

Report

Baseline Study

Improving the Lives and Livelihoods of Marginal Farmers in Jharkhand and Telangana through Sustainable Practices in Integrated Natural Resource Management and Climate-Resilient Agriculture Interventions



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List of Acronyms

Acronym	Full Form
APM	Assistant Project Manager
BRLF	Bharat Rural Livelihoods Foundation
CAG	Comptroller and Auditor General of India
CRA	Climate Risk Assessment
CRP	Community Resource Person
DFO	District Forest Officer
FAO	Food and Agriculture Organization (United Nations)
FGD	Focus Group Discussion
FPO	Farmer Producer Organisation
FSI	Forest Survey of India
GSDP	Gross State Domestic Product
HDFC	Housing Development Finance Corporation
HH	Household
ICAR	Indian Council of Agricultural Research
ICDS	Integrated Child Development Services
IMD	India Meteorological Department
KII	Key Informant Interview
LPG	Liquefied Petroleum Gas
MDPI	Multi-Dimensional Poverty Index
MEL	Monitoring, Evaluation, and Learning
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MIS	Management Information System
MOFPI	Ministry of Food Processing Industries
NABARD	National Bank for Agriculture and Rural Development
NFHS	National Family Health Survey
NFSA	National Food Security Act
NGO	Non-Governmental Organisation
NICRA	National Innovations in Climate Resilient Agriculture
NITI	National Institution for Transforming India (NITI Aayog)
NNMB	National Nutrition Monitoring Bureau
NRLM	National Rural Livelihoods Mission
NRM	Natural Resource Management
NTFP	Non-Timber Forest Produce
OBC	Other Backward Class
PDS	Public Distribution System
PJTSAU	Professor Jayashankar Telangana State Agricultural University
PLFS	Periodic Labour Force Survey
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana

PVTG	Particularly Vulnerable Tribal Group
RSETI	Rural Self Employment Training Institute
SAPCC	State Action Plan on Climate Change
SBI	State Bank of India
SC	Scheduled Caste
SECC	Socio-Economic Caste Census
SERP	Society for Elimination of Rural Poverty
SFAC	Small Farmers' Agribusiness Consortium
SHG	Self-Help Group
SLF	Sustainable Livelihoods Framework
ST	Scheduled Tribe
ToC	Theory of Change
UNDP	United Nations Development Programme
VO	Village Organisation
WDC	Watershed Development Committee

Executive Summary

This baseline study assesses the socio-economic conditions, livelihood systems, agricultural practices, natural resource access, and institutional engagement of households across selected districts of Jharkhand and Telangana. The analysis draws on primary household surveys, focus group discussions, and key informant interviews to establish benchmark indicators for future evaluation.

The findings indicate that rural livelihoods remain highly vulnerable, shaped by dependence on rainfed agriculture, limited income diversification, and uneven access to productive resources. While infrastructure access has improved in certain areas, income enhancement and livelihood stability continue to remain constrained.

The following insights emerge from the analysis:

- **Income and Economic Status:** Median annual household income across districts is approximately ₹75,000, with a large proportion of households concentrated in the lowest income bracket. In Bhadradi Kothagudem, 72% of households fall below ₹75,000, indicating significant income vulnerability despite better access to basic services.
- **Livelihood Structure:** Agriculture remains the primary source of livelihood for most households; however, it generates limited returns due to rainfed conditions and low productivity. Wage labour and migration act as important supplementary income sources, particularly in Jharkhand districts.
- **Agriculture and Cropping Patterns:** Agricultural systems are predominantly rainfed, with very limited irrigation access across districts. Cropping intensity remains low, with most households engaged in single or double cropping. In areas with irrigation access, higher cropping intensity and diversification are observed.
- **Migration Dynamics:** Seasonal migration continues to be a major coping strategy, especially in rainfed regions. High migration rates reflect limited local employment opportunities and instability in agricultural income.
- **Natural Resource Access (NRM):** Access to irrigation remains minimal across most districts, with control villages showing near-zero irrigation coverage. This reinforces the

central role of water availability in influencing agricultural productivity and livelihood outcomes.

- **PVTG and Vulnerable Groups:** Particularly Vulnerable Tribal Groups (PVTGs), especially in Pakur and Godda, face higher levels of deprivation, limited access to land and services, and greater dependence on forest-based livelihoods.
- **Forest and NTFP-Based Livelihoods:** A large proportion of households depend on forest resources such as mahua and tamarind. However, these are largely used for subsistence, with limited value addition and market integration.
- **Institutional Participation:** Self-Help Groups (SHGs) are widely present and contribute to financial inclusion. However, their role in enterprise development and income generation remains limited.
- **Poverty and Deprivation:** Multidimensional poverty remains high in Jharkhand districts, driven by gaps in sanitation, housing quality, and access to clean cooking fuel. In contrast, Bhadradi Kothagudem shows lower deprivation in basic services but continues to face income-related vulnerability.
- **Comparative Insights (Sample vs Control):** Control villages exhibit similar patterns of rainfed agriculture, income distribution, and migration, confirming their suitability as a comparison group for future evaluation.

These findings highlight the need for an integrated approach focusing on irrigation development, climate-resilient agriculture, livelihood diversification, and strengthening of community institutions. Improving market linkages and reducing dependence on migration will be critical for enhancing income stability.

The baseline establishes a reference framework for tracking changes across livelihood, agriculture, and socio-economic indicators, and will support robust assessment of programme outcomes during subsequent evaluation stages.

Chapter 1: Introduction

Project Background and Rationale for the Baseline Study

Rural livelihoods in several tribal and resource-dependent regions of India remain closely linked to agriculture and natural resources. In many districts of Jharkhand and Telangana, agriculture continues to be the primary livelihood activity for rural households, particularly among small and marginal farmers. However, agricultural systems in these regions are predominantly rainfed and characterised by low productivity, limited irrigation infrastructure, and high exposure to climate variability. These structural constraints contribute to persistent livelihood insecurity and seasonal income fluctuations among rural households.

Jharkhand, located in eastern India, has a predominantly agrarian rural economy where agriculture provides employment and income for a large proportion of the population. The state benefits from diverse agro-climatic conditions that support the cultivation of various crops including paddy, pulses, vegetables, and horticultural produce. Recent agricultural estimates indicate significant production of cereals, pulses, vegetables, and fruits, highlighting the state's agricultural potential¹. However, farming systems remain largely smallholder-based and rain-dependent, which constrains productivity and limits income growth among rural farmers.

Similarly, agriculture plays a critical role in the rural economy of Telangana. Since the formation of the state in 2014, significant investments have been made in irrigation infrastructure and agricultural support systems, contributing to improved agricultural growth and increased value of agricultural output. Studies of the state's agricultural sector indicate that expansion of irrigation coverage, access to electricity for agriculture, institutional credit, and market support mechanisms have contributed to improved agricultural performance and farm productivity in recent years².

Despite these improvements, several challenges persist across rural landscapes in both states. Small and fragmented landholdings, dependence on monsoon rainfall, declining soil fertility, and limited adoption of climate-resilient agricultural practices continue to constrain farm productivity. In addition, rural households often rely on multiple livelihood sources including

¹ MOFPI Jharkhand State Profile

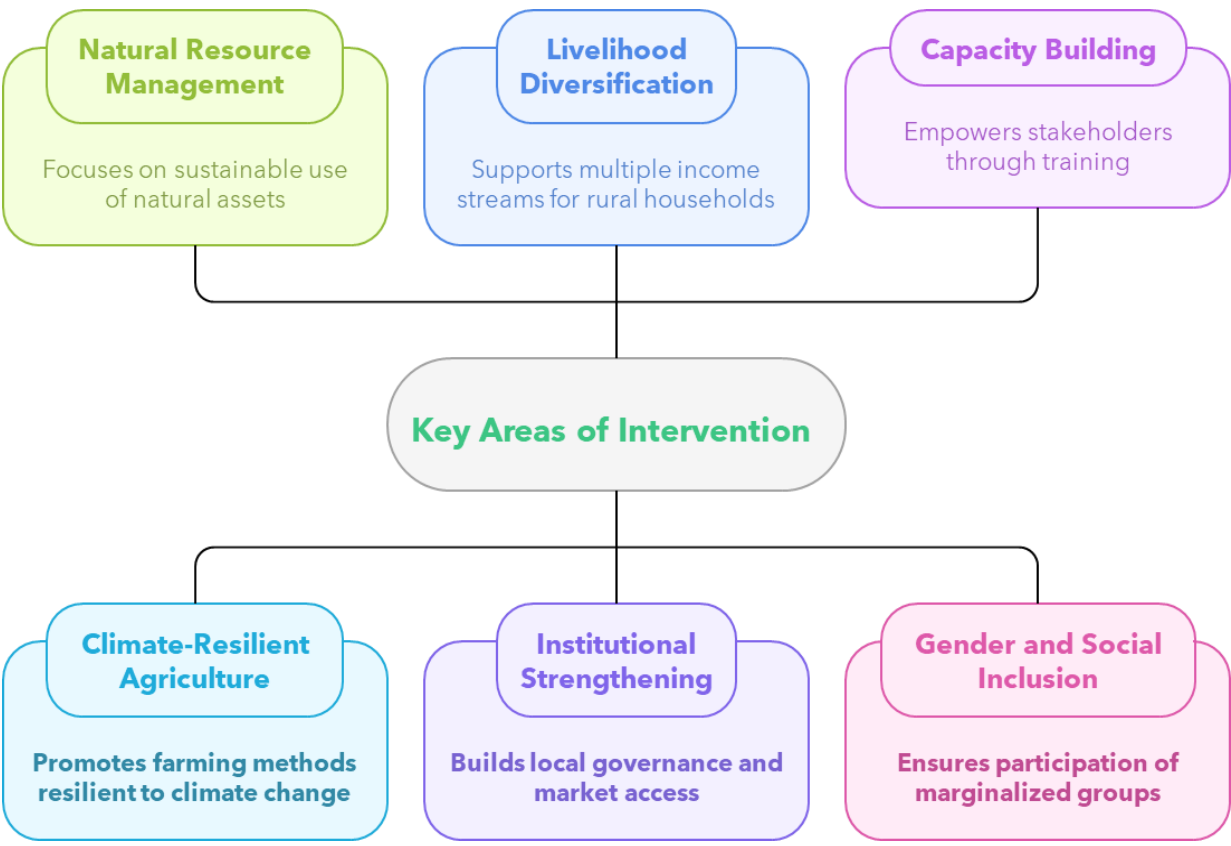
² Agricultural Transformation in Telangana, PJTSAU and published by Arcus Policy Research (APR), 2023

wage labour, livestock rearing, and forest-based activities to sustain household income. These livelihood systems remain highly sensitive to environmental shocks and market fluctuations.

Economic indicators further reflect the structural importance of agriculture within the broader state economies. In Telangana, the primary sector which includes agriculture and allied activities continues to play an important role in economic growth and employment generation³. However, fluctuations in primary sector growth highlight the vulnerability of agricultural production to climatic conditions and resource availability.

The Bharat Rural Livelihoods Foundation (BRLF), in partnership with state governments and HDFC, is implementing a comprehensive initiative aimed at strengthening the livelihoods of small and marginal farmers in the tribal regions of Jharkhand and Telangana. This initiative is designed to address the persistent challenges of poverty, low agricultural productivity, food insecurity, and ecological stress that continue to affect these communities.

The project’s aim is to reach 14,000 farmer households across 140 villages, with a clear focus on promoting sustainable practices in integrated natural resource management (NRM) and



³ Telangana Economy, Directorate of Economics and Statistics, Government of Telangana, 2024

climate-resilient agriculture (CRA). By combining ecological restoration with livelihood enhancement, the programme seeks to create long-term pathways for income growth, resilience, and food security.

By integrating these focus areas, the project aims not only to enhance agricultural productivity and incomes but also to restore ecological balance, strengthen community institutions, and create a resilient rural economy. The baseline study will serve as the foundation for measuring progress in these dimensions and for assessing the long-term impact of interventions at the household, community, and institutional levels.

In this context, the baseline study plays a critical role in establishing a comprehensive understanding of existing socio-economic conditions, agricultural practices, natural resource systems, and institutional access within the project areas. By documenting the current status of livelihoods, resource use, and climate adaptation practices prior to the implementation of project interventions, the baseline provides an essential reference point against which future changes and programme impacts can be assessed.

Objectives and Scope of the Study

The baseline study has been designed to generate a systematic and evidence-based understanding of livelihood systems, agricultural practices, and natural resource management conditions in the project areas of Jharkhand and Telangana. The study aims to establish reliable baseline indicators that will support programme implementation, monitoring, and future evaluation.

The key objectives of the baseline study are as follows:

- To assess the socio-economic profile and livelihood systems of households in the study areas
- To examine agricultural production systems, cropping patterns, and input use
- To analyse the status of natural resources, including land, water, and forest systems
- To assess climate risks, vulnerability, and adoption of climate-resilient practices
- To evaluate access to institutions, government schemes, and financial services
- To understand market access, value chains, and post-harvest systems
- To analyse gender roles and inclusion of vulnerable groups in livelihood systems

- To generate baseline indicators for monitoring and evaluation of programme interventions

The scope of the study covers selected villages in four districts, three in Jharkhand and one in Telangana representing diverse agro-ecological and socio-economic contexts. The study integrates quantitative household survey data, qualitative field insights, and secondary data sources to provide a comprehensive baseline assessment of rural livelihoods and resource systems.

Linkages between Livelihoods, Natural Resource Management, and Climate Resilience

Rural livelihoods in agrarian regions are closely intertwined with the condition and management of natural resources. Land, water, forests, and biodiversity form the ecological foundation that supports agricultural production and rural income generation. Sustainable management of these resources is therefore essential for maintaining productivity and ensuring long-term livelihood security.

Agricultural growth in many regions has historically been associated with improvements in irrigation infrastructure, access to energy for farming, and increased availability of agricultural inputs. Evidence from Telangana's agricultural transformation indicates that improvements in irrigation coverage and supportive policy interventions have significantly influenced agricultural output and farmer incomes. However, reliance on water-intensive cropping systems and expansion of irrigated agriculture can also create sustainability concerns if natural resource management practices are not adequately integrated into agricultural systems⁴.

Natural resource management interventions such as watershed development, soil conservation, water harvesting structures, and agroforestry practices have been widely recognised as important strategies for enhancing agricultural productivity while simultaneously restoring ecological balance. Such interventions can improve soil moisture retention, enhance groundwater recharge, and reduce land degradation, thereby strengthening the resilience of farming systems.

⁴ Agricultural Transformation in Telangana, PJTSAU and published by Arcus Policy Research (APR), 2023

Climate change and increasing weather variability further highlight the need for resilient agricultural systems. Variations in rainfall patterns, rising temperatures, and increased frequency of extreme weather events can significantly affect crop yields and livelihood stability in rainfed farming systems. Climate-resilient agriculture focuses on practices that enhance the adaptive capacity of farming communities by promoting diversified cropping systems, improved soil health, efficient water management, and risk-reducing farming practices.

Integrating NRM and CRA interventions within rural livelihood programmes therefore provides a holistic pathway for improving productivity while strengthening the resilience of farming communities to environmental and climatic stresses. Such integrated approaches recognise that sustainable livelihoods depend not only on economic opportunities but also on the sustainable management of ecological resources.

Structure of the Report

This report is structured to present the findings of the baseline study in a systematic and coherent manner, enabling programme teams and stakeholders to understand the socio-economic context, livelihood systems, and resource conditions in the project areas. Following the introductory chapter, Chapter 2 outlines the study design and methodology, including the research framework, sampling approach, and data collection methods. Chapter 3 provides a profile of the study area, highlighting key demographic, socio-economic, and ecological characteristics of the selected districts. Chapters 4 to 10 present the core baseline findings, covering household socio-economic conditions, livelihood systems, agricultural production, natural resource management, climate resilience, food and nutrition security, and post-harvest and market access. Chapter 11 examines participation in local institutions and access to government schemes, while Chapter 12 analyses gender and social inclusion dimensions within rural livelihood systems. Chapter 13 presents the baseline indicator framework aligned with project objectives, and the final chapter synthesises the key findings and outlines implications for project implementation and future interventions.

This baseline establishes reference values across key indicators related to livelihoods, agriculture, natural resources, institutions, and markets. These benchmarks will be used to assess programme performance during midline and endline evaluations.

Chapter 2: Study Design and Methodology

Overall Research Design and Framework

The baseline study adopts a mixed-methods research design, integrating quantitative household survey data with qualitative insights and secondary data analysis to generate a comprehensive understanding of livelihood systems, natural resource conditions, and institutional engagement across the project areas. Mixed-methods approaches are widely used in rural development and agricultural policy studies because they enable both statistical measurement of indicators and contextual interpretation of socio-economic dynamics.

The quantitative component focuses on generating statistically reliable baseline indicators on household demographics, livelihoods, agricultural production systems, natural resource management practices, and access to institutions and services. These indicators provide measurable benchmarks against which project outcomes can be assessed during midline and endline evaluations.

Complementing this, qualitative methods are used to capture contextual insights on community perceptions, institutional functioning, and local livelihood strategies that may not be fully reflected in structured survey data. Such triangulated research frameworks are commonly adopted in agricultural and rural development assessments to ensure that both numerical trends and socio-institutional dynamics are captured in the analysis.

The analytical framework underlying the study draws upon established approaches used in agricultural sector analysis and rural livelihood assessments, where household-level economic activities, access to productive resources, and institutional engagement collectively shape livelihood outcomes. Policy studies on agricultural development highlight that factors such as irrigation access, market linkages, credit availability, and public support programmes significantly influence agricultural productivity and rural incomes⁵.

⁵ Agricultural Transformation in Telangana, PJTSAU and published by Arcus Policy Research (APR), 2023

Within this framework, the baseline study examines the interaction between three core dimensions:



Livelihood systems,
including agricultural and
non-farm income sources



**Natural resource
management,** particularly
land, water, and soil
resources that support
agricultural production



Climate resilience,
reflecting households'
capacity to cope with
climatic variability and
environmental stress

These dimensions are analysed in relation to institutional access and social inclusion, enabling the study to provide an integrated understanding of the conditions influencing livelihood sustainability in the project districts.

Conceptual Framework for Analysis

The study adopts an integrated livelihood systems framework to analyse the interaction between natural resources, agriculture, institutions, and market systems.

The framework is structured around four key dimensions:

- Natural Resource Systems (land, water, forests)
- Agricultural Production Systems
- Livelihood Diversification and Market Systems
- Institutional Systems and Social Inclusion

These dimensions operate within the broader context of climate variability and socio-economic vulnerability.

The framework recognises that livelihood outcomes are shaped by the interaction between these components. Constraints in any one dimension, such as water scarcity or weak institutional capacity, can limit overall livelihood performance.

This framework has guided the analysis across all thematic chapters.

Sustainable Livelihoods Framework (SLF)

The analytical approach of this study is informed by the Sustainable Livelihoods Framework (SLF), which provides a comprehensive lens to understand the multiple dimensions influencing rural livelihoods.

The framework identifies five key livelihood capitals:

- **Human Capital** – skills, knowledge, health status, and labour availability
- **Natural Capital** – access to land, water resources, forests, and common property resources
- **Financial Capital** – income levels, savings, credit access, and financial inclusion
- **Physical Capital** – infrastructure such as housing, irrigation, roads, and productive assets
- **Social Capital** – community institutions, networks, and participation in groups such as SHGs

The baseline study captures indicators across all five capitals to assess the existing livelihood conditions of households. For instance, access to irrigation and land reflects natural capital; income and credit access represent financial capital; asset ownership and infrastructure relate to physical capital; while participation in SHGs and community institutions reflects social capital.

This framework supports a holistic understanding of vulnerabilities and opportunities and informs the design of integrated interventions under the programme.

Sampling Strategy and Coverage

The sampling design was developed to ensure that the baseline survey captures the diversity of socio-economic and ecological conditions across the project geography. The study covers selected villages in four districts: Sahibganj, Pakur, and Godda in Jharkhand, and Bhadrachalam and Kothagudem in Telangana.

These districts were selected because they represent predominantly rural and tribal regions characterised by rainfed agriculture, limited irrigation coverage, and high dependence on natural resources for livelihoods. The agricultural landscape in these areas reflects broader

patterns observed across several Indian states where small and marginal farmers dominate the agricultural sector and rely heavily on monsoon-dependent cropping systems.

The sampling strategy follows a *multi-stage stratified approach*, which allows the survey to capture variation across districts, blocks, and villages while maintaining representativeness of the study population.

The sampling process involved three stages:

- **Stage 1: Selection of Districts and Blocks**

Project districts and blocks were identified based on the geographic focus of the BRLF intervention programme and the concentration of target villages within each district.

- **Stage 2: Selection of Villages**

Villages participating in the project were selected to ensure representation across different agro-ecological conditions, levels of resource access, and institutional presence.

- **Stage 3: Selection of Households**

Within each selected village, households were sampled using structured selection procedures to capture different livelihood categories and social groups. Particular attention was given to ensuring representation of vulnerable groups, including small and marginal farmers, tribal households, and landless labourers.

Such stratified sampling approaches are widely applied in rural household surveys to ensure that survey data reflects heterogeneity in agricultural practices, landholding patterns, and socio-economic conditions across geographic areas.

