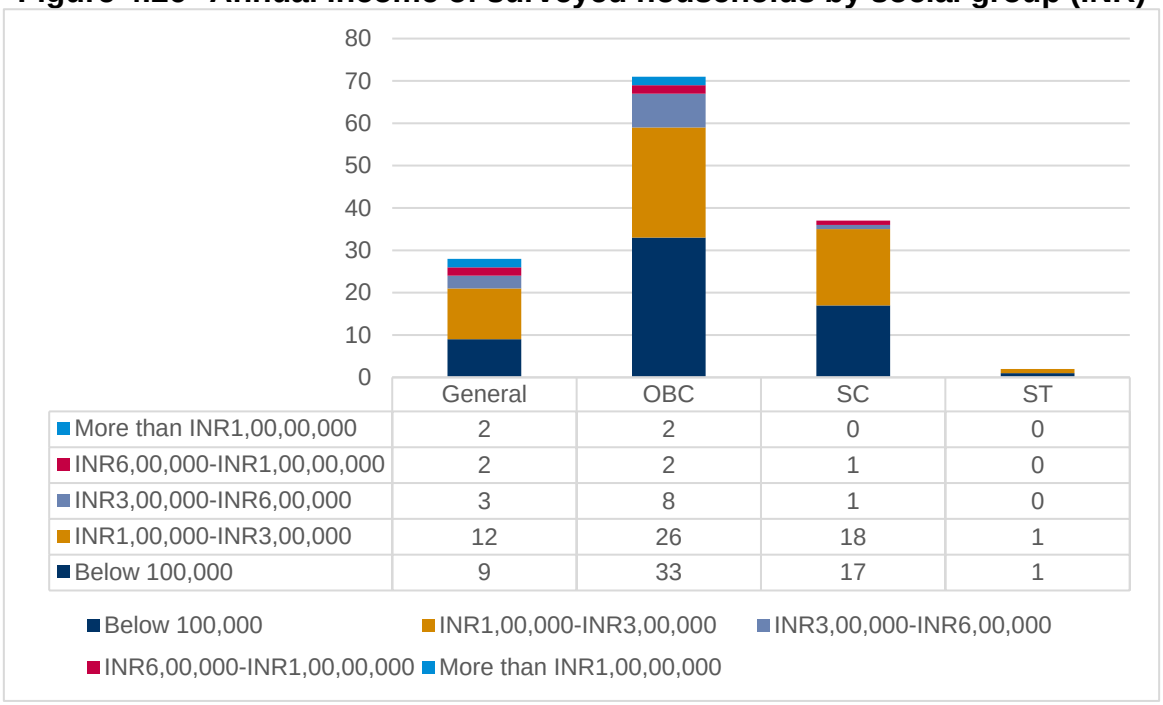
Figure 4.25 Annual income of the Surveyed Households (INR)



Source: HH survey 2020

The income across different social categories among surveyed households are detailed in Figure 4.26.

Figure 4.26 Annual Income of surveyed households by social group (INR)



	General	OBC	SC	ST
More than INR1,00,00,000	2	2	0	0
INR6,00,000-INR1,00,00,000	2	2	1	0
INR3,00,000-INR6,00,000	3	8	1	0
INR1,00,000-INR3,00,000	12	26	18	1
Below 100,000	9	33	17	1

Source: HH survey 2020

The average annual gross income reported from agriculture is INR 2, 73,497, while that from the government or private job was reported to be INR 94,740. The average income from livestock activities was reported as INR 87,820. Another important source of income for the PAHs is business activities, with an average annual income of INR 217,244. 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 I, 84,604).

Table 4.16 and Figure 4.27 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 dependence of this data on recall ability of the respondents and the general trend towards over estimating the expenses incurred in comparison to income.

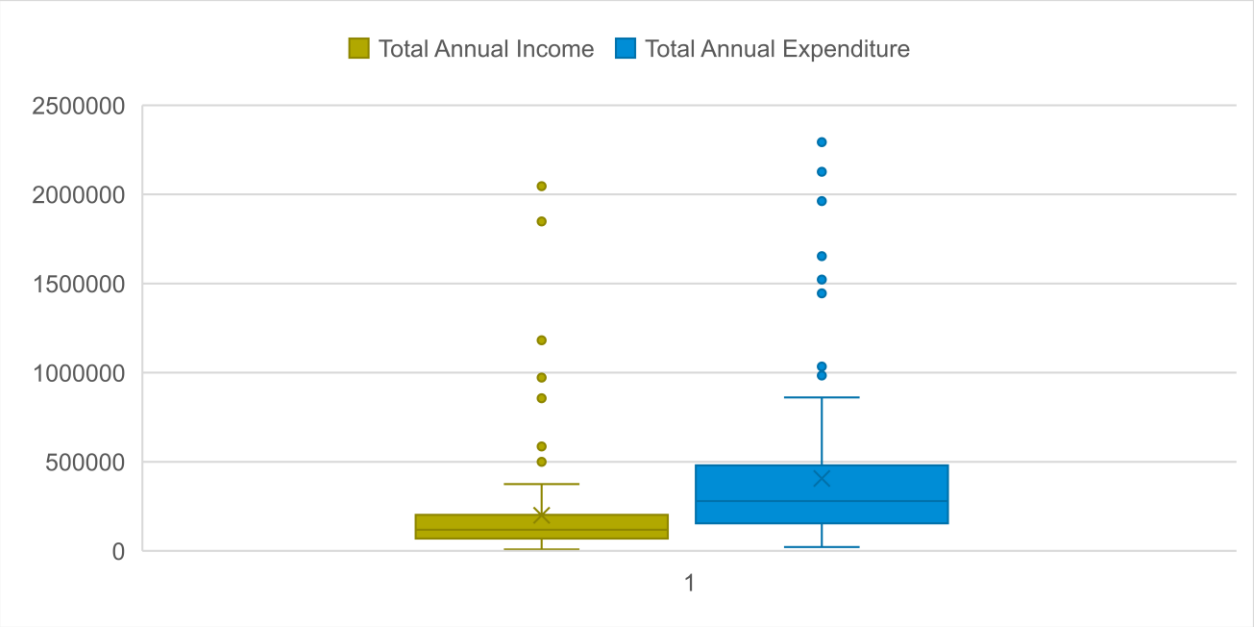
Table 4.16 Average Annual Expenditure by Income group (INR)

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	237,739	22,000	1,82,400	599,050
100,000-300,000	454,829	57,775	316,460	1,141,200
300,000-600,000	659,957	175,000	496,700	1,158,040

Income Range	Average Annual Household Expenditure (INR)	Lowest Annual Household Expenditure (INR)	Median Annual Household Expenditure (INR)	Highest Annual Household Expenditure (INR)
600,000-1,000,000	1,415,690	983,650	1,445,300	1,962,300
More than 1,000,000	2,281,812	278,000	692,730	5,861,600

Source: HH survey 2020

Figure 4.27 Income-Expenditure Comparison

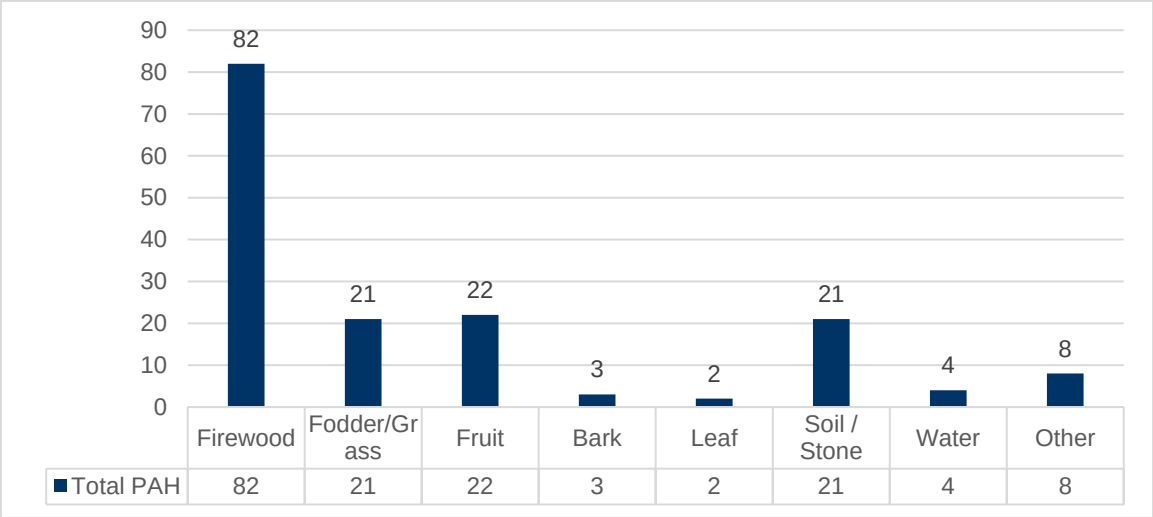


Source: HH survey 2020

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 4.28

Figure 4.28 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 (65.2 percent of PAHs) and the nearby forest (32.9 percent of PAHs). The small percentage of households that collect leaves are OBC and SC households who use dried leaves as fuel in the kitchen and for selling *paan*, as reported during consultations. It should be noted that although no forest land is included in the Project footprint, the ease of access to the land may be restricted due to the Solar Plant boundary demarcation.

The gender dynamic play a key role in natural resource procurement too. While it is 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. The households reported collecting up to 100 to 150kgs of firewood each month.

Box 4.5: Gender segregation in natural resource procurement

Another common sight in the surveyed villages are young children fetching water or wood for the house. Young girls, from a very early age are expected to contribute to the household. They work with their mothers and learn the basic household chores from a very young age along with school work. One of the primary activities that they are responsible for from a very young age is fetching water for the household. From an age of 6-7, they travel on foot, up to 1-1.5 kms to fetch water. The boys, on the other hand, are expected to work on the fields and fetch wood from the forest and are functioned into the system by the older male members of the family. The socio-cultural set up of the village get epitomized in the gendered dynamics of everyday roles from a very early age.

Source: consultations with the local community during RAP study

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. A total of 341 trees are identified.

Table 4.17 Types of Tree plantations

Unit	Type of tree	Count
Unit 4[25]	Fruit tree young non productive	7
	Fruit tree young productive	28
	Fruit tree mature	4
	Timber Tree Above 45 cm DBH	140
Agar Sub-total		**179**
Unit 5	Fruit tree young non productive	6
	Fruit tree young productive	24
	Fruit tree mature	3
	Timber Tree Above 45 cm DBH	129
Susner Sub-total		**162**
Grand total		**341**

Source: LA survey 2020

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

Table 4.18 Tree species by use

Tree Type	Fodder	Fuelwood	NTFP	Other	Timber	Grand Total
Khejdi	3	NA	30	NA	3	**36**
Palash	NA	27	NA	NA	NA	**27**
Babul	NA	NA	9	NA	4	**13**
Neem	NA	1	NA	NA	20	**21**
Imli	NA	NA	NA	1	NA	**1**
Ber	NA	NA	1	5	NA	**6**
Peepal	NA	NA	NA	NA	2	**2**
Tendu	NA	NA	1	NA	NA	**1**
Others	NA	18		4	NA	**22**
Grand Total	**3**	**46**	**41**	**10**	**29**	**129**

Source: LA survey 2020

Table 4.19 Fruit species by productivity

Fruit Type	Young Non Productive	Young Productive	Mature
Guava	2	2	NA
Orange	NA	19	NA
Mango	4	1	NA
Nutmeg	NA	2	NA
Pomegranate	NA	NA	3

[25] The count of trees for private land parcels of Unit 4 has been estimated based on the findings in Unit 5

Grand Total	**6**	**24**	**3**

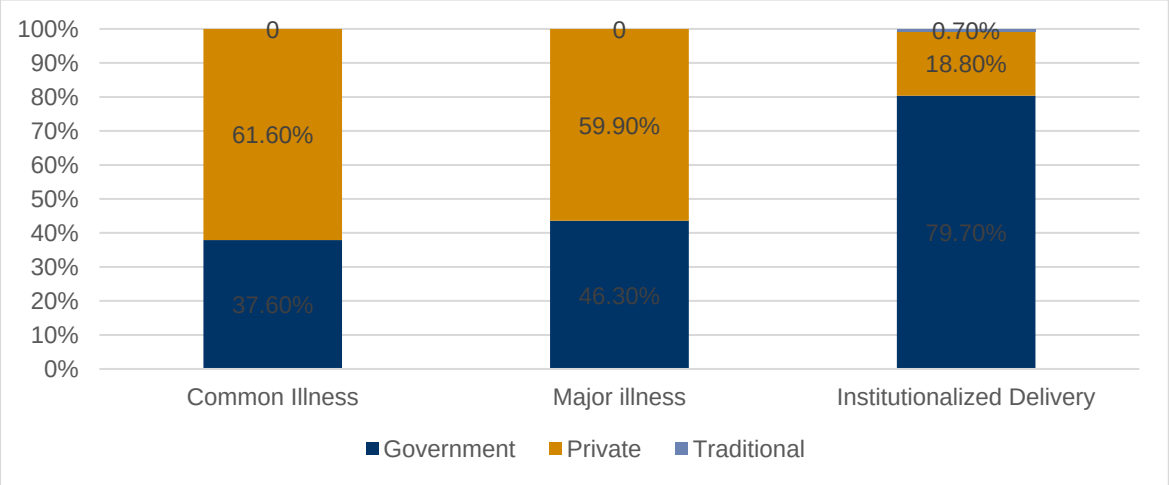
Source: LA survey 2020

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 4.29 Preference of Health care facility



Source: HH survey 2020

Amongst the surveyed households, more than 50 percent reported a preference for private facilities for medical treatment, in both common complaints and complex cases. It is understood that the preference for public facilities is mostly resultant from the cost implications of treatment at a private clinic/hospital. The distance of the facility also plays a contributing factor to the preference. 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, 70.8 percent of OBC and 50 percent of SC prefer to go to a private hospital for treatment of small illnesses. But only 39.4 percent of SC and 51.3 percent of OBC prefer private hospital for treatment of serious illnesses. They prefer to travel to a government hospital even if there is considerable distance from their village. One general category household in Pipalya Nankar reported a traditional delivery preference over private or government hospitals. Only 18.05 percent of OBC prefer to go to a private institution for delivery while 89.1 percent of SC prefer a private hospital for the same.

