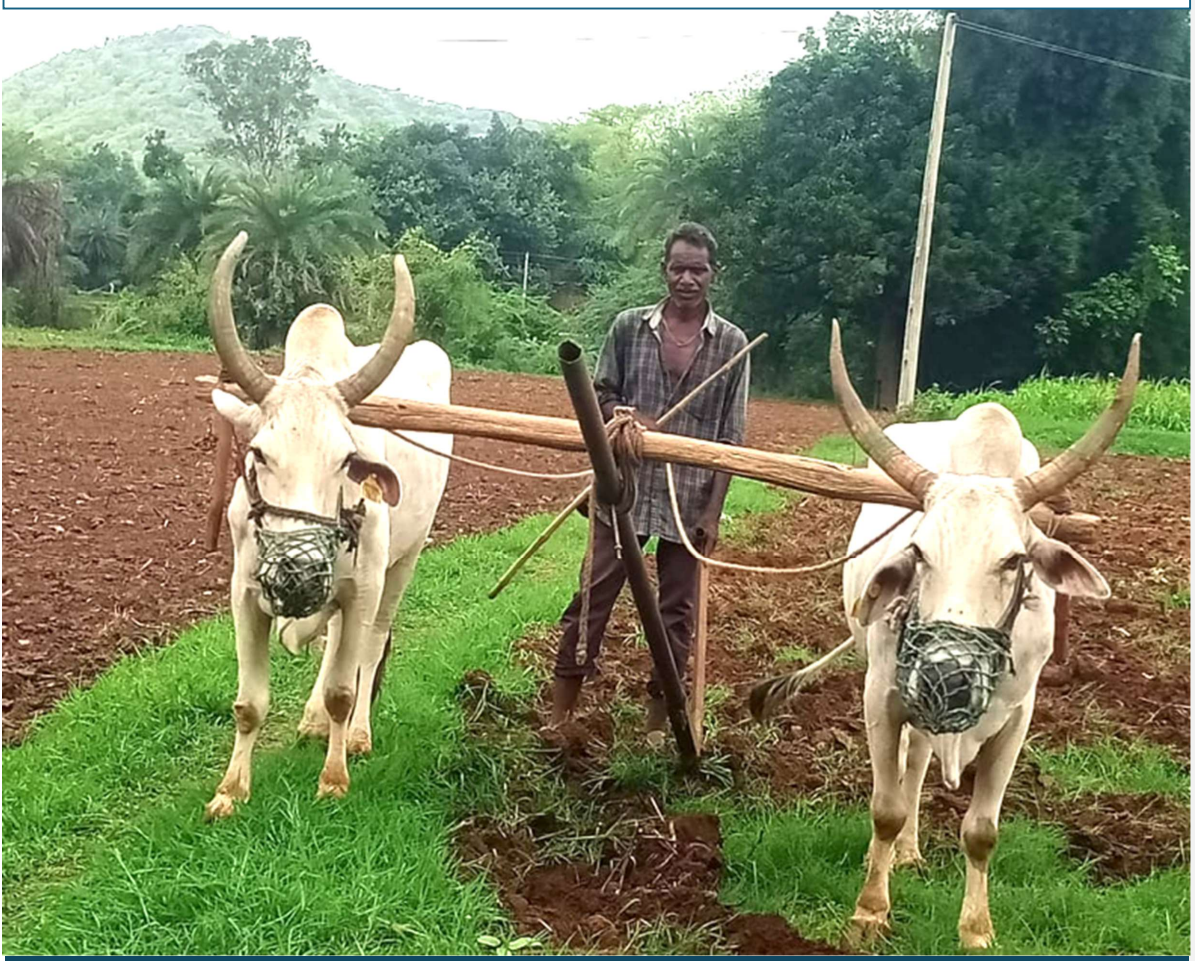
Baseline Study Report

KMBL Lakhpati Kisan Project
Danta, Banaskantha
July 2024

VIKSAT
Towards Sustainable Development



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Centre for Integrated Development
July 2024

Abbreviations

APL	Above Poverty Line
BPL	Below Poverty Line
CAPI	Computerized Assisted Personal Interview
FGD	Focussed Group Discussion
FPO	Farmer Producers Organisation
HH	Household
KII	Key Informant Interview
MIS	Micro Irrigation System
MGNREGA	Mahatma Gandhi National Rural Employment Scheme
NRLM	National Rural Livelihood Mission
OBC	Other Backward Class
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMKSN	Pradhan Mantri Kisan Sanman Nidhi
SC	Scheduled Caste
SHG	Self Help Group
SMC	Soil Moisture Conservation
ST	Scheduled Tribe

Glossary of Terms

Marginal Farmer	Land holding less than 1 hectare (2.47 acres)
Small Farmer	Land holding of 1 - 1.99 hectares (2.47-4.93 acre)
Semi Medium	Land holding of 2 - 3.99 hectares (4.94-9.87 acre)
Medium Farmer	Land holding of 4 - 9.99 hectares (9.88-24.68 acre)
Large Farmers	Land holding of 10 hectares and above (24.7 acres or more)
Housing Condition	Pucca (brick/stone walls with Sheet /RCC Roof), Kuccha (mud wall and thatch roof) Semi-Pucca (brick/stone wall with thatch roof)

Note: Classification of farmers based on landholding is as per Agricultural Census Division, Department of Agriculture & Co-operation, Ministry of Agriculture, Government of India. (http://agcensus.nic.in /)

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Context

The intervention targets some of the most neglected tribal areas in Gujarat, specifically in the Danta block of Banaskantha district, where agriculture is primarily rainfed and faces challenges like irregular rainfall, lack of irrigation, and poor agricultural practices. VIKSAT, having built a strong presence in adjacent areas, plans to expand its Lakhpati Kisan programme to 15 new villages, aiming to lift 2000 households out of poverty by increasing their income to over INR 1.2 Lakh annually.

The project will focus on improving agricultural productivity and income of tribal households through sustainable practices, promoting high-value crops, and establishing community-led agricultural extension systems. Key strategies include building community institutions like SHGs and FPOs, enabling climate resilience, fostering market linkages, and providing accessible financial services. The intervention also emphasizes innovation and entrepreneurship in rural areas, ensuring each household engages in multiple livelihood activities to mitigate risks and secure a stable income.

Objective of baseline study

The main objectives of the baseline study is to assess and document current a) socio-economic status of the households, b) status of water resources, agriculture and irrigation practices, c) non farm livelihoods, d) awareness and access to government schemes, and e) status and role of community based institutions

Methodology

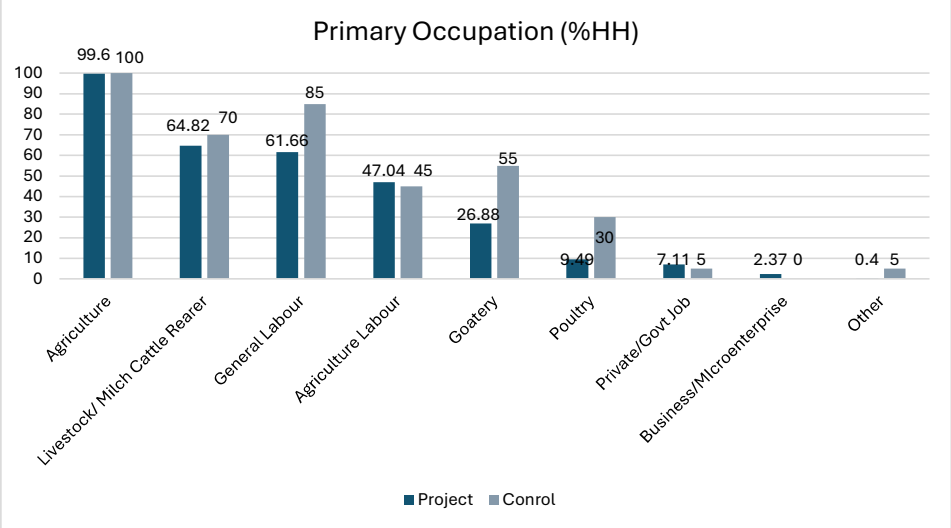
Mixed-methodology approach was applied for data collection covering qualitative as well as quantitative aspects. Quantitative Information shall be covered through CAPI based farmer /Household (HH) level surveys. Qualitative Information shall be captured through focus group discussion (FGD) with farmers, SHGs etc and KII /FGDs with PRIs and local government officers.
All the 10 project villages and additional two control villages were covered in the study. A total of 253 HHs (10% of total sample of 2500 HHs) across project villages and 20 HH from control villages were covered under CAPI based HH survey. Four FGDs with SHGs and Farmers group each, and KII with PRI members of all the villages were conducted to get comprehensive information at village level and stakeholder group level.

Key Findings

A. *Occupational Pattern*

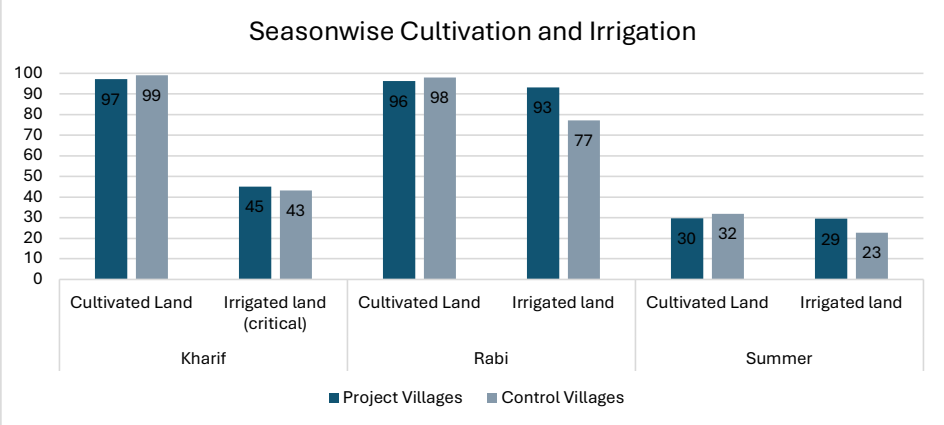
Primary occupation of almost all houses in the region is farming/ agriculture. Livestock is secondary occupation for around 70% HH. Other occupations include General labour (85% HH in control villages and 62% HH in project villages). Agriculture labourers are around 45%. Goatery is practiced more in control villages (55%) as compared to project villages (27%). As agricultural landholdings are small and there is limited income from farms, atleast one member from 15%HH

in project villages and 30% HHs in control villages migrate outside village for work. Mostly, only men migrate for work for 3-6 months, adding significant addition to annual HH income.



B. Agriculture

Land holding: Average landholding in project villages is 1.40 acres and that in control villages 1.10 acres. About 7% of farmers in project villages have taken on an average of 0.8 acre of land on lease. In control villages, around 5% farmers have taken an average of 0.5 acre of land on lease for farming.



Irrigation: Most of the farmers in the region have sources for irrigation. Around 43-45% of kharif cultivated land was provided with critical irrigation during. In Rabi 93% land in project villages and 77% land in control villages was irrigated. Around 30% of land was cultivated and irrigated in summer.

Main Crops: Cotton and Maize are main Kharif crops in the region. Cotton occupies around 44% of cultivated land of Kharif project villages and over 60% in control vilages. More than 60% farmers in project villages and more than 75% of farmers in control villages have cotton seed plots. Maize is cultivated in over 40% of land in project villages and around 20% in control villages. Wheat is the only predominant crop in Rabi season, occupying around 68% of land in project villages and around 85% land in control villages. Cotton continuous in Rabi for many farmers in project villages. Pearl Millet is cultivated in almost half of the land sown in summer. Juwar fodder cocupies one third of land in summer, while Maize is done in 5% land in poject villages and 15% land in project villages.