Control Village Selection and Approach

As per the Inception Report, 14 control villages with approx. 15 households from each control village were included to enable comparative assessment during endline evaluation. While inclusion of control groups in baseline studies is not a standard practice in many evaluation designs, it has been incorporated in this study to strengthen the robustness of future impact assessment.

Control villages were selected to ensure comparability with intervention villages based on geographic proximity, agro-ecological conditions, and socio-economic characteristics such as tribal population share, landholding patterns, and livelihood systems.

A preliminary comparison across key indicators such as irrigation access, income distribution, and migration patterns indicates that control and sample villages are broadly comparable. Both groups are characterised by high dependence on rainfed agriculture, a large proportion of households in lower income categories, and significant reliance on seasonal migration. This comparability strengthens the validity of the control villages as a counterfactual for future impact assessment.

It is important to note that the baseline study is not intended to establish causal relationships between interventions and outcomes. The inclusion of control villages is designed to enable a structured comparison over time, allowing for more robust assessment of programme impact during midline and endline evaluations through a counterfactual approach.

Sample Size and Coverage

As discussed in the Inception Report proposed a sample of approximately 800 households across 40 intervention villages and 14 control villages. During the primary data collection, the field team interacted with a slightly higher number of households across selected villages.

This was done to ensure that, in case of any data inconsistencies or incomplete responses, the final analytical sample would not fall short of the required size. After data cleaning and validation, all responses that met quality standards were retained for analysis, resulting in a final sample size higher than originally planned.

This approach ensured robustness of the dataset while maintaining adequate representation across districts and villages.

Planned Vs Actual Sample Size

Table 1:Planned Sample Distribution

Category	Planned	Actual
Intervention Villages	40	40
Control Villages	14	14
Total Villages	54	54
Sample Households	800	817

Control Households	219	219
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District-wise Sample Distribution

Table 2: Actual Sample Distribution

Districts	Sample HH (Actual)	Control (HH)
Sahibganj	161	30
Godda	223	60
Pakur	86	30
Bhadradri Kothagudem	347	99
Total	817	219

Note: The actual sample size (817 households) exceeds the planned sample (800) due to additional households surveyed during field validation and data checking. Households were added in certain villages to compensate for incomplete or invalid responses identified during the quality assurance process.

Qualitative Data

Table 3: Qualitative Data Table — KII & FGD list

S.No.	Instrument	Respondent Profile	Location	District
1	KII	District Agriculture Officer	Block office	Sahibganj
2	KII	Block Programme Officer	Block office	Godda
3	KII	SBI RSETI	Block office	Pakur
4	KII	Block Programme Manager Jharkhand State Livelihood Promotion Society	Block office	Sahibganj
5	KII	NGO/ Farmer Producer Organization	District HQ	Godda
6	KII	District Forest Officer (DFO)	District HQ	Bhadradri KG
7	KII	Society for Elimination of rural development (SERP) Assistant Project Manager (APM)	Block office	Bhadradri KG
8	FGD	Women SHG members (8-12 women)	Village	Sahibganj
9	FGD	Farmer group — mixed (10-15 farmers)	Village	Godda
10	FGD	NTFP collectors — tribal HH	Village	Pakur
11	FGD	Youth & migrant workers	Village	Bhadradri KG

Note: Stakeholders were selected using purposive sampling to ensure representation of key institutional, community, and gender perspectives. KII respondents were identified based on their role in agricultural, livelihood, or natural resource governance. FGD participants were selected with support from project field teams to ensure diversity in livelihood type and social category. District-wise qualitative coverage reflects local availability of relevant stakeholders and accessibility during the fieldwork period.

Data Collection Methods and Tools

The baseline study employed multiple data collection tools to ensure comprehensive coverage of livelihood systems, natural resource management practices, and institutional access across the study areas.

Household Survey

The household survey constituted the primary source of quantitative data for the baseline assessment. Structured questionnaires were administered to sampled households to collect information on demographic characteristics, education, livelihood sources, agricultural practices, access to irrigation and inputs, institutional participation, food security, and exposure to climate risks.

Household-level surveys are widely used in agricultural and rural development studies to capture micro-level socio-economic information that cannot be obtained through administrative statistics alone. Such surveys enable analysis of household production systems, income diversification, and access to resources.

Village-Level Survey

Village-level information was collected to understand community infrastructure, natural resource availability, and institutional structures. This included information on common property resources, irrigation infrastructure, market access, and presence of community organisations.

Village profiling provides important contextual information that complements household-level data and allows for analysis of local institutional and environmental conditions affecting livelihoods.

Qualitative Data Collection

Qualitative methods included:

Key Informant Interviews (KIIs) with local leaders, government officials, and community representatives

Focus Group Discussions (FGDs) with farmers, women's groups, and community members

These methods were used to explore issues such as climate variability, agricultural constraints, institutional functioning, and community perspectives on natural resource management.

Secondary Data Review

Secondary data from government reports, statistical publications, and sectoral studies were reviewed to provide contextual information on district-level socio-economic conditions, agricultural production patterns, and economic indicators.

For example, official economic statistics provide information on Gross State Domestic Product (GSDP), sectoral contributions to economic growth, and per capita income trends, which help situate local livelihood systems within broader regional economic dynamics.

Data Analysis, Quality Assurance, and Ethics

Data analysis involved a combination of descriptive statistical techniques and comparative analysis across districts and household categories. Quantitative data from the household surveys were processed and analysed to generate baseline indicators on livelihoods, agriculture, natural resource use, institutional participation, and food security.

Descriptive statistics such as proportions, and frequency distributions were used to summarise household characteristics and livelihood patterns. Comparative analysis across districts and social groups was conducted to identify variations in access to resources, agricultural practices, and livelihood outcomes.

Quality assurance procedures were implemented throughout the data collection and analysis process to ensure reliability and accuracy of the dataset. These included enumerator training, supervision during field data collection, and systematic data validation procedures.

Ethical considerations were also incorporated into the study design. Participation in the survey was voluntary, and respondents were informed about the purpose of the study before data collection. Confidentiality of household-level information was maintained during data processing and reporting.

Such ethical and quality assurance procedures are standard practice in socio-economic surveys and are essential to ensure the credibility and integrity of research findings.

Study Limitations

While the baseline study provides a comprehensive overview of socio-economic conditions, livelihood systems, and natural resource management practices in the project areas, certain limitations should be acknowledged.

- First, household surveys rely partly on respondents' recall of past events such as agricultural production, income sources, and climate shocks. As a result, some indicators may be subject to recall bias.
- Second, the baseline captures conditions at a specific point in time and therefore may not fully reflect seasonal variations in agricultural activities, employment patterns, and food availability.
- Third, external factors such as market fluctuations, climatic events, or policy changes may influence livelihood conditions independently of the project interventions.

Despite these limitations, the mixed-methods research design and triangulation of primary and secondary data sources strengthen the reliability of the baseline findings and provide a robust foundation for future monitoring and evaluation of project outcomes.

Theory of Change Framework

The Theory of Change for the programme is based on the understanding that rural livelihoods are constrained by interconnected challenges related to water availability, agricultural productivity, institutional capacity, and market access.

The baseline findings indicate that agriculture is largely rainfed, natural resources are under stress, institutional systems are present but limited in function, and market systems are fragmented.

If interventions focus on strengthening water resource management, promoting climate-resilient and diversified agriculture, enhancing institutional capacity, and improving market linkages, then households will be able to improve productivity, diversify income sources, and reduce vulnerability.

This will lead to improved income stability, enhanced resilience, and sustainable livelihood outcomes.

Linking Framework to Measurable Indicators

The conceptual framework linking livelihoods, natural resources, climate risks, and institutions has been operationalised using measurable indicators derived from household-level data. These include:

- Percentage of households with access to irrigation
- Cropping intensity across irrigated and rainfed households
- Income distribution across irrigation categories
- Migration rates across livelihood groups

Analysis of these indicators shows that households with irrigation access demonstrate relatively higher cropping intensity, improved income levels, and lower dependence on migration. In contrast, rainfed households exhibit higher vulnerability and income instability. These relationships validate the central role of natural resource access in shaping livelihood outcomes.

Operationalisation of Conceptual Framework: Indicator Construction

The conceptual framework linking livelihoods, natural resource management, climate risks, and institutional factors has been translated into measurable indicators using household-level data. This enables empirical assessment of how access to natural resources, particularly irrigation, influences agricultural practices, income levels, and migration patterns.

The following key variables have been constructed to operationalise the framework and establish baseline relationships across districts.

Variable 1: Household Access to Irrigation

Irrigation access has been derived by distinguishing between rainfed-only and irrigated households among land-owning households.

Formula:

$$\text{Irrigated Households} = \text{Land-owning Households} - \text{Rainfed-only Households}$$

$$\% \text{ Irrigated} = (\text{Irrigated Households} / \text{Land-owning Households}) \times 100$$

Note: Landless households are excluded from this analysis as they do not cultivate land.

Table 4: Household Access to Irrigation Sample Villages

Indicator	Sample Villages			
	Sahibganj	Godda	Pakur	Bhadradi
				KG
Total Households (HH)	161	223	86	347
Landless HH	5	13	2	10
Land-owning HH (base for %)	156	210	84	337
Rainfed Only HH	139	208	83	324
Irrigated HH (Land-owning Rainfed)	17	2	1	13
% Rainfed	89%	99%	99%	96%
% Irrigated	11%	1%	1%	4%
Irrigation Source Breakdown	(multiple responses)	(multiple responses)	(multiple responses)	(multiple responses)
Well/Borewell	33 (20%)	65 (29%)	2 (2%)	56 (16%)
Canal/Lift Irrigation	21 (13%)	39 (17%)	34 (40%)	6 (2%)
Farm Pond/Check Dam	3 (2%)	11 (5%)	7 (8%)	30 (9%)
Multiple Sources	0 (0%)	4 (2%)	0 (0%)	13 (4%)

*Note: Percentages may exceed 100% as households were permitted to report multiple irrigation sources.
Source: Primary Data*

Table 5: Household Access to Irrigation Control Villages

Indicator	Control Villages			
	Sahibganj	Godda	Pakur	Bhadradi
				KG
Total Households (HH)	30	60	30	99
Landless HH	0	6	2	8
Land-owning HH (base for %)	30	54	28	91
Rainfed Only HH	30	54	28	91
Irrigated HH (Land-owning Rainfed)	0	0	0	0
% Rainfed	100%	100%	100%	100%

% Irrigated	0%	0%	0%	0%
Irrigation Source Breakdown	(multiple responses)	(multiple responses)	(multiple responses)	(multiple responses)
Well/Borewell	10 (33%)	18 (30%)	7 (23%)	13 (13%)
Canal/Lift Irrigation	0 (0%)	3 (5%)	0 (0%)	1 (1%)
Farm Pond/Check Dam	0 (0%)	2 (3%)	0 (0%)	8 (8%)
Multiple Sources	0 (0%)	0 (0%)	0 (0%)	0 (0%)

*Note: Percentages may exceed 100% as households were permitted to report multiple irrigation sources.
Source: Primary Data*

The analysis shows that irrigation access is extremely limited across all districts, with the majority of households dependent on rainfed agriculture. Control villages report zero irrigation access, confirming their validity as counterfactual areas.

Variable 2: Cropping Intensity by Irrigation Status

Cropping intensity has been analysed separately for irrigated and rainfed households to assess the influence of water availability on agricultural practices.

Formula:

$$\% \text{ Single/Double/Multiple Cropping} = (\text{Number of households in category} / \text{Total households in group}) \times 100$$

Table 6: Cropping Intensity by Irrigation Status_ Sample Villages

Cropping Intensity	Sample Villages							
	Sahibganj		Godda		Pakur		Bhadradi KG	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
n (HH)	17	139	2	208	1	83	13	324
Single Crop	1 (6%)	62 (45%)	0 (0%)	45 (22%)	0 (0%)	21 (25%)	9 (69%)	271 (84%)
Double Crop	0 (0%)	70 (50%)	2 (100%)	145 (70%)	1 (100%)	58 (70%)	1 (8%)	49 (15%)
Multiple Crops	16 (94%)	7 (5%)	0 (0%)	18 (9%)	0 (0%)	4 (5%)	3 (23%)	4 (1%)

*Note: Irrigated sample sizes in certain districts are very small. Findings for these districts should be interpreted with caution and may not be statistically representative.
Source: Primary Data*

Table 7: Cropping Intensity by Irrigation Status_ Control Villages

Control Villages

Cropping Intensity	Sahibganj		Godda		Pakur		Bhadradri KG	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
n (HH)	0	30	0	54	0	28	0	91
Single Crop		9 (30%)		6 (11%)		28 (100%)		86 (95%)
Double Crop		20 (67%)		48 (89%)		0 (0%)		3 (3%)
Multiple Crops		1 (3%)		0 (0%)		0 (0%)		2 (2%)

Note: Irrigated sample sizes in certain districts are very small. Findings for these districts should be interpreted with caution and may not be statistically representative.

Source: Primary Data

Findings indicate that irrigation access is strongly associated with higher cropping intensity. In districts such as Sahibganj, irrigated households demonstrate significantly higher multiple cropping compared to rainfed households. However, in districts where irrigated samples are small, results should be interpreted with caution.

Variable 3: Income Distribution by Irrigation Status

Income distribution has been analysed across irrigation categories to understand the relationship between water access and household income.

Formula:

$$\% \text{ of households in each income bracket} = (\text{Number of households in bracket} / \text{Total households in group}) \times 100$$

Table 8: Income Distribution by Irrigation Status_ Sample Villages

Income Bracket	Sample Villages							
	Sahibganj		Godda		Pakur		Bhadradri KG	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
n (HH)	17	139	2	208	1	83	13	324
< Rs 75K	6 (35%)	85 (61%)	1 (50%)	100 (48%)	1 (100%)	49 (59%)	11 (85%)	232 (72%)
Rs 75K - 1.5 lakh	11 (65%)	53 (38%)	1 (50%)	106 (51%)	0 (0%)	34 (41%)	2 (15%)	78 (24%)
Rs 1.5 - 3 lakh	0 (0%)	1 (1%)	0 (0%)	2 (1%)	0 (0%)	0 (0%)	0 (0%)	14 (4%)

Note: Sample sizes for irrigated sub-groups are limited in several districts. Irrigation-income relationships should be interpreted cautiously given small irrigated sample sizes.

Source: Primary Data

Table 9: Income Distribution by Irrigation Status_ Control Villages

Income Bracket	Control Villages							
	Sahibganj		Godda		Pakur		Bhadradri KG	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
n (HH)	0	30	0	54	0	28	0	91
< Rs 75K		20 (67%)		18 (33%)		24 (86%)		85 (93%)
Rs 75K - 1.5 lakh		10 (33%)		36 (67%)		4 (14%)		5 (5%)
Rs 1.5 - 3 lakh								1 (1%)

Note: Sample sizes for irrigated sub-groups are limited in several districts. Irrigation-income relationships should be interpreted cautiously given small irrigated sample sizes.

Source: Primary Data

The results indicate that irrigated households tend to have relatively higher income levels compared to rainfed households. This suggests a positive relationship between irrigation access and income stability.

Variable 4: Migration Rate by Irrigation Status

Migration patterns have been analysed to understand whether improved agricultural conditions reduce dependence on seasonal migration.

Formula:

$$\text{Migration Rate (\%)} = (\text{Households reporting seasonal migration} / \text{Total households in group}) \times 100$$

Table 10: Migration Rate by Irrigation Status _Sample Villages

Migration Indicator	Sample Village							
	Sahibganj		Godda		Pakur		Bhadradri KG	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
n (HH)	17	139	2	208	1	83	13	324
HHs with Seasonal Migration (Yes)	12	83	2	169	1	71	1	41
% Migration Rate	71%	60%	100%	81%	100%	86%	8%	13%

Source: Primary Data

Table 11: Migration Rate by Irrigation Status _Control Villages

Migration Indicator	Control Village							
	Sahibganj		Godda		Pakur		Bhadradri KG	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
n (HH)		30		54		28		91

HHs with Seasonal Migration (Yes)	24	53	8	8
% Migration Rate	80%	98%	29%	9%

Source: Primary Data

The analysis suggests that households with access to irrigation tend to have lower migration rates, particularly in districts with stronger local agricultural systems. In predominantly rainfed regions, migration remains a key coping strategy.

Summary of Framework Indicators

The table below summarises key indicators derived from the conceptual framework across sample and control villages.

Table 12: Summary of Framework Indicators

Framework Component	Variable	Sahibganj		Godda		Pakur		Bhadradi KG	
		Sample	Control	Sample	Control	Sample	Control	Sample	Control
NRM - Water Agriculture	% Irrigated HH	11%	0%	1%	0%	1%	0%	4%	0%
	% Double + Multi Crop (all HH)	60%	70%	79%	89%	75%	0%	17%	5%
Livelihoods	% HH below Rs 75,000	57%	67%	45%	30%	58%	80%	70%	86%
Climate-Migration	% HH with Seasonal Migration	61%	80%	81%	98%	86%	29%	12%	9%

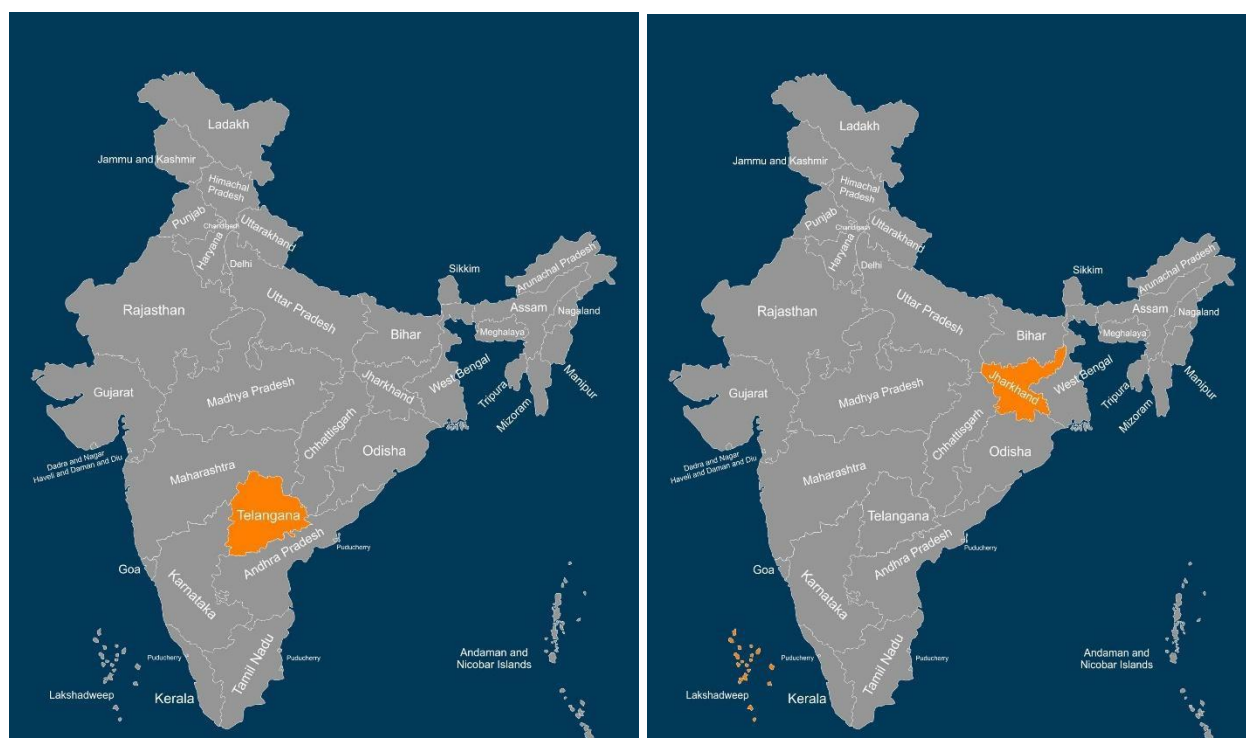
Source: Primary Data

The combined analysis confirms the central role of natural resource access, particularly irrigation, in shaping agricultural productivity, income levels, and migration behaviour. Households with limited resource access remain significantly more vulnerable, reinforcing the need for integrated NRM and climate-resilient interventions.

Chapter 3: Profile of the Study Area

Overview of the Study Area

The baseline study covers selected project villages located across four districts in two states: Sahibganj, Pakur, and Godda districts in Jharkhand, and Bhadrachalam district in Telangana. These districts are characterised by predominantly rural populations, significant tribal communities, and high dependence on agriculture and natural resources for livelihoods. The regions fall within ecologically sensitive landscapes marked by rainfed agriculture, forest dependence, and varying degrees of exposure to environmental stress and climate variability.



The Jharkhand districts are located within the Santhal Pargana region, which historically exhibits lower levels of irrigation coverage, fragmented landholdings, and limited agricultural diversification. The agricultural economy in these districts is largely monsoon-dependent, with

paddy being the dominant crop. A large share of rural households depend on agriculture and allied activities as their primary livelihood source⁶.

Bhadradi Kothagudem district, located in eastern Telangana, lies within the Godavari river basin and exhibits a mix of agricultural, forest-based, and mining-driven economic activities. While the district shows relatively higher literacy levels and improved infrastructure compared to the Jharkhand districts, large sections of the rural population continue to rely on agriculture, forest produce, and wage labour.

Together, these districts represent diverse agro-ecological conditions and socio-economic contexts where integrated natural resource management and climate-resilient agriculture interventions are particularly relevant.