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

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

Table 4.20 Sources of Electricity

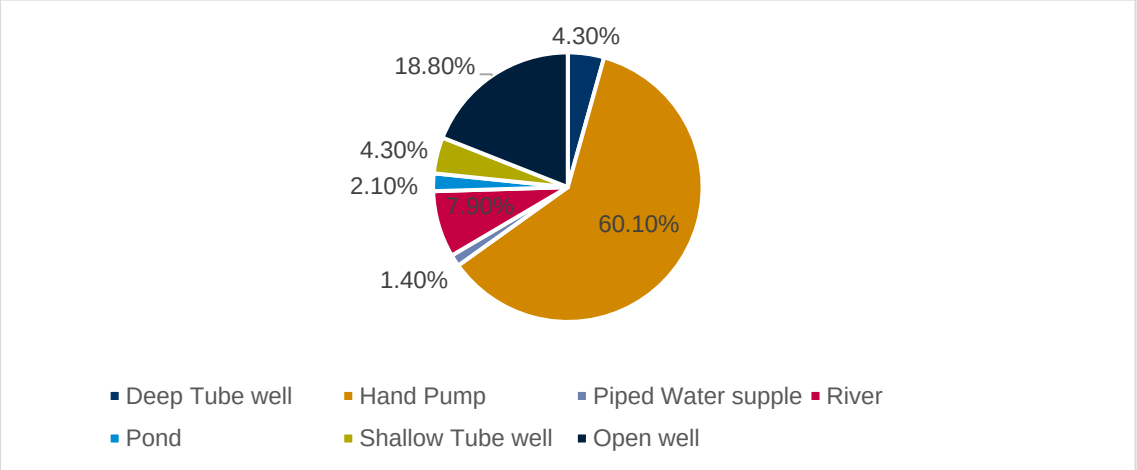
Type of access	PAHs	Proportion (%)
Government supply	135	97.8
Solar Panel	2	1.4
NA	1	0.7
Total	138	100

Source: HH survey 2020

The two (2) households that use solar panels for their electricity are in Pipalya Nankar and Kesai Dahariya.

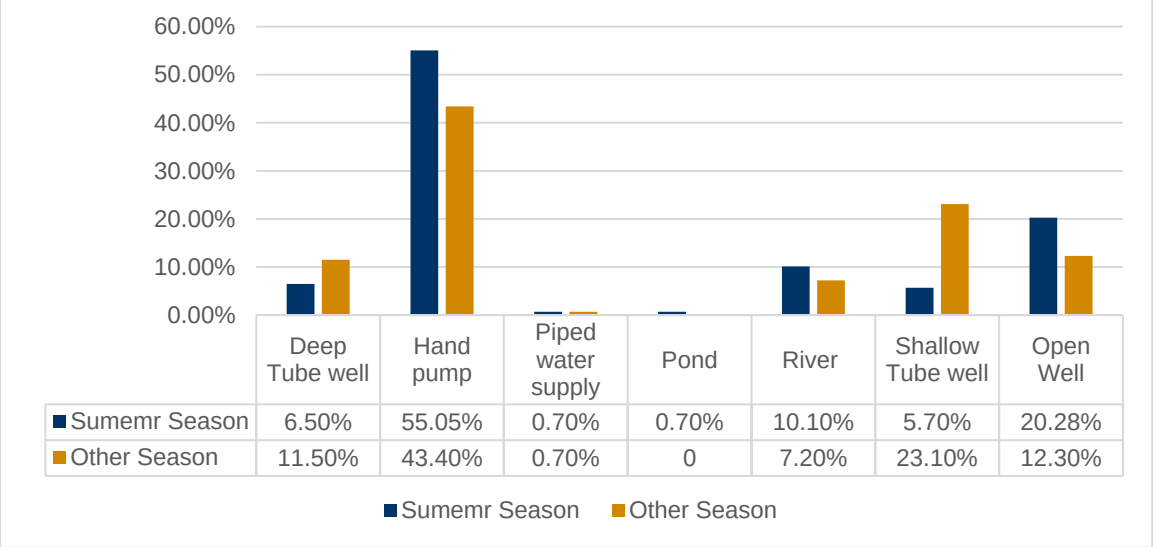
4.2.10.3 Drinking water and Water for household consumption

Figure 4.30 Source of Drinking water



Source: HH survey 2020

Figure 4.31 Source of water for household use



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 91 percent of the households experienced good water while 7 percent complained of water being of poor quality.

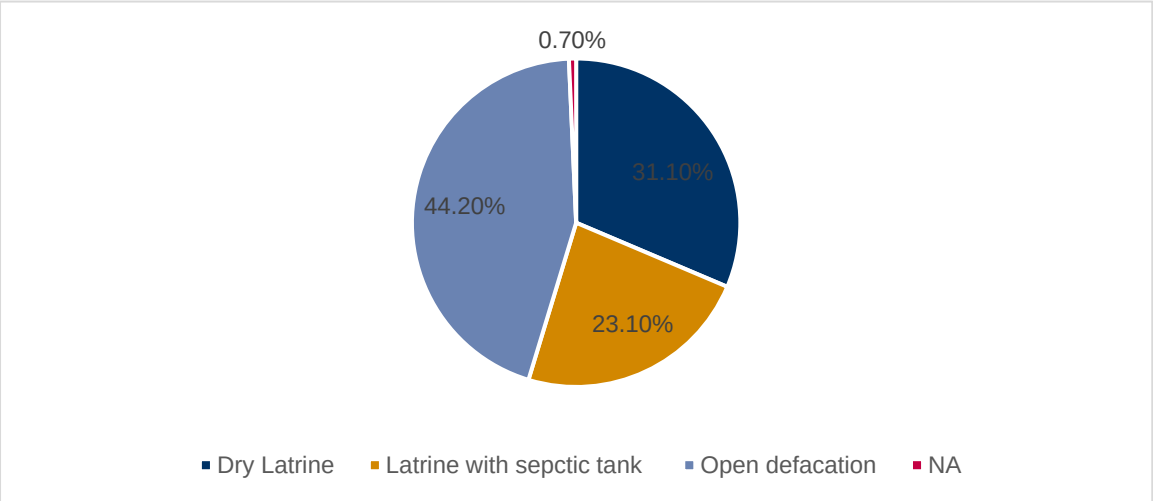
Of the total households surveyed, 50 percent reported having access to drinking water purposes and 22.46 percent reported to have access to water for household purposes at a distance of more than 100 metres. These comprise of those households dependent upon tube wells and hand pumps.

When it comes to scarcity of water, 47.1 percent of the households reported that they do not face any severe scarcity of drinking water for household. 31.8 percent reported that they face shortage of water for a period of 2-3 months during the summer season and 20.2 percent reported to face water scarcity for more than 3 months in summer

4.2.10.4 Sanitation and Wastewater Disposal

In terms of access to sanitation facilities, 50 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 4.32 Sanitation Facilities in households



Source: HH survey 2020

Of those who have latrine with septic tanks, 43.75 percent are in the general category and 6.5 percent each are in the SC and OBC category. Nearly 64 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 Unit 4 and Unit 5. During consultation it was understood that though almost every house has a toilet, most people prefer to 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 especially in the villages in Unit, specifically Madhopur.

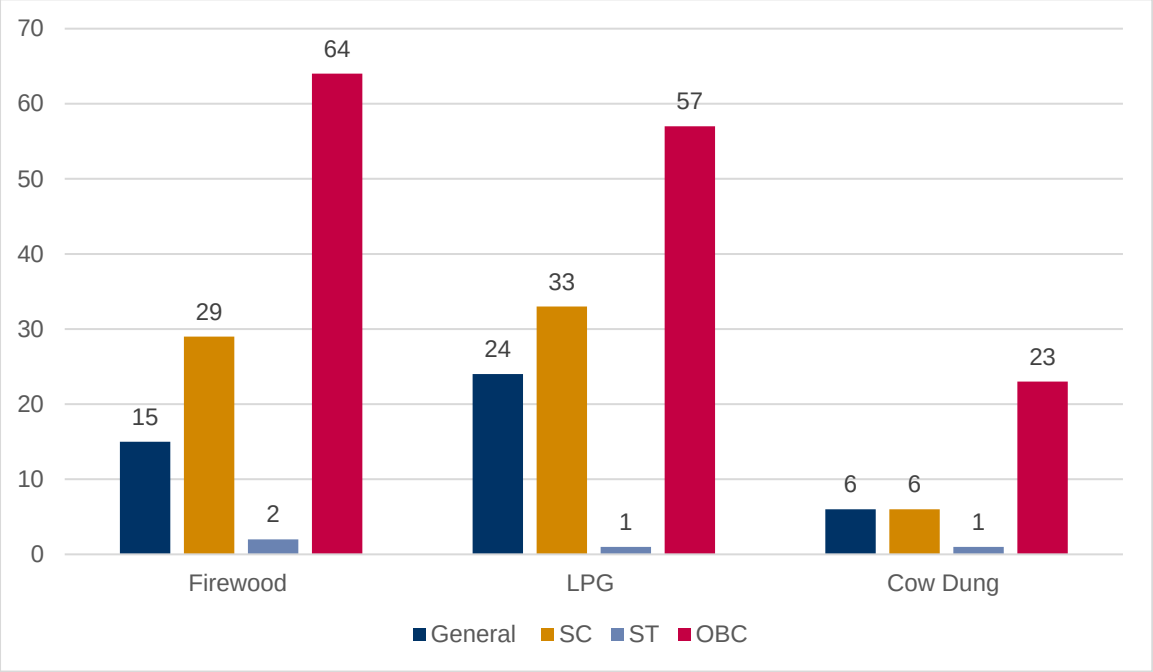
Box 4.6: The Swach Bharat Mission in Agar

As a part of the *swach bharat mission* mass construction of toilets were undertaken for each household (who did not have a toilet with the household premises). People do not prefer to use the toilets, primarily, because the toilets constructed and all 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 water facility for these toilets. The toilets are now defunct, due to the above reasons. The sanitation system of these toilets have made them categorically unusable in most houses which has led to an increase in cases of open defecation over the years.

Source: consultations with the local community during RAP study

4.2.10.5 Energy

Figure 4.33 Cooking Fuel Usage across Social Groups



Source: HH survey 2020

The graph shows the fuel requirement across surveyed households. It must be noted that 24.6 percent of the households use 2 sources of fuel and 23.4 percent of the households use 3 sources of fuel, thus, the above graph does not represent individual households. These households use a combination of LPG, firewood and cow dung. While LPG gas remains an unviable option for a substantial proportion of the surveyed households, there are growing concerns associated with the dependence upon fire wood as a cooking fuel. These concerns are primarily resultant from the decreasing availability of agricultural land (due to developmental projects in the area) and increasing market rates for fire wood. This can be seen in the fact that more than 50 percent of the surveyed households reported having to transverse a distance of more than 3 km for the procurement of fire wood.

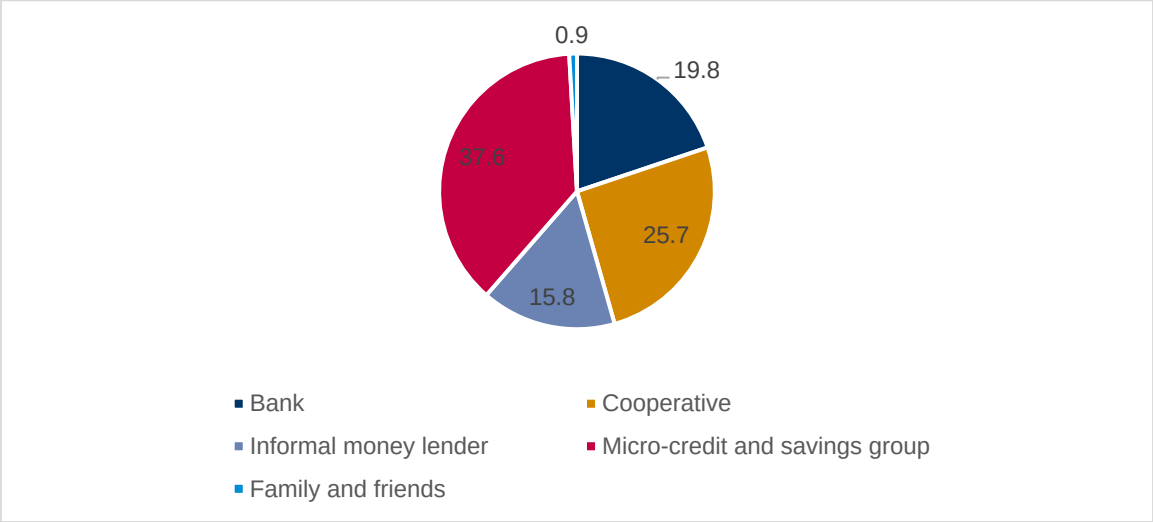
4.2.10.6 Markets and Market Linkage

Among the surveyed households, nearly 59 percent of the households have taken 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 home construction (33.3 percent). Those who took loan for

health and treatment (14.8 percent) also took loans to pay off another loan, for marriage or ritual, for expenditure on livestock and expenditure on agriculture.

The most common sources of loan are from micro-credit or savings group (46.9 percent). Nearly 24.7 percent of the surveyed households sourced their loan from the bank. Those who took a bank loan also took loans 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 4.34 Sources of Credit



Source: HH survey 2020

In terms of access to market facilities, nearly 37 percent of the surveyed households reported that they have a village facility within 500ms for their daily needs. 22.09 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 Unit 5. 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. 24.1 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. In Susner tehsil, the preferred market is in Susner city and in Agar Tehsil, the preferred market is in Agar city.