Seasonal Cropping Pattern - % of Cultivated Land in the season

Season	Crop	Project	Control
Kharif	Cotton	44.20	60.45
	Maize	40.64	21.36
	Groundnut	2.47	-
	Black Gram	0.22	-
	Oil Seed	1.75	-
	Pigeon Pea	2.07	-
	Castor	2.85	-
	Mix/ Fodder	2.60	18.18
Rabi	Wheat	93.5	100
	Maize	5.4	-
	Other	1.2	-
Summer	Pearl Millet	57.2	46.15
	Green Gram (Mung)	6.30	-
	Maize	5.10	15.38
	Fodder	28.28	38.46

Commented [MOU1]: Area of cultivation of that crop against total cultivated land in that season (so seasonwise total would be around 100%)

Agricultural practices: In Kharif crops most of the farmers use certified seeds, and 60-70 % farmers go for deep ploughing, except for maize in control villages. Application of farm manure is common practice, and sowing is mostly done by dibbling/ in row. However, few farmers also go for random/ boradcasting method of sowing. Critical irrgation is provided by farmers when needed, in an otherwise a rainfed practice for Kharif crops. DAP and Urea are commonly used fertilisers, while pesticides like monocoto and Emida are commonly used by farmers in varying dose. Use of organic fertilisers or biopesticides is negligible in the region.

Seeds used for Wheat are generally certified seeds or seeds preserved at home. For Maize, use of certified seeds is more common.

Crop	Season	Type of Seeds		
		Certified	Preserved at home	Non certified
Cotton	Kharif	98%	2%	-
Maize	Kharif	80%	20%	
Wheat	Rabi	30%	60%	10%
Pearl Millet	Summer	50%	20%	30%

Both deep plouging and shallow plouging is prevelant for Rabi and Summer crops, as per understanding of farmers. Chemical fertilisers and pesticides are widely applied, with none of the farmers using organic products.

Productivity: In Cotton seed production, average productivity in project villages is 182 Kg/ Acre, while in control villages it is 178 kg/ acre. In Maize, average productivity in project villages is 440 Kg/ Acre, while in control villages it is 314 kg/ acre. In rabi season, average productivity of Wheat in project villages is 550 Kg/ Acre, while in control villages it is 494 kg/ acre. In Summer, average productivity of pearl Millet in project villages is 332 Kg/ Acre, while in control villages it is 300 kg/ acre. if the data on crop productivity is segrregated according to land holding, it is evident that the farmers with large land holding has better productivity in almost all major crops.

Cost of cultivation: Cost of cultivation of Kharif Cotton ranges around Rs.6000-8000 per acre, while that of Kharif Maize is Rs.3100-3500. Cost of cultivation of Wheat is around Rs. 4200/ acre and that of Summer Pearl Millet is around Rs. 2500-2600 per acre.

Sale Price: Average sale price of Cotton is Rs. 1277 per 20 Kg in project villages and, Rs. 1066 in control villages. For Cotton seed, sale price is around Rs. 500 per kg. Sale price of Kharif Maize, Rabi Wheat and Sumer Pearl Millet remains in range of Rs. 375 to 485 per 20 Kg.

Income: Most of the farmers earn substaintial amount in cotton seed plots, with net household income around Rs. 80000, while average net income from Kharif cotton is just around Rs. 4000 per HH. Average net income from Maize is Rs. 5140 in project villages, it is only Rs. 1576 in control villages. Net income from Wheat averages Rs. 9127 in project villages and Rs. 7982 in control villages. Similarly net income from Summer Pearl Millet is around Rs. 3335 in project villages and Rs. 2600 in control villages. The average net income from agriculture in project villages is Rs. 33366/HH, while that in control villages is Rs. 54633/HH.

Commented [VN2]: In **Crop Wise Cost and Income** table net income is high in project villages and here in control villges?

Commented [MOU2R2]: HH income is calculated as income from all crops in all cultivate areas family has taken. And income for crop is calculated for specific crop. So that may differ as area, number of crops, input cost , sell price vary for HH

C. *Horticulture/agroforestry:* Less than 20% HH in project and less than 5% HH in control villages have one or more fruit bearing plants. Lemon and Guava are seen in Jalena, while Mango plantations are seen in Ghorad However for almost all HHs, the number is less than 5 plants in less than 0.5 acre. The fruits are used for home consumption only, except for two farmers in Ghorad, who sell Mango in local market. It implies that there is no systematic horticulture plantations in the region. Thus the income from horticulture is negligible and does not add effectively to household income for most of the farmers.

D. Animal Husbandry and Livestock Rearing

Cattle: Though, 76% HH in project village and 80% HH in control village have cattle, the number of milch cattle per HH is limited to 2-3, and their yield is 2-4 litres per day per cattle only. Most of the milk is used for home consumption and affiliation to dairy is low in the region, and hence there is no significant income from cattle rearing. Access to veterinary services is also poor in the region.

Goatery: Around 42% of HHs in project villages and 30% HHs in control villages have goats. However the average number owned by HHs is 4 or less. This implies that again there is no significant income from goatery.

Poultry: Backyard poultry is also there in 20% of HH in project villages and 45% HH in control villages. Average number of bird is less than 6 per HH. The eggs and meat is also consumed at home only.

E. Kitchen garden and Nutritional Consumption Pattern

Small scale backyard Kitchen garden is practiced by 38% HH in project villages and 50% HH in control villages. However, the produce is used for home consumption only and there is no additional income from sale of the vegetable. Consumption pattern of Vegetable, Milk, Pulses and Eggs reveal that around half of the HHs consume vegetable on daily basis, and nearly one third HHs twice a day also. Consumption of milk is relatively low with one third of HHs able to take it once a week only and another 24-30% HHs twice a week. Consumption of pulses is high, with nearly 45% HH consuming it twice a day. Consumption of eggs is less, with 24% HHs in project villages and 45% HH in control villages, consuming it only once in 15 days or more.

F. Institutional Affiliations

Multiple women SHGs have been formed in almost all villages under various government and NGO works. Nearly 53% HH in project villages and 45% HHs in control villages are affiliated to SHGs. Out of these HHs, nearly 40% are affiliated to SHGs formed within one year (by Viksat). Dairy penetration in the region is comparatively low, with less than 25% HHs associated with dairy cooperatives.

G. Access to Government Schemes

Enrolment to Ayushman Bharat scheme is around 60% across all villages. 30-40% of HH have also reported to have benefitted by National food security mission. Nearly 37% of farmers have enrolled in PM Kisan Sanman Nidhi programme.

H. Household Income

It is evident from the study that Agriculture, and Animal Husbandry form largest source of income for most of the households, supplemented by General labour and Agriculture labour work. Income from goatery, poultry, horticulture and kitchen garden have been insignificant. Few families also have substantial source of income from private job and government job.

Below table summarises the average annual income from selected livelihoods in project and control villages.

Source Wise Household Net Income (Rs.)		
Type of Occupation	**Project Villages**	**Control Villages**

	% HHs	Average Annual Income- Rs.	% HHs	Average Annual Income- Rs.
Agriculture	100	33366	100	54633
Animal Husbandry	76	15612	80	12847
Goatery	43	5528	30	4000

Summary & Way Forward

Due to limited handholding and conventional farming practices, the yield of crops and the income from agriculture remains lower than the potential in the region. With notable irrigation facilities, if the focus is on diversifying the farm based activities (introducing horticulture and flori culture) and processing of produce through micro enterprise, the income of farmers can be greatly enhanced. Further, though livestock is also a mainstay livelihood, households are unable to fetch substantial income from it due to limited ownership, lack of health services as well as lack of good and adequate feed/fodder. Institutional affiliation and the active role of institutions are limited and need to be explored for farm and non-farm livelihoods for collective actions.

1. Project Brief

1.1 Context

Project villages in Danta block of Banaskantha district of Gujarat are mainly dominated by tribal population. Agriculture is the primary occupation in these regions. However, due to limited access to irrigation facilities, agriculture has been mainly rainfed. Irregularities in rainfall patterns, lack of irrigation facilities at critical cropping stage and lack of knowledge on appropriate cultivation practices have affected crop productivity by time. Farmers thus have been relying on heavy application of fertilizers to maintain basic productive capacity. Households supplement their income through livestock rearing. However, lack of accessibility to veterinary services, poor knowledge regarding upkeep and maintenance of livestock, reduction of grazing pastures, and lack of fodder/feed are major obstacles in achieving adequate returns on livestock. The lack of institutional and affordable credit services, market linkage facilities and government extension services are leading to over exploitation from the non-institutional player.

1.2 Project details

VIKSAT has been working from last fifteen years in adjoining area of new cluster and has good rapport with other selected villages. VIKSAT has been working on building community institutions, sustainable agriculture, land and water resources development and backward and forward linkages through farmer producer organizations. The proposed project area for scaling of Lakhpati Kisan programme is adjacent to the current project villages spread over 15 villages of tribal belt of Danta Taluka of Banaskantha District. These would be new villages where VIKSAT and CInI has not yet intervened under its Lakhpati Kisan but are contiguous to current cluster of villages being intervened under the ongoing program. The total geographical area of proposed project area for scaling of Lakhpati Kisan is 6364.9 Ha and covering 2953 households. Under the project area, 54% area under forest cover; 3% area under Barren & Un-cultivable Land Area, 1 % Permanent Pastures and Other Grazing Land Area, 7% Culturable Waste Land Area, and 27 % cultivable land in the project villages. The cultivatable land having 59 % area is under irrigation and 41%, is un-irrigated in total private land area of villages.

Goal: 2000 households irreversibly brought out of poverty with increased life choices, and earn an income of more than Rupees One Lakh Twenty Thousand.

The objectives of the project are:

- Ensuring sustainable improvement in agriculture production and income enhancement;
- Create and strengthen SHGs, Vos & CLF and other Community Based institutions to sustainably promote, support and manage land, water and agriculture development in the project area;

- Promote cultivation of high value crops – especially vegetables on a large scale both in the Kharif as well as Rabi seasons and establish vegetable cultivation as an economically viable enterprise activity;
- Establish community led agriculture extension systems;
- Expand the livelihood options – farm and non-farm, so as to help the tribal families achieve sustainable income levels.

The intervention are planned to increase resilience of communities against climatic and other risks and also empower community (and community institutions) to secure and enhance sustainable and tap market potential, thereby ensuring assured yearly returns of more than INR. 1 lakh.

As per the project design, key features of proposed interventions are

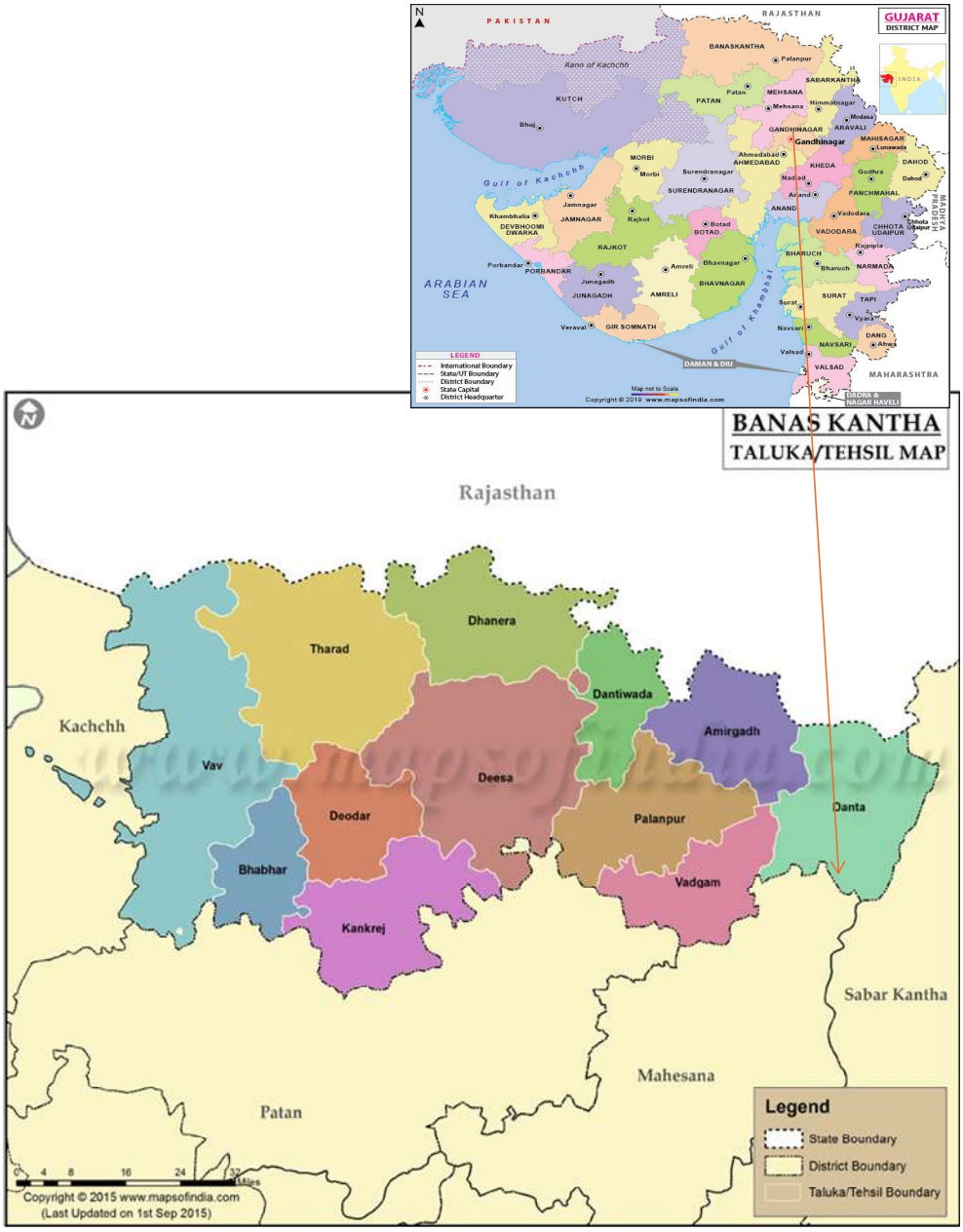


Figure 1 Study Region

2. About the Study

2.1 Objective

The main objectives of the baseline study will be to assess and document:

- The current socio-economic status of the households includes their literacy, occupation, land holding, migration, occupational pattern, and income from various sources.
- Current scenario of water resources including irrigation sources. The irrigation, agriculture and animal husbandry practices of the household level
- Irrigation water availability, current practices on usage of water and soil conservation at household and village level and water management practices and water footprint.
- Current agricultural practices include cropping pattern, yield, input cost, knowledge and usage of sustainable and climate-resilient practices if any.
- Status and income from non-farm interventions like livestock rearing, micro- enterprise etc.
- The awareness and access to various government schemes such as MGNREGA, Jan Dhan, PMFBY, etc.
- The current status of natural resources in the village including water, common land, vegetation etc.
- The current level of financial literacy & financial inclusion
- Impact of climate change on agriculture and livestock and local coping mechanism, if any.
- Scoping of existing community institutions in the region and their role
- Income and expenditure pattern of households.
- Nutritional consumption pattern of households
- Status of health care services
- The key issues faced by the community and possible interventions to mitigate the same

2.2 Methodology

The study plans to adopt a mixed-methodology approach for data collection covering qualitative as well as quantitative aspects. Quantitative Information shall be covered through CAPI based farmer /Household (HH) level surveys. Qualitative Information shall be captured through focus group discussion (FGD) with farmers, SHGs etc and KII /FGDs with PRIs and local government officers.

Sampling

- Villages: All 10 project villages and 2 control villages in Danta block have been covered in the study.
- Households: Total 253 HHs (10% of total sample of 2500 HHs) across 10 project villages (avg.

25 per village), and total 20 HHs in control villages have been included in the study. HHs within the village are sampled considering varied socio-economy covering various strata/clusters within village, varied size of landholding and specific vulnerability if any.

List of villages covered under the project are as follows

Table 1 List of Project Villages

Sr. No	Name of Project Villages	Name of Gram Panchayat
1	Jelana	Beda
2	Ranika	Barvas
3	Samaya	Dalapura
4	Dalapura	Dalapura
5	Mankadi	Mankadi
6	Sembal	Mankadi
7	Vekari	Mankadi
8	Thalvada	Mankadi
9	Kukadi	Sandhosi
10	Ghorad	Chorasan

Apart from these 10 project villages, baseline study also includes two villages outside project region as control villages. These villages are Umbra and Sekda, which were selected because of the close proximity to project region and having similar socio economy and agricultural practices.

3. Brief on Project Region

3.1 Physiography & Climate

Banaskantha district is situated in the north western part of the state and lies between north latitudes 23°33' & 24°25', and east longitude 71°07' & 73°02'. It has an area of 10,303 sq. km and is bounded by state of Rajasthan in north, Rann of Kachchh in west, by Sabarkantha, Mehsana and Patan districts in east, south and south west respectively.

The district has semi arid climate. Climate in the district is characterised by the hot summer and dryness in the non-rainy seasons. The year is marked by four distinct seasons i.e cold from December to February followed by the hot season from March to May/(mid-June). The south-west monsoon season is from mid June to mid September and Post monsoon season is from mid September to end of October. May is the hottest month with mean daily maximum temperature of 41°C. January is the coldest month in which the mean daily minimum temperature of 9.8°C. Annual rainfall of the district is 578.8 mm and is mostly received during the south-west monsoon season from June to September

Banaskantha lies in agro climatic zone of Gujarat Plains and Hills Region (XIII) according to Planning commission The elevation in the district ranges from less than 10 m in the western part to more than 800 m above mean sea level in the northeastern part.

The district has semi arid climate. Extreme temperatures, erratic rainfall and high evaporation are the characteristic features of this type of climate.

In Banaskantha district major part of the soils are sandy in nature. In general the soils are poor to medium in fertility and water retention capacity. Economy of the district is basically dependent on agriculture as about 65% of the workers are engaged in primary sector.

3.2 Water Resources

Since the district experiences a semi arid type of climate, the rivers flowing through it are of ephemeral nature i.e. have water during monsoon only and dry up after monsoon. The drainage network in the district is constituted mainly by the Banas and Saraswati rivers and their tributaries. In the extreme east, Sabarmati river forms district boundary with Sabarkantha district and in part controls the drainage network of the hilly area east of Danta.

The surface water resources of the district are very limited. Groundwater is the main source of irrigation. Important Irrigation schemes of the districts are Dantiwada, Mukteshvar Irrigation Project, Sipu Reservoir Project and Hadmatiya Irrigation Scheme.

Major surface and ground water resources reported in villages under the study are listed in table below.

Table 2 Village wise water resources

	No. of Ponds	No. of River /Stream	Unlined Canal Km	Lined Canal	No. of tanks	No. of Open wells (<30ft)	No. of Open wells (>30ft)	No. of Bore wells (<100 ft)	No. of Bore wells (100 - 300 ft)	No. of Bore wells (300-500 ft)	No. of Bore wells (>500 ft)	No. of Check dam	No. of Farm Ponds
Project Villages													
Samaya	2				3	7	25		15			6	3
Dalapura	2				2	5	20		5	10		4	
Thalvada		1			1		12			5		6	
Vekari	6				3	8	12		22	0		9	0
Mankadi	4	1			4	25	15		4	2		10	15
Kukadi					1		5		20	10	2	2	
Jelana	5	1			6	10	15		8	14		10	15
Ranika	3				2	2	6		4	6	5	3	0
Ghorad	8	0	10	8	4	7	8			12	8	20	5
Sembal	3	1		1	2	10	7		2	9		5	3
Control Villages													
Sekda	0	1			4	5	10		10	8		4	5
Umbra	1				2	2	10		10	3		1	

Table 3 Seasonal water table

Villages	Kharif season- feet	Rabi season- feet	Summer season- feet	Rabi 10 years back feet
Project Villages				
Samaya	30	25	6	30
Dalapura	25	15	5	30
Thalvada	30	20	4	30
Vekari	35	24	2	32
Mankadi	35	20	0	35
Kukadi	40	20		30
Jelana	35	30	10	35
Ranika	30	20	5	25
Ghorad	35	20	15	30
Sembal	40	25	5	30
Control Villages				
Sekda	35	20	4	30
Umbra	35	20	5	30

This implies that major source of drinking water and irrigation water in the project area is groundwater based- open wells and borewells. Average water table depth of wells is around 30-40feet during monsoon, which reduces to around 20 feet in winters and around 5 feet or less in summers.

Most of the borewells range from 100 ft to 500ft in depth. There are several checkdams in the area indicating measures for water conservation and recharge. Most of the villages also have ponds and tanks with limited water availability. However, canal is available in only one village.

4. Socio-Economy Profile of Study Participants

4.1 Demographic Details of Respondents

Table 4 Demographic details

Respondents Profile- % HHs				
Men	Project Villages: 56%	Control Villages: 65%	Women	Project Villages: 44% / Control Villages: 35%

Parameter	Category	Project Villages- % HH (n=251)	Control Villages- % HHs (n= 20)
Family Size	>6 Members	43	50
	5-6 Members	40	40
	3-4 Members	15	5
	< 2 Members	2	5
Single Women/Widow		3.56%	-
Caste Category	ST	73	100
	SC	9	0
	OBC	18	0
	General	0	0
Poverty Status	BPL	66	70
	APL	32	30
	Antyodya	2	0
Educational Qualification	Illiterate	5	0
	1-5 std pass	8	10
	6-10 std pass	31	35
	10th pass	14	5
	Inter/diploma+2 pass	24	40
	Graduate	16	10
	Post graduate	3	0

4.1.1 Gender

56% respondents in project villages and 65% respondents in control villages were male, while 44% in project villages and 35% in control villages were female

4.1.2 Age

46% of respondents of project villages and 55% respondents in control villages are in range of 36-50 years. 35% of respondents across all villages are 26-35 years. 15% of respondents in project villages and 10% respondents in control villages are of above 50 years and above

4.1.3 Family Size

Family size in the region is on higher side with more than 43% HH in project villages and 50% HH in control villages have more than 6 members, while 40% HHs across all villages have 5-6 members.

Table 5 Family size

Total Number of Family Members (%HH)		
Value	Project	Control
>6 Members	43	50
5-6 Members	40	40
3-4 Members	15	5
< 2 Members	2	5

4.1.4 Caste

The region is pre-dominantly tribal, with more than 70% HHs in project villages and 100% HH of control villages falling under ST category. In project villages 18% HH are OBC, and 9% HH are SC

Table 6 Caste of respondents

Caste (% HH)		
Value	Project	Control
ST	73.12	100
OBC	18.18	0
SC	8.7	0

4.1.5 Economic Status:

66% of HH in project villages and 70% HH in control villages come under BPL category, while nearly 30- 32% HH fall under APL. 2%HH in project villages are of Antyodaya category.

Table 7 Economic Status of respondents

Economic Status (% HH)		
Value	Project	Control
BPL	66	70
APL	32	30
Antyodya	2	0

As per reports obtained from Panchayat officials, the current status of number of families under different categories is listed in the table below.

Table 8 Village wise caste and poverty

Villages	Population	Total HH	ST HH	BPL HH	Antyodaya HH	Single women headed
Project Villages						
Samaya	1850	250	250	150	25	NA
Dalapura	5000	250	250	60	10	6
Thalvada	750	170	NA	55	15	0
Vekari	3280	275	275	173	2	5
Mankadi	3500	912	842	NA	NA	10
Kukadi	3000	500	500	120	50	5
Jelana	1400	207	207	50	25	15
Ranika	1800	175	185	100	15	5
Ghorad	1250	153	8	70	13	15
Sembal	1500	250	250	130	70	0
Control Villages						
Sekda	1092	199	199	NA	NA	12
Umbra	750	90	90	50	7	6

4.2 Education Status

31% HH in project villages and 35% HH in control villages have highest education of 6-10th grade, while atleast one member of 24% HH in project region and 40% HH in control villages have completed inter or diploma. Only 16% HH in project villages and 10% HH in control villages have graduate family members.