District-Level Variations and Analytical Relevance

Although the study districts share several structural characteristics, they also exhibit important differences in socio-economic and ecological conditions.

- Pakur district has one of the highest tribal population shares in the region and is characterised by extensive stone mining activities.
- Sahibganj district exhibits significant dependence on agriculture but faces constraints due to soil erosion and limited irrigation infrastructure.
- Godda district combines agricultural livelihoods with large-scale coal mining activities, particularly in the Rajmahal coalfields.
- Bhadradi Kothagudem district has comparatively higher literacy rates and better infrastructure but faces ecological challenges linked to mining and forest degradation.

These variations are analytically important for the baseline study, as they influence livelihood strategies, natural resource use, and institutional access across the project geography. The baseline analysis therefore adopts a district-level comparative approach to capture these differences and to inform context-sensitive programme implementation.

⁶ District Agriculture Office, Sahibganj

Comparative District Profile

The four study districts—Sahibganj, Pakur, Godda (Jharkhand), and Bhadradri Kothagudem (Telangana)—represent distinct socio-economic and ecological contexts while sharing common structural characteristics such as high rural populations, dependence on agriculture, and presence of tribal communities. A comparative analysis of district indicators provides important context for interpreting baseline findings and identifying district-specific development priorities.

Table 13: Comparative District Profile

Comparative District Profile				
Indicator	Sahibganj	Pakur	Godda	Bhadradri Kothagudem
Total Population	~1.15 million	900,422	~1.31 million	1,069,261
Literacy Rate	~43%	48.82%	~44%	66.4%
Scheduled Tribe Population (%)	~26.8%	~42%	~17%	~28%
Rural Population (%)	>85%	~92%	>85%	Majority rural
Dominant Livelihood	Agriculture	Agriculture & mining labour	Agriculture & mining	Agriculture, forestry & mining
Irrigation Coverage	Low	Very low	Low	Low–moderate
Forest Cover	Moderate but degraded	~18–19%	~18–19%	High but fragmented
Major Crops	Paddy, pulses	Paddy, maize	Paddy, wheat	Paddy, cotton
Presence of Mining	Stone quarrying	Stone quarrying	Coal mining	Coal mining
Agro-climatic Zone	Eastern Plateau & Hills	Eastern Plateau & Hills	Eastern Plateau & Hills	Deccan Plateau

Sources: Census of India 2011; District Statistical Handbooks; Government of Telangana Directorate of Economics and Statistics; Forest Survey of India; District Administration Portals; Government agricultural statistics.

This comparison highlights important variations across the study districts. For example, Pakur district has a significantly higher share of tribal population, while Bhadradri Kothagudem shows relatively higher literacy rates and greater infrastructure access. Similarly, mining activities are particularly prominent in Pakur and Godda districts, influencing local livelihood structures and environmental conditions.

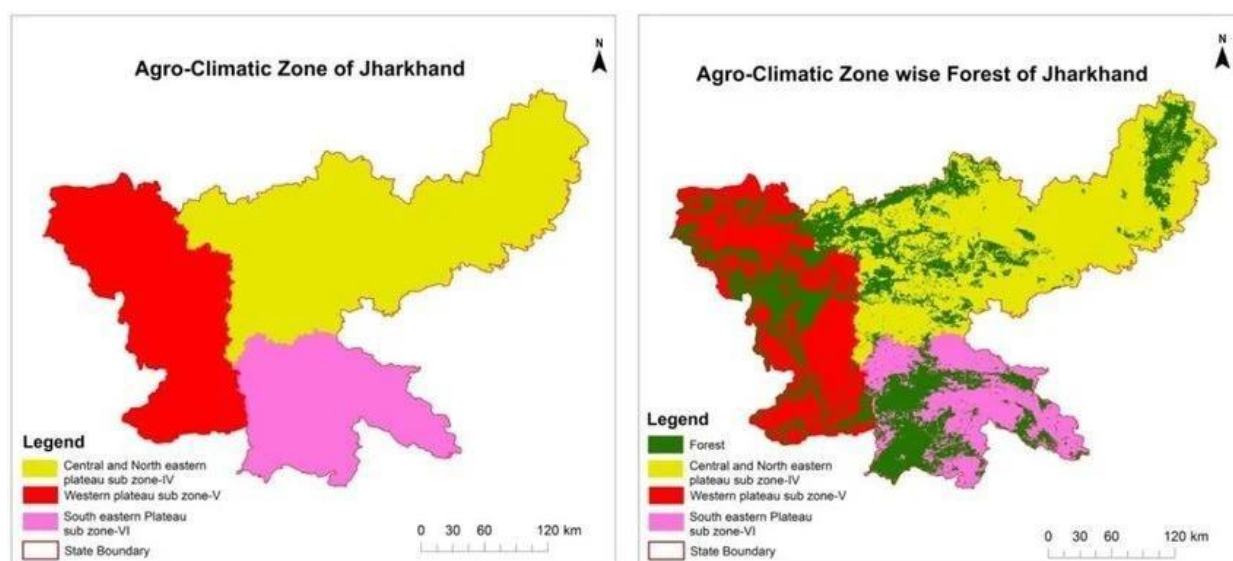
Understanding these district-level variations is essential for designing context-specific interventions under the project, particularly in areas related to natural resource management, livelihood diversification, and institutional strengthening.

Agro-Ecological Context of the Study Area

The project districts fall within distinct agro-ecological regions that influence agricultural practices, natural resource availability, and livelihood patterns.

Jharkhand Districts

The districts of Sahibganj, Pakur, and Godda are located within the Eastern Plateau and Hill Region, one of India's major agro-ecological zones. This region is characterised by undulating terrain, moderate to high rainfall, and significant forest cover. However, agricultural productivity remains relatively low due to limited irrigation infrastructure, soil erosion, and fragmented landholdings.



Agriculture in this region is predominantly rainfed, with paddy cultivated during the monsoon season forming the backbone of the cropping system. The presence of lateritic and red soils, combined with sloping terrain, increases vulnerability to soil erosion and runoff during high-intensity rainfall events.

The region also supports a wide range of forest resources that contribute to household livelihoods through collection of minor forest produce such as mahua, lac, and medicinal plants. However, pressures from mining, deforestation, and infrastructure development have led to degradation of forest ecosystems in several areas.

Telangana District

Bhadradi Kothagudem district lies within the Deccan Plateau agro-climatic region and forms part of the Godavari river basin. The district receives relatively higher rainfall compared to several other districts in Telangana and supports agriculture as well as forest-based livelihoods.

Agriculture in the district includes cultivation of crops such as paddy, cotton, maize, and pulses. The presence of the Godavari river system

provides opportunities for irrigation development, although irrigation access remains uneven across the district.

The district also has substantial forest cover, which supports livelihoods through collection of non-timber forest produce and provides ecological services such as soil conservation and groundwater recharge.

From an agro-ecological perspective, the study districts represent diverse environmental conditions ranging from plateau and hill ecosystems in Jharkhand to river basin landscapes in



Telangana. These variations influence agricultural productivity, water availability, and resilience to climate variability.

Livelihood Systems in the Study Area

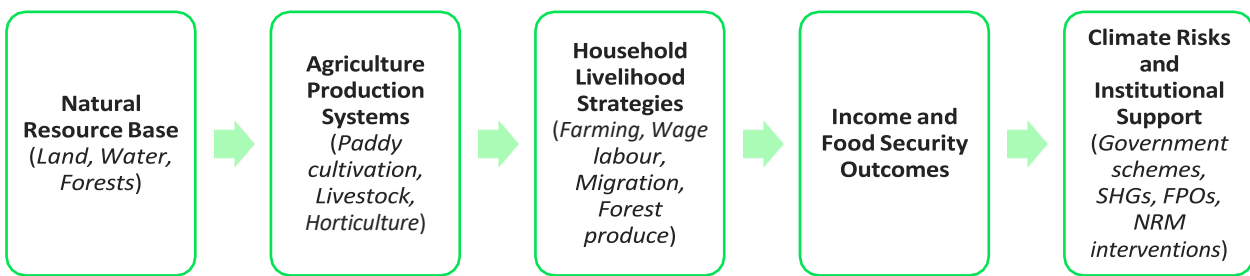
Livelihood systems across the study districts are closely linked to natural resources, particularly land, water, and forest ecosystems. Agriculture forms the primary livelihood activity for most rural households, supplemented by wage labour, livestock rearing, forest produce collection, and seasonal migration.

In Jharkhand, the dominance of rainfed agriculture results in a single cropping season for most farmers, with paddy cultivated during the kharif season. Limited irrigation infrastructure restricts the possibility of rabi cropping, leading to under-utilisation of agricultural land during large parts of the year. Consequently, rural households often depend on wage labour and migration to supplement farm income.

The presence of mining activities in districts such as Pakur and Godda has created additional employment opportunities, particularly in stone quarrying and coal mining. However, these activities also contribute to environmental degradation and increased pressure on land and water resources.

In Bhadradri Kothagudem district, livelihood systems combine agriculture with forest-based activities and employment in mining and allied industries. The district’s relatively higher literacy levels and infrastructure availability also enable greater diversification into non-farm occupations compared to the Jharkhand districts.

Livelihood System in the Study Area



The livelihood systems in the study districts reflect a combination of subsistence agriculture, natural resource dependence, and informal labour markets. The vulnerability of these systems

to climate variability, ecological degradation, and market fluctuations underscores the importance of interventions that strengthen natural resource management and promote climate-resilient agricultural practices.

Block-Level Profile of Study Areas

While district-level profiles provide an overall understanding of the study context, significant variation exists within districts at the block level in terms of livelihood systems, natural resource endowments, and agro-ecological conditions.

To capture these intra-district differences and better contextualise the village-level findings, a block-level profile of the study areas is presented below. This provides insights into dominant livelihood patterns, irrigation conditions, and ecological characteristics across the selected blocks.

Table 14: Dominant livelihood patterns, irrigation conditions, and ecological characteristics

State	District	Block	Dominant Livelihood	Irrigation Status	Agro-Ecological Features
Jharkhand	Sahibganj	Mandro	Rainfed agriculture, wage labour, seasonal migration	Low irrigation coverage (predominantly rainfed)	Undulating terrain, lateritic soil, forest fringe areas
	Godda	Mahagama	Agriculture, wage labour, small-scale livestock	Predominantly rainfed	Plateau region, moderate rainfall, mixed red and loamy soils
	Godda	Meherma	Agriculture, migration-dependent households	Limited irrigation access	Semi-undulating terrain, seasonal water scarcity
	Pakur	Littipara	Agriculture, NTFP collection, wage labour	Highly rainfed, negligible irrigation	Tribal-dominated, forested uplands, rocky terrain
Telangana	Bhadradri Kothagudem	Charla	Agriculture (paddy, chilli), wage labour	Partial irrigation (borewell and minor irrigation sources)	Forested tracts, mixed cropping systems
	Bhadradri Kothagudem	Dummugudem	Agriculture, livestock, wage labour	Moderate irrigation pockets	Riverine influence (Godavari basin), alluvial patches
	Bhadradri Kothagudem	Karakagudem	Agriculture, forest-based livelihood	Limited to moderate irrigation	Forest fringe, tribal habitations, mixed soils

Source: *District Statistical Handbooks (2022–23)*, Directorate of Economics and Statistics, Government of Jharkhand and Telangana; *District Irrigation Plans under PMKSY*; *Land Use Statistics at a Glance 2023–24*, Government of India.

The block-level analysis indicates that most study areas are characterised by rainfed agricultural systems with limited irrigation infrastructure, particularly in Jharkhand districts. In contrast, parts of Bhadrachalam district in Telangana exhibit relatively better irrigation access and crop diversification.

Forest-based livelihoods and NTFP collection play a significant role in blocks such as Litchipara and Charla, particularly among tribal communities. These variations highlight the need for location-specific strategies that account for differences in resource availability, livelihood dependence, and ecological conditions.

Block-Level Profile

Jharkhand

Sahibganj District

Mandro Block

Mandro block is characterized by undulating terrain and limited irrigation infrastructure, resulting in high dependence on rainfed agriculture. Paddy is the dominant crop cultivated during the kharif season, with minimal rabi cropping due to water scarcity. A significant proportion of households depend on seasonal migration and wage labour for income. The presence of forest fringe areas provides supplementary livelihood through NTFP collection, though this remains largely subsistence-oriented. The block has a high tribal population and limited access to formal market systems, contributing to persistent livelihood vulnerability.

Godda District

Mahagama Block

Mahagama block exhibits a mixed agro-ecological profile with relatively flatter terrain and moderate soil fertility. Agriculture is the primary livelihood activity, supplemented by wage labour and seasonal migration. While most cultivation remains rainfed, some pockets have access to irrigation through borewells and local water structures. Crop diversification is

emerging, though productivity levels remain moderate. Market connectivity is relatively better compared to other blocks, but lack of aggregation and institutional support limits income potential.

Meherma Block

Meherma block demonstrates relatively better agricultural potential due to the presence of alluvial soil patches and moderate groundwater availability. Paddy cultivation dominates, along with limited cultivation of pulses and oilseeds. Livestock rearing, particularly goat and poultry, is an important supplementary livelihood activity. Despite these advantages, access to extension services and improved agricultural practices remains limited. Seasonal migration continues to be a key coping strategy for landless and marginal households.

Pakur District (Jharkhand)

Littipara Block

Littipara is a predominantly tribal block with a significant presence of Particularly Vulnerable Tribal Groups (PVTGs), especially the Paharia communities. The block is characterized by hilly terrain, high forest cover, and minimal irrigation infrastructure. Agriculture is largely subsistence-oriented and rainfed, with paddy as the primary crop. Forest-based livelihoods, including collection of mahua, tamarind, and other NTFPs, play a critical role in household income. However, lack of processing, storage, and market linkages limits income generation. Remoteness, weak infrastructure, and limited institutional penetration further contribute to high levels of socio-economic vulnerability.

Telangana

Bhadradi Kothagudem District

Charla Block

Charla block reflects a transition towards more commercialized agriculture, with crops such as chilli and cotton gaining prominence. The agro-ecology is characterized by red soils and forested uplands, with partial irrigation access through borewells and seasonal sources. Farmers in the block are increasingly adopting input-intensive cultivation practices, leading to

higher production costs. While market access is relatively better compared to Jharkhand districts, price volatility and dependence on intermediaries affect income stability.

Dummugudem Block

Dummugudem block benefits from proximity to the Godavari river system, resulting in relatively better irrigation potential compared to other blocks. The block supports diversified cropping systems, including paddy, vegetables, and pulses. Livestock rearing is an important supplementary livelihood activity. The presence of tribal populations and forest areas contributes to livelihood diversification through NTFP collection. However, infrastructure constraints and limited institutional capacity continue to affect market access and value realization.

Karakagudem Block

Karakagudem block is characterized by a mix of agricultural and forest-based livelihoods. Irrigation access is uneven across villages, resulting in variability in cropping intensity. Households depend on a combination of agriculture, wage labour, and forest produce for income. There is significant potential for strengthening livelihood systems through improved irrigation, NTFP value chains, and institutional interventions. However, current constraints related to infrastructure, extension services, and market linkages limit income enhancement opportunities.

Analytical Summary

The block-level analysis highlights clear regional differences across the study areas. Jharkhand blocks are predominantly characterized by rainfed agriculture, high dependence on forest resources, and significant tribal populations, resulting in higher livelihood vulnerability. In contrast, blocks in Bhadravri Kothagudem show relatively better market integration and partial irrigation access, though they face emerging risks related to input-intensive agriculture.

These variations underscore the need for differentiated, location-specific intervention strategies focusing on natural resource management, climate-resilient agriculture, livelihood diversification, and institutional strengthening.

Chapter 4: Socio-economic and Demographic Profile

Understanding the socio-economic and demographic characteristics of households is essential for interpreting livelihood systems, resource access, and vulnerability patterns in the study area. Household composition, social identity, education levels, asset ownership, and access to basic services significantly influence how families engage with agriculture, natural resources, and institutional support systems. These findings reflect key dimensions of human, physical, and financial capital within the Sustainable Livelihoods Framework.

The project districts covered under the study Sahibganj, Pakur, and Godda in Jharkhand and Bhadradi Kothagudem in Telangana are predominantly rural and characterised by high levels of dependence on agriculture and natural resource-based livelihoods, as discussed in Chapter 3. Within these districts, households exhibit diverse socio-economic conditions shaped by factors such as land ownership, education levels, access to infrastructure, and participation in community institutions.

This chapter presents the baseline socio-economic profile of surveyed households, focusing on household composition, social categories, vulnerable groups, and access to basic services. The analysis provides a contextual foundation for understanding the livelihood dynamics and institutional engagement patterns examined in subsequent chapters.

Sample Distribution and Respondent Profile

Table 15: Sample Distribution and Respondent Profile

The study covered a total of 817 sample households and 219 control households across four districts. Bhadradi Kothagudem accounts for the largest share of the sample, followed by Godda, Sahibganj, and Pakur.

District	Sample (%)	Control (%)
Sahibganj	20%	14%
Godda	27%	26%
Pakur	11%	14%
Bhadradi Kothagudem	42%	45%
Total	100%	100%

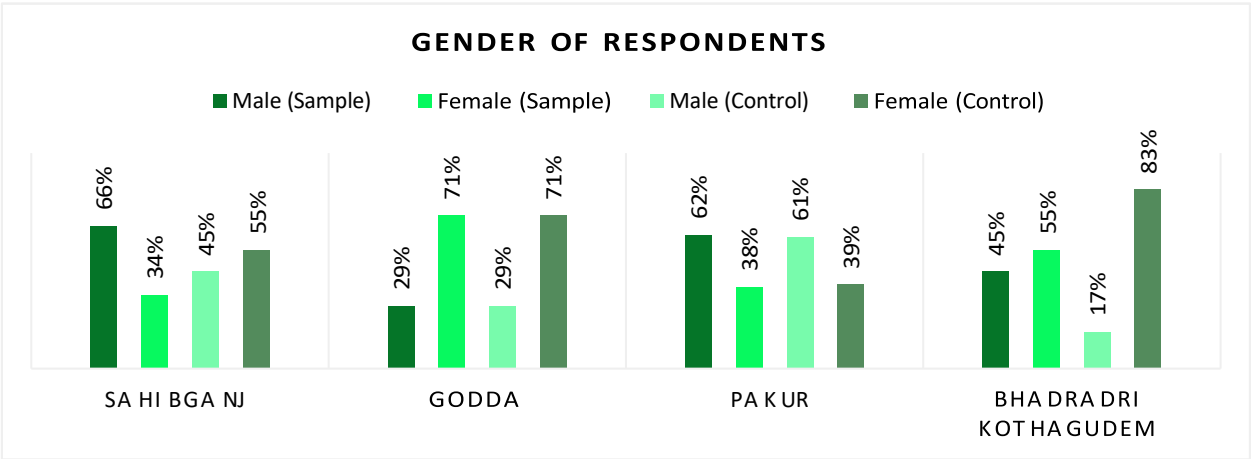
Source: Primary Data

Respondent Profile

Gender of Respondent

The respondent profile indicates variation across districts, with higher female participation in Godda and Bhadradri Kothagudem.

Figure 1:Gender of Respondents



Source: Primary Data

Age of Respondent

The majority of respondents fall within the economically active age group of 26–45 years.

Table 16: Age of Respondent

Age Group	Age Distribution (%)			
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem
Up to 25 Years	7%	6%	10%	1%
26–35 Years	30%	29%	27%	25%
36–45 Years	36%	39%	30%	40%
46–55 Years	14%	17%	24%	20%
56+ Years	12%	10%	8%	14%

Source: Primary Data

Social Composition and Household Structure

Social Category

The study areas, particularly Sahibganj, Pakur, and Bhadradri Kothagudem, are predominantly tribal.

Table 17: Social Category

Category	Social Category (%)			
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem
SC	1%	34%	0%	0%
ST	99%	29%	93%	99%
OBC	0%	37%	7%	1%

Source: Primary Data

Particularly Vulnerable Tribal Groups (PVTGs)

The study areas in Pakur and Godda districts include populations belonging to *Particularly Vulnerable Tribal Groups (PVTGs)*, particularly the Paharia communities. These groups are characterized by higher levels of socio-economic vulnerability, limited access to land and services, and dependence on forest-based livelihoods.

While the survey primarily captured Scheduled Tribe households as a broader category, field observations and qualitative interactions indicate that PVTG households face additional constraints in accessing livelihood opportunities and institutional support. These findings highlight the need for targeted interventions for PVTG communities within the programme design.

Table 18: Particularly Vulnerable Tribal Groups (PVTGs)

PVTG Indicator	Pakur	Godda	Sahibganj	Bhadradri KG
PVTG communities present	Paharia (Mal/Sauria)	Mal Paharia	Paharia (significant)	Not significant
Estimated PVTG share of ST population	~15-20%	~10-15%	Minimal	–
Primary livelihood	Forest/NTFP	Forest/NTFP + wage	Agriculture	–
Key vulnerability	Land access, isolation	Remoteness, migration	Limited	–

Household Size

Most households fall within the 3–6 member range.

Table 19: Household Size

Household Size (%)				
Size	Sahibganj	Godda	Pakur	Bhadradi Kothagudem
Up to 2 Members	4%	1%	9%	12%
3–4 Members	27%	26%	38%	53%
5–6 Members	58%	54%	41%	27%
7+ Members	11%	19%	12%	8%

Source: Primary Data

Household Head Characteristics

Gender of Household Head

Households are predominantly male headed.