4.2.10.7 Memberships of Groups

Among the villages in the solar park, there is a prevalence of self- help groups (SHG). The most common of them is an SHG for buffalo procurement, whose members are pre-dominantly male. There are relatively few female SHGs in the area, most of them are non-functional the female SHGs are primarily for provision of monetary support for setting up small businesses. The potential reason for the non-functionality of these female led SHGs is the lack of coordination and support for management.

4.2.11 Gender Profile

As mentioned before, the surveyed villages have a traditional backdrop. The decision making authority is reserved with the men of the household. The men are considered to be the main earning member of the family even though the women contribute equally. Their economic stance in the domestic front gives them the natural authority within the household. Only 5.05 percent of households are headed by women. These households have the eldest woman as the head (mostly widows). Within these households as well, the eldest son, is reported to be the economic and subsequently social power holder in the family while the eldest woman simply holds position of the head.

Understanding the literacy levels among women, 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 reason or the same has been discussed in **Section 4.2.3.1.** The women headed households, too do not encourage females to study beyond middle school. The illiteracy rate among the project affected people is 42.3 percent and women constitute 60.2 percent of this proportion. The low literacy rate among women is due to a number of reasons; 73.4 percent of the women reported dropping out of formal education due to pressure of household chores followed by illness or disability (8.6 percent).

Box 4.7: Traditional gender biases

Across the two units, there were very few women who were comfortable in participating during the survey. Most women hesitated in answering any questions or even talking in the absence of the male member of their household. They were uncomfortable engaging with any outsider without their sons or husbands. This was a general trend across the villages. The women who interacted did so by veiling their face. It was uncommon to see women travelling or interacting with others without a veil over their head or in some cases, covering their face. This was a common traditional practice in the village and was expected of women specifically. The gendered traditions within these villages were almost always upheld by women and are very clearly evident in everyday practices within the villages

Source: HH survey 2020

As mentioned earlier, Madhopur and Bijnakhedi (Unit 4) higher proportion of women headed households. These households have relatively smaller family sizes as compared to the other villages. This has been an outcome of migration of male members (eldest male members) to outside the district for work. While the head of the household and the decision making authority is held by the eldest male members, the women are the decision makers and heads when the male head is away. The demographic characteristics of the women headed households are provided in the table below.

Table 4.21 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
Unit 4						
Bijnakhedi	1	14	1000	1150	5	5.5
Madhopur		11		1104		5.6
Kesai Dehariya	3	2	750	714	4.6	4.8
Pipalya Kumhar		3		875		5
Ladwan		NA	NA	NA	NA	NA
Karwa Khedi		NA	NA	NA	NA	NA
Dudhpura		NA	NA	NA	NA	NA
Total	**4**	**30**	**875**	**960**	**4.8**	**5.2**
Unit 5						
Umariya	3	33	600	770	2.7	5.5
Naharkheda		30		854		5.9
Pipalya Nankar		16		809		4.7

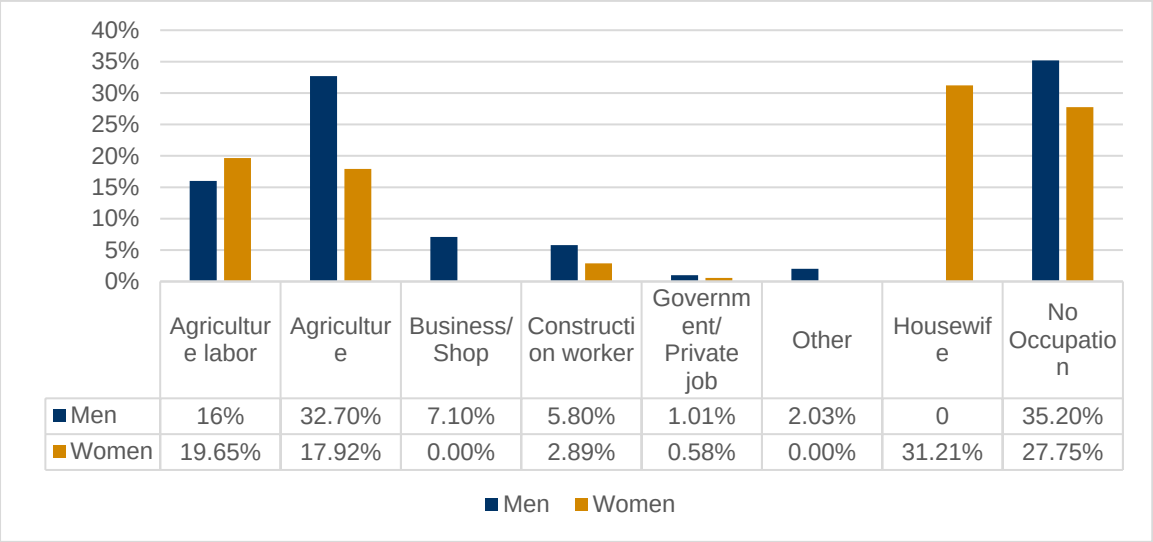
Village/town	Number		Sex Ratio		Average family size	
Palada		22		969		5.8
Total	**3**	**101**	**600**	**850**	**2.7**	**5.4**
Grand Total	**7**	**130**	**737**	**905**	**3.7**	**5.3**

Source: HH survey 2020

Nearly 20 percent of the women reported that their primary occupation as agriculture labour and 8.8 percent of them were housewives and construction labourers 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 negligible daily wage as compared to their male counter parts working along with them. In both cases, working women are not considered 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 (31.5 percent). Those who have reported an income earning activity, had an average annual income of INR 194,860 approximately. This is lower than the average annual income of women in the women-led households where it was reported to be INR 223,760 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. In recent years, the state has offered a rebate in the applicable stamp duty and registration fees if the owner is female- this may have resulted in the increase of female land/asset owners. 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 4.35. details the primary occupation among men and women. As reported the predominant occupations reported by women were home maker and agricultural activities.

Figure 4.35 Primary Employment among women



	Agriculture labor	Agriculture	Business/ Shop	Construction worker	Government/ Private job	Other	Housewife	No Occupation
Men	16%	32.70%	7.10%	5.80%	1.01%	2.03%	0	35.20%
Women	19.65%	17.92%	0.00%	2.89%	0.58%	0.00%	31.21%	27.75%

Source: HH Survey 2020

Discussions with women stakeholders revealed that the living conditions and the economic environment at the village level has 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 4.22 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.	Women legally own and co-own land and responsible for decisions relating to land too.
Literacy Levels	Majority of members of male headed households are literate and educated till higher secondary level. There are also significant instances of gradate and vocational students in these households. Drop outs are due to work and household chores	Majority of members of a female headed household are literate and are educated till primary and secondary level. Few instances of vocational education and graduates. Drop outs are due to work and household chores
Skill Levels	Agriculture and livestock rearing Few instances of artisans and masons.	Agriculture and livestock rearing One instance of artisan
Participation in the Work Force	Working age people (15-60) are mostly engaged in farm based livelihoods and as	Working age people (15-60) are mostly engaged in farm based livelihoods. Very

Aspect	Male Headed Households	Women Headed Household
	construction workers. Relatively larger number engaged in business or shop ownership as compared to women headed households.	few instances of business and shop ownership.
Infrastructure access	Mostly Semi-pucca houses. Majority of the households have a dry pit latrine, with a limited number of houses having latrine with septic tank. A combination of firewood and LPG is used as source of cooking.	Mostly pucca 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.

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 ability 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 holder owns Antodaya card which is for the poorest of the poor[26]. [27]. The report utilizes the Niti Ayog method[28] 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.. As per this method of determining poverty levels, 9 project affected households fall under the below poverty lines.
- Female headed households: Gender related challenges 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. Some are also BPL or headed by women. 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

[26] State Planning Commission. (2016). Report on socio-economic Disparities in Madhya Pradesh (Working Paper I).
[27] 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

[28] 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

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.

- Landless: Another vulnerable group is people who lack economic resources. Despite of several development projects in the region, the life situation of landless people in the region has changed or improved over the years. They have mainly remained excluded from the benefits of developments planned to improve the quality of life of people.
- Village artisans: Though there is only one household artisan, this vulnerable group has been identified in keeping with the ESMF applicable for the project. However, there is a need to support the artisans as they have no other livelihood source. Furthermore, lack on data on artisan have hampered the required assistance or security from the state. Apart from the above mentioned vulnerabilities, another category has been identified for the PF;
- Uneducated youth without skills. The total number of individuals in this category are 45, of which 27 (60 percent) belong to the OBC category, whereas 6 are in the general category, 9 are SC and 2 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 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

Most PAHs were vulnerable in more than one way, thus, they had overlapping vulnerabilities. While there are 80 percent BPL holders, women headed households constitute 4.2 percent of the PAH and there are 1.05 percent artisans and elderly households each.

Table 4.23 Types of vulnerability among PAHs

Administrative Unit	Below Poverty Line	Women HoH	Artisan	Elderly Households	Uneducated youth without skills
Unit 4					
Bijnakhedi	2				
Madhopur		1			8
Kesai Dehariya	2		1		2
Pipalya Kumhar					
Ladwan	NA	NA	NA	NA	
Karwa Khedi	NA	NA	NA	NA	
Dudhpura	NA	NA	NA	NA	
Sub total		**1**	**1**		**10**
Unit 5					
Umariya	2	3	1		14
Naharkheda	3		1	1	8
Pipalya Nankar					4
Palada					9

Administrative Unit	Below Poverty Line	Women HoH	Artisan	Elderly Households	Uneducated youth without skills
Sub total		**3**	**2**	**1**	**35**
Grand Total	**9**	**4**	**3**	**1**	**45**

Source: HH survey 2020

It can be noted that there is only one household in Umariya who are below the poverty line. The household which is an elderly household are residents of Naharkheda and are also BPL holders. 66.7 percent of the artisans are also BPL holders, of which 33.3 percent are women headed household living in Kesai Dahariya. Only about 57.1 percent of the women headed household have a BPL card.

71.4 percent of the women headed households are OBC, while only 14.2 percent are in the general category It can be noted the PAH in the OBC category are the most vulnerable as compared to other social groups.

Another case of vulnerability are the youth (15-35 years) who are illiterate and have no skill sets. They constitute nearly 9.4 percent of the overall PAH.

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 life cycle, 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 Categorisation

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Individual and Community	■ Private land owners and Patta land holders from the Project Area villages ■ Informal land Users (Encroachers/Squatters to be impacted) ■ Agricultural labourers ■ Grazers/Livestock holding households ■ Banjara households and Bhil households ■ Women groups ■ Vulnerable groups (Landless households, 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 Agar-Malwa ■ Gram Panchayats of the impacted villages ■ Agar and Susner Tehsildars; ■ Patwaris ■ EPC Contractor ■ RUMSL	■ Civil Society/Local Non-governmental organizations (NGOs) ■ Local Media ■ Local Political Groups ■ Dairy Cooperatives ■ Agriculture and Livestock Department at Agar ■ Industrial Training Institute (ITI), Agar ■ Department of Animal Husbandry, Dairy Development, Agar

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 land owners	This group is dependent on their land parcels for their livelihood needs; Among the communities in the villages of PFA, majority of the land holding is with the Sondhiyas, Rajputs, Gurjars, and Thakurs. While Harijans and Banjaras have the lowest or no landholding, as reported during the resettlement surveys. Among the land owning households, the share of marginal land holding is highest (85% of the PAEs)	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 and livestock 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 in land holdings; Additionally, if this stakeholder group is provided with an alternate land parcel, the quality of alternate land parcels and the effort and investment required to make it fit for cultivation, is also of key concern, as land improvement investments have been undertaken by these land owners on their existing parcels. The private land owners with marginal land holding (less than 1 ha.) also work as agricultural labourers on other agricultural land as daily wage labour. The impact on livelihood will be therefore two-fold – loss of income from reduced land	Considerable concern influencing a few

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
				holding of self, and loss of income from agricultural labour	
2	Informal Land Users (encroachers/squatters (for agriculture)	Encroachment differs in Agar and Susner tehsils- In Agar, large private land owners 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. In Susner, the households with existing patta land (which is outside the project footprint) have relied on encroachment for seasonal cropping, and grazing. Squatting for agriculture has been reported by households wherein arable land parcels/land classified as grazing land is used for farming at a location which is not adjoining their private land parcel (if any). The landless households of Harijan and the Sondhiya community have been practicing encroachment on	The power of this stakeholder group to impact is moderate, considering they do not have legal rights on the land. However they can influence the attitude of the large community by virtue of their economic position in the village, as in the case of households having access to encroached land in Agar tehsil who belong to the wealthier strata and have a dominant position in the villages.	The project would lead to disruption of economic activities and incomes to these households. The extent of economic displacement of this group is high considering the lack of legal ownership of land, and immovable assets. The dependence on land-based livelihood is high, and the income loss is twofold – loss of income from agriculture on current informal land use, and lack of alternative economic opportunities.	Awareness among the few but no real concern

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		government land which is barren and mountainous terrain			
3	Agricultural labourers	Agricultural labour work and non-farm labour is a prominent economic activity for all the villagers. Almost all private land owners work as farm and non-farm labourers. Households owning marginal land (less than one ha.) work as farm labour for other land owners for daily wages. They are employed by large land owners and those who are higher in the caste hierarchy in the village	The influence of this group on the project is minimal, considering they are a subset of the private land owning group and/or belong to landless households	Both men and women derive income from agricultural labour; There also exists sharecropping arrangement where the farm labour work is paid in terms of share in crop output; The project would lead loss of income for this stakeholder group, and also force them to shift to non-farm labour which is less available in the villages and will require short-term/long-tern migration	Awareness amongst a few but no real concern
4	Banjara households in Madhopur and Bhil community of Ladwan	There is one pocket of Banjara settlements (10 HHs) in the Madhopur, who depend on income from livestock and are primarily squatters for agriculture on government land. They have settled in Madhopur for more than three generations, and derive their primary income from livestock (as grazers)	Although this group forms part of the larger category of informal users their concerns and impacts are to be treated separately as their livelihood profile and location profile is relatively unique compared to the overall profile of the village. They depend on livestock (grazing, cattle management) as their main source of livelihood. Their power to impact the project is limited but crucial as according to the	The dependence on the project is the potential loss of access to open grazing land, leading to shift towards stall feeding, and therefore higher costs of livestock management. The second impact is higher dependence on non-farm labour which is majorly seasonal in nature	Awareness amongst a few but no real concern