Table 9 Educational Status of respondents

Highest Educational Qualification in family		
	Project	Control
Illiterate	5	0
1-5 std pass	8	10
6-10 std pass	31	35
10th pass	14	5
Inter/diploma+2 pass	24	40
Graduate	16	10
Post graduate	3	0

4.3 Occupational Status

Primary occupation of almost all houses in the region is farming/ agriculture. Livestock is primary occupation for 60-70% HH. HHs engaged in General labour is higher in control villages (85%) compared to project villages (62%). Agriculture labourers are around 45%. Goatery is practiced more in control villages (55%) as compared to project villages (27%). In control village Sekda- 80% of HH is occupied in fishing from Dharoi dam

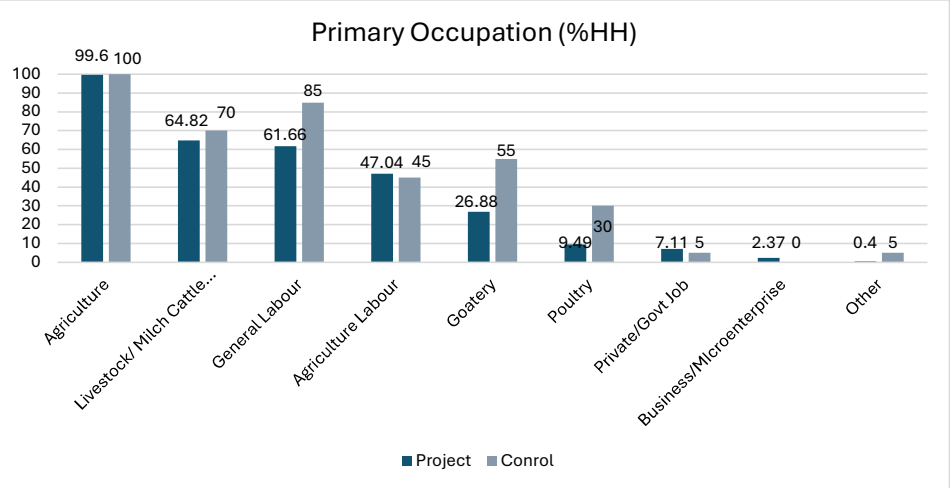


Figure 2 Occupational Details

List of village wise occupation details is listed in the table below.

Table 10 Village wise occupation details

Villages	Households									
	Farming	Cattle Rearing	Agri Labour	Goatery	General Labour	Poultry	Govt service	Pvt Job	Trader/ Shop	Fisheries
Samaya	200	225	5	100	25	110	25	10	15	
Dalapura	200	225	5	110	300	12	25	10	10	
Thalvada	155	160	10	3	15			10	5	
Vekari	220	75	250	200	400	20	1	15	10	7
Mankadi	750	770	500	10	5	400	18	20	25	0
Kukadi	350	450	100	250	30	10	55	10	8	5
Jelana	50	100	200	150	150	190	10	50	20	
Ranika	150	170	45	160	80	90	25	60	3	
Ghorad	140	75	10	40	12	4	3	45	5	
Sembal	200	15	120	25	10	5	3	2	6	2

Control Villages	Farming	Cattle Rearing	Agri Labour	Goatery	General Labour	Poultry	Govt service	Pvt Job	Trader/ Shop	Fisheries
Sekda	140	90	25	170	20	150	10	9	7	180
Umbra	65	80	12	50	45	75	6	8	3	

4.4 Migration

As agricultural landholdings are small and there is limited income from farms, atleast one member from 15HH in project villages nd 30% HHs in control villages migrate outside village for work. Mostly, only men migrate for work for 3-6 months, adding significant addition to annual HH income. This indicates that most of the migration is aspirational migration to supplement the income from agriculture and animal husbandry. Many men go in search of better work prospects.

Table 11 Migration details

Regional Pattern of Migration		
Details	**Project**	**Control**
% HHs Migrating	15	30
Pattern of Migration		
upto 3 months	50	65
4-6 months	40	35
> 6 months	10	0
Person Migrating	Mostly men	Mostly men
Place of Migration	50% to nearby town, 50% outside district	Mostly to nearby town

4.5 Housing Type and Condition:

100% HH have own houses in the region.

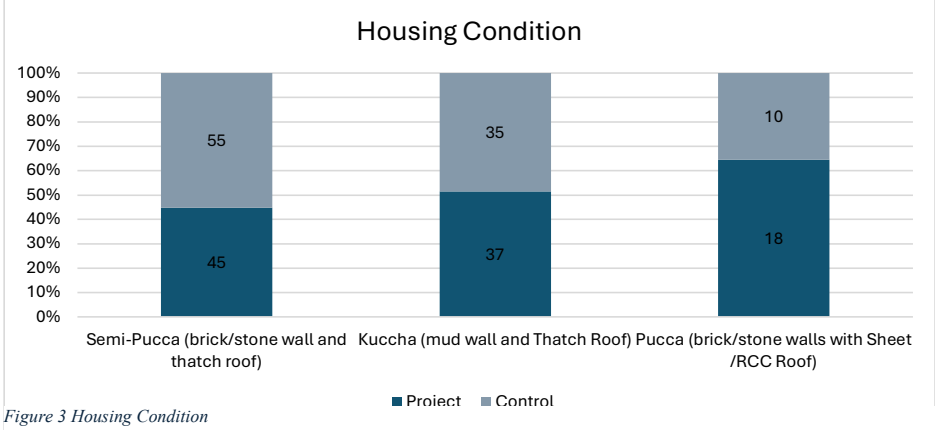


Figure 3 Housing Condition

35-37% HH have kutcha house, 45-55% HH have semi pucca houses and only 10-18% HH have pucca houses in the region. The difference of percentages in project and control villages have been given in figure below.

4.6 Document Availability

Adhar, Ration card, Bank pass book and Voter ID are available with almost all HHs. MGNREGA job card is available with 30% HH in project villages and nearly 65% HH in control villages. PAN card is available with 15-20% HHs.

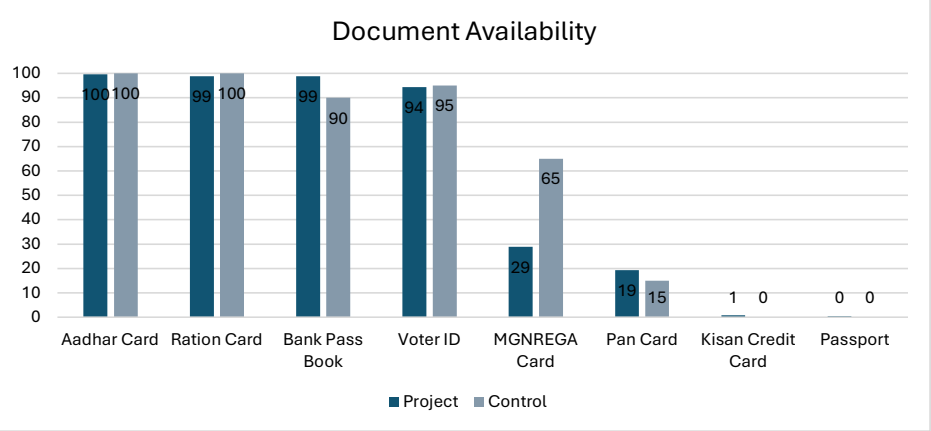


Figure 4 Document Availability

4.7 HH Assets

Mobile phones are available with almost 95% HH, followed by two wheelers (40-43%), and LPG connection with 35-42%) HH. Bicycle is present in 50% of HH in control villages and 31% HH in project villages. TV is possessed by 20-30% HH, while HHs car and freeze are around 10%.

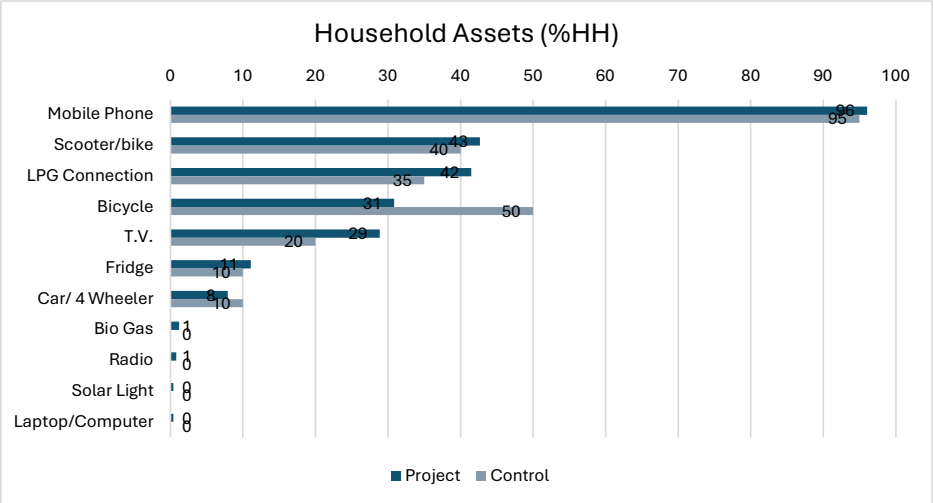


Figure 5 Household Assets

4.8 Drinking Water

35-45% HHs across the region still depend on hand pumps for drinking water. HH tap connection is available in only 25% HH in project villages and none in control villages. Open well and borewell are another major sources of drinking water.

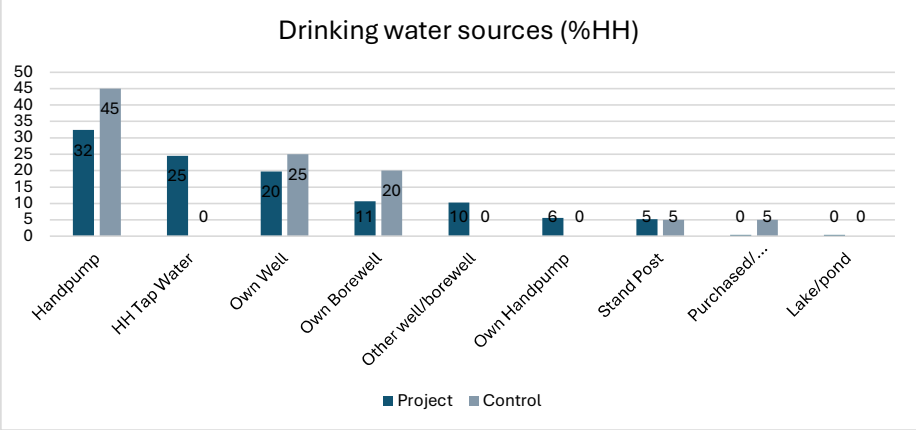


Figure 6 Drinking water sources

4.9 Sanitation

Only 27% HHs in project villages and 15% HHs in control villages have functional household toilets. Open defecation in rampant in both project and control villages.

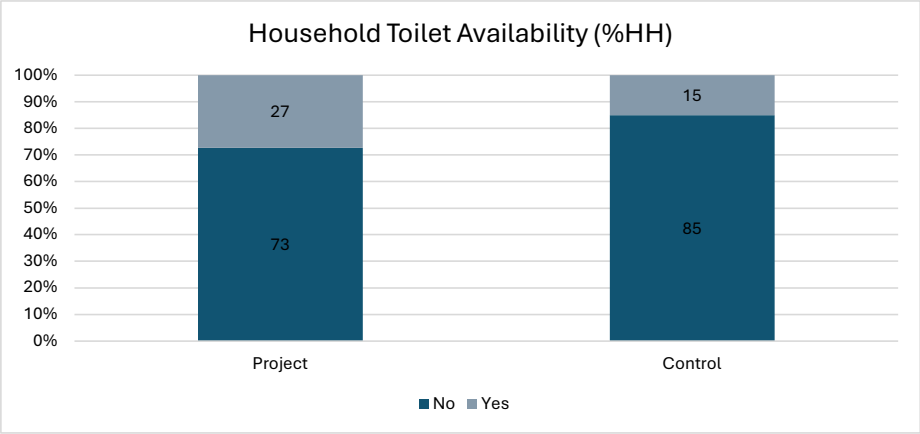


Figure 7 Household Toilet Availability

At village level only four project villages have WATSAN committee (Pani / Swachchhta Samiti), and in only one village, water tax is levied. Open defecation is observed in all villages as not all HHs of the village have access to toilet or use the existing toilet.

Table 12 Village wise water and sanitation

Project Villages	Presence of WATSAN Committee or Pani Samiti	Water tax levied by Panchayat	No. of HH having HH toilet	No. of HH defecating in open
Project Villages				
Samaya	No	No	75	175
Dalapura	Yes	Yes	25	225
Thalvada	No	No	5	165
Vekari	No	No	5	270
Mankadi	Yes	No	300	612
Kukadi	Yes	No	50	200
Jelana	Yes	No	57	150
Ranika	No	No	15	170
Ghorad	No	No	140	13
Sembal	No	No	10	240
Control Villages				
Sekda	No	No	35	164
Umbra	No	No	10	80

4.10 Health Issues

25% HH in control villages and 9% HHs in project villages face incidents of water borne diseases multiple times a year. 22% HH in project villages and 10% HHs in control villages have incidents of water borne diseases atleast once a year.