Table 20: Gender of Household Head

Gender of Household Head (%)		
District	Male	Female
Sahibganj	87%	13%
Godda	90%	10%
Pakur ⁷	99%	1%
Bhadradi Kothagudem	86%	14%

Source: Primary Data

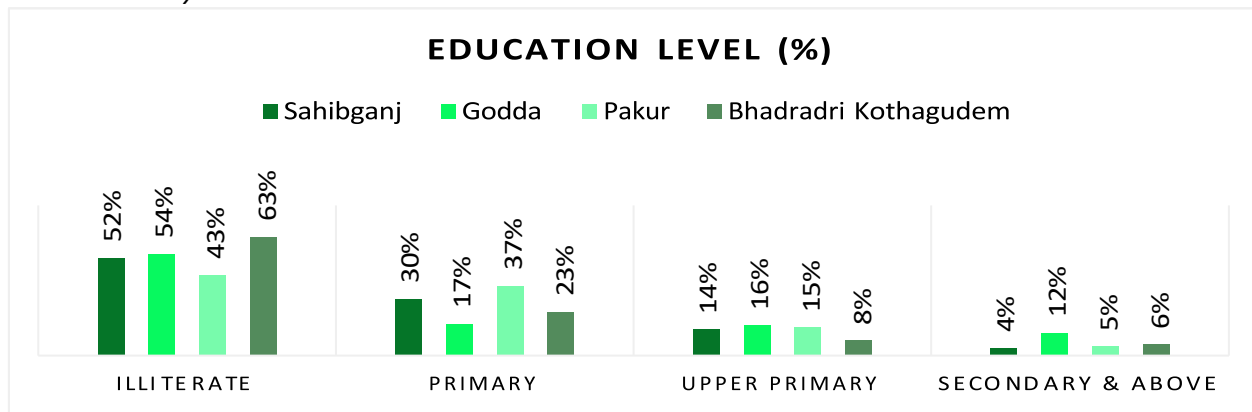
Education Level

Low literacy levels are evident, with a high proportion of illiterate household heads.

Figure 2: Education Level

⁷ The low proportion of female-headed households observed in Pakur may be influenced by the sampling approach and local socio-cultural factors. A fixed number of households per village may not fully capture the actual distribution of female-headed households in the district. As per the Socio-Economic and Caste Census (SECC) data from 2011 the percentage of female-headed households in Pakur district (rural) is 11.56%.

Source: Primary Data Collected



Housing and Basic Services

Type of Housing

A large proportion of households in Sahibganj and Pakur reside in kutcha houses, indicating limited access to durable housing infrastructure. Godda shows a transition pattern with a mix of kutcha and semi-pucca structures. In contrast, Bhadradi Kothagudem has a significantly higher share of pucca houses, reflecting relatively better housing conditions and possibly stronger access to housing schemes or higher income stability.

Table 21: Type of Housing

	Housing Type (%)			
Type	Sahibganj	Godda	Pakur	Bhadradi Kothagudem
Kutcha	76%	53%	80%	27%
Semi-pucca	21%	30%	17%	30%
Pucca	3%	17%	2%	43%

Source: Primary Data

Source of Drinking Water

Table 22: Source of Drinking Water

	Drinking Water Source (%)			
Source	Sahibganj	Godda	Pakur	Bhadradi Kothagudem
Tap	2%	5%	2%	53%
Handpump/Tubewell	88%	93%	98%	38%
Others	10%	2%	0%	9%

Source: Primary Data

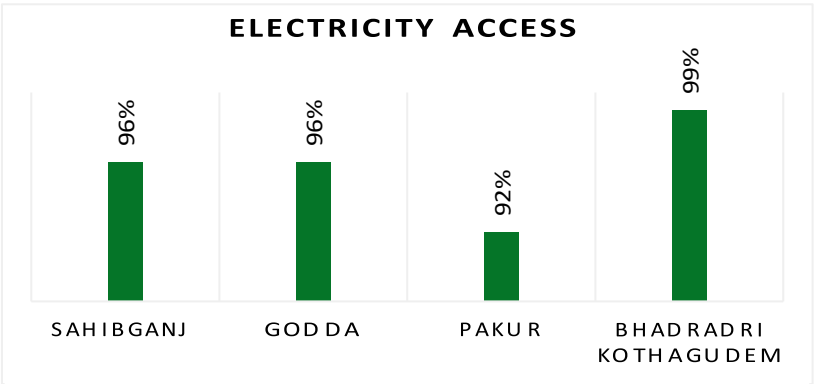
Dependence on handpumps is dominant across Sahibganj, Godda, and Pakur, indicating limited penetration of piped water supply systems. Bhadradi Kothagudem presents a different

pattern, with more than half of households accessing tap water. This suggests better infrastructure provisioning and improved service delivery in comparison to the Jharkhand districts.

Electricity Access

Electricity access is nearly universal across all districts, with only a small proportion of households reporting lack of connection. This reflects effective implementation of rural electrification initiatives. Minor gaps remain in Pakur and Sahibganj, which may be linked to remote habitations or infrastructural constraints.

Figure 3:Electricity Access

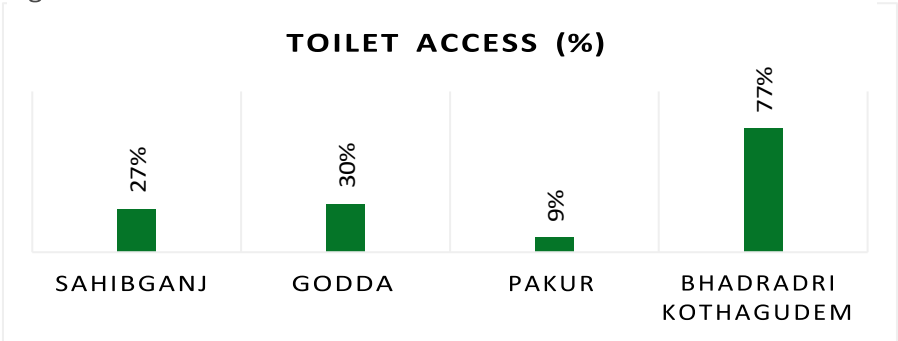


Source: Primary Data

Toilet Facility

Access to sanitation facilities varies sharply across districts. Pakur and Sahibganj show a high proportion of households without toilets, indicating continued reliance on

Figure 4:Toilet access



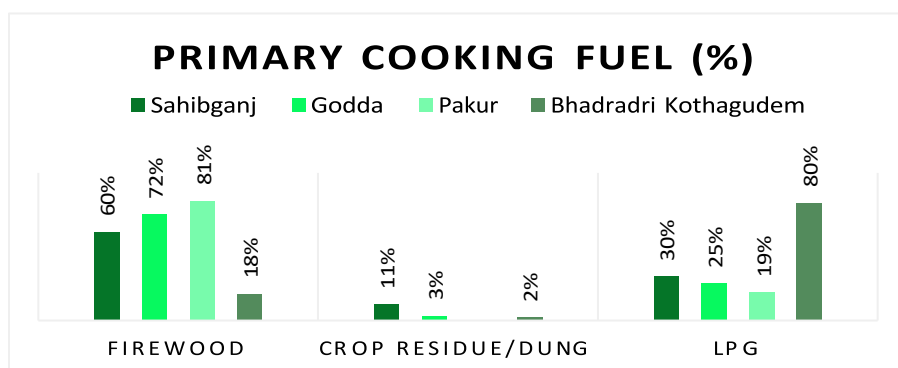
Source: Primary Data

open defecation. Godda shows marginal improvement but still reflects gaps in sanitation coverage. Bhadradi Kothagudem demonstrates relatively better access, suggesting stronger uptake of sanitation schemes and improved awareness.

Primary Cooking Fuel

Traditional biomass fuels such as firewood continue to be the primary source of cooking energy in Sahibganj, Godda, and Pakur. This indicates dependence on natural resources and limited access to clean energy alternatives.

Figure 5: Primary Cooking Fuel



Source: Primary Data

Bhadradi Kothagudem shows a contrasting pattern with a high adoption of LPG, reflecting better energy access and reduced dependence on biomass.

Ownership Status of Housing

Table 23: Ownership Status of Housing

Housing ownership is nearly universal across all districts, indicating strong tenure security among rural households.

Status	Sahibganj	Godda	Pakur	Bhadradi Kothagudem
Owned	99%	100%	100%	98%
Rented	1%			1%
No dwelling				2%

Source: Primary Data

Instances of rented housing or absence of dwelling are minimal and limited to a small number of households, primarily in Bhadradi Kothagudem.

Household Assets, Tenure, and Decision-Making

Asset ownership and control over productive resources are critical determinants of livelihood security. The survey findings indicate variation across districts in ownership of land and productive assets, as well as decision-making patterns within households.

Female ownership of assets is relatively higher in districts such as Pakur and Bhadradi Kothagudem, while it remains limited in Godda and Sahibganj. Decision-making in agriculture

is predominantly joint in most households; however, variations exist across districts in terms of female participation and control over income.

These patterns highlight the importance of strengthening women's participation, improving access to productive assets, and promoting equitable decision-making within households.

Interpretation of Living Conditions

The patterns observed across housing, water, sanitation, and energy use indicate a clear differentiation in the quality of living conditions across the study districts. In Sahibganj, Godda, and Pakur, the continued dominance of kutchha housing, reliance on handpumps, and widespread use of firewood suggest that households are still closely dependent on traditional resources and have limited access to improved infrastructure. The low coverage of toilet facilities in these districts further reflects gaps in sanitation adoption, which has implications for health and hygiene outcomes.

At the same time, the near-universal access to electricity across all districts indicates that certain basic services have seen strong penetration. However, access to electricity alone has not translated into broader improvements in living standards, as reflected in the continued dependence on biomass fuels and inadequate sanitation facilities.

Bhadradi Kothagudem presents a relatively improved profile across multiple indicators. A higher proportion of pucca houses, greater access to tap water, and widespread use of LPG indicate better infrastructure availability and higher levels of service access. The higher coverage of toilets also reflects stronger uptake of sanitation interventions and behavioural shifts at the household level.

These variations point to differences in development trajectories across regions. In the Jharkhand districts, structural constraints such as remoteness, lower income levels, and dependence on natural resources appear to influence access to improved services. In contrast, Bhadradi Kothagudem reflects better integration with infrastructure networks and service delivery systems.

The observed living conditions are closely linked to livelihood patterns and economic capacity, which are examined in subsequent sections. Limited access to improved housing, sanitation,

and clean energy can reinforce cycles of vulnerability, while better access to these services supports improved health, productivity, and overall well-being.

Multi-Dimensional Poverty Index (MDPI)

To provide a more comprehensive assessment of household-level deprivation, a Multi-Dimensional Poverty Index (MDPI) was developed using key indicators related to access to essential basic services. While the preceding sections examine individual dimensions such as housing, sanitation, drinking water, electricity, and cooking fuel separately, the MDPI integrates these indicators to present a consolidated picture of deprivation at the household level.

The index is constructed using five core indicators: access to toilet facilities, electricity connectivity, type of cooking fuel used, source of drinking water, and housing condition. Each household was assigned a deprivation score ranging from 0 to 5, based on the number of dimensions in which deprivation was observed. Based on the cumulative score, households were categorised into three groups: low deprivation (0–1), moderate deprivation (2), and high deprivation (3–5). Households falling within the high deprivation category are considered multidimensionally poor.

Table 24: Multi-Dimensional Poverty Index Classification

Multi-Dimensional Poverty Index Classification		
Deprivation Score	Category	Definition
0–1	Low Deprivation	Access to most essential basic services
2	Moderate Deprivation	Deprived in two basic service dimensions; relatively vulnerable
3–5	High Deprivation (MD Poor)	Deprived in three or more dimensions

The analysis reveals considerable inter-district variation in deprivation levels across the study area. Pakur emerges as the most deprived district, recording an average deprivation score of 2.60, with approximately 62 percent of households classified as multidimensionally poor. The high level of deprivation is largely attributable to inadequate sanitation facilities, poor housing conditions, and continued dependence on biomass-based cooking fuel. Sahibganj also demonstrates a high incidence of multidimensional poverty, with nearly half of all households

(50 percent) falling within the high deprivation category. Godda reflects comparatively moderate levels of deprivation, with 41 percent of households identified as multidimensionally poor.

In contrast, Bhadradri Kothagudem exhibits substantially lower levels of deprivation, with an average deprivation score of 0.80 and only 5 percent of households categorised as multidimensionally poor. The relatively better performance of the district indicates improved access to essential services, potentially reflecting stronger implementation and outreach of government welfare and infrastructure programmes.

Table 25: District-wise Multi-Dimensional Poverty Index Results

District-wise Multi-Dimensional Poverty Index Results				
District	Average Deprivation Score	Low Deprivation (%)	Moderate Deprivation (%)	High Deprivation (MD Poor) (%)
Sahibganj	2.33	19%	31%	50%
Godda	2.03	31%	28%	41%
Pakur	2.60	5%	34%	62%
Bhadradri Kothagudem	0.80	80%	15%	5%

Source: Primary Data

Across the study districts, deprivation is most acute in the areas of sanitation, housing quality, and access to clean cooking fuel. In comparison, access to electricity and safe drinking water is relatively widespread and does not emerge as a major constraint in most districts.

The findings indicate that a significant proportion of households, particularly within the Jharkhand districts, continue to face multiple and overlapping deprivations. The results underscore the need for integrated and targeted interventions focusing on sanitation infrastructure, housing improvement, and access to clean energy solutions, complemented by livelihood enhancement initiatives, to achieve sustainable improvements in household well-being and quality of life.

While the poverty index captures deprivation in basic services, income levels and livelihood systems play a critical role in shaping household vulnerability. These dimensions are examined in detail in the following chapter.

Chapter 5: Livelihood Systems and Income

This chapter examines the livelihood systems, income patterns, and economic activities of households across the study districts. Building on the socio-economic profile discussed in Chapter 4, the analysis focuses on primary and secondary livelihood sources, income levels, employment duration, migration patterns, and land-based livelihoods. These dimensions are critical for understanding livelihood security, diversification, and vulnerability in rural contexts.

The findings are aligned with national trends observed in rural livelihood assessments by government agencies such as NABARD and MoRD, which indicate continued dependence on agriculture alongside increasing reliance on wage labour and migration.

This chapter is analysed within the broader livelihood framework, highlighting linkages between agriculture, natural resources, institutions, and market systems.

Primary Livelihood Sources

Agriculture emerges as the dominant primary livelihood across all study districts, with near-universal dependence observed in Pakur and very high levels in Sahibganj and Godda. Even in Bhadradri Kothagudem, where diversification is relatively higher, agriculture continues to be the principal source of livelihood for the majority of households.

Table 26: Primary Livelihood Source

Source	Primary Livelihood Source (%)				
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
Agriculture	98%	96%	100%	96%	86%–100%
Others (combined)	<2%	<4%	0%	<4%	0%–14%

Source: Primary Data

Control villages show a similar pattern, although a slightly higher share of households are engaged in non-agricultural activities such as wage labour and services. This aligns with national rural livelihood patterns reported by government sources such as the Periodic Labour Force Survey (PLFS), where agriculture remains the primary employment sector in rural India.

The data indicates limited diversification of primary livelihoods, reflecting high dependence on land-based activities.

Secondary Livelihood Sources and Diversification

Table 27: Secondary Livelihood Source

Source	Secondary Livelihood Source (%)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Wage labour (non-farm)	72%	86%	98%	56%	48%–98%
Wage labour (farm)	15%	7%	0%	17%	0%–19%
Others	<10%	<7%	<2%	<10%	Minimal

Source: Primary Data

Secondary livelihood patterns indicate a strong reliance on non-farm wage labour, particularly in Pakur and Godda where it accounts for a substantial proportion of households. Sahibganj also shows high dependence, while Bhadradi Kothagudem reflects relatively lower but still significant engagement. Control villages demonstrate a similar dependence, with non-farm wage labour being a key supplementary income source. This trend is consistent with findings from rural livelihood studies by NITI Aayog and the Ministry of Rural Development, which highlight the growing importance of wage labour in supporting agricultural households.

The findings suggest that households supplement agricultural income through wage labour due to limited returns from farming.

Employment Stability

Most households are engaged in livelihood activities for 6 to 9 months in a year, indicating seasonal employment patterns across districts.

Table 28: Months of Livelihood Engagement

Duration	Months of Livelihood Engagement (%)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
<6 months	19%	6%	3%	15%	6%–19%
6–9 months	78%	77%	78%	84%	77%–94%
10–12 months	4%	17%	19%	1%	0%–12%

Source: Primary Data

A relatively small proportion of households report year-round engagement, particularly in Bhadradri Kothagudem and Sahibganj. Control villages show slightly better engagement in some districts, but the dominant pattern remains seasonal. This reflects broader rural employment trends documented in government datasets such as the PLFS, where underemployment and seasonality are key concerns in agrarian economies. The data highlights the prevalence of seasonal livelihoods with limited year-round income opportunities.

Income Levels and Economic Status

A significant proportion of households fall within the lowest income bracket, particularly in Bhadradri Kothagudem and Pakur.

Table 29: Annual Household Income

	Annual Household Income (%)				
Income Category (In INR)	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
< ₹75,000	58%	50%	59%	72%	36%–92%
₹75,000–1.5 lakh	41%	49%	41%	24%	7%–64%
₹1.5–3 lakh	1%	1%	-	4%	0%–1%

Source: Primary Data

Godda shows a relatively better distribution across income categories, although higher income groups remain minimal across all districts. Control villages exhibit similar trends, with some districts showing even higher concentration in lower income brackets. These patterns align with national rural income trends reported by NABARD’s All India Rural Financial Inclusion Survey, which highlights low- and uneven-income levels among smallholder households. The findings indicate a predominance of low-income households with limited upward mobility.

A disaggregated analysis of income levels by irrigation status (presented in Chapter 2) indicates that households with irrigation access tend to have relatively higher income levels compared to rainfed households. This reinforces the role of natural resource access in shaping livelihood outcomes.

To further understand income patterns, additional analysis has been undertaken on income distribution, livelihood linkages, and determinants of income, presented in the following sections.

Income Levels and Distribution

To strengthen the understanding of income patterns, both median income estimates and income distribution across households have been analysed.

Table 30: Median Household Income Across Districts

Median Household Income Across Districts	
District	Median Annual Household Income (Estimated)
Sahibganj	Rs 75,000
Godda	Rs 75,000 – 80,000
Pakur	Rs 75,000
Bhadradi Kothagudem	Rs 75,000 (lower range)

Source: Primary Data

The median income across all districts is concentrated around Rs 75,000, indicating a uniformly low-income base. Bhadradi Kothagudem reflects relatively higher vulnerability, with a larger share of households positioned below the median despite better access to basic services.

Table 31: Income Distribution Across Districts

Income Distribution Across Districts (% Households)				
Income Category	Sahibganj	Godda	Pakur	Bhadradi Kothagudem
Below Rs 75,000	58%	50%	59%	72%
Rs 75,000 – 1.5 lakh	41%	49%	41%	24%
Above Rs 1.5 lakh	1%	1%	0%	4%

Source: Primary Data

The distribution shows a high concentration of households in the lowest income bracket across all districts. Pakur and Sahibganj reflect particularly high-income concentration, while Bhadradi Kothagudem shows the highest proportion of low-income households. The upper income category remains negligible across the study area, indicating limited upward mobility.

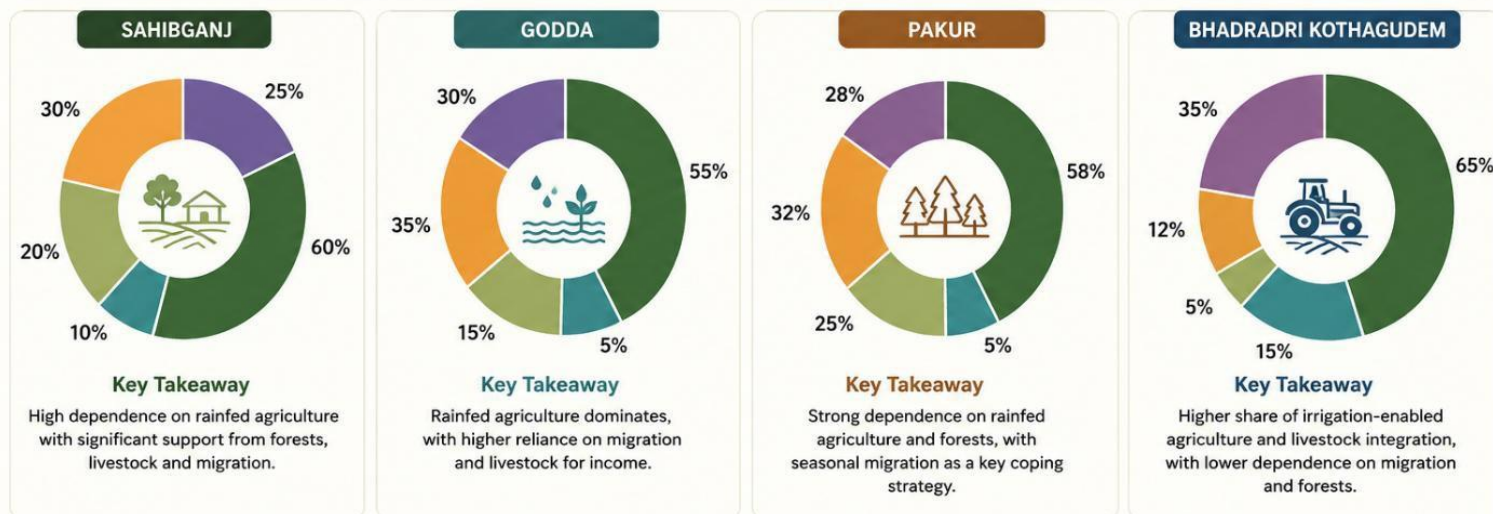
The findings confirm that household incomes are clustered at the lower end, reflecting structural constraints in livelihood systems.