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		Bhil community (16 HHs) present in Ladwan village. They live on the outskirts of the village, and are marginalized in terms of social hierarchy. The Bhil community also practices livestock – based livelihood and derive their primary income from sale of livestock products	requirements of IFC PS 7, prior informed consent from the IP households is required to be undertaken by the project.		
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
6	Livestock holding households/Grazers of cattle on government land	Livestock holding is an economic activity to support farm income, and for landless households, the major income source. All households, whether holding large land parcels, small/marginal land parcels, or landless own some amount of livestock.	This group also has minimal influence on the project as they have no direct control on the land purchase; however they can raise concerns regarding the loss of common property resource (CPR) of the village which was being used for grazing	Livestock holding is an economic activity to support farm income, and for landless households, the major income source of livelihood. This group, which is a part of the private land owners group as well as households without any land holding will be	Considerable concern influencing many

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		Livestock holding gives rise to various earning sources such as hired herder for cows (grazers), sale of fodder, and sale of animal/animal products.	Based on the consultations undertaken during RAP study, villagers in Dudhpura, Ladwan, and Karwa Khedi have raised objections to the location of the Project on their village land due to their concern regarding the potential impact on grazing land, and loss of access to common fodder lots	impacted by loss of available government land for grazing The impact of such loss will be higher for landless households with livestock who rely on government grazing land for fodder	
7	Owners of land required for temporary occupation or use	Some of the project components would require short term leasing of land available, largely from Private and/ or Patta land owners	This stakeholder group is critical for availability of land parcels that are conveniently located in the vicinity of project footprint (based on the needs) and are available without disturbances or issues during the lease period.	The project related activities on these land parcels may be for purposes of storage, set up of labour camps, etc. and may result in change in land use/ land cover due to construction activities, contamination issues, etc.	Awareness amongst a few but no real concern
8	Gram Panchayats	This stakeholder group is comprised of Sarpanch, ward member and Gram Sewak of Panchayats of Palda, Naharkheda (including Umariya village), and Pipalya Nankar in Susner Tehsil, and Pipalya Kumhar, Ladwan (including Karwa Khedi village), Kesai Dehariya (including Dudhpura village), and Bijnakhedi (including Madhopur village) in Agar Tehsil.	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

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
9	Agar and Susner Tehsildars	This group is comprised of the regulatory authorities at the tehsil level that are responsible for land demarcation for the project and for various permits and licenses pertaining to the project	The Tehsildars are responsible for executing the land demarcation exercise, and the extent of encroachment on government land within the project boundary. Allotment of land parcels 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.	The impact of the project is limited on this stakeholder group, and is limited to permitting requirements.	Broader awareness, but little concern
10	Patwaris	This stakeholder group is critical because the physical verification of the allotted land parcels, verification of encroachment area, extent of squatting on the allotted government land parcels is carried out by this stakeholder group	This group has critical role in impacting the project because of their role determining the land parcels, and also guiding village opinion on the project activities and the land take process	No impact	Broader awareness, but little concern
11	District Administration	The DC is important as all land-related issues, and the current protest towards land procurement in the four villages of Agar (refer Section 5.2.3) have been reaching out	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, but little concern

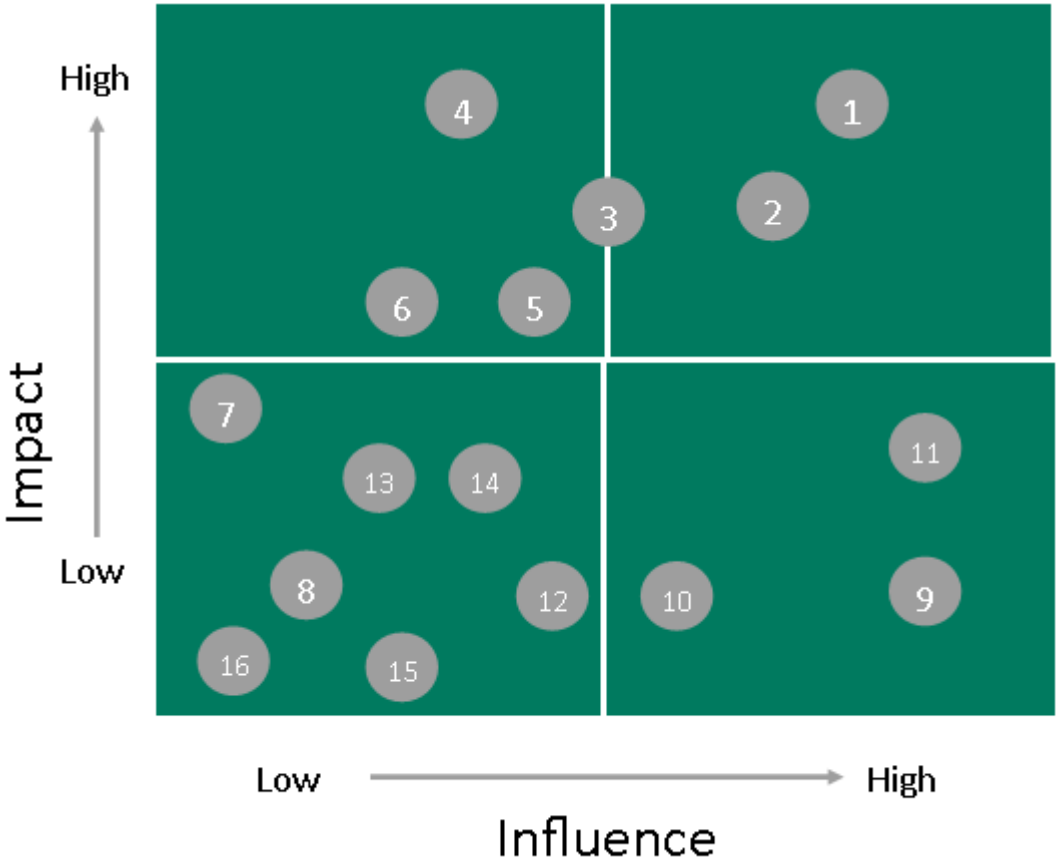
Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
		the District Administration with regards to their grievances	compensation, solatium for private land purchase, and for other land based impacts, as decided by the project		
	Secondary Stakeholders				
12	Fence Line Community	This stakeholder group is comprised of the local population in the eleven 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 vicnity These activities will be disrupted after the project related activities commence on the identified land	Awareness amongst a few but no real concern
13	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 Fence line 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

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
14	Civil Society/Local NGOs	NGOs and Civil Society Organizations at local level who may be active in the area. Most of the NGOs and CSOs working in the region are district level NGOs. However, currently there are no active NGOs working in the Agar-Malwa region in the project affected villages, and hence no consultation could be undertaken	The influence of this stakeholder group is potentially limited as currently, there are no active NGOs working in this region Based on understanding through consultations with villagers on NGOs who were operating in the past, their role is short-term in nature and limited in outreach.	No impact	Awareness amongst a few but no real concern
15	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
16	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.	No impact	Awareness amongst a few but no real concern

Sr. no	Stakeholder	Profile	Power to Impact	Impacted by the Project	Perception/ Expectation
			They can influence the impact mitigation measures to be adopted by the Project during the construction and operation stage		

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 **Table5.4** provides the ranking of all the stakeholders, relevant to Agar Solar Park, based on their power to impact the project, and influence of the project.

Table5.4 Stakeholder positioning

S. No	Stakeholder	S. No	Stakeholder
1	Private land owners	9	Gram Panchayat
2	Informal land users	10	Agar and Susner Tehsil Administration
3	Agricultural labourers	11	District Administration
4	Grazers of cattle	12	Patwari
5	Banjara and Bhil households	13	Industrial Training Institute (ITI)
6	Vulnerable households	14	Agricultural and Dairy Development Board
7	Fence line community	15	Local Political Groups
8	Owners of land required during construction phase	16	Civil Society/NGOs

5.2 Overview of Engagement as part of Resettlement Planning

5.2.1 Project Layout Finalization

Consultations were undertaken during this stage by ERM with the villages that were identified to be part of the project footprint (September 2018). During this stage, a site reconnaissance visit was undertaken based on the proposed project footprint. As part of the visit, consultations were undertaken with the residents of the following villages: Umariya, Pipalya Nankar, Ladwan and Karwa Khedi.

The main concern raised during this stage was that while the project would require the diversion of land from the villages, the local community is unlikely to benefit from the development of the project in terms of employment opportunities. The community reported that even if the project provides them with economic opportunities, it will be restricted to the construction phase and for small contracts and unskilled work.

5.2.2 Government Land Allotment

The land allotment process was initiated in 2016 for the government land parcels, and later for the private land parcels. For Agar Solar Park, the land allotment process was undertaken from 2016 to 2019. As part of the land allotment process, consultations were undertaken by the following agencies with the village community in general, and land owners in particular.

- RUMSL was 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 land parcels 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 land parcel 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 land parcels informally on the duration of encroachment, and use of such encroached parcels.

It should be noted that despite more than 90 percent of the government land required is already allotted to the project, however, despite that a process of optimization was undertaken in early 2020, considering the environmental and social sensitivities identified.

5.2.3 ESIA

The ERM team undertook the ESIA study related site visits from December 2019 – January 2020 to develop the socio-economic baseline of the villages in the project footprint, and held consultations across all the eleven villages in the Solar Park. These consultations were focused on understanding the general profile of the villages with specific focus on the types of caste groups, land holding pattern, 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 was updated based on the RAP study.

5.2.4 Resettlement Surveys

The resettlement surveys were undertaken during the period July – August 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 extent of land use of private land, government land, livelihood profile, caste differences in land use, 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 towards each village community followed 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 incorporate feedback from the general community on the concerns regarding involuntary impacts, and feedback for project planning.

It was during the kick-off meetings with Ladwan, Dudhpura, Bijnakhedi and Pipalya Kumhar (Unit 4) which provided the scope of right to refusal of the village towards to the project and its associated activities, based on the understanding of the extent of impacts on the households. The villagers of Ladwan and Bijnakhedi opposed the project due to impact anticipated on loss of government grazing land. The villagers of Dudhpura were concerned with the cumulative impacts foreseen on the village due to this project, given that there had previous land based impact due to construction of check dam. They were of the opinion that the solar project will lead to further loss of private agricultural land, which has already reduced, and the households have to fulfil their livelihood requirements from reduced land size holding.

The refusal to participate in resettlement surveys by one village created a ripple effect – the refusal by one village (the first refusal was expressed by Ladwan) spreads to other villages in terms of negative sentiments regarding the project. The concerns and reasons of refusal were recorded from the kick-off meetings and subsequent meetings held with Sarpanch, Tehsildar and the same was shared with RUMSL.

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 Agar Solar Park.

Table 5.5 Feedback Received for Incorporation into Resettlement Planning

Feedback Received	Incorporation into Resettlement Planning
Cumulative impacts and double land loss: Lack of engagement by the project prior to the ESIA stage of the project	The villagers of Dudhpura have already been impacted by land loss due to water catchment area created by Watershed department created 10 – 15 years ago. The lake is spread across 1.675 hectares over private and government land parcels. Due to submergence of land for the lake, the available notified grazing land for the village has reduced. The land procurement for the solar park will result in double – land loss, and lead to further reduction in available government land for the village. As part of the Resettlement Planning, alternative grazing land has been recommended with ease of access to such grazing lands for the village
Provision of water supply	The community in Kasai Dehariya has raised the concern of lack of water supply infrastructure and have expressed the need for provision of pipelines to draw water from the dam to their fields to make irrigation water supply perennial in nature.

Feedback Received	Incorporation into Resettlement Planning
infrastructure from existing dam	
Allow grass cutting/ fodder collection within the project boundary	The households across the project impacted villages have depended on open grazing and use the Charnoi/Chargah land parcels for collection of fodder to be used for stall feeding. Given the extent of government land to be used for the project. A significant loss of access to grazing land is estimated. The common feedback across the impacted villages has been to allow uninterrupted access to those land parcels that will be included in the project boundary for collection of fodder. As part of Resettlement Planning, a Grazing Management Plan has been prepared (included in the consolidated RAP report) that includes the measures
Increase in distance to access grazing land	The villagers of Umariya were concerned over the increase in time taken to travel to the government land parcels once the project boundary is set up. Currently, the grazing land used to collect fodder/firewood, and for open grazing – all these activities are equally shared by men and women. The women can allocate time to collect fodder since the land parcels are within 10 - 15 minutes of walking time. Once the project is set up (Unit 5), the alternative grazing land will be at much farther distance, and the hence the time cost associated with accessing the land parcels will increase (women will have to spend more time to travel to such fields and this will lead to time loss for other activities) As part of Resettlement Planning, the loss of access to grazing land has been assessed and mitigation measures have been included in the Grazing Management Plan.
Heat Island effect leading to effect on land productivity of the remaining land parcels	Villagers in Naharkheda were concerned over the potential loss in productivity of remaining land parcels under agricultural use due to the heat generated from the solar plant. The rise in surface temperatures due to the solar panels will lead to loss in productive output. As part of project disclosure and engagement activities, the communities will be informed and made aware of the mitigation measures to reduce the same, and improve farm productivity.
Loss of access to land for Open defecation	One of the key concerns expressed over the loss of land to the project is the current use of land for open defection will be obstructed. Women, particularly, rely on open defecation as the dry latrine toilets do not have drainage facility, and the structures are mostly in impaired condition. The apprehension is the loss of immediate accessible land parcels for defecation, and the risk to safety of women in accessing distant land parcels for the same. As part of the Resettlement Planning, this issue has been addressed in the Gender Action Plan (GAP).

6. INVOLUNTARY RESETTLEMENT IMPACTS

This section presents the involuntary resettlement impacts linked to land procurement (for the project boundaries of Unit 4 and Unit 5) associated with the Agar 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) land parcels 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 6.1**and covers the extent and scale of loss of land and change in land use, loss of assets on all such land parcels that are falling within the project footprint.