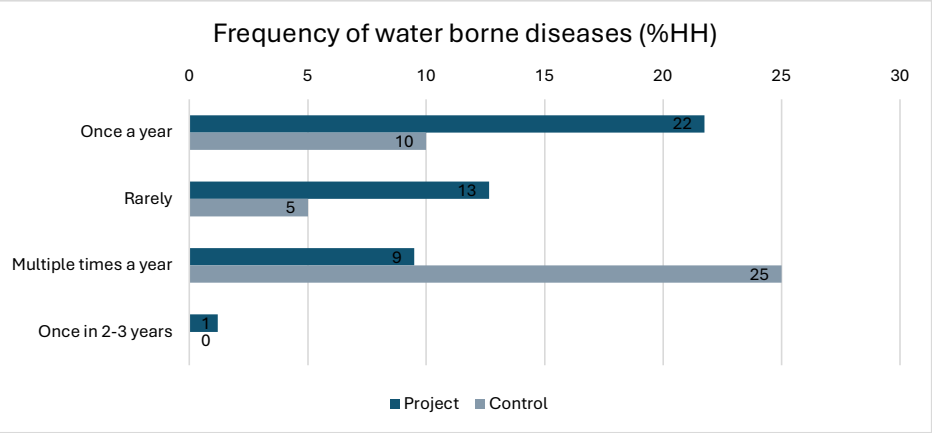


Figure 8 Frequency of water borne diseases

4.11 Power Supply:

96%HH in project villages and 100% HH in control villages have electricity at home. 64%HHs in project villages and 75% HHs in control villages have electricity supply in farms.

4.12 Institutional affiliation

Multiple women SHGs have been formed in almost all villages under various government and NGO works. Nearly 53% HH in project villages and 45% HHs in control villages are affiliated to SHGs. Dairy penetration in the region is comparatively low, with less than 25% HHs associated with dairy cooperatives.

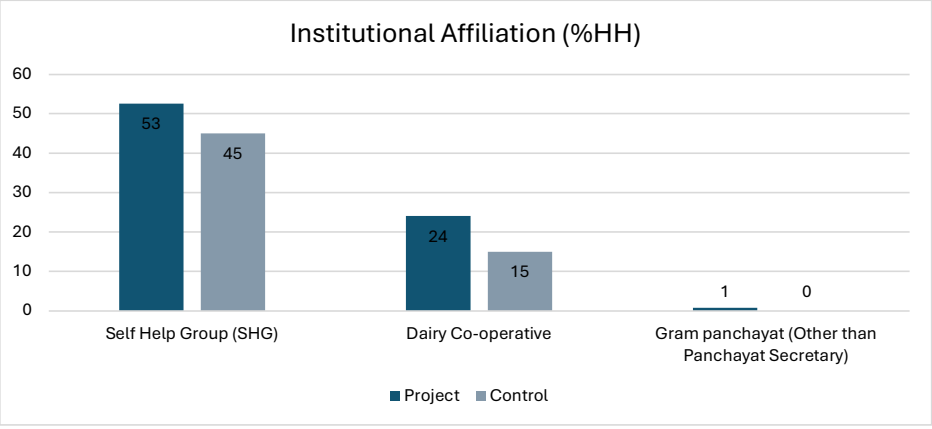


Figure 9 Institutional Affiliation

5. Key Findings

5.1 Agriculture

5.1.1 Landholding

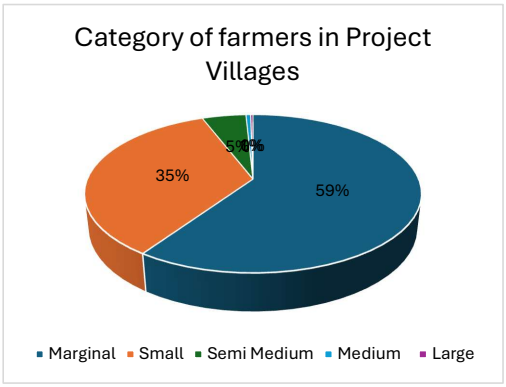
Average landholding in project villages is 1.38 acres and that in control villages 1.10 acres. About 7% of farmers in project villages have taken on an average of 0.8 acre of land on lease. In control villages, around 5% farmers have taken an average of 0.5 acre of land on lease for farming.

Table 13 Land ownership and lease

Land Ownership and Lease		
Details	Project Villages	Control Villages
Avg. landholding- acre	1.38	1.10
% HH taking land on lease- acre	7.17	5.0
Avg./ Leased Land- acre	0.80	0.5

5.1.2 Categories of farmers

Around 59-66% of farmers in the project as well control villages fall under marginal category (land holding less than 1 hectare (2.47 acres)), while nearly 1/3rd are small farmers (land holding of 1 - 1.99 hectares (2.47-4.93 acre)). Semi medium category farmers (land holding of 2 - 3.99 hectares (4.94-9.87 acre)) are less than 5%.



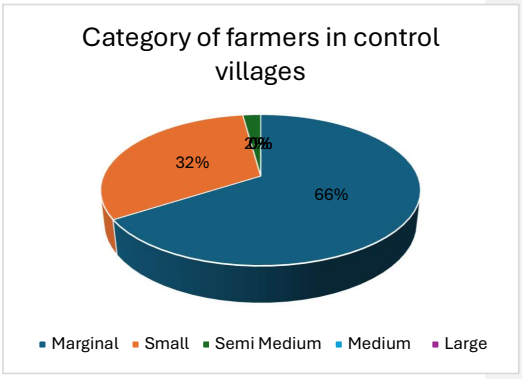


Figure 10 Categories of farmers

5.1.3 Irrigation Scenario

Around 80% HH in project villages and 90% HH in control villages have irrigation facility. Main source of irrigation is open wells (40-55%) followed by borewells (25-30%). Around 15% farmers also purchase water from others to fulfill their irrigation needs.

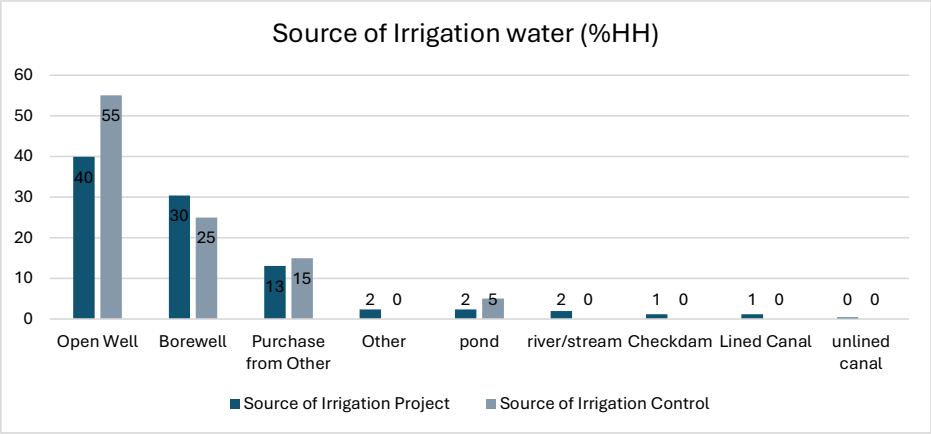


Figure 11 Source of irrigation

Figure 13 Tank for irrigation

Figure 12 Sembal Village Canal

Open wells, borewells and government handpumps are the main sources of drinking water in most of the villages. Water supply pipleine is there in Dalwada village and Mankadi villaghe. In Kukadi village, people have to buy tanker for drinking water.

High TDS has been reported in Dalawada and Kukadi.

However, there is no control over use of any water sources for any purpose in msot of the villages, except in project villages of Mankdi, Jelana, and in control village of Sekda, where there are resrictions for lift irrigation from ponds, river, checkdam, and regulation for construction of borewells. Water budget plan is prepared in Jalena. No other vilages have such plan

5.1.4 Seasonal Cultivation & Irrigation

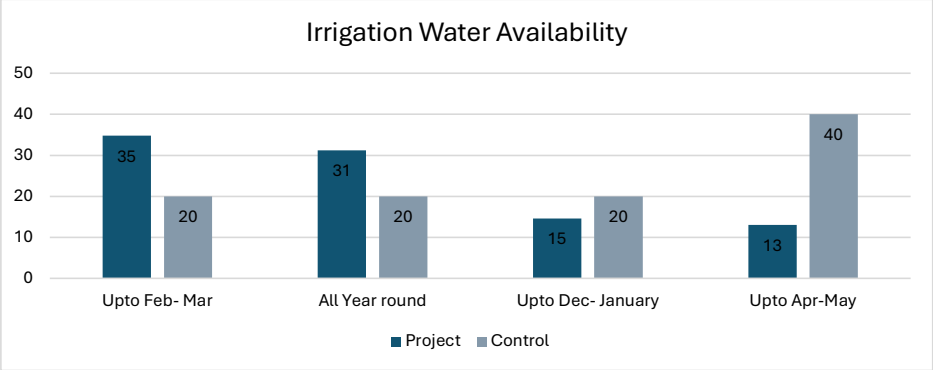


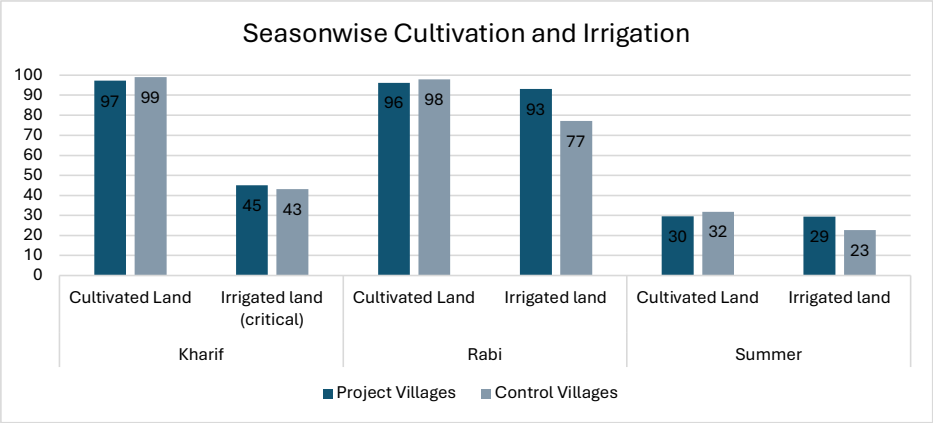
Figure 14 Irrigation Water Availability

Most of the farmers in the region have sources for irrigation. Around 43-46% of farmers were able to provide critical irrigation during Kharif crops, while almost all farmers were able to provide irrigation in Rabi crops. One third of the farmers were also able to take summer crops in limited area.

Table 14 Seasonal Cultivation and irrigation Pattern

Seasonal Cultivation & Irrigation Pattern- % Land Owned			
Season	Cultivation & Irrigation	Project Villages (n=253)	Control Villages (n=20)
Kharif	Cultivated Land	97	99
	Irrigated land (critical)	45	43
Rabi	Cultivated Land	96	98
	Irrigated land	93	77
Summer	Cultivated Land	30	32
	Irrigated land	29	23
% Farmers taking at least two crops in a year		100	100

Figure 15 Seasonal Cultivation and Irrigation



5.1.5 Seasonal Cropping Pattern

Cotton and Maize are main Kharif crops in the region. Cotton occupies around 44% of cultivated land of Kharif project villages and over 60% in control vilages. Maize is cultivated in over 40% of land in project villages and around 20% in control villages. Wheat is the only predominant crop in Rabi season, occupying 67% Rabi cultivable land in project villages and around 85% land in control villages. Cotton continuous in rabi for many farmers in project villages. Pearl Millet is cultivated in almost half of the land sown in summer. Juwar fodder cocupies one third of land in summer, while Maize is done in 5% land in poject villages and 15% land in project villages.