LIVELIHOOD SYSTEMS ACROSS STUDY DISTRICTS

Distribution of Households by Primary Livelihood Type



Livelihoods in the study areas are diverse, with a strong dependence on rainfed agriculture. Livestock integration and migration play a significant role in supplementing household incomes.



LIVELIHOOD TYPE LEGEND



OVERALL INSIGHTS

- Rainfed agriculture is the primary livelihood base across all districts.
- Livestock integration and migration significantly supplement household incomes.
- District-level differences highlight the need for location-specific strategies under BRLF.

Note: Percentages are indicative and based on primary and secondary livelihood engagement patterns.

Income by Livelihood Source

Household income levels vary significantly depending on the nature of livelihood activities. The analysis highlights the relationship between primary and secondary livelihood sources and income outcomes.

Table 32: Income by Livelihood Category

Income by Livelihood Category			
Livelihood Category	Estimated HH Share	Income Range (Rs/year)	Key Observation
Farm-dependent	90–100%	40,000 – 80,000	Low returns due to rainfed agriculture and single cropping Critical supplementary income; seasonal and migration-linked
Wage-dependent (non-farm)	56–98%	50,000 – 1,20,000	

Livestock-integrated	66–91%	60,000 – 1,20,000	Supports income stability but remains secondary
Forest-linked (NTFP)	57–100% usage	30,000 – 60,000	Primarily subsistence; limited income contribution

Source: Primary Data

The findings indicate that agriculture alone does not provide sufficient income, and households depend heavily on wage labour and diversified activities. Wage income, particularly through migration, plays a critical role in moving households into the middle-income category.

Multinomial Logistic Regression: Determinants of Income

Method: Multinomial Logistic Regression (MNLogit). Base category = households with income <₹75,000.

Two outcome comparisons:

- ₹75,000–1.5 lakh vs <₹75,000; and
- ₹1.5–3 lakh vs <₹75,000

Model Specification

Table 33: Model Specification

Component	Details
Method	Multinomial Logistic Regression (MNLogit)
Dependent Variable	Annual household income category (3 levels)
Base Category (0)	< ₹75,000 (n=506, 61.9%)
Category 1	₹75,000 – 1.5 lakh (n=294, 36.0%)
Category 2	₹1.5 – 3 lakh (n=17, 2.1%)
Sample	817 households (Sample Villages only)
Independent Variables	HH size, Gender of HH head, Education, Livelihood months, Seasonal migration, Land (acres), Irrigation access

Model Fit Statistics

Table 34: Model Fit Statistics

Metric	Value	Interpretation
Observations	817	Full sample village dataset
Log-likelihood (full model)	-544.86	
Log-likelihood (null model)	-608.74	

McFadden Pseudo R ²	0.105	Moderate fit — acceptable for social science MNLogit
LR Chi-square (14 df)	127.77	
LR p-value	< 0.001	Model is highly significant overall

Interpretation: A McFadden R² of **0.105** is considered a moderate fit for multinomial logistic models' values **between 0.10 and 0.20 indicate a satisfactory model**. The LR p-value < 0.001 confirms the model is statistically significant.

Regression Category 1 vs Base (₹75k–1.5L vs <₹75k)

Table 35: Regression Category 1 vs Base

Variable	Coefficient (β)	Std. Error	z-value	p-value	Odds Ratio + Sig.
Intercept	-4.206	0.509	-8.26	<0.001	0.015 ***
Household Size	0.265	0.052	5.15	<0.001	1.304 ***
Gender of HH Head (Male=1)	0.11	0.263	0.42	0.675	1.116
Education Level of HH Head (0-5)	0.137	0.079	1.74	0.082	1.146
Livelihood Months (1=<6m, 2=6-9m, 3=10-12m)	0.702	0.189	3.7	<0.001	2.017 ***
Seasonal Migration (Yes=1)	0.73	0.179	4.08	<0.001	2.074 ***
Land Accessed (acres)	0.131	0.029	4.44	<0.001	1.140 ***
Irrigation Access (Non-rainfed=1)	0.017	0.382	0.05	0.964	1.017

Significance: ***p<0.001** p<0.01* p<0.05 (highlighted rows = statistically significant). Green rows = significant predictors.

Findings - Category 1 (₹75k–1.5L vs <₹75k)

Table 36: Findings - Category

Variable	Finding	Odds Ratio	Implication
Livelihood Months ***	Each step up in livelihood engagement significantly increases income	2.017	Each additional livelihood season doubles probability of higher income
Seasonal Migration ***	Migrating households 2x more likely to be in ₹75k-1.5L bracket	2.074	Migration is a key income ladder for this group

Land (acres) ***	Each additional acre increases odds of higher income by 14%	1.140	Land remains central asset, even marginal land matters
Household Size ***	Larger HH have higher odds — possibly more earners	1.304	Multi-earner effect, but can also mean higher consumption needs
Education	Positive but not significant (p=0.082)	1.146	Education matters directionally but not statistically significant at this level
Gender of HH Head	Not significant	1.116	No structural gender difference in income category probability
Irrigation Access	Not significant at HH level	1.017	Very few irrigated HH (n=33) limits this variable's power

Category 2 vs Base (₹1.5–3L vs <₹75k)

Table 37: Category 2 vs Base

\	Coefficient (β)	Std. Error	z-value	p-value	Odds Ratio + Sig.
Intercept	-7.739	1.966	-3.94	<0.001	0.000 ***
Household Size	-0.127	0.185	-0.69	0.492	0.881
Gender of HH Head (Male=1)	0.288	0.956	0.3	0.764	1.333
Education Level of HH Head (0-5)	0.469	0.241	1.94	0.052	1.598
Livelihood Months (1=<6m, 2=6-9m, 3=10-12m)	1.471	0.793	1.85	0.064	4.352
Seasonal Migration (Yes=1)	-0.067	0.629	-0.11	0.915	0.935
Land Accessed (acres)	0.303	0.052	5.78	<0.001	1.354 ***
Irrigation Access (Non-irrigated=1)	-12.865	590.68	-0.02	0.983	0.000 Δ

Note on Irrigation: Irrigation variable shows very large standard error for Category 2 (SE=590.68) — this is due to near-perfect separation: almost no irrigated HH fall in the ₹1.5–3L category (n=17 total). This coefficient should not be interpreted. This is a known convergence issue when a predictor perfectly predicts an outcome in a small group.

Findings - Category 2 vs Base (₹1.5–3L vs <₹75k)

Table 38: Findings - Category

Variable	Finding	Odds Ratio	Implication
Land (acres) ***	Each acre increases odds of highest income by 35%	1.354	Land is the ONLY significant predictor at highest income level

Education	Borderline significant (p=0.052) — positive direction	1.598	Education has stronger effect at highest income but sample too small to confirm
Livelihood Months	Positive direction (OR=4.35) but p=0.064 — not significant	4.352	Strong directional signal — larger sample needed
Migration	Not significant at highest income level	-0.067	Migration helps reach middle income but not top income band
HH Size	Not significant	0.881	Household size doesn't predict very high income

Determinants of Household Income

To understand what drives differences in household income, a **multinomial logistic regression analysis** was carried out using data from 817 households. The analysis compares households across three income groups, with those earning below Rs 75,000 as the reference category.

- The results show that land access is the most important factor influencing income. Households with more land are significantly more likely to move into higher income categories. Even small increases in landholding improve the chances of earning more, highlighting the central role of land as a productive asset.
- Livelihood engagement and migration also play a major role, particularly for households in the middle-income category (Rs 75,000 – 1.5 lakh). Households that are engaged in income-generating activities for a longer duration during the year, or those that participate in seasonal migration, are much more likely to earn higher incomes. This indicates that wage labour and migration are important pathways for improving income, especially for land-poor households.
- Household size shows a positive relationship with income, suggesting that households with more working members may have higher earning potential. However, this may also be associated with higher household expenses.
- Education shows a positive but weak relationship with income. While better education tends to support higher earnings, the effect is not strong in this sample, likely because most households have low and similar levels of education.

- Gender of the household head does not have a significant influence on income levels. Similarly, irrigation does not show a clear effect in this analysis, mainly because very few households in the sample have access to irrigation, which limits its statistical influence.

The analysis indicates that access to land and opportunities for year-round and diversified livelihood activities are the key factors that influence household income levels.

Linking Income and Poverty

A comparison of income levels with the multidimensional poverty index provides additional insight into household vulnerability.

Table 39: Poverty Index and Income Alignment

Poverty Index and Income Alignment				
District	Avg Deprivation Score	% Multidimensional Poor	% HH Below Rs 75,000	Alignment
Pakur	2.60	62%	59%	Strong
Sahibganj	2.33	58%	58%	Strong
Godda	2.83	41%	50%	Good
Bhadradi	0.80	5%	72%	Partial
Kothagudem				

Source: Primary Data

The analysis shows a strong alignment between income poverty and multidimensional deprivation in most districts. However, Bhadradi Kothagudem presents a distinct pattern, while basic service deprivation is low, income poverty remains high.

This indicates that improvements in infrastructure and service access do not necessarily translate into higher incomes, highlighting the need for stronger livelihood and income-focused interventions.

Migration as a Livelihood Strategy

Migration is highly prevalent in Sahibganj, Godda, and Pakur, where a large proportion of households depend on seasonal migration for income.

Table 40: Migration Incidence

Category	Migration Incidence (%)				Control Avg. (Range)
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	

Yes	60%	82%	86%	13%	9%–98%
No	40%	18%	14%	87%	2%–91%

Source: Primary Data

In contrast, Bhadradri Kothagudem shows significantly lower migration levels, indicating relatively better local livelihood opportunities in nearby regions (*they go for work in nearby locations and come back by evening. Also, there are contract farming process wherein majority of locals are engaged in monitoring seed crops*). Control villages reflect similar patterns, with high migration rates in Jharkhand districts. Government reports, including those from the Ministry of Rural Development, have consistently identified migration as a coping mechanism in regions with limited employment diversification. The data suggests that migration plays a critical role in supporting household incomes in certain districts.

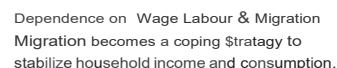
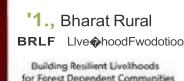
Further analysis (see Chapter 2) shows variation in migration rates between irrigated and rainfed households, with rainfed households exhibiting relatively higher dependence on seasonal migration.

Table 41: Migration Duration

Duration	Migration Duration (%)				
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
<3 months	15%	8%	0%	23%	7%–67%
3–6 months	63%	58%	70%	77%	33%–56%
>6 months	22%	34%	30%	-	0%–37%

Source: Primary Data

Migration is largely seasonal, with most households migrating for 3 to 6 months annually. A considerable share in Godda and Pakur migrate for longer durations exceeding six months, indicating deeper livelihood stress. Short-term migration is relatively limited across districts. Control villages also show similar duration patterns. This aligns with findings from migration studies by government agencies, where seasonal migration is closely tied to agricultural lean periods. The pattern reflects dependence on temporary migration to bridge income gaps.



**F00d & Nutrition
Insecurity**
52♦54% of househ.olds
in Jharkhand districts
have only adequat'e
food security: in
Pakur (47%).

1. "_____,
_____/?_____/_____- \1

Landholding and Livelihood Base

Landholding patterns show a dominance of small and marginal farmers, particularly in Godda and Pakur. Bhadradri Kothagudem has a relatively higher proportion of medium and large landholders compared to Jharkhand districts.

Table 42: Landholding Category

Category	Landholding Category (%)				Control Avg. (Range)
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	
Landless	3%	6%	2%	3%	0%–10%
<1 acre	17%	52%	19%	1%	0%–59%
1–2 acres	28%	36%	50%	25%	17%–61%
2–5 acres	31%	6%	27%	39%	3%–52%
>5 acres	21%		2%	32%	0%–24%

Source: Primary Data

Control villages reflect similar distributions, although with some variation across districts. These findings are consistent with agricultural census data, which highlights the predominance of smallholder farming in India. The distribution indicates limited land availability as a constraint to livelihood expansion.

Livelihood systems across the study districts are heavily dependent on agriculture, supplemented by wage labour and migration. Employment remains largely seasonal, and income levels are concentrated in lower brackets. Landholding patterns reinforce the dominance of small-scale farming, while migration serves as an important strategy for income stabilization in certain regions.

These patterns indicate structural constraints in livelihood diversification, which are further examined in subsequent chapters focusing on agriculture, climate resilience, and institutional support.

Livelihood Typology

Livelihood Typology Across Study Areas

The baseline findings indicate the presence of distinct livelihood systems across the study regions, reflecting varying degrees of dependence on agriculture, natural resources, and non-farm activities.

- **Rainfed Agriculture-Based Households** – Highly dependent on monsoon, characterized by low productivity and high vulnerability
- **Irrigation-Enabled Households** – Higher productivity, crop diversification, and relatively stable incomes
- **Forest-Dependent Households** – Reliance on NTFP collection and seasonal forest-based income
- **Migration-Dependent Households** – Significant dependence on wage labour outside the village
- **Livestock-Integrated Households** – Supplementary income through poultry, goat rearing, and allied activities

To further understand the distribution of these livelihood systems, an approximate classification of households across districts is presented below. These estimates are derived from primary occupation patterns reported during the household survey and reflect the dominant livelihood source.

Distribution of Livelihood Types

Table 43: Distribution of Livelihood Types

Livelihood Type	Sahibganj	Godda	Pakur	Bhadradi Kothagudem
Rainfed Agriculture-Based	60%	55%	58%	65%
Irrigation-Enabled Agriculture	10%	5%	5%	15%
Forest / NTFP-Based	20%	15%	25%	5%
Migration-Dependent	30%	35%	32%	12%
Livestock-Integrated / Diversified	25%	30%	28%	35%

Note: Percentages are indicative and based on primary and secondary livelihood engagement patterns. Categories are not mutually exclusive, as households often depend on multiple livelihood sources simultaneously.

Source: Primary Data

The distribution highlights a high concentration of households dependent on rainfed agriculture across all districts, particularly in Jharkhand, indicating structural vulnerability due to climate variability and limited irrigation access. Forest-based and migration-dependent livelihoods are more prominent in Jharkhand districts, reflecting reliance on natural resources and external income sources. In contrast, Bhadradi Kothagudem shows relatively greater diversification, supported by better irrigation access and engagement in allied activities.

Methodological Note: *Livelihood typology is based on the primary source of income reported by households. Given that most households engage in multiple livelihood activities, the classification reflects dominant dependence rather than exclusive livelihood engagement.*

These findings underscore the need for differentiated and context-specific intervention strategies across districts rather than a uniform approach.

Given the central role of agriculture in livelihoods, the next chapter examines agricultural production systems in detail

Chapter 6: Agriculture Production Systems

This chapter examines agricultural production systems within the broader livelihood framework, highlighting linkages with natural resources, institutions, and market access. Agriculture remains the central pillar of livelihoods across the study districts, as highlighted in Chapter 5. However, the structure of agricultural production systems is characterized by smallholder dominance, high dependence on monsoon rainfall, and limited integration of improved practices. These systems are largely subsistence-oriented, with varying degrees of commercialization observed across regions.

The production systems are influenced by a combination of landholding patterns, irrigation access, input use, and institutional support. While Bhadradi Kothagudem demonstrates relatively diversified and market-linked agriculture, the Jharkhand districts continue to rely on traditional, low-input systems.

This chapter examines cropping systems, seasonality, irrigation, input use, allied activities, and production constraints, integrating household and village-level data with field-based observations and secondary evidence from sources such as the Ministry of Agriculture & Farmers Welfare, Agricultural Census, and ICAR reports.

These patterns highlight the role of natural capital and its influence on livelihood outcomes.

Cropping Patterns

Cropping systems across districts are dominated by paddy-based monoculture, particularly in Jharkhand, where Kharif cultivation is the primary agricultural activity. Secondary crops such as maize, pulses, and oilseeds are grown in limited areas, often dependent on residual soil moisture. Vegetable cultivation is present but remains small-scale and localized.

Table 44: Major Crops Cultivated by Households

Major Crops Cultivated by Households (%)					
Crop	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Paddy	92%	88%	95%	90%	80%–96%
Maize	35%	42%	38%	22%	18%–45%

Vegetables	28%	31%	26%	40%	20%–44%
Pulses/Oilseeds	18%	24%	20%	12%	10%–28%
Commercial Crops (Chilli/Cotton)	2%	4%	1%	36%	0%–38%

Source: Primary Data

In contrast, Bhadradri Kothagudem shows a transition towards diversified and semi-commercial production systems, with crops such as chilli and cotton gaining prominence. This reflects better irrigation access, market connectivity, and input availability.

Secondary evidence from the Agricultural Census and ICAR studies on rainfed agriculture indicates that eastern India continues to be dominated by cereal-based systems with low diversification, while southern states have seen a gradual shift towards commercial crops.

Field observations indicate that cropping choices are largely risk-averse, with farmers prioritizing staple crops for food security. Diversification is constrained by irrigation access, market linkages, and input costs.

The production system remains cereal-centric, with diversification emerging only in areas with better resource access.

Implications and Strategic Focus Areas

- Promote crop diversification models (pulses, oilseeds, vegetables) in paddy-dominated systems.
- Introduce location-specific cropping systems based on agro-climatic conditions.
- Encourage commercial crop clusters in suitable areas (e.g., chilli, cotton in Telangana).
- Strengthen extension support for crop planning and diversification.

Field evidence from KIIs and FGDs highlights a growing shift towards high value but high-risk agricultural practices, particularly hybrid paddy seed production under contract farming arrangements. While these models provide assured input supply and market linkage, farmers bear the majority of production risks, including high input costs, water dependency, and price uncertainty.

Key informants indicated that such practices often lead to increasing indebtedness among tribal farmers, as advance payments and input costs are deducted before final settlement. In many cases, net returns remain modest relative to the risks involved. This suggests a need to



IRRIGATION ACCESS MAP – BRLF BASELINE STUDY

Understanding the Status, Drivers and Pathways for Improvement

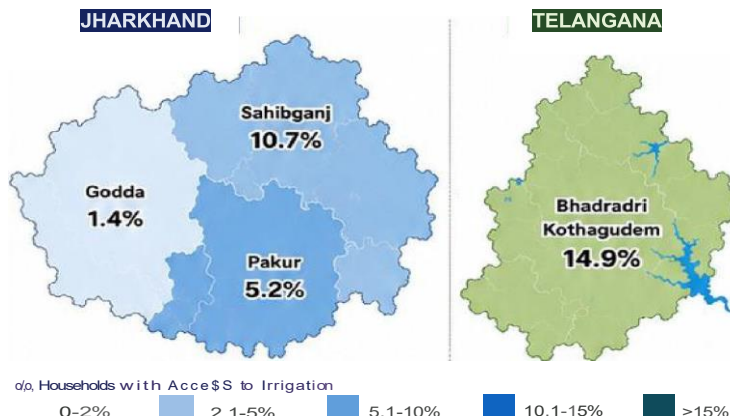


Bharat Rural
Livelihood Foundation

Building Resilient Livelihoods
for Forest Dependent Communities

Irrigation access is very limited across the study districts. Only 10.7% of land-owning, households in Sahibganj, 1.4% in Godda, 5.2% in Pakur (Jharkhand) and 14.9% in Bhadradi Kothagudem (Telangana) have access to irrigation.

% OF HOUSEHOLDS WITH ACCESS TO IRRIGATION (District level)



Source: Primary Data (Household Survey)

WHY IS IRRIGATION ACCESS LOW?

High Dependence on Rainfall
Agriculture is predominantly rainfed in all study districts, making production highly seasonal and uncertain.

Limited Water Resources
Low availability of surface water, groundwater over-extraction and uneven distribution of water sources.

Inadequate Infrastructure
Insufficient irrigation canals, tanks, lift irrigation and water harvesting structures.

Financial Constraints
High cost of irrigation assets and limited access to affordable credit restrict investments.

Small & Marginal Landholdings
Fragmented landholdings make irrigation investments less feasible and less productive.

IMPACT OF LIMITED IRRIGATION ACCESS

Low Cropping Intensity

18% in Sahibganj, 12% in Godda, 15% in Pakur and 28% in Bhadradi Kothagudem are multi-cropping; majority are limited to single cropping.

Low Productivity & Income

72% of households in Bhadradi Kothagudem and 59% in Pakur earn less than ₹75,000 annually.

High Migration

60% in Sahibganj, 80% in Godda and 70% in Pakur households have at least one member migrating for seasonal or long-term work.

Vulnerability to Climate Shock

Erratic rainfall and droughts result in crop failure, income instability and food insecurity.

Food & Nutritional Insecurity

52-54% of households in Jharkhand have only adequate food security; very low in Pakur (47%).