The second part, **Section 6.2** 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 land parcels 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 7 residential structures in Naharkheda and Dudhpura villages. These structures are associated with 5 PAHs. The total homestead area to be impacted is 0.812 ha ■ The magnitude of the impact is likely to be low as the impact is limited to 7 residential structures of which 4 are permanent residential structures.
Impact on Immovable Assets	■ The project will result in an impact on 7 immovable structures such as cattle shed, water feeding stall, fodder storage shed, any other agricultural structures, ■ The project will also result in 59 fixed and salvageable assets included sanitary arrangement, wire fencing (with cemented pillar, and wooden poles), open wells and pipelines There are 11 households who will be impacted by loss of immovable structures ■ The impacts on immovable assets are restricted to Unit 5. However, these are likely to be medium in terms of impact magnitude as these are not primary residences for the households. ■ The impacts on the other salvageable assets and structures is mostly in Unit 5, with only 4 of the 59 assets identified being located in Unit 4. Within the Unit 5 villages, Umariya is likely to be most impacted as 22 structures (37 percent) are located in this village. ■ The magnitude of this impact however is likely to be low
Impact on Private and Patta Agricultural Land Parcels with Project Footprint	■ As part of the project footprint optimization, an attempt was made to reduce the number of private land parcels for the reduction of E&S risks. However, due to restrictions on land availability and technical constraints, the present project footprint will affect fifty nine (59) private/patta land parcels. These land parcels have a cumulative area of 133.7 ha (10 percent of the total land requirement); ■ These land parcels are associated with 164 PAHs, corresponding with 147 individual land owners ■ All these land parcels 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 land parcels 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 1273.4 ha of government land, 60.9 ha (5 percent) is occupied (encroached/squatted) for informal use for agriculture or fodder cultivation (for private consumption). Of the total area under informal use, 76 percent is under squatting for agriculture. There are 77 PAHs who will be impacted by loss of livelihood arising from informal use of government land ■ 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 that is under occupation for cultivation.
Impact due to Clearing of Crops	■ 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 that has been used for cultivation. ■ 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 for the cultivation that would have been undertaken on the land parcel in the next season. This is assuming that the PAHs will likely take one

Category of Impact	Summary of Impact
	more agricultural season to procure replacement land and make it productive, or participate in the Livelihood Restoration opportunities
Change of land use on government land used for grazing	■ Data from the household survey with PAHs revealed that 65 percent of the PAHs depend on government land for collection of firewood, followed by fodder, soil and/or stone for top soil, boundary marking, and fruits. While most of it common property accessible to local community, certain households have also demarcated areas for their own personal use through fencing ■ Of the total government land identified for the project footprint, 198.68 ha is designated as grazing land (Charnoi or Chargah) land in government records. In addition to this, 3.4 ha is understood to be under use for grazing through private fodder lots constructed for use by a household. ■ The LA survey assessed five (5) such land parcels with a total area of 3 hectares which were reported to be used as fodder lots by individual households(apart from agricultural use) from where firewood was collected from the Khejdi trees and fodder/grass was collected for self-consumption. ■ Livestock holding has been reported by 24 percent of the PAHs (171), of which 35 percent of the households depend on livestock as a source of income. ■ The impact on government land; including such land parcels, due to project footprint, will result in a reduction of land available for natural resource collection
Impact on Timber and/or Fruit Trees	■ A total of 341 trees (timber and fruit) have been identified across 23 land parcels in the project footprint. ■ 108 PAHs are assessed to be impacted by the loss of timber trees, while 19 PAHs will be impacted by loss of 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, 11 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. ■ 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	■ 21 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 land parcels. 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 4

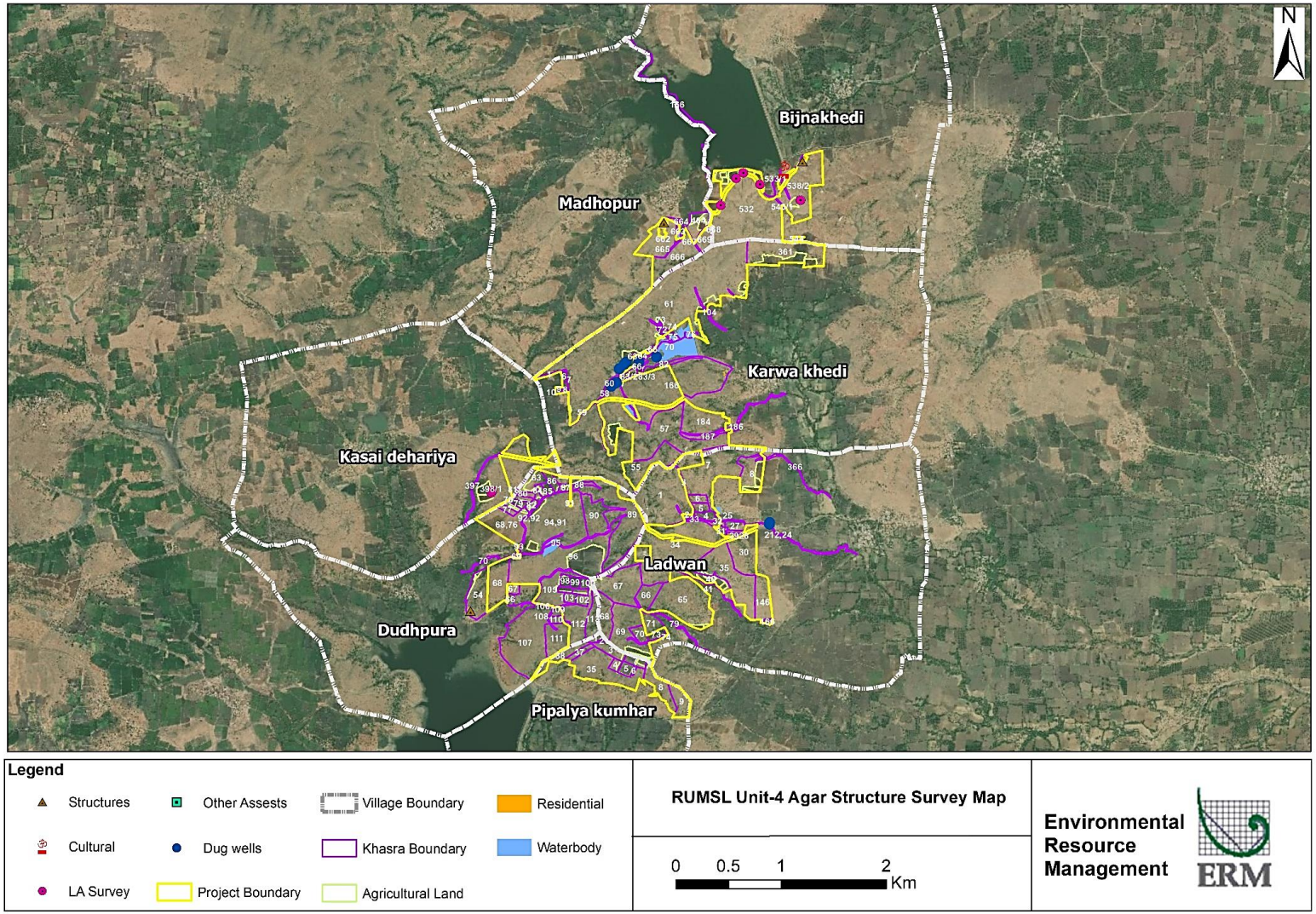
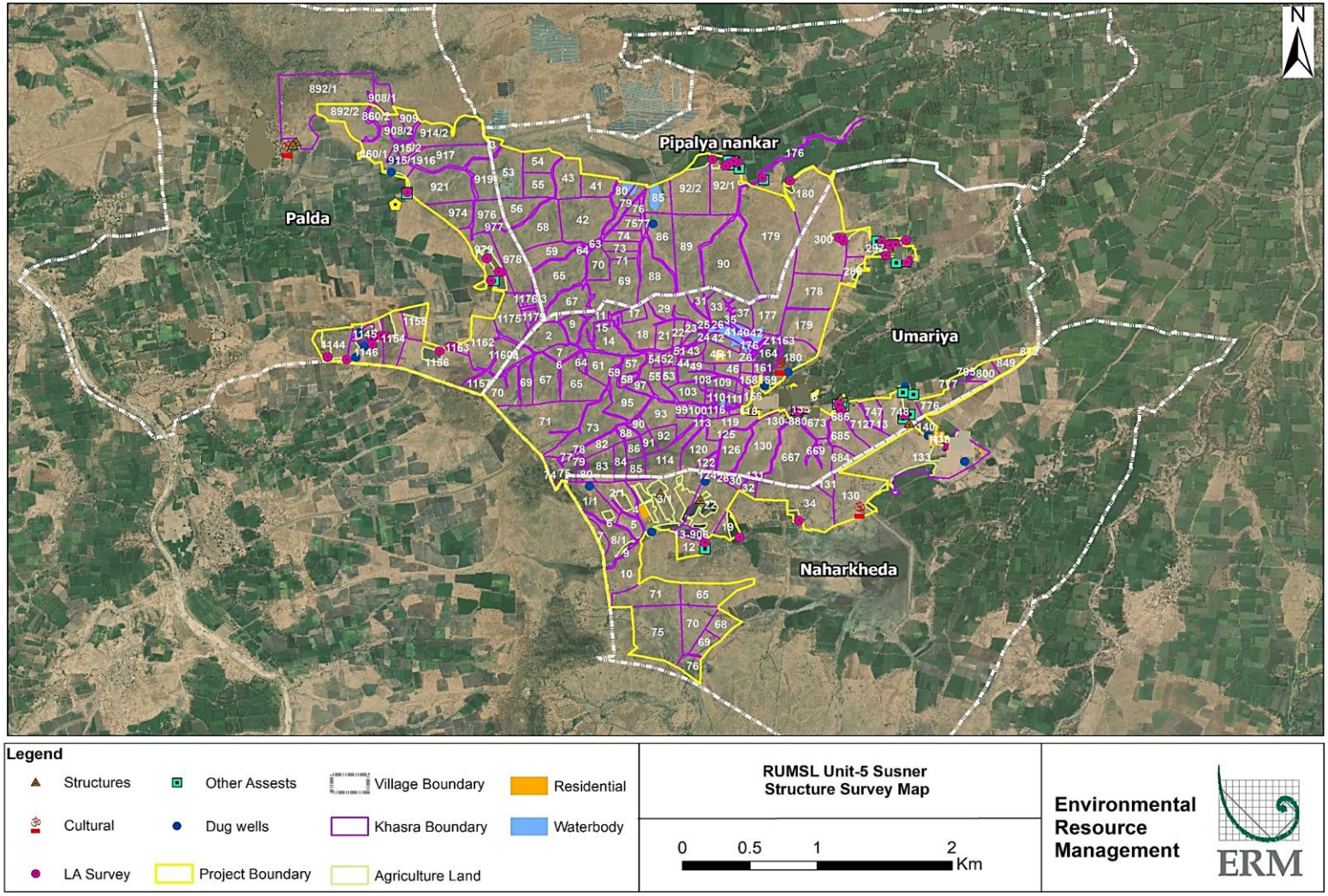


Figure 6.2 Overview of impacted assets surveyed in Unit 5



6.2.1 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 seven (7) residential structures.

- Of these, three structures are located in Naharkheda (Unit 5). These structures have a common homestead area, with each residence having a different outer wall and use. The total land area of these structures taken together is 60.75 m^2 (0.006 ha).
- The 3 structures in Naharkheda are cemented structures (RCC with tin roof) used as secondary residential accommodation, during the farming period, and also for storing fodder, firewood, etc.
- In addition to this, Geospatial assessment of aerial imagery shows that there are four (4) households in Dudhpura (Unit 4), whose residential structure will be impacted due to land procurement. These could not be surveyed due to the limitations mentioned in Section 1.3.4. These structures are on government land, with an estimated total homestead area of 0.806 ha.
- The LA survey assessed three structures in Naharkheda within a common homestead area, each having a different outer wall and separate use. The total land area of these structures taken together is 60.75 m^2 (0.006 ha).
- The impact from the land procurement for the project on these structures will be permanent as these structures will be removed during the land procurement.
- These impacts are likely to have an overall low magnitude as the impact is limited to two villages. The 3 structures in Naharkheda are on private land and are not the primary residences of the households. However, the magnitude of impact in Dudhpura is estimated to be higher, as based on the review of the aerial imagery it is assumed that these structures are primary residential structures.

6.2.2 Affected Immovable Assets

Immovable structures include cattle shed, water feeding stall, fodder storage shed, any other agricultural structures, which are used for agricultural activities.

- The project footprint will result in an impact on seven (7) such structures in Naharkheda and Umariya villages, both in Unit 5. The estimated total area to be affected is 0.25 hectares. The Table below provides an understanding of these structures by type and village.
- The agricultural and storage shed structures are primarily made of brick and wood, with mud flooring, and supported by tin sheets/plastic sheets/thatch for roofing.
- Visual observations of these structure during the LA survey showed that these structures are in currently in use during the *Rabi* cropping season.

Other fixed and *salvageable* assets surveyed across the land parcels included sanitary arrangement, wire fencing (with cemented pillar, and wooden poles), open wells and pipelines. There are fifty nine (59) such assets on twenty seven (27) land parcels, Details of these assets are as given below:

- Sanitary arrangement: Dry latrines constructed in the last two (2) years, most of them as part of Clean India Mission program. These structures were built at an average cost of INR 25,000.
- Open Well: Lined with brick and cement on the inside, these structures are typically 60 feet in depth, and five (5) metres diameter, drawing water from the shallow aquifers. There are 36 open wells, of which 95 percent are used by informal users of government land. The cost of construction, including labour was reported to be an average of INR 3 lakhs. Some of the wells are new (2 – 5 years) while one was reported to have been constructed ten (10) years ago.