Seasonal Cropping Pattern - % of Cultivated Land in the season			
Season	**Crop**	**Project**	**Control**
Kharif	Cotton	44.20	60.45
	Maize	40.64	21.36
	Groundnut	2.47	-
	Black Gram	0.22	-
	Oil Seed	1.75	-
	Pigeon Pea	2.07	-
	Castor	2.85	-
	Mix/ Fodder	2.60	18.18
Rabi	Wheat	67.87	85.0
	Maize	3.90	-
Summer	Peral Millet	54.25	46.15
	Green Gram (Mung)	6.00	-
	Maize	4.80	15.38
	Fodder	27.83	38.46

Table 15 Seasonal Cropping Pattern and land

5.1.6 Package of Practices

Seed: Most of the farmers use certified seeds for Cotton and Maize in Kharif season. For Wheat in Rabi season 60% of farmers, and for Pearl Millet in summer 50% of farmers use certified seeds

Plouging: For Cotton, 65-70% farmers do deep plouginh (more than 8 inch), while in Maize 65% in project villages and 40% in control villages go for deep plouging. For Wheat 40-50% farmers, and for Pearl Millet 50-65% do deep plouging.

Figure 16 Cotton Plot

Seed treatment: Less than 3% farmers in project villages, and less than 20% farmers in control do seed treatment for Cotton. Simlarly, less than 10% farmers in project villages, and less than 25% farmers in control do seed treatment for Maize. For Wheat, the percentage of farmers doing seed treatment is 12% and 10% respectively for project and control villages.

Sowing: Most of the farmers across all village go for dibbling in Cotton, and in-row sowing Wheat and Maize . The distance between rows is 24 to 42 inch in Cotton and 12 inch in maize. For Pearl Millet, most of farmers do broadcasting across all villages.

Figure 17 Farmers FGD

Irrigation method: Most of the farmes adopt rows in Kharif crops, and flooding and rows, both methods in Rabi and Summer crops. Use of micro irrgation systems is negligible in the region, with only 4-5 farmers in each village may be using it.

Land preperation: Around 400-700 Kg of Farm yard manure is used for land preperation, mainly for Kharif crops. Few farmers apply before rabi crops also.

Type of fertiliser: Use of chemical fertilisers, mainly DAP and Urea is common across all the villages for almost all crops except pearl Millet in summer. Dosage of fertilisers is around 80-100 Kg per acre in Kharif, and 120 Kg in Rabi.

Type of pesticides: Chemical pesticides are used for all the crops. in Kharif, its genrally 1-4 litre per acre of dosage using pesticides like Monocoto, Vikas, Ak56, Forvet and Emida.

Soil Conservation measures: farm bunds have been found in 15% of farmers in project villages and 30% of farmers in control villages. Land levelling was done by 8% farmers in project villages and 5% farmers in control villages.

In most of the village the farmers follow conventional farming practices. Also practices are influenced by peers and suggestions by Agro vedors. Key package of practices for main crops across the season are given below.

Table 16 Kharif farming practices

Crop	Kharif Cotton		Kharif Maize	
	Project	**Control**	**Project**	**Control**
Seed variety	Hybrid, (seed for plot given by company), Ajit		Kanchan, Kaveri, Nidhi, Surya	
Type of Seed	Mostly Certified	Certified	80% Certified	Certified
Seed Quantity per acre	200 gram	200 gram	6 Kg	6 Kg
Type of ploughing / tilling	65% Deep, 35% Shallow	70% Deep Ploughing , 30% Shallow Ploughing	60-65% Deep, 35-40% Shallow	40% Deep Ploughing, 60% Shallow Ploughing
Seed Treatment	less than 3%	Less than 20%	less than 10%	25%
Seed Sowing Method	Dibbling	Dibbling	In line	In line
Seed sowing row distance	24 to 42 inch	36 inch	12 to 24 inch	4-12 inch
Type of Irrigation	75-80% row, 23% unirrigated, 3% flood	Mostly rows	Mostly row	Rows and flooding
Total pumping hours per acre per season		5 to 40 (Average 12)	12	30-36
Type of Fertilisers	60-65% Chemical, 30-35% both, 5% natural	Mostly chemical	Mostly Chemical, 20% using both	Mostly chemical, few natural
Name of fertilisers	Urea, D.A.P, Sulphate		Urea, D.A.P, Sulphate	
Dosage of fertiliser (Kg/Acre)	100	100	80	80
Quantity of Field Manure (Kg/ Acre)	500-700 Kg	700-800 Kg	400-700 Kg	500-600 Kg
Type of pesticides	Mostly chemical, few- both	Chemical	Mostly Chemical	Chemical
Name of Pesticides	Monocoto, Vikas, Ak56, Emida		Forvet, Ak56,Emida	
Dosage of pesticides (litre/acre)	1		4	
Sale place	Local trader and company		Local trader, APMC	Local trader

Package of practices for main Rabi and Summer crop are given below:

Table 17 Rabi and Summer farming practices

Crop	Rabi Wheat		Summer Perl Millet	
	Project	**Control**	**Project**	**Control**
Seed variety	Lokvan, 272, 496		Hybrid, Desi	
Type of Seed	60% Home made, 30% Certified, 10% non Certified	60% Certified, 35% Home seeds, 5% Uncertified	50% Certified, 30% Non Certified, 20% Home made	Certified
Seed Quantity- Kg/acre	50	50	2.5	2.5
Type of ploughing / tilling	40% Deep, 60% Shallow	50% Deep, 50% Shallow	60-65% Deep, 35-40% Shallow	50% Deep, 50% Shallow
Seed Treatment	15%	10%	None	None
Seed Sowing Method	In Line	In line and Broadcasting	Mostly broadcasting	Broadcasting
Seed sowing distance / Grid in	6 inch	NA	NA	
Type of Irrigation	Rows irrigation	Rows irrigation	70% flooding, 30% rows	Flooding
Total pumping hours per acre	47	42	50	80-90
Type of Fertilisers	Mainly Chemical	Mostly chemical	Mostly Chemical	
Name of fertilisers	DAP, Urea		Urea, DAP	
Dosage of fertiliser (Kg/Acre)	120	120	100	100
Quantity of Field Manure (Kg/ Acre)	Mostly dont apply, those who apply - use upto 400Kg	400-500 Kg	Mostly dont apply, those who apply - use upto 700Kg	
Type of pesticides	Mostly Chemical	Chemical	Mostly Chemical	Chemicals
Sale place	Local trader, APMC	Local trader	Local trader, village market	Local trader

5.1.7 Soil Moisture Conservation measures

Farm bunds are adopted by 15% farmers in Project villages and 30% farmers in control villages. Land levelling is also adopted by few farmers for limiting the runoff and conservation of soil moisture.

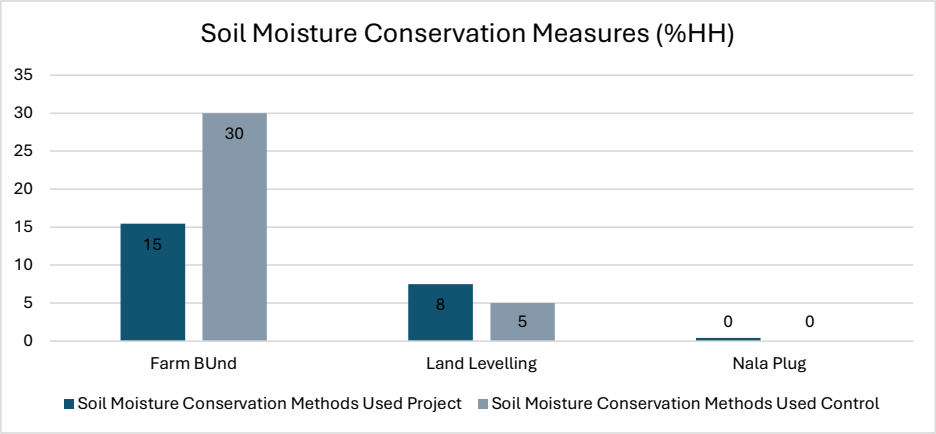


Figure 18 Soil Moisture conservation measure

5.1.8 Crop Wise Productivity

Crop producivity of Maize and Cotton in Kharif, Wheat in Rabi, and Pearl Millet in summer is slighlty better in project villages as compared to control villages. On other hand, producitity of Summer Maize is better in control villages. Productivity of all the crops is much lesser than district avarage. This can be attributed to low land holding, conventional farming practices, lack of knowledge of nutrient requirement and inadequate outreach for awareness and capacity building.

In Cotton, average productivity in project villages is 182 Kg/ Acre, while in control villages it is 178 kg/ acre. In Maize, average productivity in project villages is 440 Kg/ Acre, while in control villages it is 314 kg/ acre. In Rabi season, average productivity of Wheat in project villages is 550 Kg/ Acre, while in control villages it is 494 kg/ acre. Similarly in Summer, average productivity of pearl Millet in project villages is 332 Kg/ Acre, while in control villages it is 300 kg/ acre

Table 18 Crop Productivity

Crop Productivity- Kg/Acre (Average)			
Type of Crop			
	Project Villages	Control Villages	District Average*
Kharif			
Maize	440	314	891
Cotton	182	178	226.58
Black gram Udad	130		351.77
Groundnut	412		434.97
Pigeon pea	280		791.29

Oil Seeds	520		1154.53
Rabi			
Wheat	550	494	1249.40
Maize	508		1097.09
Summer			
Pearl Millet	332	300	1136.96
Maize	320	400	918.84
Groundnut	370		893.55
Green Gram (Moong)	224		392.89
***District-wise Area, Production and Yield of Important Food & Non-food Crops in Gujarat State Year : 2017-18, 2018-19 & 2019-20**			

If the data on crop productivity is segrregated according to land holding, it is evident that the farmers with large land holding has better productivity in almost all crops. The segregated data is given in table below.

Table 19 Landholding wise crop productivity

Crop	Project Villages			Control Villages		
	Marginal (< 2.5 acre) kg/ acre	**Small (2.5-5 Acre) kg/ acre**	**Semi Medium (5-10 Acre) kg/ acre**	**Marginal (< 2.5 acre) kg/ acre**	**Small (2.5-5 Acre) kg/ acre**	**Semi Medium (5-10 Acre) kg/ acre**
Kharif Cotton	174 (n=142)	180 (n=19)	236 (n=5)	177 (n=14)	280 (n=1)	-
Kharif Maize	431 (n= 127)	506 (n=20)	420 (n=6)	308 (n=7)	360 (n=1)	-
Rabi Wheat	520 (n=204)	720 (n=24)	856 (n=7)	483 (n=19)	700 (n=1)	
Rabi Maize	460 (n=6)	590 (n=3)	522 (n=3)	-	-	-
Summer Pearl Millet	310 (n=31)	380 (n=11)	400 (n=6)	300 (n= 3)	300 (n=1)	-

5.1.9 Crop Wise Cost and Income

It is evident that most of the farming is sustenace agriculture for small and marginal farmers. The net income from various crops indicate that farmers struggle to meet the ends relying only on farming. The input cost and other costs fro cultivation is increasing every year and against that the farmers are not getting returns. FGDs reveal that the youth is losing interest in agriculture due to meagre income and high risk.

Average income from avrious crops, its cultivation crop and sale prices are given the table below:

Table 20 Crop wise cost and income

	Kharif Cotton		Cotton Seed Plot		Kharif Maize		Rabi Wheat		Summer Pearl Millet	
	Project	**Control**	**Project**	**Control**	**Project**	**Control**	**Project**	**Control**	**Project**	**Control**
Average cultivation cost- Rs./acre	6290	5666	8362	6483	3366	3187	4208	4200	2661	2525
Average Sale Price - Rs./Mann(20Kg)	1277	1066	10169 (508/Kg)	10000 (500/Kg)	485	375	436	410	393	400
Average Gross Income (per HH)	10198	8566	80515	78725	8412	3570	14175	12770	6020	4750
Average Net Income (Per HH)	3907	4233	73236	72683	5140	1576	9127	7982	3335	2600

Cost of cultivation of Kharif Cotton ranges around Rs.6000-7000 per acre, while that of Kharif Maize is Rs.3100-3300. Cost of cultivation of Wheat is around Rs. 4200/ acre and that of Summer Pearl Millet is around Rs. 2500-2600 per acre.

5.1.10 Sale price and market

For normal cotton cropping, average sale price of in Project villages is Rs. 1277 per 20 Kg, while that in control village is Rs. 1066. More than 60% farmers in project villages have done Cotton seed plot in less than 1 acre area. For Cotton seed, sale price is around Rs. 500 per kg. This lucrative sale prices is the reason why farmers have started adopting seed plots, faciliatted by the companies. Sale price of Kharif Maize, Rabi Wheat and Sumer Pearl Millet remains in range of Rs. 375 to 470 per 20 Kg. Most of the farmers sell their products in local market.