MEASURES TO IMPROVE IRRIGATION ACCESS

Expand Minor Irrigation Infrastructure
Check dams, farm ponds, percolation tanks, lift irrigation and canal renovation.

Promote Water Harvesting & Watershed Development
Sustainable ridge to valley treatment, recharge structures and soil moisture conservation.

Adopt Efficient Irrigation Technologies
Solar pumps, drip and sprinkler systems to ensure efficient and sustainable water use.

Improve Access to Credit & Subsidies
Facilitate affordable credit and subsidy linkages and risk mitigation for irrigation investments.

Strengthen Community Institutions
Empower water user groups and SHGs for operation, maintenance and equitable water distribution.

CONVERGENCE WITH GOVERNMENT SCHEMES IS ESSENTIAL

Although BRLF (Bharat Rural Livelihood Foundation) is working in this thematic domain, convergence with government schemes will help foster growth and ensure sustainability.

0

PMKSY - AIBP/ Har Khet Ko Pani
Expansion of irrigation infrastructure and efficient water use.

PMKSY - Watershed Development Component
Watershed treatment and water resource development.

PM-KUSUM
Solar pump for irrigation and energy security.

0

NABARD - RIDF & FIF

Financing for minor irrigation and water resource projects.

RKVY - Micro Irrigation
Promotion of drip and sprinkler irrigation systems.

MGNREGS
Creation of water harvesting and soil conservation structures.

EXPECTED OUTCOMES



Increased in cultivated area under assured irrigation



Improved crop productivity and diversification



Higher and more stable household incomes

Reduced migration and improved dignity of life



Improved food security and climate resilience of communities



Enhancing irrigation access is key to building climate resilience, improving livelihoods and promoting sustainable agriculture in the Bharat Rural Livelihood Foundation (BRLF) project areas.



risk crops.

Cropping Intensity and Seasonality

Cropping intensity remains low across districts, with a majority of households cultivating only during the Kharif season. Jharkhand districts show a strong dependence on single-season agriculture, reflecting constraints in irrigation and water availability. Bhadradri Kothagudem demonstrates relatively higher multi-season cultivation.

Table 45: Cropping Season Engagement

Cropping Season Engagement (%)					
Season	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
Kharif Only	68%	72%	75%	54%	50%–78%
Kharif + Rabi	32%	28%	25%	46%	22%–48%

Source: Primary Data

According to the Ministry of Agriculture statistics, cropping intensity in rainfed regions remains significantly lower than irrigated regions, which is consistent with the patterns observed in the study areas.

Field observations suggest that even where water sources exist, their limited capacity and unequal access prevent widespread adoption of Rabi cropping. As a result, agricultural land remains underutilized for a significant part of the year.

Low cropping intensity limits both productivity and income potential of farming systems.

Implications and Strategic Focus Areas

- Promote double cropping and short-duration crop varieties to increase land utilization.
- Strengthen convergence with PMKSY for expanding irrigation coverage.
- Introduce mixed and intercropping systems in single-season areas.
- Develop village-level crop planning aligned with water availability.

Irrigation and Water Resource Access

To further understand the implications of irrigation access on agricultural outcomes, comparative analysis between irrigated and rainfed households is presented below (refer Chapter 2: Framework Variables).

Irrigation remains a critical determinant of agricultural productivity. A majority of households in Jharkhand depend solely on rainfall, while Bhadradri Kothagudem benefits from a mix of groundwater and river-based irrigation systems.

Table 46: Irrigation Access by Source

Source	Irrigation Access by Source (%)				
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
Rainfed Only	89%	99%	99%	96%	100%
Well/Borewell	21%	31%	2%	17%	14%–32%
Canal/Lift	13%	19%	40%	2%	1%–6%
Farm pond/Check dam	2%	5%	8%	9%	4%–9%
Multiple sources	0%	2%	0%	4%	0%

Source: Primary Data

Secondary evidence from PMKSY and State Irrigation Department reports indicates that irrigation coverage remains limited in eastern India, despite the presence of water resources. This is reflected in the study areas, where infrastructure exists but is underutilized.

Field observations highlight issues such as silted ponds, limited borewell coverage, and unequal distribution of irrigation resources. These factors contribute to variability in agricultural outcomes across households.

Irrigation constraints continue to shape production systems and limit intensification.

Implications and Strategic Focus Areas

- Strengthen convergence with **PMKSY** and **VB-G-RAM-G** for irrigation infrastructure development.
- Promote revival and maintenance of traditional water bodies.
- Introduce micro-irrigation systems for efficient water use.
- Ensure equitable access to irrigation at community level.

Input Use and Technology Adoption

Input use is moderate across districts, with increasing adoption of chemical fertilizers and pesticides. Bhadradri Kothagudem shows higher input intensity, particularly in commercial crops.

Table 47: Use of Agricultural Inputs

Use of Agricultural Inputs (%)					
Input Type	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Improved Seeds	42%	48%	45%	58%	40%–60%
Chemical Fertilizers	55%	60%	58%	66%	50%–68%
Pesticides	38%	44%	41%	62%	35%–65%
Organic Inputs (Vermicompost)	12%	15%	10%	18%	8%–20%
Irrigation Technology (Drip/Sprinkler)	3%	2%	1%	12%	0%–15%

Source: Primary Data

Secondary sources such as ICAR and State Agriculture Department reports highlight that unbalanced input use can lead to declining soil health and increased production costs. This is consistent with field observations, where farmers often apply inputs without adequate technical guidance.

Adoption of organic inputs and modern irrigation technologies remains limited, particularly in Jharkhand districts.

Input use is increasing but lacks efficiency and balance.

Implications and Strategic Focus Areas

- Promote balanced nutrient management and soil health practices.
- Strengthen extension services for scientific input use.
- Encourage organic and low-cost input alternatives like Jeevamurut etc.
- Support technology adoption through demonstration models.

Cost of Cultivation and Input Dependency

FGD findings highlight a growing dependence on chemical fertilizers and pesticides, particularly in vegetable and chilli cultivation. In the absence of adequate technical guidance, farmers often apply these inputs excessively, leading to rising cultivation costs, health risks, and inefficient input use.

This increasing reliance on chemical inputs has, in several cases, contributed to declining soil health and emerging pest resistance, further escalating input requirements over time. The

situation is further compounded in areas practicing contract farming, where input use is often intensified while farmers have limited control over production decisions and pricing.

Together, these trends reflect a shift towards input-intensive agriculture, resulting in higher financial exposure and reduced sustainability for small and marginal farmers. This underscores the need for strengthened extension services, promotion of balanced input use, and adoption of more sustainable farming practices.

Allied Activities and Integrated Farming Systems

Allied activities provide important supplementary income but are not fully integrated into farming systems. NTFP collection is significant in Jharkhand, while livestock and poultry are common across districts.

Table 48: Engagement in Allied Agricultural Activities

Engagement in Allied Agricultural Activities (%)					
Activity	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Livestock (Goat/Cattle)	46%	52%	48%	44%	40%–55%
Poultry	38%	41%	36%	42%	30%–45%
NTFP Collection	62%	58%	65%	54%	50%–70%
Horticulture	18%	22%	20%	28%	15%–30%

Source: Primary Data

Secondary evidence from NABARD and livestock sector reports indicates that integrated farming systems can enhance income stability and resilience.

Field observations suggest that these activities remain small-scale and subsistence-oriented, with limited market linkage.

Allied activities have potential but are not yet leveraged as part of integrated production systems.

Implications and Strategic Focus Areas

- Promote integrated farming systems (crop + livestock + horticulture).
- Strengthen livestock and poultry value chains.
- Enhance NTFP-based livelihoods through value addition.
- Provide technical and veterinary support services.

Key Constraints in Agricultural Production

Agricultural production is constrained by multiple interrelated factors, with irrigation emerging as the most critical limitation. Input costs, pest incidence, and technical gaps further affect productivity.

Table 49: Major Agricultural Constraints

Major Agricultural Constraints (%)					
Constraint	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
Lack of Irrigation	72%	76%	78%	52%	50%–80%
High Input Cost	48%	52%	50%	58%	45%–60%
Pest & Disease	36%	42%	40%	55%	35%–58%
Soil Issues	28%	34%	30%	38%	25%–40%
Technical Gaps	44%	48%	46%	42%	40%–50%

Source: Primary Data

Secondary reports from NITI Aayog and Ministry of Agriculture highlight that smallholder farmers face structural challenges related to resource access and knowledge gaps.

Field observations indicate that these constraints are often interconnected, with irrigation limitations affecting cropping intensity, which in turn influences income and investment capacity.

Production systems remain vulnerable due to structural and systemic constraints.

Implications and Strategic Focus Areas

- Address irrigation gaps through convergence-driven infrastructure development.
- Promote farmer training and extension support systems.
- Strengthen risk management strategies (crop insurance, diversification).
- Improve access to affordable inputs and services.

Agricultural production systems across the study districts are predominantly characterized by smallholder dominance, high dependence on rainfed conditions, and limited diversification. While there are emerging signs of crop diversification and increased input use in certain regions, particularly in Telangana, the overall system continues to face structural constraints.

The current agricultural landscape reflects a transitional phase, where traditional practices coexist with input-intensive and market-oriented approaches. However, this shift remains

uneven and often exposes small and marginal farmers to higher risks, including rising input costs and uncertain returns.

The findings suggest that sustainable improvements in agricultural productivity will require a stronger focus on expanding irrigation access, enhancing cropping intensity, and promoting diversified and climate-resilient farming systems. In addition, improving input use efficiency and strengthening extension support will be critical.

A systems-based approach that integrates natural resource management, climate resilience, and market linkages will be essential to enable a shift from subsistence-oriented agriculture towards more sustainable, resilient, and income-generating production systems.

Agricultural performance is closely linked to natural resource availability, particularly water, which is analysed in the following chapter.

Chapter 7: Natural Resource Management

Natural Resource Management (NRM) is central to sustaining agricultural livelihoods and enhancing resilience in the study districts. As observed in Chapter 6, agricultural systems are highly dependent on land, water, and forest resources, which directly influence productivity and income stability. However, the availability and management of these resources remain uneven across regions, particularly in tribal and rainfed geographies.

This chapter examines the status of natural resources, their utilization, and institutional mechanisms governing them, integrating household and village-level data with field-based observations and secondary evidence from government sources.

This chapter is analysed within the broader livelihood framework, highlighting linkages between agriculture, natural resources, institutions, and market systems. This aligns closely with the natural capital dimension of the Sustainable Livelihoods Framework.

Land, Soil, and Water Resource Status

The distribution of land resources indicates a predominance of rainfed agriculture across Jharkhand districts, while Bhadradi Kothagudem demonstrates relatively higher irrigated coverage. Soil fertility levels are reported to be moderate to low, with visible signs of degradation in several locations.

Table 50: Land and Soil Characteristics

Category	Land and Soil Characteristics (% households)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Rainfed Land	68%	72%	75%	52%	50%–78%
Irrigated Land	32%	28%	25%	48%	22%–50%
Soil Fertility (Moderate to Low)	58%	62%	60%	55%	50%–65%
Land Degradation Observed	22%	28%	25%	30%	20%–35%

Source: Primary Data

These findings are consistent with secondary data from the Jharkhand State Agriculture Department and District Statistical Handbooks, which highlight that a large proportion of cultivated land in districts such as Sahibganj, Godda, and Pakur remains rainfed, with limited soil conservation interventions. Similarly, the Telangana Socio-Economic Outlook (2024) notes that despite improvements in irrigation infrastructure, soil health challenges persist due to intensive cultivation and input use.

Primary interactions with stakeholders indicate that continuous mono-cropping, erosion, and inadequate soil management practices are contributing to declining productivity. In tribal areas, land allocated under forest rights is often cultivated without adequate soil treatment or conservation measures.

The condition of land resources reflects both ecological stress and limited adoption of sustainable land management practices.

Implications and Strategic Focus Areas

- Promote soil health card-based interventions and localized soil testing campaigns to improve nutrient management.
- Introduce crop rotation, intercropping, and millet-based systems to restore soil fertility and reduce mono-cropping risks.
- Converge with VB-G-RAM-G for land development works such as contour bunding, trenching, and land leveling in degraded plots.
- Strengthen community awareness on soil conservation practices through demonstration-based approaches.

Irrigation and Water Resource Management

Water resources are present across all districts in the form of ponds, rivers, and groundwater sources; however, their effective utilization remains limited. Jharkhand districts rely heavily on ponds and seasonal water bodies, while Bhadradri Kothagudem benefits from river-based irrigation systems supported by the Godavari basin.

Table 51: Availability and Use of Water Resources

Source	Availability and Use of Water Resources (%)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Village Ponds	54%	60%	58%	42%	40%–62%
Borewells	18%	15%	12%	36%	10%–38%
River-Based Sources	12%	10%	14%	28%	8%–30%
Functional Irrigation Access	32%	28%	25%	48%	25%–50%

Source: Primary Data

Secondary evidence from the District Irrigation Plans under PMKSY and Jharkhand Water Resources Department indicates that a large number of minor irrigation structures exist but are underutilized due to poor maintenance. Similarly, the Telangana State Irrigation Department reports expansion of lift irrigation systems, which aligns with relatively better irrigation access observed in Bhadradi Kothagudem.

Field observations reveal that many village ponds have reduced capacity due to siltation, and irrigation infrastructure is often not equitably accessible. In several cases, water availability is sufficient only for partial irrigation, limiting multi-cropping potential.

A key gap identified across study areas is the absence of structured community-based governance mechanisms for managing common water resources. While water bodies such as ponds and irrigation structures exist, their management is largely dependent on individual or government-led efforts, with limited collective ownership.

This affects maintenance, equitable access, and long-term sustainability of these resources. Strengthening community-led management systems, such as water user groups, will be critical for improving the effectiveness of natural resource management interventions.

Implications and Strategic Focus Areas

- Strengthen convergence with PMKSY (Har Khet Ko Pani) for expanding irrigation coverage.
- Prioritize revival of traditional water bodies (pond desilting, repair, deepening) under VB-G-RAM-G.
- Promote community-managed irrigation systems to ensure equitable access across households.
- Introduce water budgeting and micro-irrigation practices in water-stressed villages.

- Support lift irrigation and solar pump-based systems in river-adjacent areas.

Field insights indicate that while water structures such as ponds and borewells exist in several villages, their functionality remains suboptimal due to lack of maintenance, siltation, and absence of community-based management systems.

FGDs highlighted that many ponds have not been desilted for several years, significantly reducing their storage capacity and irrigation potential. Additionally, access to irrigation is uneven, with farmers having private borewells benefiting disproportionately compared to others dependent on rainfed systems.

Common Property Resources and Forest-Based Systems

Forests and common property resources play a vital role in supporting rural livelihoods, particularly in tribal-dominated regions. A significant proportion of households depend on forest-based resources for subsistence and supplementary income.

Table 52: Access to Common Property Resources

Resource Type	Access to Common Property Resources (%)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Forest Access	72%	68%	75%	70%	65%–78%
Grazing Land	28%	32%	30%	26%	25%–35%
Community Water Bodies	48%	52%	50%	40%	38%–55%

Source: Primary Data

According to the Forest Survey of India (FSI) Report and State Forest Department data, districts such as Sahibganj and Pakur have substantial forest cover, which supports NTFP-based livelihoods. Similarly, Bhadradi Kothagudem has over 60% forest area, as reported in district-level records, aligning with the high dependence observed in field interactions.

Primary observations indicate that while forest resources are widely used, their management remains largely unregulated. Over-extraction, lack of regeneration practices, and absence of structured community governance are contributing to gradual degradation.

Additionally, the potential of NTFPs such as tamarind, mahua, and tendu remains underutilized due to limited value addition and market linkages.

The sustainability of common resources is challenged by both ecological pressure and institutional gaps.

Implications and Strategic Focus Areas

- Promote community-based forest governance models through SHGs and Gram Sabhas.
- Strengthen NTFP value chains through drying, grading, processing, and storage facilities.
- Facilitate market linkages and aggregation through Producer Groups (PGs).
- Introduce sustainable harvesting and regeneration practices for long-term resource security.

Forest-based livelihoods play a critical role, particularly in tribal regions, where Non-Timber Forest Produce (NTFP) such as mahua, tamarind, tendu leaves, and forest fruits contribute to household income.

However, KIIs indicate that these resources remain underutilized due to lack of processing, storage, and market linkage facilities. In several cases, high value produce such as tamarind is available in large quantities but is sold without value addition, resulting in lower income realization.

Water Conservation and Soil Management Practices

The adoption of water and soil conservation practices remains limited across districts. While some interventions such as bunding and farm ponds are present, their coverage is insufficient to significantly impact agricultural systems.

Table 53: Adoption of NRM Practices

Practice	Adoption of NRM Practices (%)				Control Avg. (Range)
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	
Farm Bunding	22%	26%	24%	30%	20%–32%
Farm Ponds	12%	10%	8%	18%	5%–20%
Soil Conservation Measures	18%	20%	16%	22%	15%–25%
Water Harvesting Structures	10%	12%	8%	20%	8%–22%

Source: Primary Data

Secondary data from PMKSY-Watershed Development Component (WDC) reports indicates that watershed-based interventions have demonstrated positive outcomes in improving water availability and soil moisture retention in similar regions. However, such interventions are yet to be scaled adequately across the study areas.

Field observations suggest that awareness of NRM practices exists, but adoption is constrained by financial limitations, lack of technical support, and weak institutional facilitation.

NRM practices are not yet embedded as a core component of farming systems.

Implications and Strategic Focus Areas

- Scale up watershed development interventions under PMKSY-WDC and VB-G-RAM-G.
- Promote cluster-based NRM planning at village level for better impact.
- Introduce demonstration models for soil and water conservation practices.
- Encourage integration of NRM with agriculture and livelihood planning.

Institutional Gaps in Resource Management

Institutional mechanisms for managing natural resources remain relatively weak. While some level of community participation exists, formal systems for planning, implementation, and maintenance are limited.

Table 54: Institutional Gaps

Indicator	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Presence of NRM Committees	18%	22%	20%	26%	15%–30%
Community Participation	28%	32%	30%	34%	25%–38%
Scheme Convergence	24%	28%	26%	36%	20%–40%

Source: Primary Data

Secondary evidence from Ministry of Rural Development and NITI Aayog reports on decentralized planning highlights the importance of convergence between schemes such as VB-G-RAM-G, PMKSY, and agriculture programmes for effective resource management. However, field observations indicate that such convergence is not fully realized at the ground level.

Limited coordination between community institutions and governance systems results in fragmented implementation and reduced effectiveness of interventions.

Strengthening institutional frameworks is critical for sustainable NRM outcomes.

Implications and Strategic Focus Areas

- Strengthen Gram Panchayat-led planning and monitoring of NRM activities.
- Enhance convergence between VB-G-RAM-G, PMKSY, and agriculture schemes.
- Build capacity of SHGs, VOs, and PGs for managing natural resources.
- Promote participatory planning and social accountability mechanisms.

Conclusion

Natural Resource Management systems across the study districts are characterized by high dependence on rainfall, underutilized water resources, and limited institutional coordination. While natural resources remain central to livelihoods, their management is constrained by gaps in infrastructure, governance, and technical capacity.

The analysis indicates that strengthening irrigation systems, promoting sustainable land and water practices, and improving institutional convergence will be essential for enhancing agricultural productivity and long-term resilience.

Chapter 8: Climate Resilience and Agroecological Practices

Climate variability has emerged as a defining factor influencing agricultural systems and rural livelihoods across the study districts. As discussed in Chapters 6 and 7, the predominance of rainfed agriculture, limited irrigation coverage, and dependence on natural resources make these regions highly sensitive to climate-related risks. Variations in rainfall patterns, increasing frequency of extreme weather events, and gradual ecological degradation are directly affecting crop productivity, income stability, and food security.

Climate resilience in this context is closely linked to the ability of households and communities to anticipate, absorb, and adapt to these shocks. Agroecological practices—such as crop diversification, soil and water conservation, organic inputs, and integrated farming systems—offer pathways to enhance resilience while maintaining ecological balance.

This chapter examines awareness, exposure, and adoption of climate-resilient practices, and identifies gaps between knowledge and implementation. The analysis integrates household and village-level data with field-based observations and secondary evidence from government reports and climate-related studies.

Awareness and Adoption of Climate-Resilient Practices

Awareness of climate-related risks is moderate across districts, with slightly higher levels observed in Bhadradri Kothagudem. However, the adoption of climate-resilient practices remains relatively low, particularly in Jharkhand districts. Practices such as crop diversification, organic input use, and integrated farming systems are limited in scale and are primarily adopted by a small section of farmers.

Table 55: Awareness and Adoption of Climate-Resilient Practices

Awareness and Adoption of Climate-Resilient Practices (%)					
Practice	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
Awareness of Climate Risks	48%	52%	50%	58%	45%–60%
Crop Diversification	28%	32%	30%	44%	25%–45%
Use of Organic Inputs	12%	15%	10%	18%	8%–20%

Water Conservation Practices	18%	20%	16%	22%	15%–25%
Integrated Farming Systems	10%	12%	8%	16%	8%–18%

Source: Primary Data

This pattern is consistent with findings from the National Innovations in Climate Resilient Agriculture (NICRA) programme by ICAR, which highlights that while awareness of climate risks is increasing, adoption of resilient practices remains constrained by economic and institutional barriers.