- Wire fencing (with wooden poles): The boundary walls constituted of wire fencing, held together by wooden pillars in majority of the cases (it is easier to replace, and incurs less cost compared to cement pillars). Nine (9) such wire fencings have been observed during the LA survey. These have been observed to be in use, specifically by the encroachers, to demarcate their land use area, as separate from others.
- Wire fencing with stone pillars: Two households were observed to have erected stone boundary fencing. The stone pillars are of higher cost (each pillar costs around 30,000 – 35,000).

Table 6.2 Count of Immovable and Fixed Assets

Unit	Village	Agricultural shed	Storage/ Cattle shed	Sanitary asset	Open well	Other	Pipeline	Wire fencing with stone pillar	Wire fencing with wooden pole
Unit 4									
	Bijnakhedi	NA	NA	NA	NA	NA	2	NA	NA
	Madhopur	NA	NA	NA	2			NA	NA
Unit 5									
	Naharkheda	4	1	1	4	1	2	NA	NA
	Palada	NA	NA	NA	9	2	NA	NA	NA
	Pipalya Nankar	NA	NA	NA	9		2	NA	3
	Umariya	1	1	2	12			2	6
Grand Total		**5**	**2**	**3**	**36**	**3**	**6**	**2**	**9**

Source: LA survey 2020

NA: Not Applicable

Figure 6.3 Storage shed structure on agricultural parcels

- The impacts on immovable assets are restricted to Unit 5. However, these are likely to be medium in terms of impact magnitude as these are not primary residences for the households.
- The impact on the other salvageable assets and structures is mostly in Unit 5, with only 4 of the 59 assets identified being located in Unit 4. Within the Unit 5 villages, Umariya is likely to be most impacted as 22 structures (37 percent) are located in this village. 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 land parcel

6.2.3 Private agricultural land parcels

The selection of private parcels has been undertaken following avoidance criteria (**Section 2.2**) wherein, the private land parcels within the final project boundary were selected after 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 land parcels for the reduction of E&S risks. The only impact on Patta land is in Dudhpura village. However, due to restrictions on land availability and technical constraints, the present project footprint will affect fifty nine (59) private/patta land parcels. These land parcels have a cumulative area of 133.7 ha (10 percent of the total land requirement);
- Of these 59 land parcels, 21 (36 percent) are located in Unit 4, while the remaining are in Unit 5. Of the total impacted private land, 61 percent of the land is being procured from four villages in Unit 5.
- The average area under holding per household is less 0.5 hectares. However, in terms of land area, 38 percent of the total private land area is in Unit 4, while the remaining is in Unit 5, indicating towards a larger size of land parcels in Unit 4.
- All these land parcels 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 land parcels 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. Within the project footprint, the villages of Dudhpura (Unit 4) and Naharkheda (Unit 5) are likely to most impacted, as the highest proportion of private land requirement is from these villages, comprising of 80 percent of the total private land requirement for the solar park.

6.2.4 Government land used for agriculture and private fodder lots

- Of the 1273.4 ha of government land, 60.9 ha (5 percent) is occupied (encroached/squatted) for agriculture or fodder cultivation (for private consumption). Of the total area under informal use, 76 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)	Squatter for Agriculture and fodder (ha)	Squatter for fodder lot (ha)	Grand Total
Unit 4	Bijnakhedi	3.4	1.5	NA	NA	4.9
	Kesai Dehariya		3.3	NA	NA	3.3
	Madhopur Kheda	2.8	1.4	NA	NA	4.2
Agar Sub-total		**6.22**	**6.2**			**12.4**
Unit 5	Naharkheda	NA	7.5	2.7	NA	10.2
	Palada	1.1	10.1	NA	NA	11.2
	Pipalya Nankar	3.8	NA	NA	NA	3.8
	Umariya	1.2	21.5		0.16	22.8
Susner Sub-total		**6.1**	**39.1**	**2.7**	**0.16**	**48.06**
Grand Total		**12.3**	**45.3**	**2.7**	**0.16**	**60.46**

Source: LA survey 2020

NA: Not Applicable

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

- Encroachment of government land adjacent to existing owned land to cultivate larger parcels or plots in villages of Unit 4 (Ladwan, Karwa Khedi, Dudhpura, Pipalya Kumhar). Land owners of large land parcels 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. This practice has been in existence for more than ten (10) years due to which the land owning class has amassed large parcels for farm-related use.
- Limited scale of squatting for agriculture: In certain villages of Susner tehsil, the use of government land is prevalent among the marginal land holding households and/or landless households (Pipalya Nankar, Umariya, Palada). These households have relied on squatting for seasonal cropping, and grazing. The government land used for seasonal farming is mostly barren and is of mountainous terrain usable for only single cropping.

- The general trend among encroachers/squatters, is to utilize government notified kabil kast land (land suitable for farming) for agriculture.
- In addition to this, 3.4 ha of government land has been encroached/squatted upon by individuals for creation of private fodder lots for use by a single household/family.
- Across both the Units, Umariya village in Unit 5 has the highest area that has been occupied for informal use (22 hectares)
- As seen from the table above, squatting is more common, and there is relatively a larger share of land under squatting in Susner, as compared to Agar.
- When compared with private land parcels in terms of crop being cultivated, it is understood that the government land under agriculture is primarily used for cultivation of crop for income purposes, with soyabean being the dominant crop (54 percent of the area under cultivation). This preference is because this is a dependable source of income with a ready market and has a lower investment requirement than wheat. Furthermore, this land is primarily cropped for a single season, with only 30 percent of the total area being reported to be cultivated during the Rabi season as well;
- 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 crops

A total of 194.6 hectares of land is under agricultural use (private and government land).

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, the private land parcels reported a higher number of crops in a given year (up to six crops), in comparison to agriculture on government land (up to 4 crops). Thus, given the trend to multi crop in the area, the likelihood of impacts to standing crops increases. The land parcels 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, 198.68 ha is designated as grazing land (Charnoi or Chargah) land in government records.

As discussed in Section 4.2.7, open grazing is the preferred form of livestock feeding in most villages. The dependence on government land for grazing has been assessed through village profiling and consultations.

Table 6.4 Households dependent on open grazing

Village	No.of persons	% of total population
Naharkheda	20	1.6
Umariya	750	100

Village	No.of persons	% of total population
Palada	100	10.6
Madhopur	350	82
Pipalya Nankar	200	11.1

Source: LA survey 2020

The above table shows that grazing is an important source of livelihood and is linked to availability of land parcels for open grazing.

The impact observed is the highest in Umariya in Unit 5, where the potential magnitude of impact is high – both in terms of loss of access grazing land, and loss of livelihood to grazers, as also the individuals who are engaged in grazing activity as a source of livelihood.

Madhopur in Unit 5 also has high dependence which was also confirmed through consultations with households. Their main source of livelihood is grazing of livestock which is supplemented by farm income.

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. This impact is likely to be most significant for the villages Palda, Pipaliya Nankar, (unit 5) and Kesai Dehariya (Unit 4), as these villages will have the lowest proportion of grazing land available after project land take. Kesai Dehariya does not have any grazing land remaining after project land take.

6.2.7 Clearing of privately owned fruit and timber trees

- A total of 341 trees (timber and fruit) have been identified across 23 land parcels in the project footprint.
- A total of 129 timber trees, spread across 10 private land parcels have been identified in the project footprint. Of these 35 percent of the trees surveyed are used for fuelwood, followed by construction related use (21 percent). On an average, there are 10 – 12 trees on a single land parcel.
- Among the timber trees assessed, 35 percent of them have an average diameter of more than 45 cm at breast height.
- Similarly, 33 fruit trees were assessed on 13 land parcels with an average of 1 -3 fruit trees on one land parcel. It has been found that 72 percent of the fruit trees are in the young productive (fruit bearing) years. Majority of the fruit trees are orange (57 percent). The orange trees surveyed were not part of a planted orchard.
- 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 comparable across the two units. While Unit 4 has a larger number of trees being impacted in comparison to Unit 5, the difference between the two units in terms of number of trees and type is small (less than 10 percent)

6.3 Involuntary Displacement 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 displacement of 257 PAHs, of which 95 (36 percent) were covered through the LA survey. There are five (5) households who will be displaced due to loss of physical structure, and hence are likely to physically displaced.

Table 6.5 Economic and Physical displacement of PAHs

Unit	Villages	Total PAHs	Economically displaced PAHs	Physically displaced PAHs
Unit 4	Bijnakhedi	9	9	0
	Kesai Dehariya	3	3	0
	Madhopur	5	5	0
	Ladwan	12	12	0
	Karwa Khedi	16	16	0
	Dudhpura	75	71	4
	Pipaliya Kumhar	3	3	0
Agar Sub-total		**123**	**119**	**4**
Unit 5	Naharkheda	41	41	1
	Palda	27	35	0
	Pipalya Nankar	23	24	0
	Umariya	48	53	**0**
Susner Sub-total		**139**	**138**	**1**
Grand Total		**262**	**257**	**5**

Source: LA survey 2020

6.3.1 Physical Displacement: Households Impacted by Loss of Residential Structure and other Immovable Assets

A key impact due to the land procurement for the project is the loss of residential structures located within the project footprint. 5 PAHs will be impacted by the loss of residential structures across the two units.

There are a total of seven structures, out of which, three structures are on private land parcel belonging to one household, and the rest of the structures are on government land parcels belonging to four (4) households. While the household in Naharkheda will be impacted by loss of temporary residential structure, the four households in Dudhpura will be impacted by the loss of the permanent residential structure.

Thus, the magnitude of impact is expected to be higher for the 4 PAHs in Dudhpura. 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.

Figure 6.4 A typical residential structure

The above image represents the type of affected residential structures in Agar Solar Park. These are isolated structures, away from the main village settlement and have seasonal use.

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 164 PAHs (63 percent of total PAHs) are to be impacted by the loss of private/patta land. These correspond to 147 individual land owners spread across 133.7 ha

Table 6.6 Project-affected households owning private/patta land

Unit	Villages	Private land owning PAHs	Patta land owning PAHs	Total PAPs	Potential landless PAHs
Unit 4	Bijnakhedi	0	0	0	NA
	Kesai Dehariya	1	0	4	0
	Madhopur	0	0	0	NA
	Ladwan	12	0	48	0
	Karwa Khedi	16	0	240	0
	Dudhpura	42	33	450	0

Unit	Villages	Private land owning PAHs	Patta land owning PAHs	Total PAPs	Potential landless PAHs
	Pipalya Kumhar	3	0	15	0
Agar Sub-total		**74**	**33**	**753**	**0**
Unit 5	Naharkheda	18	0	72	0
	Palda	11	0	77	10
	Pipalya Nankar	11	0	78	5
	Umariya	17	0	59	0
Susner Sub-total		**59**	**0**	**286**	**11**
Grand total		**131**	**33**	**1039**	**26**

Source: LA survey & HH survey 2020

These 164 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 26 households who would become landless due to the project land take.

While Dudhpura (unit 4) has the highest number of PAHs impacted by loss of private/patta land, Palda (unit 5) has the highest number of PAHs who would become landless.

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

There are 77 PAHs who will be impacted by loss of livelihood arising from informal use of government land for agriculture, due to project land allotment. Of these 77 PAHs, 60 (77 percent) 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 less than one hectare under informal agricultural use. Of the 77 PAHs, 3 PAHs reported informal use of occupied government land for fodder crop cultivation (two PAHs in Naharkheda, and one PAH in Umariya)

Table 6.7 Number of Informal Users (squatters/encroachers)

Unit	Village	Squatting households	Encroacher households
Unit 4	Bijnakhedi	3	NA
	Kesai Dehariya	2	NA
	Madhopur	1	2
Agar Sub-total		**15**	**2**
Unit 5	Naharkheda	11	NA
	Palda	13	1
	Pipaliya Nankar	NA	11
	Umariya	23	3

Unit	Village	Squatting households	Encroacher households
Susner Sub-total		**45**	**15**
Grand Total		**60**	**17**

Source: HH survey 2020

Across both the Units, Umariya in Unit 5 has the highest area under informal use (22 ha) with 26 PAHs. Nine (9) of these households also reported to 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 9 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

There are eleven (11) households who will be impacted by loss of immovable structures. Six of the household are informal users of government land for agriculture and have constructed structures for agricultural uses on those government parcels such as -livestock sheds, fodder storage shed, water feeding stall. The rest are private land owners who have constructed temporary sheds/ kutcha structures on their private agricultural land. 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 4.2the primary occupation amongst the PAHs is farm based activities (~76 percent across the age group 35-60 years) and a total of 194.6 ha across the solar park is under agricultural use presently30. Almost all of the PAHs also engage in agricultural labour work. On an average, agricultural income comprises 57 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 land parcel 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

- 108 PAHs are assessed to be impacted by the loss of timber trees, while 19 PAHs will be impacted by loss of fruit trees

30

Table 6.8 PAH impacted by loss of timber trees

Village	PAH	Count of Trees									
Village	PAH	Neem	Khejdi	Babul	Palash	Ber	Custard Apple	Imli	Arand	Bakain	Others
Madhopur	32	4	0	0	0	0	0	0	0	0	0
Naharkheda	57	30	49	11	33	6	3	8	0	0	102
Palada	5		12	4	0	0	0	0	0	0	15
Pipalya Nankar	2	3	0	0	0	0	0	1	0	0	2
Umariya	12	33	10	4	31	0	0	1	3	12	73
Grand total	**108**	**70**	**71**	**19**	**64**	**6**	**3**	**10**	**3**	**12**	**192**

Source: LA survey 2020

- There are 27 PAHs who have trees on the land parcels, either in the category of timber, fodder, or fuelwood. Of these, 9 PAHs are private land parcel holders.
- Of the total timber trees reported, 71 percent (321 out of 450 trees) have been grown on government land parcels being informally used for agriculture. 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;
- All the households (17 PAHs) who have planted trees on government land parcel use it on an ongoing basis for fodder, or twigs for use as fuelwood.
- On an average a typical households has about 4 – 5 timber trees on the land parcel under agricultural use,. The difference among private land owners and those who are cultivating government land informally is in the type of trees grown. The informal land using households grow *neem* (INR 10 per sapling), and *Khejdi* trees for household uses, while private land owners cultivate *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 land parcel owners and informal land users during consultations.
- There are 19 PAHs who have reported and have been assessed for fruit trees on the land under agricultural use. Of these, 12 PAHs are private land parcel holders while remaining are encroachers/squatters on government land. The LA survey assessed 54 such fruit trees, across 13 land parcels, majority of which contained orange trees.