5.1.11 Income from Agriculture

Most of the farmers earn substaintial amount in cotton seed plots, with net household income around Rs. 80000, while average net income from Kharif cotton is just around Rs. 4000 per HH. Average net income from Maize is Rs. 5140 in project villages, it is only Rs. 1576 in control villages. Net income from Wheat averages Rs. 9127 in project villages and Rs. 7982 in control villages. Similarly net income from Summer Pearl Millet is around Rs. 3335 in project villages and Rs. 2600 in control villages. The average net income from agriculture in project villages is Rs. 33366/HH, while that in control villages is Rs. 54633/HH.

Table 21 Net household income from agriculture

Average net inocme from Agriculture is about Rs. 33000-55000 per household, or Rs. 27000-43000 per acre across the region.

Net Income from Agriculture (Rs)		
	Project	Control
Net Income From Agriculture Rs. HH	33366	54633
Net Income From Agriculture Rs/ Acre	27089	45235

Commented [VN3]: In last report 35284.25

Commented [MOU3R2]: Cotton Seed plot selling rate was not applied. Only normal cotton sell price was considered in earlier report. As sample size of control is less, it shows this difference.

5.1.12 Climatic Impact

Farm based livelihood are subjected to major climatic risks. FGDs with farmers indicate that there have been several instances of unseasonal rains, hailstorms, high intensity rains, high temperature in winter, and drought like situation due to meagre rainfall. The trend of unpredictable and untimely (unseasonal) rains have increased in last decade. These events lead to complete or partial crop loss, lower productivity, increased pest attacks. In some places, land submergence and soil erosion/ land cutting have also been reported.

5.1.13 Source of Information

TV, Newspaper, and Mobile are the main sources of information on agriculture, crops and weather. Suggestions by Agro dealers and the fellow farmers also play key role in decision of farming practices.

5.2 Horticulture/agroforestry

Less than 20% HH in project and less than 5% HH in control villages have one or more fruit bearing plants. Lemon and Guava are seen in Jalena, while Mango plantations are seen in Ghorad However for almost all HHs, the number is less than 5 plants in less than 0.5 acre. The fruits are used for home consumption only, except for two farmers in Ghorad, who sell Mango in local market. It implies that there is no systematic horticulture plantations in the region. Thus the income from horticulture is negligible and does not add effectively to household income for most of the farmers.

5.3 Cattle rearing

Though, 76-80 % HH have cattle, the number of milch cattle, their yield, and affiliation to dairy is low in the region, and hence there is no significant income from cattle rearing. The milk produced, is used for home consumption.

Average number of cattle per HH is limited to 2-3. Milk production per cattle per day is also 1-2 litre for cows and 2-4 litres for buffalo. Only 30% HH owning cattle have cattle insurance and around 50% provide regular vaccine and deworming for cattle. Most of them depend on private veterinary doctors to provide these services on demand and paying fees for it. Government outreach and dairy affiliation is limited in the region.

Most of the cattle rearers grow fodder in their farm. Around 24-35% HH also access forest area for grazing, while 5-9% HH have access to open grassland.

Most of the cattle rearers use milk for self consumption, and so actual the income from the sales negligible. However, if we consider the value of milk, it comes to about Rs. 27000 in project villages and Rs.20000 in control villages. Considering the average cost of cattle rearing Rs. 7000-11000 per year, as reported by respondents, the net value of milk comes to around Rs. 12000-16000.

Table 22 Cattle rearing details

Cattle Rearing Details		
Description	Project	Control
% HHs owning animals	76	80
Average no./HH	2-3	2-3
Avg. Milk Production in Cow (Litres)	1-2	1-2
Avg. Milk production in Buffalo (Litres)	2-4	2-4
% HH having insurance	30	30
% HHs giving regular vaccine	50	50
% HHs doing regular de-worming	50	50
Major Source of Medical Services	Private	Private
Major source of Fodder	%HH	%HH
Home cultivation	78	85
Forest	24	35
Open Grassland	9	5
Restricted pastureland	4	5
Other	0	0
Average gross income from selling of milk (Rs.)	26930	20342
Average Annual spending of cattle (Rs.)	11317	7495
Average Net Income/HH (Rs.)	15612	12847

Majority of HHs avail natural green grass and dry grass for cattle feed. Around 40% of HH also use silage, while 10-15% HH also avail mineral mix. Multi-cut grass is used by less than 10% HH in project villages.

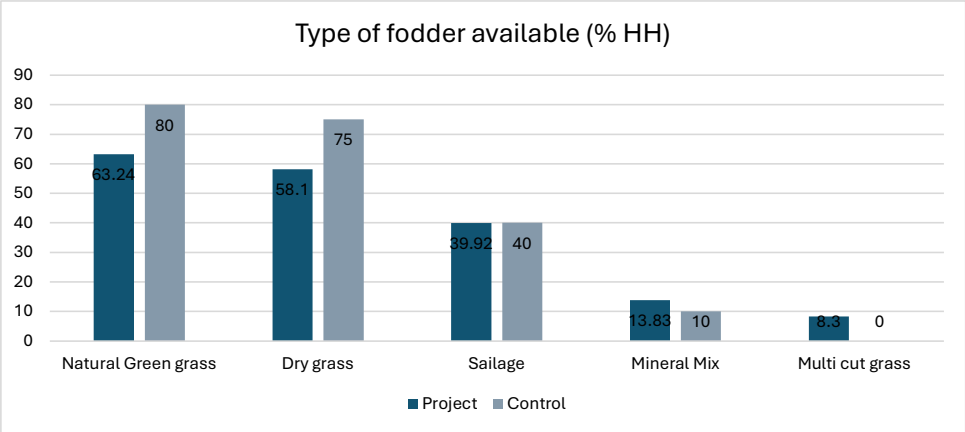


Figure 19 Type of fodder availability

Table 23 Data from Dairy

Village	Year	Operational Since	Members	Total Milk Collection (Litre)	Total Income (Rs.)
Navanupadar	2023-24	Oct 2009	60	460	19500
	2024 (till Aug)		60	1281	48573
Ghorad	2023-24	2023	134	814141	33456978
Thalvada Kangar	2023-24		170	47188361	19196555
	2024 (till Aug)		170	162000	5600000

5.3.1 Challenges in cattle rearing

Discussion with cattle owners reveal that there has been several concerns regarding cattle rearing, which include

- Lack of appropriate shelter/shed leads to higher chances of cattle diseases and low productivity.
- Lower milk production and lack of marketing support led to meagre income from milk production.
- Limited access to veterinary services also lead to higher diseases and mortality among cattle.

- Shrinking pasture land has made it difficult for small holder farmers to provide feed and fodder to cattle by their own.

Figure 20 Buffalo Shed

Table 24 Major Concerns for Cattle rearing

Major Concerns	Affected Villages	
	Project Villages (Out of 10)	Control Villages (out of 2)
Lack of appropriate shelter/shed	8	2
High mortality rate	7	2
Frequent diseases	3	0
Lower milk production	7	2
Inadequate feed and fodder in village	1	0
Lack of veterinary services	6	2
Lack of marketing support	7	2
Lack of awareness on various government schemes	2	2
Lack of fodder	1	0
Shrinking pasture land	1	1

5.4 Goatery

Around 42% of HHs in project villages and 30% HHs in control villages have goats. However the average number owned by HHs is 4 or less. This implies that again there is no significant income from goatery. Rate of Mortality among goats is 7-8% per year. None of the goat rearers have insurance cover for goats. Only 2% HH provide vaccine or deworming.

Figure 21 Goat shed

Table 25 Goatery details

Status of Goatery		
Description		
	Project	**Control**
% HHs owning animals	42	30
Average no./HH	4	3.7
Mortality Rate	7.5	6.8
% HH having insurance	0	0
% HHs giving regular vaccine	2	0
% HHs doing regular de-worming	2	0
Major Source of Medical Services	Private Veterinary	
Average Net Income/HH (Rs.)	5528	4000

No. of goats owned	% of HH	
	Project villages	**Control villages**
Less than 3	**44**	**22**
3-5	**38**	**78**
More than 5	**18**	**0**

5.5 Poultry

Backyard poultry is also there in 20% of HH in project villages and 45% HH in control villages. Average number of bird is less than 6 per HH. The eggs and meat is mainly consumed at home only, and hence average annual net income from sale of eggs is less than Rs. 1000 per household. Mortality rate among birds is as high as 33% in project villages and 17% in control villages. This can be attributed to poor health and hygiene practices. None of the HH having poultry have insurance cover or regular vaccination/ medical services.

Figure 22 Poultry

Table 26 Poultry Details

Status of Poultry		
Description	**Project**	**Control**
% HHs owning animals	20	45
Average no./HH	5.8	5.2
Mortality Rate	33	17.2
% HH having insurance	0	0
% HHs giving regular vaccine	0	0
Average Net Income/HH- Rs.	920	675

5.6 Kitchen garden Nutritional Consumption

Small scale backyard Kitchen garden is practiced by 38% HH in project villages and 50% HH in control villages. However, the produce is used for home consumption only and there is no additional income from sale of the vegetable.

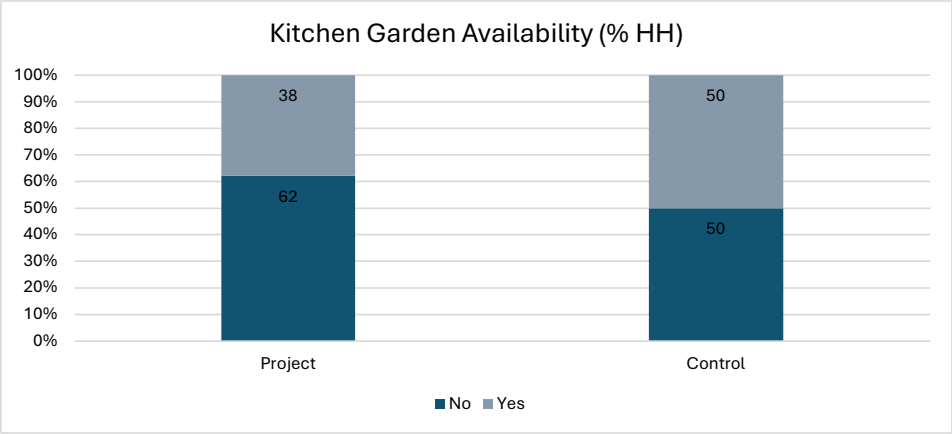


Figure 23 Kitchen Garden Availability

Consumption pattern of Vegetable, Milk, Pulses and Eggs (as nutritional food) reveal that around half of the HHs consume vegetable on daily basis, and nearly one third HHs twice a day also. Consumption of milk is relatively low with one third of HHs able to take it once a week only and another 24-30% HHs twice a week. Consumption of pulses is high, with nearly 45% HH consuming it twice a day. Consumption of eggs is less, with 24% HHs in project villages and 45% HH in control villages, consuming it only once in 15 days or more.

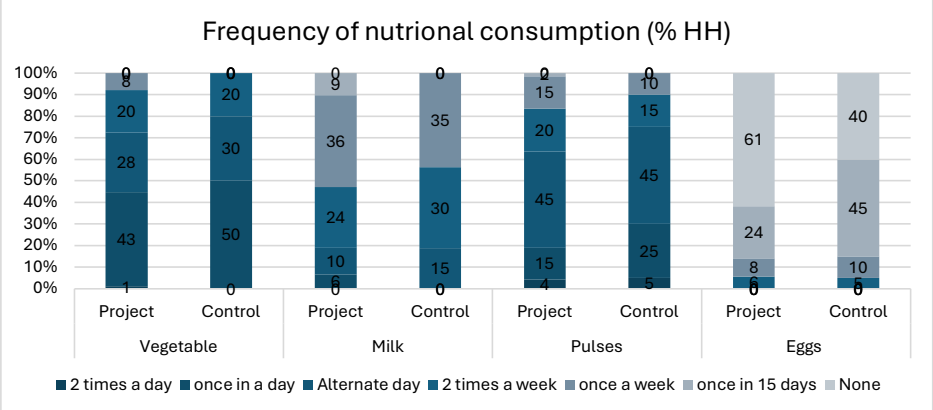


Figure 24 Consumption Pattern of nutritional foods

5.7 Household Income

It is evident that Agriculture, General labour, Agriculture labour, and Animal Husbandry form largest source of income for most of the households. Income from goatery, poultry, horticulture, kitchen garden have been insignificant. Few families also have substantial source of income from private job and government job.