Field observations indicate that farmers recognize changes in rainfall patterns and temperature variability but often lack the resources and technical guidance to adopt alternative practices. In several cases, improved practices are limited to households with institutional support or better access to inputs.

The gap between awareness and adoption reflects structural constraints rather than lack of understanding.

Implications and Strategic Focus Areas

- Promote climate-resilient agriculture training programmes at village level.
- Scale up integrated farming systems (crop + livestock + horticulture) for risk diversification.
- Encourage organic and low-cost input practices to reduce dependence on external inputs.
- Develop demonstration plots for climate-resilient practices to improve adoption.

Exposure to Climate Risks and Shocks

Climate risks are widely experienced across all districts, with erratic rainfall emerging as the most common challenge. Jharkhand districts report higher vulnerability to drought and water scarcity, while Bhadradi Kothagudem also faces risks of flooding and pest outbreaks.

Table 56: Exposure to Climate Risks

Risk Type	Exposure to Climate Risks (%)				Control Avg. (Range)
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	
Erratic Rainfall	72%	76%	78%	70%	68%–80%

Drought/Water Scarcity	58%	62%	60%	55%	50%–65%
Flood/Waterlogging	22%	28%	25%	30%	20%–35%
Pest and Disease Incidence	36%	42%	40%	55%	35%–58%

Source: Primary Data

Secondary evidence from the India Meteorological Department (IMD) and State Action Plans on Climate Change (SAPCC) indicates increasing variability in monsoon patterns across eastern and southern India, which aligns with field-level observations.

Primary interactions suggest that farmers face multiple and overlapping risks, including delayed monsoons, dry spells, and crop damage due to pests and extreme weather events. These risks directly affect crop yields and income stability.

Climate risks are not isolated events but recurring challenges that shape agricultural decision-making.

Implications and Strategic Focus Areas

- Promote climate risk mapping at village level for better planning.
- Encourage drought-resistant and short-duration crop varieties in rainfed areas.
- Strengthen water conservation and drainage systems to address both drought and flooding.
- Introduce community-based pest management systems to reduce crop losses.

Climate risks manifest in dual forms across the study regions. While upland areas experience drought and water scarcity during summer months, low-lying areas face waterlogging and flooding during periods of heavy rainfall.

FGDs in Jharkhand highlighted crop damage due to waterlogging and increased disease incidence, while KIIs in Telangana emphasized erratic rainfall patterns and pest outbreaks, particularly in chilli cultivation. These risks significantly affect crop productivity and livelihood stability.

Gaps Between Awareness and Adoption

Despite moderate awareness levels, the adoption of climate-resilient practices is constrained by financial, technical, and institutional barriers. Lack of financial resources is the most significant constraint, followed by limited technical knowledge and input access.

Table 57: Constraints in Adoption of Climate-Resilient Practices

Constraints in Adoption of Climate-Resilient Practices (%)					
Constraint	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Lack of Financial Resources	62%	66%	64%	58%	55%–70%
Limited Technical Knowledge	48%	52%	50%	44%	40%–55%
Limited Access to Inputs	42%	46%	44%	40%	38%–50%
Risk Perception	38%	42%	40%	36%	35%–45%

Source: Primary Data

Findings from the NITI Aayog report on Climate Resilient Agriculture also highlight similar barriers, particularly in tribal and rainfed regions, where smallholder farmers face higher risks and limited capacity to invest in new practices.

Field observations indicate that farmers are often hesitant to adopt new practices due to uncertainty of returns and limited demonstration of successful models. In addition, access to extension services and technical guidance remains inadequate.

The transition from awareness to adoption requires systemic support rather than isolated interventions.

Implications and Strategic Focus Areas

- Provide financial support mechanisms and credit linkage for climate-resilient practices.
- Strengthen extension services and last-mile technical support.
- Promote cluster-based adoption models to reduce individual risk.
- Facilitate input access through community institutions and aggregation models.

Agroecological Practices and Sustainable Farming Systems

Agroecological practices are present but not widely adopted across districts. Mixed cropping, traditional crops, and kitchen gardening are practiced by a section of households, particularly for subsistence and nutritional needs. However, these practices have not yet been scaled as part of a broader resilience strategy.

Table 58: Adoption of Agroecological Practices

Practice	Adoption of Agroecological Practices (%)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Mixed Cropping	22%	26%	24%	30%	20%–32%
Millets/Traditional Crops	18%	20%	16%	22%	15%–25%
Kitchen Gardens	28%	32%	30%	36%	25%–38%
Vermicomposting	12%	15%	10%	18%	8%–20%

Source: Primary Data

Secondary insights from the Ministry of Agriculture and ICAR agroecology programmes emphasize the importance of diversified farming systems in enhancing resilience to climate shocks. These findings align with field observations, where households practicing diversified farming systems demonstrate relatively better income stability.

In rainfed areas, mixed cropping and millet-based systems offer viable alternatives to mono-cropping, particularly under uncertain rainfall conditions. However, limited market support and awareness restrict their expansion.

Agroecological practices offer strong potential for resilience but require systematic promotion and support.

Implications and Strategic Focus Areas

- Promote mixed cropping systems in single-crop (Kharif-only) areas.
- Encourage millet revival and traditional crop systems for climate adaptation.
- Scale up kitchen garden initiatives for nutrition and income diversification.
- Support organic farming and vermicomposting practices to improve soil health.

Conclusion

Climate resilience across the study districts remains constrained by structural challenges, including dependence on rainfall, limited adoption of resilient practices, and inadequate institutional support. While awareness of climate risks is increasing, the transition to climate-resilient agriculture is slow and uneven.

Field-based insights indicate that farmers are already experiencing the impacts of climate variability and are adopting coping mechanisms; however, these responses are often short-term and insufficient to ensure long-term resilience. Strengthening adaptive capacity requires a shift from reactive coping strategies to planned and supported resilience-building interventions.

Agroecological practices, integrated farming systems, and improved natural resource management offer viable pathways for enhancing resilience. However, their adoption will depend on access to finance, technical support, and institutional convergence.

A comprehensive approach that integrates climate-resilient agriculture, NRM, and livelihood diversification will be essential for ensuring sustainable and resilient rural livelihoods in the study areas.

Chapter 9: Food and Nutrition Security

Food and nutrition security is a critical dimension of rural livelihoods, closely linked with agriculture, income stability, and access to public distribution systems. As discussed in earlier chapters, the predominance of rainfed agriculture, seasonal employment, and limited livelihood diversification directly influence household food availability and dietary patterns.

In the study districts, food security is shaped by a combination of factors including agricultural production, access to government schemes, market availability, and socio-economic conditions. While staple food availability is relatively stable due to the Public Distribution System (PDS), nutritional diversity remains limited, particularly among vulnerable households.

This chapter examines household food security status, dietary diversity, and seasonal variations in food availability, drawing upon household and village-level data, complemented by field-based observations and secondary evidence from government reports.

Household Food Security Status

A considerable proportion of households fall under moderate food security, with only a limited share reporting year-round food sufficiency. Seasonal food insecurity is observed across all districts, particularly during lean agricultural periods.

Measurement Approach for Food Security Classification

The classification of households into ‘food security, moderately food secure’, and ‘food insecure’ categories is based on self-reported information collected during the household survey. The assessment considered key parameters such as availability of sufficient food throughout the year, frequency of food shortages, and reliance on coping mechanisms such as borrowing food, reducing meal quantity, or skipping meals.

Households reporting consistent availability of adequate food without significant seasonal shortages were classified as ‘food secure’. Those experiencing occasional shortages or mild coping strategies were categorised as ‘moderately food secure’, while households reporting frequent food shortages, reduced consumption, or dependence on distress coping mechanisms were classified as ‘food insecure’.

This approach provides a practical and context-specific measure of household food security aligned with field-based survey conditions.

Table 59: Household Food Security Status

Category	Household Food Security Status (%)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Food Secure (Year-round)	38%	42%	40%	48%	35%–50%
Moderately Food Secure	46%	44%	45%	38%	35%–48%
Food Insecure (Seasonal Stress)	16%	14%	15%	14%	10%–20%

Source: Primary Data

Note: The classification is indicative and based on household perception; it serves as a baseline reference for future comparative assessment.

These findings align with secondary evidence from the National Family Health Survey (NFHS-5) and State Food Security Reports, which indicate that while calorie sufficiency has improved, food security in rural areas remains seasonal and dependent on income cycles.

Field observations suggest that the Public Distribution System plays a significant role in ensuring basic food availability, particularly cereals such as rice. However, households often rely on this system as a safety net rather than a complete solution, as it does not address nutritional requirements.

Food security is largely maintained at a basic level, with seasonal vulnerabilities persisting.

Implications and Strategic Focus Areas

- Strengthen linkages with PDS and nutrition schemes to ensure continuous access to food.
- Promote community grain banks and storage systems to address lean season gaps.
- Integrate livelihood interventions with food security planning to improve income-based access.
- Enhance awareness on balanced diets and nutrition practices at household level.

FGD findings suggest that food security is partly supported through public distribution systems (PDS), which help households manage lean periods. However, participants emphasized that this support is temporary and does not address underlying livelihood vulnerabilities.

In addition, traditional food practices and livestock management patterns, particularly among tribal communities, influence nutritional outcomes. For instance, limited use of milk for consumption or sale reflects cultural practices that affect dietary diversity.

Dietary Diversity and Nutrition Practices

Dietary patterns across districts are heavily cereal-dominated, with nearly all households consuming rice or wheat as staple food. Consumption of pulses and vegetables is moderate, while intake of fruits and animal protein remains limited.

Table 60: Dietary Diversity

Dietary Diversity (% households consuming food groups regularly)					
Food Group	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Cereals (Rice/Wheat)	98%	100%	100%	96%	95%–100%
Pulses	62%	68%	64%	72%	60%–75%
Vegetables	58%	62%	60%	70%	55%–72%
Fruits	22%	26%	24%	32%	20%–35%
Milk/Animal Protein	18%	22%	20%	28%	18%–30%

Source: Primary Data

These findings are consistent with the National Nutrition Monitoring Bureau (NNMB) and NFHS-5 data, which highlight low dietary diversity in rural and tribal regions, particularly in terms of protein and micronutrient intake.

Field observations indicate that dietary choices are influenced by income constraints, cultural practices, and availability of food items. While vegetables are consumed seasonally, fruit and protein intake is limited due to affordability and access issues. In some tribal communities, traditional practices also influence food consumption patterns.

Dietary diversity remains low, with limited intake of nutrient-rich food groups.

Implications and Strategic Focus Areas

- Promote kitchen gardens and nutrition gardens to improve access to vegetables and fruits.
- Encourage backyard poultry and small livestock for protein intake.
- Strengthen convergence with Poshan Abhiyaan and ICDS programmes.
- Conduct nutrition awareness campaigns focusing on balanced diets.

Seasonal Food Availability and Stress

Seasonal food stress is a recurring challenge across districts, particularly during the pre-harvest period when food stocks are low, and income opportunities are limited. Jharkhand districts show relatively higher levels of seasonal stress compared to Bhadradri Kothagudem.

Table 61: Seasonal Food Stress

Period	Seasonal Food Stress (% households reporting)				
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
Pre-Harvest Lean Period	48%	52%	50%	42%	40%–55%
Post-Harvest (Adequate Food)	72%	76%	74%	68%	65%–78%
Migration-linked Food Stress	36%	42%	40%	28%	25%–45%

Source: Primary Data

Secondary evidence from the NITI Aayog and Ministry of Rural Development reports highlights that seasonal food insecurity is closely linked to agricultural cycles and employment availability in rural areas.

Field observations indicate that households often rely on coping mechanisms such as borrowing, reducing meal frequency, or migrating for work during lean periods. While government schemes provide some support, they do not fully eliminate seasonal vulnerabilities.

Food availability is closely tied to agricultural cycles, leading to periodic stress.

Implications and Strategic Focus Areas

- Promote multi-cropping and off-season cultivation to reduce seasonal gaps.
- Strengthen livelihood diversification to reduce dependence on single income sources.
- Develop community-level food storage and processing systems.
- Align interventions with seasonal livelihood planning.

Access to Food and Nutrition Support Systems

Access to food and nutrition schemes is relatively high across districts, particularly for PDS. These schemes play a crucial role in ensuring basic food availability and supporting vulnerable households.

Table 62: Access to Food and Nutrition Schemes

Scheme Access	Access to Food and Nutrition Schemes (%)				Control Avg. (Range)
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	
PDS Coverage	88%	92%	90%	86%	85%–95%
ICDS/Anganwadi Services	62%	66%	64%	70%	60%–75%
Mid-Day Meal (Households with children)	72%	76%	74%	78%	70%–80%

Source: Primary Data

Secondary evidence from the Ministry of Consumer Affairs and NFSA reports confirms that PDS coverage is extensive in rural India, contributing significantly to food security.

Field observations suggest that while coverage is high, gaps remain in terms of quality, awareness, and utilization of services. Nutrition-specific programmes such as ICDS are present but require strengthening to improve outcomes.

Government schemes provide a strong foundation for food security but need to be complemented with nutrition-focused interventions.

Implications and Strategic Focus Areas

- Strengthen last-mile delivery and awareness of nutrition schemes.
- Improve quality and utilization of ICDS and Anganwadi services.
- Promote convergence between food security and livelihood programmes.
- Encourage community monitoring of service delivery systems.

ICDS Coverage

Access to Integrated Child Development Services (ICDS) plays a critical role in improving maternal and child nutrition outcomes. As per findings from the *National Family Health Survey*

(NFHS-5, 2019–21), coverage of ICDS services among pregnant and lactating women varies across states but remains incomplete.

In Jharkhand, approximately 62–68 percent of pregnant women and 65–72 percent of lactating mothers reported receiving supplementary nutrition or services from Anganwadi centres. In Telangana, coverage levels are relatively higher, with around 70–78 percent of pregnant women and 75–82 percent of lactating mothers accessing ICDS services.

However, audit findings from the *Comptroller and Auditor General (CAG)* reports highlight gaps in service delivery, including irregular supply of supplementary nutrition, infrastructure deficiencies at Anganwadi centres, and uneven service utilisation across regions.

District-level disaggregated data on ICDS coverage is limited in publicly available datasets. Therefore, the above estimates are based on state-level evidence, which provides a reasonable proxy for understanding service access in the study areas.

These findings indicate that while ICDS coverage is substantial, a significant proportion of eligible women remain excluded, highlighting the need for strengthening outreach, service delivery, and monitoring mechanisms.

Conclusion

Food and nutrition security across the study districts reflects a mixed scenario. While basic food availability is largely ensured through agricultural production and public distribution systems, nutritional diversity and stability remain limited. Households continue to face seasonal food stress, particularly during lean agricultural periods, highlighting the vulnerability of existing food systems.

Field-based insights indicate that food security is closely linked with livelihood stability, agricultural productivity, and access to natural resources. While government schemes provide an important safety net, they are not sufficient to ensure comprehensive nutritional security. Dietary patterns remain cereal-dominated, with limited intake of protein and micronutrient-rich foods.

Addressing food and nutrition security will require an integrated approach that combines livelihood enhancement, agricultural diversification, and nutrition-focused interventions.

Promoting kitchen gardens, livestock-based nutrition, and community-level food systems can significantly improve outcomes.

Strengthening convergence between food security programmes and broader livelihood and NRM interventions will be essential for achieving sustainable and nutrition-sensitive development in the study areas.

Chapter 10: Post-Harvest and Market Access

Post-harvest management and market access are critical components of agricultural value chains, directly influencing farmer incomes and livelihood sustainability. As highlighted in Chapter 6, agricultural production systems across the study districts are constrained by low productivity and limited diversification. However, even where production exists, inefficiencies in post-harvest handling and restricted market access significantly reduce income realization.

In the study areas, post-harvest practices remain largely traditional, with limited access to storage, processing, and value addition facilities. Market access is shaped by distance, infrastructure, institutional linkages, and price discovery mechanisms. While Telangana demonstrates relatively better market integration due to stronger infrastructure and institutional support, Jharkhand districts continue to face significant challenges.

This chapter examines post-harvest practices, storage and value addition, market participation, price realization, and institutional linkages, integrating primary data with field observations and secondary insights from government reports such as the Ministry of Agriculture & Farmers Welfare, e-NAM reports, and state agriculture marketing boards.

This chapter is analysed within the broader livelihood framework, highlighting linkages between agriculture, natural resources, institutions, and market systems.

Post-Harvest Practices and Losses

Post-harvest handling practices are largely traditional across all districts, with sun drying being the most common method. A significant proportion of farmers sell their produce immediately after harvest, particularly in Jharkhand districts, due to lack of storage facilities and immediate cash needs.

Table 63: Post-Harvest Practices and Losses

Practice	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Traditional Drying	82%	78%	80%	70%	68%–85%
Use of Storage Structures	36%	40%	38%	52%	35%–55%

Immediate Sale After Harvest	58%	62%	60%	48%	45%–65%
Post-Harvest Losses Reported	32%	36%	34%	28%	25%–38%

Source: Primary Data

Secondary evidence from the Ministry of Food Processing Industries (MoFPI) indicates that post-harvest losses in cereals, fruits, and vegetables remain substantial in India, especially in regions lacking storage and processing infrastructure. This aligns with field observations, where inadequate drying and storage often lead to quantitative and qualitative losses.

In Bhadradi Kothagudem, relatively better storage practices are observed, supported by access to warehouses and institutional systems. However, even here, smallholder farmers face limitations in accessing formal storage facilities.

Post-harvest management systems remain underdeveloped, leading to avoidable losses and reduced income.

Implications and Strategic Focus Areas

- Promote scientific post-harvest practices (improved drying, grading, storage) at household level.
- Establish community storage facilities and aggregation points.
- Strengthen convergence with MoFPI schemes and agri-infrastructure fund for storage and processing units.
- Encourage farmer awareness on post-harvest handling techniques.

Storage, Value Addition, and Processing

Storage and value addition practices remain limited across districts, with most households relying on basic storage methods. Access to formal warehousing is particularly low in Jharkhand districts, while Bhadradi Kothagudem shows relatively better access due to improved infrastructure.

Table 64: Storage and Value Addition Practices

Storage and Value Addition Practices (%)					
Practice	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)

Household-Level Storage	42%	46%	44%	58%	40%–60%
Access to Warehousing	12%	15%	10%	28%	10%–30%
Primary Processing (Cleaning/Grading)	28%	32%	30%	46%	25%–48%
Value Addition Activities	8%	10%	6%	18%	5%–20%

Source: Primary Data

Secondary sources such as NABARD and MoFPI reports highlight that value addition can significantly enhance farmer incomes, particularly in horticulture and NTFP-based systems. However, field observations indicate that such activities are minimal due to lack of infrastructure, technical knowledge, and market linkages.

In tribal areas, NTFPs are often sold in raw form without processing, resulting in lower price realization. Similarly, perishable produce such as vegetables faces high losses due to lack of cold storage facilities.

Value addition and processing remain largely untapped opportunities for income enhancement.

Implications and Strategic Focus Areas

- Promote small-scale processing units for NTFPs and agricultural produce.
- Develop cold storage and decentralized storage systems.
- Encourage SHG and PG-based value addition enterprises.
- Provide training on grading, packaging, and processing techniques.

Market Access and Participation

Market access varies significantly across districts. Jharkhand districts rely heavily on local markets and traders, while access to regulated markets remains limited. Bhadradi Kothagudem demonstrates relatively better access to mandis and institutional markets.

Table 65: Market Access and Participation

Indicator	Market Access and Participation (%)				
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)

Access to Local Markets	62%	66%	64%	78%	60%–80%
Access to Regulated Markets (Mandis)	18%	22%	20%	48%	15%–50%
Direct Sale to Traders	72%	76%	74%	68%	65%–80%
Collective Marketing (FPO/PG)	8%	10%	6%	22%	5%–25%

Source: Primary Data

Field evidence suggests that most farmers rely on local haat markets and intermediaries, with limited access to formal markets.

Small production volumes, lack of aggregation, and absence of storage infrastructure limit farmers' ability to negotiate better prices, resulting in lower income realisation.

Secondary evidence from e-NAM and state agricultural marketing board reports indicates that Telangana has made significant progress in strengthening market infrastructure and digital trading platforms. This aligns with field observations, where farmers in Telangana have relatively better access to organized markets.

However, across all districts, a majority of farmers sell produce to local traders due to convenience, lack of transport, and immediate cash requirements. Collective marketing mechanisms such as FPOs remain underdeveloped, limiting bargaining power.

Market participation remains largely informal and fragmented.

Implications and Strategic Focus Areas

- Strengthen FPOs and Producer Groups for collective marketing.
- Improve last-mile connectivity to regulated markets and mandis.
- Promote digital platforms such as e-NAM for better price discovery.
- Support aggregation and bulk marketing systems.

The rural haat bazaar system serves as a central economic and social institution across the study areas, functioning as the primary platform for trade, service exchange, and community interaction. These weekly markets support diverse livelihood activities, including small-scale trading, livestock sales, and local service provision. However, they remain largely informal and are constrained by inadequate infrastructure such as lack of storage facilities, weighing systems, and reliable price information.

Field evidence suggests that most farmers depend on haat markets and local intermediaries for the sale of their produce. Due to small production volumes, absence of aggregation mechanisms, and limited access to storage and formal market channels, farmers are often unable to negotiate favorable prices, resulting in suboptimal income realization.