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, and reduce the net income from sale of livestock products.

Table 6.9 Dependence of households on grazing land

Unit	Village	No.of HHs using government land for grazing	% of total HHs in the village
Unit 4	Ladwan	NA	NA
	Dudhpura	40	40
	Bijnakhedi	50	15
	Kesai Dehariya	25	25
	Madhopur	20	16
	Pipalya Kumhar	0	0
Agar Sub-total		**135**	**21**
	Naharkheda	55	18
	Palada	0	0
	Pipalya Nankar	50	16
	Umariya	0	0
Susner sub-total		**105**	**17.5**
Grand total		**240**	**19.2**

Source: Village Profiling 2020

- Open grazing of livestock is the most preferred option, as against stall feeding, reported during consultations with livestock grazing households.
- Livestock holding has been reported by 24 percent of the PAHs (171), of which 35 percent of the households depend on livestock as a source of income.
- The loss of income form livestock is estimated at INR 36,000 per year, excluding input costs of fodder. Livestock income is a crucial source of livelihood for the marginal farmers and landless households and is also a regular source of income for graziers – who tend to cattle for a cluster of houses for a fee.
- These households also include the Banjara community of Madhopur (10 households), who depend specifically on livestock as the primary source of livelihood, supplemented by agricultural income. Although these households are not directly impacted by the land procurement for the project, consultations with these communities reveal that they will be affected by the loss of land for open grazing.
- Livestock management is the most important activity, and these households rely on grazing as means of income (employed as graziers). 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 therefore affect their income.

- 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 Dudhpura, 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 Female headed households as a vulnerable group. Based on the information available, four (4) such households have been identified; based on extrapolated data for the entire PAH, there are estimated to be 11 female headed households.

Female headed households are primarily dependent on agricultural labour work, and supplementary income from livestock.

Out of these four households, two have reported agricultural work on their private land parcels, and who will be impacted by loss of private land to the project footprint. Both of these households are small land holders (less than 2 hectares), and derive an annual average income of INR 1, 77,500 from agriculture for the household. The other two households depend on income from agriculture on occupied government land.

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.

Another impact on female headed households will be the Impact due to loss of access to government grazing land that were located near their village, and are now included in the project boundary. This is based on the understanding that the grazing 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 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 21 vulnerable households, four of which are women headed, and the rest are artisanal income based (3 households), and 9 household below poverty line. The impacts of these households are uniform in nature to the involuntary economic displacement related impacts, discussed earlier.

However, there is one specific settlement of households belonging to the indigenous group, who will be economically displaced due to land procurement, and project activities. The *Bhil* community in Ladwan (16 households) will be potentially economically displaced due to project activities.

- 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.
- As reported from consultations with the community, a Bhil household family could incur a loss assessed to be about INR 1,32,000.00 annually due to the shift to market purchase of fodder. The added adverse impact will be on women and children of these households who undertake the responsibility of stall feeding, and major portion of livestock management related activities, including milking, cleaning, washing etc. This may lead to distress sales of livestock due to lack of grazing land, potentially affecting family incomes and nutrition levels.
- In terms of impact due to loss of agricultural land, ten (10) households reported to using land (an average of 0.5 ha) which includes both private land owners as well as encroachers. According to the households, the land procurement could lead to loss of agricultural labour work (30 per cent of their total income), loss of farm output produced for self-consumption as well as for sale.
- All Bhil families collect firewood from the area where the solar park is proposed. On an average, every family collects firewood worth INR 450.00 per month. The families would lose the access to the firewood and dependency on alternative sources would increase, if alternate areas are not available or accessible to them.

7. IMPLEMENTATION STRATEGIES FOR AGAR 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 Agar 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 summarises specific mechanisms that will need to be incorporated as a part of the RAP and LRP Implementation, with specific focus on Unit 4 of the Solar Park, prior to the implementation of RAP-LRP:

Table 7.1 Pre- implementation actions

Aspect	Description
Stakeholder consultations and information disclosure;	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. 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 and the provisions for protection of Nistar rights. These engagement activities shall specifically be focused on the three villages Ladwan, Karwa Khedi and Dudhpura that had filed formal objections against the project to the District Collector.
Completion of RAP&LRP surveys	Undertake the resettlement surveys for the villages which refused to participate in the process during the RAP&LRP preparation. The completion of the RAP&LRP surveys should be undertaken only with the consent of the PAHs. As such, the project will have to ensure an informed willingness to participate in the project activities amongst the local community. As needed, the project shall undertake focused discussions with groups of affected households, land owners and other key stakeholder such as the Panchayat members.

7.2 Stakeholder Engagement and Grievance Management

Given the gap at the current stage with regards to missing information from four villages of Unit 4, and the associated large scale grievances reported during the resettlement surveys undertaken in August 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.

As understood from consultations with DREO, 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 include –

- Consultations with the Gram Panchayat to provide update on the land procurement process of private land in the villages
- 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 DREO, 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 as a grievance record keeping and resolution platform.

7.3 RAP implementation schedule for Agar Solar Park

The overall implementation schedule in the Volume I of the RAP-LRP contains the key project timelines, including the disclosure of RAP and LRP as well as regular engagement activities. A Solar Park level implementation schedule will be prepared in keeping with the Volume 1 schedule for Agar Solar Park. .

APPENDIX A PHOTO-DOCUMENTATION

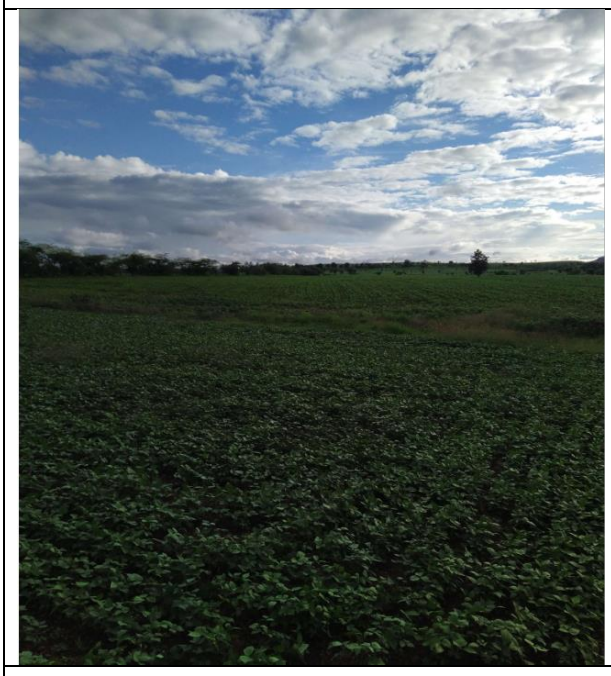


Photo 1: Land parcel in Unit 5

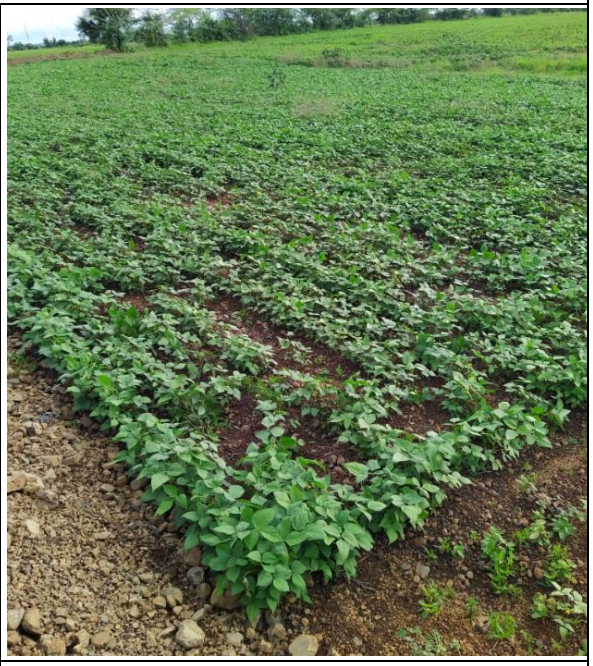


Photo 2: Soyabean crop on a land parcel in Unit 5

Photo 3: A kutcha structure in the middle of a land parcel in Unit 5

Photo 4: Residential structures in Unit 4

Photo 5: An isolated structure on a land parcel in Unit 5

Photo 6: Umariya Village in Unit 5

Photo 7: Kickoff meeting at Palda, Unit 5

Photo 8: An open well in Umariya, Unit 5

	
Photo 9: Area within Project Boundary in Umariya, Unit 5	Photo 10: Residence in Umariya, Unit 5
	
Phot 11: Developmental Projects in Unit 4.	Photo 12: Residential structure in Unit 4.
	
Photo 13: FGD in Naharkheda, Unit 5	Photo 14: Household Survey in Umariya, Unit 5

Photo 15: Residential structure in Palda

Photo 16: Kick off meeting in Naharkheda, Unit 5

Photo 17: L&A survey in Umariya, Unit 5

Photo 18: Corporate developmental initiative in Agar

Photo 19: Soyabean pests in Unit 5

Photo 20: Local deity in Unit 5

APPENDIX B SUMMARY OF CONSULTATIONS

SUMMARY OF CONSULTATIONS

FGD with Grazer's Groups at Umariya

- The village has approximately 200-3000 cows, 1500-2000 Buffaloes and 1000-1500 goats.
- The typical
- Most of the grazing area is restricted to the immediate vicinity (1-2 km) around the village abadi area
- The community does not use the land towards the east for grazing purposes as the land is more fertile and suitable for agriculture. On the other hand the land towards the west of the abadi area is hilly so more suitable for grazing
- The community emphasised the importance of livestock holdings in the livelihoods of the local community and suggested that the project should consider taking the panchvan land instead
- The local community were of the opinion that the project should not disturb the waterbodies existing in the proposed project footprint and allow access to the community for the same
- Also, for water requirements for the project, the water should be purchased from the local community instead of setting up new bore wells
- Lastly, the community wanted access to project benefits through free electricity, jobs and hiring of vehicles from the local village

FGD with Women's group at Umariya Village

- The women reported that livestock holdings are an essential part of the livelihood and sustenance of the households
- The men are responsible for the grazing of the livestock heads on the open government land. The typical grazing area is 2-3 km around the village abadi area
- The women are responsible for the activities surrounding livestock maintenance within the homestead, such as cleaning the shed, milking, fodder for stall feeding and washing of the animal
- Women are responsible for the collection of firewood and dung from the government land surrounding the abadi area and typically go upto 1 km for the same
- The women also use the land in the immediate vicinity of the abadi area for open defecation
- If the project is set up close to the abadi area, women will lose access to the government land and this will impact their sense of security as well the overall sustenance of the household

FGD with Grazer's group at Palda

- The community reported that very little grazing land remains in the village as a lot has been diverted to forest land
- The local community is not allowed to the forest land within the village
- The cows in the village graze upto approximately 2 km from the abadi area whereas the goats graze upto 4 km, upto the Pipaliya Nankar border
- There are a lot of 'awara gai' in the village as outsiders come and strand the cattle they do not want in the middle of the night in their village. They are thus not able to trace those responsible
- While the project may set up gaushalas for cows, it will only for stray cows and not other animals
- Also, one shelter cannot be created for goats and bufflaoes together
- Also, the catlle breed needs to open graze in order to get adequate exercise and thus stall feeding wont work, the households also typically don't have adequate infrastructure to keep all the livestock at home through the day

- If grazing land is left it should be close to the abadi area as they will not be able to use the land beyond 2 km

FGD with Grazer's group at Naharkheda

- The cows in the village graze upto approximately 2 km from the abadi area
- There are a lot of 'awara gai' in the village as outsiders come and strand the cattle they do not want in the middle of the night in their village.
- While the project may set up gaushalas for cows, it will only for stray cows and not other animals. The local community will not consent to keeping their own cows in a gaushala as every household has a different approach to maintaining their cattle, including the kind and amount of fodder being used
- Also, the catlle breed needs to open graze in order to get adequate exercise and thus stall feeding wont work, the households also typically don't have adequate infrastructure to keep all the livestock at home through the day
- If grazing land is left it should be close to the abadi area as they will not be able to use the land that is too far away as the cattle cannot reach the land, graze and return within the same day
- The village does not allow the nomadic herding community to graze in the area

FGD with Grazer's group at Pipaliya Nankar

- The cattle graze in the open for 8 months in a year. Rest is stall feeding with crop residue
- Typically you need 15-18 kg of a fodder a day for a cow and 30-35 kg of fodder a day for buffaloes. Goats eat significantly less, with only 1-2 kg of fodder being required
- The typical cost of fodder and supplements for a cow is 8000 Rs for a month while for a buffalo its more than 12000
- In the past as well other projects have been developed in the area, which have not benefited the population at all. It has increased the pressure on the existing land in the village
- While on paper 2% land may be available for grazing, the local community does not know of its location and that is not enough
- According to the local community, if the cattle doesn't roam while grazing, their health and productivity will suffer
- A reduction in grazing land would result in an increase in out migration from the village and an increase in awara gai population

FGD with local community and Grazers at Palda

- The village has forest land which should be diverted for the project, instead of grazing land being used. This is because, grazing land is critical for the local community while they are not allowed access to the forest land
- Livestock was reported to be critical for sustenance, as agricultural activities have an unpredictability associated with them, in terms of yield and productivity
- Instead of 2% land, they need atleast 25% land in the village for grazing purposes
- The local community had heard about the complaint filed by the Ladwan village against the project and were keen to do the same as well
- The project, if it comes, should undertake water shed development work that would help the livestock holding
- The village is divided into hamlets, and each hamlet has their own grazing area which is not used by the other hamlets. Thus while the entire village may have 2% land remaining, it may not be equally distributed

- The reduction in grazing land would result in a reduction in livestock holding, increase in awara gai and overall increase in out migration

FGD with local community at Pipaliya Kumhar

- The village is divided into two main settlements, Pipaliya Kumhar and Nai Abadi. The grazing land between these two villages is divided, and the two populations do not use the other hamlets land
- There was a dam constructed in the village without the community's consent or participation and that resulted in a reduction in the overall land available for grazing
- While on government records, grazing land may be remaining in the village, it may be concentrated in one hamlet or already be encroached upon. Furthermore, the community is not aware of the location of the government designated grazing land

FGD with women at Pipaliya Kumhar

- At the time of the dam construction, the local community was deceived. During the public meetings they were asked for their consent to the project. While the local community was against the project, they were made to sign on a declaration supporting the project. this was done as at that time the community was not literate and could not verify what was written on the document
- In addition to grazing, the remaining government land is also used by the community for purposes such as firewood and dung collection and open defecation.
- Any new project in the village will result in an impact on the sustenance of the households in the village

FGD with grazers and youth at Kesai Dehariya

- According to the local community, the most stable and biggest source of income for the local community was their livestock holding
- The community was opposed to the project as it would reduce the government land available for grazing, which would result in a reduction in total livestock holdings in the village and an increase in awara gai in the area
- Furthermore, the agricultural activities will also get impacted as the livestock holdings serve as an important source of manure for the cultivation
- If the project is to be constructed, adequate grazing needs to be left for the community and the project needs to work with the government to provide free electricity and water to the community from the Dam
- The project should also provide employment. If employment is provided, even women of the community will work
- Unemployment in the youth is high in the village due to lack of opportunities. Most young boys take care of the livestock holdings of the household and the young men typcailly migrate to Mahrasthra and Rajasthan for work. While in Maharashtra, the youth is typically engaged in cultivation of Tuar pulse and cotton, in Rajasthan they are involved in tile manufacturing

APPENDIX C SUMMARY PROFILE OF INFORMAL USERS IN AGAR SOLAR PARK

Summary Profile of Informal Users in Agar Solar Park

The table below provides a summary of the profile of the informal users (encroachers and squatters) on government land who will be impacted due to the land procurement for the Agar Solar Park.