Table 27 Source wise income of households

Occupation	Project villages		Control Villages	
	Average annual Gross Income per HH	Average annual Net Income per HH	Average annual Gross Income per HH	Average annual Net Income per HH
Agriculture	51369	33366	65418	54633
Animal Husbandry	26930	15612	20342	12847
Goatery	-	5528	-	4000

However, there is high disparity of income range amongst the respondents. 60% of HHs in project villages, and 30% HH in control villages fall under category of annual net income of less than Rs. 30000. Whereas, 25% HH in project villages and 40% HH from control villages have income range of Rs. 30000 to Rs. 100000. It is also notable that 10% HH in project and control villages have income more than Rs. 1.2 Lakh per annum.

Table 28 Net income ranges of Households

Net Income ranges of HHs						
Range of Income (Rs.)	**Project Villages**			**Control Villages**		
	No. of HHs	Average Income- Rs.	% HHs	No. of HHs	Average Income- Rs.	% HHs
< 30000	154	9994	60	6	12275	30
30000-50000	26	40857	10	3	41620	15
50000-80000	32	62019	13	4	71375	20
80000-100000	7	89475	3	1	93000	5
100000-120000	9	109291	4	4	109175	20
>120000	25	243722	10	2	174000	10

5.8 Savings and Credit Profile

HH survey reveals that currently 16% HH in project villages and 10% HH in control villages have taken loan or credit in last three years. Major source of credit has been private bank, family or friends and Government bank in project villages and family or friends and SHGs in control villages. There is wide range of amount of loan taken. In Project villages, the average amount of loan is Rs. 66281 and in control villages, it is Rs. 8000. The loan and credit amount are spent on cattle purchase, children's education, household expenses and health related expenses. Rate of interest on loan as reported by respondents is 5-8% per annum or even less.

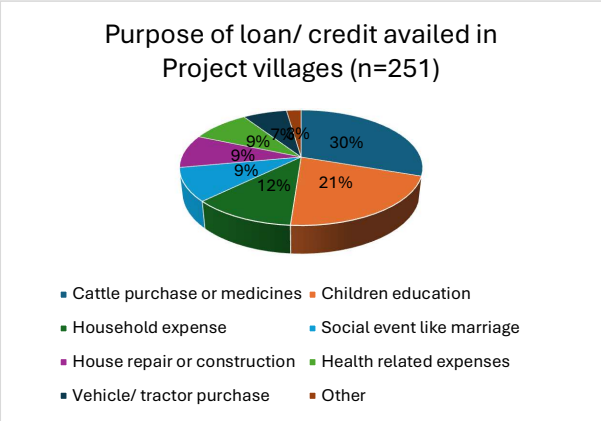


Figure 25 Purpose of taking loan/ credit

Table 29 Credit pattern of households

Credit Pattern		
Details	**Project** (n=251)	**Control** (n=20)
% HHs who have taken loan/credit in past 3 years	16%	10%
Major Source of Credit	Private Bank, Family and Friends, Government Bank	Family Friends and SHG
Average Credit Taken	Rs. 66281	Rs. 8000
Purpose of taking credit	Cattle Purchase, Children Education, Household expense	Household and health related expenses
Rate of Interest per month	<5% and 5-8%	<5%

5.9 Entitlements /Access to Government Schemes

FGDs have revealed that Gramsabha has been held in all villages but the average number of participating people is around 100, with around 30% women. GPDP has been prepared for only 4 project villages, while water budgeting exercises have been done in 2 villages.

Enrolment to Ayushman Bharat scheme is around 60% across all villages. 30-40% of HH have also reported to have benefitted by National food security mission. Nearly one fourth of farmers have

also enrolled in PM Kisan programmes, and around 12-15% have received benefits under PM Kisan Sanman Nidhi programme.

Table 30 Access to government schemes

Access to Government Schemes - % HHs		
Type of Scheme	**Project**	**Control**
Pradhan Mantri Kisan Sanman Nidhi	37.5	40.0
Works under MGNREGS	9.6	5.0
National Food Security Mission	31.9	40.0
Agri inputs (seeds, fertilizers) under Agriculture Department	0.0	5.0
Ayushman Bharat	63.3	60.0
MAA card	6.4	5.0
Old Age Pension	0.0	5.0
Widow Pension	0.4	0.0

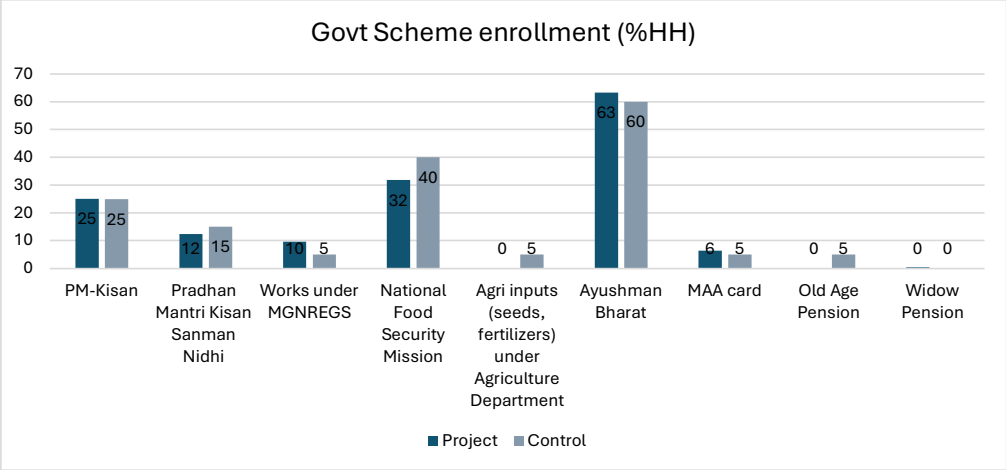


Figure 26 Government scheme enrolment by households

5.10 Common Concerns at village level

Common concerns as discussed in FGDs at different villages are listed below

Table 31 Common concerns of villages

Project Villages	Common concerns
Thalvada	Lack of penetration of government schemes due to group panchayat
Vekari	Undulating terrain and scattered cluster of houses makes outreach difficult. Rocky land makes farming difficult. Lack of irrigation water. In summer cattle are released to graze by themselves as there is scarcity of fodder. Education level is poor.
Mankadi	Alleged corruption and mismanagement to avail benefits of government schemes for needy and poor
Jelana	Lack of price realisation of crops. Animal menace damaging crops, and hence summer crops are not taken. Lack of reliable employment opportunities
Ranika	Lack of education and lack of information of government schemes
Ghorad	Agriculture and animal husbandry is better compared to other villages
Control Villages	**Common concerns**
Sekda	80% of HHs are involved in fishing in Dharoi dam
Umbra	Wild boars menace damages crops every season. Lack of outreach of government schemes. Lack of irrigation facilities

Figure 27 Meeting with SHGs

6. Summary & Recommendation

Due to limited handholding and conventional farming practices, the yield of crops and the income from agriculture remains lower than the potential in the region. With notable irrigation facilities, if the focus is on diversifying the farm based activities (introducing horticulture and flori culture) and processing of produce through micro enterprise, the income of farmers can be greatly enhanced. Further, though livestock is also a mainstay livelihood, households are unable to fetch substantial income from it due to limited ownership, lack of health services as well as lack of good and adequate feed/fodder. Institutional affiliation and the active role of institutions are limited and need to be explored for farm and non-farm livelihoods for collective actions.

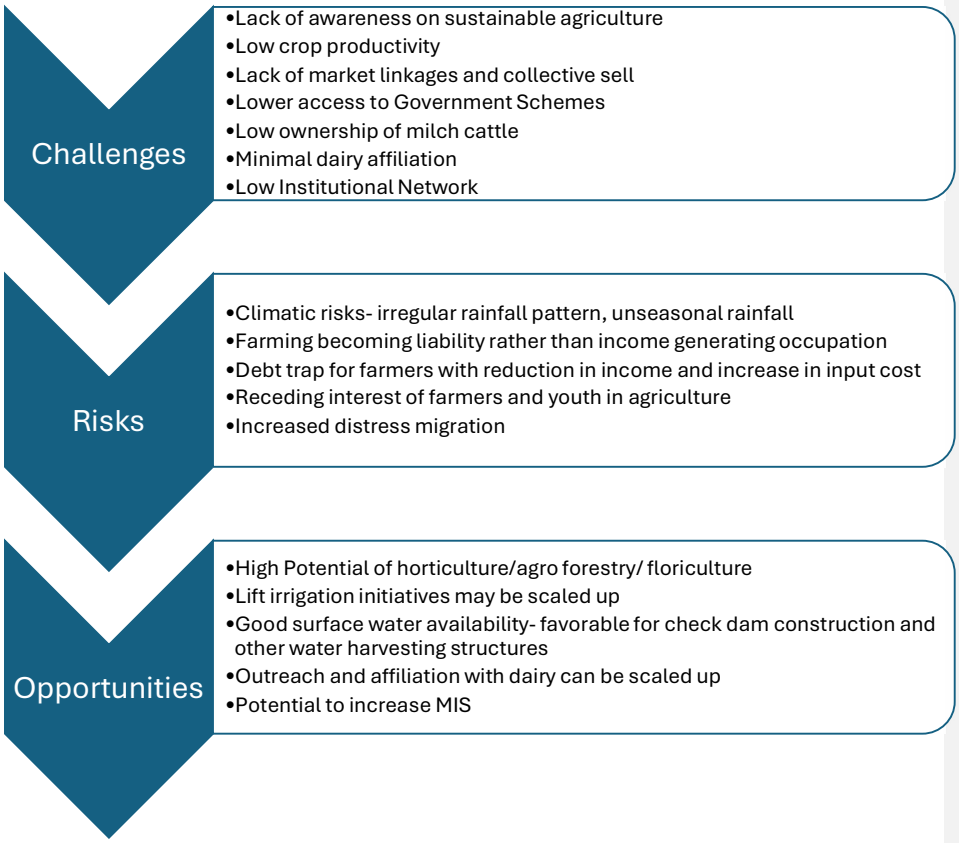


Figure 28 Challenges, Risks and Opportunities

For comprehensive results on income of farmers, following four aspects may be prioritised in a sequential manner.

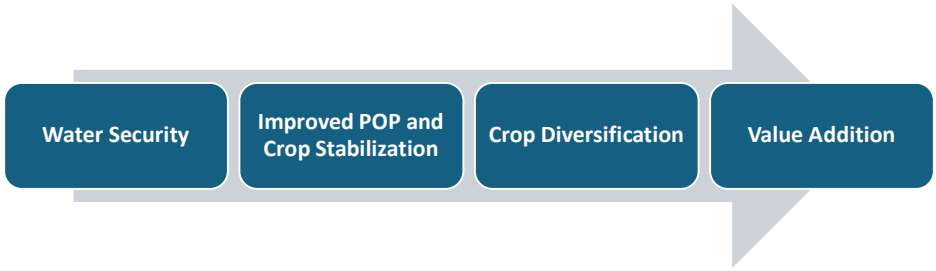


Figure 29 Sequential steps to achieve project objectives

First priority should be given to water security, which implies that adequate and timely availability of irrigation water should be ensured through various measures of water harvesting and conservation. Once there is assured irrigation, farmers can focus on better cultivation practices to augment crop productivity from regular crops. Along with package of practices, there is need to explore crop protection measures against climatic risks and other risks. The next step may be to support farmers to diversify farming with introduction of horticulture, floriculture, agro forestry and vegetables, as feasible in local context. Crop processing and value addition may be then taken up through strengthening local institutions like SHGs and FPOs. All these measures if applied in an integrated manner will ensure increase in income from farming practices in the region. Moreover, income from livestock can be augmented with promotion of better management practices and affiliation to dairy and other cooperatives. Strengthening credit access to small holders may also be beneficial to promote micro enterprises focussing on processing and value addition.

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