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)
Umariya	297	531128	10123168120	SC	Squatter	0.56	Agriculture	No	5+	Yes	NA
Umariya	297	531131	10123169129	SC	Squatter	0.84	Agriculture	Yes	5+	No	Three (3) uneducated youth without any skill set
Umariya	849	531116	10123171132	SC	Squatter	4.40	Agriculture	Yes	5	No	Squatter on forest land
Umariya	748	531112	10123168110	OBC	Squatter	0.50	Agriculture/ Toilet	Yes	5	Yes	One uneducated youth without any skill set
Umariya	872	531115	10123167131	OBC	Squatter	0.10	Agriculture	Yes	3+	Yes	One uneducated youth without any skill set
Umariya	748	531113	10123167111	OBC	Encroacher	0.35	Agriculture	Yes	3 - 5	Yes	One uneducated youth without any skill set
Umariya	748	531114	10123170112	OBC	Encroacher	0.36	Agriculture	Yes	3 - 5	Yes	NA
Umariya	712	531120	10123170118	OBC	Encroacher	0.02	Agriculture	Yes	2+	Yes	One educated youth without any skill set
Umariya	776	531140	10123170122	SC	Squatter	2.04	Agriculture	Yes	3+	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)
Umariya	776	531119	10123170125	OBC	Squatter	0.00	Agriculture	NA	3 - 5	NA	NA
Umariya	300, 297	531134	10123167136	SC	Squatter	0.85	Agriculture	Yes	NA	Yes	NA
Umariya	297	531124	10123170117	SC	Squatter	0.31	Agriculture	Yes	NA	Yes	NA
Umariya	297	531129	10123169128	SC	Squatter	0.50	Agriculture	Yes	3	No	NA
Umariya	297	531132	10123164130	OBC	Squatter	0.51	Agriculture	Yes	NA	Yes	NA
Umariya	297	531130	10123164127	General	Squatter	0.10	Fodder Lot	Yes	<1	Yes	Women HoH
Umariya	748	531107	10123164104	SC	Squatter	0.65	Agriculture	Yes	5+	No	Below Poverty Line, and Artisan household with one uneducated youth without any skill set
Umariya	748	531108	10123164104	SC	Squatter	0.60	Agriculture	Yes	5+	No	Below Poverty Line and Artisan
Umariya	748	531109	10123164106	SC	Squatter	0.98	Agriculture	Yes	3+	No	One uneducated youth without any skill set
Umariya	748	531110	10123167107	SC	Squatter	1.34	Agriculture	Yes	<3	No	One uneducated youth without any skill set
Umariya	748	531111	10123170105	SC	Squatter	1.42	Agriculture	Yes	<3	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)
Umariya	297	531127	10123169126	OBC	Squatter	0.85	Agriculture	Yes	<3	No	NA
Umariya	712	531121	10123168101	OBC	Encroacher	0.06	Fodder Lot	No	<5	Yes	NA
Umariya	800	531118	10123164719	OBC	Squatter	3.10	Agriculture	Yes	<3	No	NA
Umariya	297	531133	10123367126	General	Squatter	0.61	Agriculture	Yes	3 - 5	Yes	One uneducated youth without any skill set
Umariya	180	531138	Refused to HH survey		Squatter	0.16	Agriculture	Yes	5+	No	NA
Umariya	180	531137	Refused to HH survey		Squatter	0.48	Agriculture	Yes	5+	No	NA
Naharkheda	138	532148	10123269164	SC	Squatter	0.03	Agriculture	No	5+	Yes	NA
Naharkheda	34	532161	Refused to HH survey		Squatter	1.56	Agriculture	Yes	5+	No	NA
Naharkheda	135	532149	10123269174	SC	Squatter	0.06	Agriculture	No	<10	Yes	NA
Naharkheda	135	532152	10123269171	SC	Squatter	0.07	Agriculture + Storage shed	No	5	Yes	NA
Naharkheda	137	532147	10123269167	SC	Squatter	0.03	Agriculture	No	<10	No	NA
Naharkheda	140	532142	10123264156	SC	Squatter	2.54	Agriculture	No	<10	Yes	NA
Naharkheda	19	532164	10123265163	General	Squatter	1.26	Agriculture	Yes	5+	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)
Naharkheda	19	532165	10123265163	General	Squatter	1.26	Agriculture	Yes	5+	No	NA
Naharkheda	19	532166	10123265163	General	Squatter		Agriculture	Yes	5+	No	NA
Naharkheda	19	532167	10123269157	General	Squatter		Agriculture	No	<10	Yes	NA
Naharkheda	19	532168	10123268151	General							NA
Naharkheda	140	532145	10123269166	SC	Squatter	0.80	Agriculture	No	<10	Yes	One uneducated youth without any skill set
Naharkheda	137	532143	10123269160	SC	Squatter	2.70	Agriculture + Storage shed	Yes	10	No	NA
Naharkheda	136	532146	10123264169	SC	Squatter	0.03	Agriculture	No	3+	Yes	Elderly HH
Naharkheda	140	532144	10123264165	SC	Squatter	0.80	Agriculture	No	3+	Yes	NA
Naharkheda	135	532150	10123264172	SC	Squatter	0.06	Agriculture	No	3+	Yes	NA
Palada	921	534237	10123470267	OBC	Squatter	0.12	Agriculture	No	15+	Yes	NA
Palada	1146	534239	10123470267	OBC	Squatter	0.20	Agriculture	No	15+	Yes	NA
Palada	1163	534252	Refused to HH survey		Squatter	0.70	Agriculture	Yes	NA	No	NA
Palada	979	534248	10123468261	SC	Squatter	1.00	Agriculture	Yes	10	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)
Palada	1145, 1146	534240	10123470270	SC	Squatter	2.40	Agriculture	Yes	<7	Yes	One uneducated youth without any skill set
Palada	1146	534241	10123470270	SC	Squatter	1.20	Agriculture	Yes	5	No	NA
Palada	1146	534242	10123470270	SC	Squatter		Agriculture	Yes	5	No	NA
Palada	860	534290	10123468268	OBC	Encroacher	1.10	Agriculture	No	<7	Yes	NA
Palada	1156	534251	10123470269	General	Squatter	1.20	Agriculture	No	7	Yes	NA
Palada	979	534249	10123467260	SC	Squatter	1.00	Agriculture	Yes	10	No	One uneducated youth without any skill set
Palada	979	534247	10123468259	SC	Squatter	0.30	Agriculture	Yes	<7	Yes	NA
Palada	1144	534243	10123465393	OBC	Squatter	0.56	Agriculture	Yes	5	No	Two (2) uneducated youth without any skill set
Palada	1154	534253	10123369400	General	Squatter	1.30	Agriculture	No	5	Yes	NA
Palada	1144	534244	10123469392	OBC	Squatter	0.25	Agriculture	Yes	<10	No	NA
Palada	1144	534245	10123464391	OBC	Squatter		Agriculture	No	3 - 5	Yes	NA
Palada	1144	534246	10123469394	OBC	Squatter		Agriculture	Yes	7 - 10	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)
Palada	979	534250	10123470266	SC	Squatter	0.90	Agriculture	Yes	5	No	One uneducated youth without any skill set
Pipliya Nankar	92	533228	10123365386	OBC	Encroacher	0.30	Agriculture	No	5+	Yes	NA
Pipliya Nankar	92	533225	10123364372	OBC	Encroacher	0.50	Agriculture	No	5+	Yes	NA
Pipliya Nankar	92	533231	Not available for HH survey		Encroacher	0.10	Agriculture	No	5 - 6	Yes	NA
Pipliya Nankar	178	533233	10123365376	OBC	Encroacher	0.30	Agriculture	No	10 - 15	Yes	NA
Pipliya Nankar	178	533235	10123165113	OBC	Encroacher		Agriculture	No	10 - 15	Yes	One uneducated youth without any skill set
Pipliya Nankar	178	533232	10123364377	General	Encroacher		Agriculture	No	10+	Yes	NA
Pipliya Nankar	92	533226	10123365374	OBC	Encroacher		Agriculture	Yes	10 - 15	Yes	NA
Pipliya Nankar	92	533229	Refused to HH survey		Encroacher	0.45	Agriculture	No	<10	Yes	NA
Pipliya Nankar	92	533230	Refused to HH survey		Encroacher		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)
Pipliya Nankar	92	533224	10123365371	OBC	Encroacher	0.50	Agriculture	No	6+	Yes	NA
Pipliya Nankar	92	533227	10123369373	OBC	Encroacher	0.30	Agriculture	No	7+	Yes	NA
Pipliya Nankar	178	533234	11123170117	OBC	Encroacher		Agriculture	No	5	Yes	NA
Bijnakhedi	532	435357	10113565900	OBC	Squatter	0.33	Agriculture	Yes	<5	No	NA
Bijnakhedi	538	435356	10113564901	SC	Encroacher	0.83	Agriculture	No	5	Yes	NA
Bijnakhedi	532	435360	10113667586	OBC	Encroacher	2.50	Agriculture	No	5	Yes	Two (2) uneducated youth without any skill set
Bijnakhedi	532	435361	10113667577	OBC	Encroacher		Agriculture	No	5	Yes	Two (2) uneducated youth without any skill set
Bijnakhedi	532	435363	10113667577	OBC	Encroacher		Agriculture	No	5	Yes	NA
Bijnakhedi	532	435718	10113668584	OBC	Squatter	0.33	Agriculture	Yes	10+	No	NA
Bijnakhedi	532	435359	10113668590	OBC	Squatter	0.83	Agriculture	Yes	10+	No	WOMEN HoH with two (2) uneducated youth without any skill set

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)
Bijnakhedi	532	435362	10113667585	OBC	Encroacher	2.50	Agriculture	No	5	Yes	NA
Madhopur	464	436714	10113665591	OBC	Squatter	1.40	Agriculture	Yes	10+	No	NA
Madhopur	464	436713	10113668584	OBC	Squatter		Agriculture	Yes	10+	No	NA
Madhopur	464	436715	10113668583	OBC	Squatter		Agriculture	Yes	<8	No	One uneducated youth without any skill set
Madhopur	464	436712	10136667595	OBC	Encroacher		Agriculture	Yes	<8	No	NA
Madhopur	464	436710	10113668572	OBC	Encroacher		Agriculture	Yes	<8	No	Two (2) uneducated youth without any skill set
Madhopur	464	436711	10113668571	OBC	Encroacher		Agriculture	Yes	<8	No	Two (2) uneducated youth without any skill set
Kesai Dehariya	397	437391	10113770592	OBC	Squatter	2.38	Agriculture	Yes	10+	No	NA
Kesai Dehariya	397	437392	10113768593	SC	Squatter	0.96	Agriculture	Yes	10+	No	NA

APPENDIX D PROFILE OF RESIDENTIAL STRUCTURES WITHIN AGAR SOLAR PARK

Summary Profile of Residential STructures in Agar Solar Park

The tables 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	Village	Khasra No.	Direct/ Induced Displacement	Ownership Status of Land	PAH ID	PAE ID	Area of Structure (sq.mtr)	Description of Structure	Status of Use (temporary/ permanent)	Vulnerability Status of PAH	Approx Value of Structure
	Unit 4										
1	Dudhpura[31]	54	Induced Displacement	Squatter on Government land	Not surveyed	Not surveyed	8060	Not available	Permanent	None	3,97,51,920[32]
	Unit 5										
2	Naharkheda	22-1	Direct Displacement	Private Land Owner	10123270153	532502	20.25	RCC	Temporary	None	1,38,955
3	Naharkheda	13-906	Direct Displacement	Private Land Owner	10123270153	532503	20.25	RCC	Temporary	None	1,38,955
4	Naharkheda	32-1	Direct Displacement	Private Land Owner	10123270153	532502	20.25	RCC	Temporary	None	1,38,955

[31] DUdhpura local community did not consent to participate in the resettlement survey process. The details of the structure are based on the desk based sensitivity analysis undertaken

[32] Assuming RBC type structures to be physically displaced with an approximate total area of 8060 sq.mtrs.

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