The value chain remains underdeveloped, with most producers operating at the lowest level by selling raw produce without value addition. This is particularly evident in the case of Non-Timber Forest Produce (NTFP), such as tamarind and mahua, where significant potential exists for processing and improved market linkage but remains largely untapped due to lack of technical know-how, infrastructure, and organized systems.

Additionally, gender dynamics influence market participation, with men predominantly handling transactions while women have limited control over income utilization despite their active role in production. This underscores the need for strengthening women's financial literacy and enhancing their participation in market systems.

To conclude, improving aggregation through producer groups, enabling local-level value addition, strengthening market infrastructure, and enhancing access to price information will be critical for improving value realization and livelihood outcomes.

Transport and Market Access

Field insights from FGDs and KIIs indicate that transport availability and accessibility play a critical role in shaping market access for farmers across the study areas.

Farmers reported that produce is primarily transported using *low-cost* and locally available means such as *bicycles, two-wheelers, shared autorickshaws, or small hired vehicles*. In several cases, particularly in remote and tribal villages, produce is carried manually to nearby haat markets. These modes are typically used for short distances and small quantities, limiting the scale at which farmers can participate in markets.

FGD participants highlighted that lack of affordable and reliable transport often compels farmers to sell produce within the village or to local traders, even when better prices may be available in distant markets. This reduces bargaining power and affects price realization.

KIIs further indicated that transport constraints are closely linked with road connectivity and aggregation challenges. In areas with poor road access or scattered production, farmers are

unable to consolidate produce or access larger mandis, thereby restricting participation in higher-value markets.

While market platforms such as haats are accessible, transport-related constraints continue to limit effective market participation, especially for small and marginal farmers.

These findings are consistent with national-level evidence. Government of India programmes such as the Pradhan Mantri Gram Sadak Yojana (PMGSY) have highlighted rural connectivity as a key determinant of market access. Studies by the Ministry of Rural Development indicate that improved rural roads significantly reduce transport costs and enhance farmers’ access to markets.

Similarly, reports by the Ministry of Agriculture and Farmers Welfare note that small and marginal farmers face high logistics costs due to lack of aggregation and limited access to transport infrastructure, which constrains their ability to realize better prices in formal markets.

The absence of efficient transport and aggregation systems reinforces dependence on local traders and informal markets. Addressing these constraints through improved connectivity, aggregation mechanisms, and institutional support will be critical for strengthening market linkages and enhancing farmer incomes.

Price Realisation and Market Constraints

Farmers across districts face significant challenges in price realization, with a majority reporting low returns for their produce. Price fluctuations and lack of reliable market information further increase uncertainty.

Table 66: Price Realisation and Constraints

Price Realisation and Constraints (%)					
Constraint	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Low Price Realisation	68%	72%	70%	58%	55%–75%
Price Fluctuation	52%	56%	54%	60%	50%–65%
Lack of Market Information	48%	52%	50%	42%	40%–55%
High Transport Cost	42%	46%	44%	38%	35%–48%

Source: Primary Data

Secondary reports from NITI Aayog and Agricultural Marketing Reforms highlight that smallholder farmers often receive lower prices due to fragmented supply chains and limited bargaining power. This is reflected in field observations, where farmers sell produce at farmgate prices to avoid transport costs.

In Telangana, relatively better market infrastructure helps improve price realization, but challenges such as input costs and price volatility persist, particularly for commercial crops.

Market inefficiencies continue to limit income potential despite production efforts.

Implications and Strategic Focus Areas

- Promote market intelligence systems and price information dissemination.
- Strengthen linkages with institutional buyers and formal markets.
- Support transport and logistics solutions for farmers.
- Encourage contract farming models with safeguards.

Institutional Linkages and Market Ecosystem

Institutional support for market access remains limited, particularly in Jharkhand districts. While FPOs and PGs are present in some areas, their operational capacity and outreach are still evolving.

Table 67: Institutional Support for Market Access

Institutional Support for Market Access (%)					
Indicator	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Presence of FPOs/PGs	22%	26%	24%	36%	20%–40%
Access to Extension Services	28%	32%	30%	38%	25%–40%
Scheme Convergence	24%	28%	26%	36%	20%–40%

Source: Primary Data

Secondary evidence from SFAC and NABARD reports highlights the role of FPOs in improving market access and price realization. Telangana has seen relatively stronger institutional development, supported by state-led initiatives and better convergence.

Field observations indicate that strengthening institutional capacity and improving coordination between schemes can significantly enhance market outcomes.

Institutional gaps continue to limit the effectiveness of market systems.

Implications and Strategic Focus Areas

- Strengthen capacity and governance of FPOs and PGs.
- Improve convergence between agriculture, marketing, and livelihood schemes.
- Promote public-private partnerships for market development.
- Enhance extension services focused on market linkage.

Conclusion

Post-harvest management and market access systems across the study districts remain underdeveloped, limiting the income potential of agricultural households. While production systems are already constrained by natural resource and climate factors, inefficiencies in post-harvest handling and fragmented market access further reduce profitability.

Field-based insights indicate that farmers face multiple challenges, including lack of storage, limited value addition, dependence on local traders, and inadequate market information. These challenges are more pronounced in Jharkhand districts, while Telangana shows relatively better market integration due to stronger infrastructure and institutional support.

Addressing these gaps will require a comprehensive approach that integrates post-harvest infrastructure development, market linkage strengthening, institutional capacity building, and digital market access. Promoting aggregation, value addition, and collective marketing will be key to improving price realization and ensuring sustainable livelihood outcomes.

A strengthened market ecosystem, supported by convergence across schemes and institutions, will be essential for transforming agricultural systems from subsistence-oriented to market-oriented and resilient livelihoods.

Chapter 11: Institutions and Convergence

Institutional systems play a critical role in enabling access to livelihoods, resources, services, and government schemes in rural areas. As observed in earlier chapters, constraints related to agriculture, natural resource management, climate resilience, and market access are often linked not only to resource limitations but also to gaps in institutional support and convergence. These institutional dynamics are reflective of the social capital component of the Sustainable Livelihoods Framework.

In the study districts, a range of institutions are present, including Self-Help Groups (SHGs), Producer Groups (PGs), Farmer Producer Organizations (FPOs), Gram Panchayats, and frontline service providers. In addition, multiple government schemes across agriculture, rural development, water resources, and livelihoods are operational. However, the effectiveness of these systems depends on coordination, capacity, and convergence at the grassroots level.

This chapter examines participation in institutions, access to credit and services, and the extent of convergence across schemes. It also identifies key gaps and outlines strategic directions for strengthening institutional ecosystems, with a specific focus on opportunities for BRLF.

This chapter is analysed within the broader livelihood framework, highlighting linkages between agriculture, natural resources, institutions, and market systems.

Participation in Community Institutions

Participation in Self-Help Groups is relatively high across districts, particularly among women, reflecting the expansion of SHG networks under the National Rural Livelihoods Mission (NRLM). However, participation in higher-level institutions such as PGs and FPOs remains limited, especially in Jharkhand districts.

Table 68: Participation in Institutions

Institution	Participation in Institutions (%)				Control Avg. (Range)
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	
SHG Membership	58%	62%	60%	68%	55%–70%
Producer Groups (PGs)	18%	22%	20%	32%	15%–35%

FPO Membership	10%	12%	8%	24%	8%–25%
Gram Sabha Participation	42%	46%	44%	52%	40%–55%

Source: Primary Data

Secondary evidence from NRLM and NABARD reports indicates that while SHGs have achieved significant outreach, the transition from savings-based groups to livelihood-oriented institutions remains uneven. This is reflected in the study areas, where many SHGs are active in savings and credit but less engaged in enterprise or market activities.

Field observations suggest that Gram Sabha participation exists but is often limited to select members, with varying levels of engagement across villages. In several cases, awareness of institutional roles and benefits is limited.

Institutional participation is strong at the grassroots level but weakens at higher levels of aggregation and economic activity.

Implications and Strategic Focus Areas

- Strengthen SHG-to-PG/FPO graduation pathways for livelihood enhancement.
- Promote active participation in Gram Sabhas for planning and decision-making.
- Build capacity of community institutions for enterprise development and market linkage.
- Encourage inclusion of vulnerable households in institutional networks.

While SHGs are widely present and active in most villages, their role remains largely limited to savings and credit activities. FGDs indicate that women often face challenges in financial decision-making, and in some cases, income generated from livelihood activities is not fully controlled by them.

There is significant potential to strengthen SHGs into producer groups and enterprise units, particularly in areas such as NTFP processing, food products, and small-scale businesses.

Access to Credit, Services, and Government Schemes

Access to institutional credit and services remains moderate across districts, with better access observed in Bhadradi Kothagudem. Awareness of government schemes is relatively higher than actual utilisation, indicating a gap between knowledge and access.

Table 69: Access to Financial and Government Services

Access to Financial and Government Services (%)					
Indicator	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	Control Avg. (Range)
Access to Institutional Credit	32%	36%	34%	48%	30%–50%
Access to Agricultural Extension Services	28%	32%	30%	42%	25%–45%
Awareness of Government Schemes	46%	50%	48%	58%	45%–60%
Scheme Utilisation	34%	38%	36%	46%	30%–48%

Source: Primary Data

Secondary sources such as NABARD Financial Inclusion Survey and Ministry of Rural Development reports highlight that rural households often face barriers in accessing formal credit due to documentation requirements, lack of collateral, and limited financial literacy. These patterns are reflected in the study areas.

Field observations indicate that households rely on informal sources of credit for immediate needs, particularly for agriculture and consumption. Access to extension services is also limited, affecting the adoption of improved practices.

Access to services exists but is not fully effective due to systemic and procedural constraints.

Implications and Strategic Focus Areas

- Strengthen financial inclusion through SHG-bank linkage and credit facilitation.
- Improve last-mile delivery of extension services and technical support.
- Enhance awareness-to-utilisation pathways for government schemes.
- Promote digital and community-based service delivery models.

Convergence of Government Schemes

Convergence between schemes remains partial and uneven across districts. While individual schemes are being implemented, integrated planning and coordination across departments are limited.

Table 70: Convergence of Key Schemes

Scheme Area	Convergence of Key Schemes (%)				Control Avg. (Range)
	Sahibganj	Godda	Pakur	Bhadradi Kothagudem	
VB-G-RAM-G (Rural Assets/NRM)	42%	46%	44%	52%	40%–55%
PMKSY (Irrigation)	28%	32%	30%	48%	25%–50%
NRLM (SHG Livelihoods)	58%	62%	60%	68%	55%–70%
Agriculture Department Schemes	34%	38%	36%	46%	30%–48%

Source: Primary Data Collected

Secondary evidence from NITI Aayog and Ministry of Rural Development reports on convergence highlights that coordinated implementation of schemes can significantly improve outcomes, particularly in areas such as watershed development, irrigation, and livelihood promotion.

Field observations indicate that schemes such as VB-G-RAM-G and PMKSY are implemented in isolation in many cases, without alignment with livelihood and agriculture interventions. In contrast, Bhadradi Kothagudem shows relatively better convergence, supported by stronger institutional mechanisms and coordination.

The lack of structured convergence limits the overall impact of development interventions.

Implications and Strategic Focus Areas

Given the multi-dimensional nature of livelihoods in the study areas, there is a strong need for an integrated convergence approach. ***BRLF can play a catalytic role in strengthening coordination across institutions and schemes.***

Key Areas for Focus

- **Integrated Village Development Planning**
 - Facilitate convergence planning at Gram Panchayat level linking NRM, agriculture, livelihoods, and infrastructure.
 - Support preparation of village-level resource and livelihood plans aligned with multiple schemes.
- **NRM and Livelihood Convergence**
 - Align VB-G-RAM-G works (ponds, bunding, land development) with agricultural productivity and climate resilience goals.

- Converge PMKSY irrigation interventions with cropping system improvements.
- **Strengthening Livelihood Institutions**
 - Build capacity of SHGs, PGs, and FPOs to access and leverage multiple schemes.
 - Promote cluster-based livelihood models linked with institutional platforms.
- **Market and Enterprise Convergence**
 - Link FPOs with MoFPI, e-NAM, and state marketing systems.
 - Support value chain development for agriculture and NTFPs through institutional mechanisms.
- **Last-Mile Service Delivery**
 - Strengthen extension systems through community resource persons (CRPs).
 - Improve access to credit, inputs, and technical services through institutional platforms.
- **Data-Driven Planning and Monitoring**
 - Use baseline findings to develop convergence dashboards and monitoring systems.
 - Support evidence-based decision-making at district and block levels.

Convergence Opportunities Across Thematic Areas

This matrix identifies opportunities for convergence across schemes and thematic areas, enabling integrated planning and implementation.

Table 71: Scheme Convergence Matrix for Integrated Development

Scheme Convergence Matrix for Integrated Development			
Thematic Area	Key Issue Identified	Relevant Schemes	Convergence Opportunity
Irrigation	Limited irrigation coverage	PMKSY + VB-G-RAM-G	Farm ponds, check dams, and irrigation linkage
Land Development	Soil degradation and uneven land use	VB-G-RAM-G + Agriculture Dept.	Land leveling, bunding, soil conservation
Agriculture	Low diversification and productivity	Agriculture Dept. + NRLM	Crop diversification and extension support
Livelihoods	High dependence on wage labour	NRLM + Skill Development	Enterprise promotion and non-farm livelihoods
Climate Resilience	Low adoption of resilient practices	PMKSY-WDC + Agriculture Dept.	Climate-resilient agriculture models

NRM	Underutilized water and forest resources	VB-G-RAM-G + Forest Dept.	Watershed and community resource management
Food & Nutrition	Low dietary diversity	ICDS + Poshan + NRLM	Nutrition gardens and livestock integration
Market Access	Weak aggregation and low price realization	FPO + e-NAM + MoFPI	Collective marketing and processing units
Institutional Strength	Weak FPO and PG systems	NRLM + NABARD + SFAC	Capacity building and institutional strengthening
Gender Inclusion	Limited economic empowerment	NRLM + Women & Child Dept.	Women-led enterprises and leadership roles

Institutional Gaps and Challenges

Institutional gaps across districts include limited capacity, weak convergence mechanisms, and exclusion of vulnerable groups. These gaps reduce the effectiveness of existing programmes and limit their reach.

Table 72: Key Institutional Gaps

Gap	Key Institutional Gaps (%)				
	Sahibganj	Godda	Pakur	Bhadradri Kothagudem	Control Avg. (Range)
Limited Institutional Capacity	48%	52%	50%	42%	40%–55%
Weak Convergence Mechanisms	52%	56%	54%	46%	45%–60%
Limited Awareness of Schemes	46%	50%	48%	42%	40%–55%
Exclusion of Vulnerable Groups	38%	42%	40%	36%	35%–45%

Source: Primary Data

Field observations suggest that while institutions exist, their functionality varies significantly. Capacity constraints, lack of coordination, and limited accountability mechanisms are key challenges affecting performance.

Addressing these gaps will be critical for improving service delivery and achieving sustainable development outcomes.

Implications and Strategic Focus Areas

- Strengthen institutional capacity through training and continuous support.
- Develop convergence frameworks at block and district levels.
- Promote inclusive institutional participation, especially for vulnerable groups.
- Enhance accountability and monitoring systems.

Conclusion

Institutional systems across the study districts provide a strong foundation for rural development, with widespread presence of Self-Help Groups (SHGs) and increasing outreach of government schemes. However, their overall effectiveness remains constrained by limited functional capacity, weak coordination, and insufficient convergence across programmes.

While multiple schemes address specific components such as livelihoods, natural resource management, and infrastructure, their impact is fragmented due to the absence of integrated planning and implementation. The findings underscore that convergence is not just an operational necessity but a critical pathway for achieving sustainable and scalable outcomes.

Although institutional structures like SHGs and Village Organizations are well established, their role continues to be largely confined to financial inclusion, with limited transition towards livelihood promotion, enterprise development, and aggregation functions. Strengthening their capacity, leadership, and linkages with government programmes is essential to enable them to evolve into effective platforms for planning, service delivery, and economic activities.

Field insights further highlight that improving institutional linkages, enhancing service delivery mechanisms, and promoting active community participation can significantly expand access to resources and opportunities.

In this context, BRLF is strategically positioned to act as a convergence enabler by bridging gaps between schemes, institutions, and communities. By facilitating integrated planning, strengthening grassroots institutions, and promoting coordinated implementation, BRLF can play a pivotal role in advancing sustainable livelihoods and building resilient rural systems in the study areas.

Chapter 12: Gender and Social Inclusion

Gender and social inclusion are central to equitable and sustainable rural development. As observed in previous chapters, access to livelihoods, resources, institutions, and services is not uniform across households and is influenced by gender roles, social identity, and economic status. Women, tribal communities, landless households, and other vulnerable groups often face structural barriers that limit their participation in decision-making processes and access to opportunities.

In the study districts, a large proportion of the population belongs to Scheduled Tribe communities, particularly in Sahibganj, Pakur, and Bhadradi Kothagudem, as discussed in Chapter 4. While institutional platforms such as SHGs have improved women's participation in financial and social activities, their role in productive decision-making and control over resources remains limited.

This chapter examines women's participation, inclusion of marginalized groups, and key barriers affecting equitable access, integrating household and village-level data with field-based observations and secondary insights from government sources such as NRLM, NFHS-5, and Ministry of Women & Child Development reports.

Women's Participation, Decision-Making and Inclusion

Women's participation across the study areas reflects a mixed pattern, where engagement is visible—particularly through Self-Help Groups (SHGs)—but does not consistently translate into decision-making authority or control over productive resources.

Women's involvement in SHGs is strong across all districts and serves as an important entry point for financial inclusion and community engagement. However, this participation is largely concentrated around savings and credit activities, with limited transition into enterprise development, market engagement, or leadership roles.

To better assess gender dynamics, women's participation and decision-making have been analysed using quantitative household-level indicators, as presented below.

Women's Ownership of Land/Productive Assets

Table 73: Women's Ownership of Land/Productive Assets

Ownership of productive assets among women shows significant variation across districts. Bhadradi Kothagudem and Pakur demonstrate relatively higher ownership levels, indicating better inclusion in asset holding. In contrast, Godda and Sahibganj reflect structural constraints in women's access to land and productive resources, which limits their economic agency.

Women's Ownership of Land/Productive Assets		
District	Sample (%)	Control (%)
Sahibganj	27%	32%
Godda	17%	12%
Pakur	51%	74%
Bhadradi Kothagudem	55%	63%

Source: Primary Data

Decision-Making in Agricultural Activities

Table 74: Decision-Making in Agricultural Activities

Decision-making in agriculture is predominantly joint across all districts (64%–74%), indicating shared roles within households.

Decision-Making in Agricultural Activities			
District	Male (%)	Female (%)	Joint (%)
Sahibganj	9%	27%	64%
Godda	7%	20%	73%
Pakur	5%	21%	74%
Bhadradi Kothagudem	13%	15%	72%

Source: Primary Data

However, independent decision

making by women remains limited (15%–27%), suggesting that while participation exists, autonomy is still evolving.

Control over Income (Agriculture/Livestock)

Table 75: Control over Income (Agriculture/Livestock)

Income control patterns indicate a mix of joint and gender-specific dynamics. While joint control is dominant in most districts,

Control over Income (Agriculture/Livestock)			
District	Male (%)	Female (%)	Joint (%)
Sahibganj	18%	18%	64%
Godda	4%	54%	42%
Pakur	21%	23%	56%
Bhadradi Kothagudem	29%	20%	52%

Source: Primary Data

Godda stands out with relatively

higher female control (54%), indicating stronger agency in certain contexts. However, male-dominated control persists in districts such as Bhadradi Kothagudem, reflecting uneven gender dynamics.

Women’s Participation in Institutions

Table 76: Women’s Participation in Institutions

Despite strong SHG presence, active institutional participation remains limited.	Women’s Participation in Institutions			
	District	Active (%)	Passive (%)	Not a Member (%)
	Sahibganj	19%	19%	61%
	Godda	17%	46%	36%
	Pakur	17%	23%	59%
	Bhadradi Kothagudem	26%	40%	34%

Source: Primary Data

A significant proportion of women are either passive members or not associated with any institution, particularly in Sahibganj and Pakur. This indicates that while access to institutions exists, meaningful engagement and leadership roles are still limited.

The findings highlight a clear gap between participation and empowerment. Women are actively involved in SHGs and contribute significantly to agricultural and livelihood activities; however, this engagement does not consistently translate into decision-making power, control over income, or ownership of assets.

The predominance of joint decision-making suggests a gradual shift towards shared household roles. However, independent agency of women remains limited, particularly in economic and market-related decisions. Structural barriers—such as limited asset ownership, socio-cultural norms, and restricted market exposure—continue to influence these outcomes.

District-level variations are notable. Bhadradi Kothagudem reflects relatively

stronger participation and asset ownership, likely influenced by more active institutional networks and livelihood interventions. In contrast, districts such as Godda and Sahibganj demonstrate gaps in asset access and institutional engagement, despite moderate participation in household decisions.

Implications for Programme Design

- **Strengthen women’s leadership** within SHGs, Producer Groups, and FPOs
- **Promote women-led livelihood** and enterprise activities to enhance income control
- Improve **access to productive assets** such as land, livestock, and enterprises
- Encourage joint and informed household decision-making through **targeted capacity building**
- **Enhance institutional participation** by enabling women to transition from passive membership to active leadership roles

Women’s participation is visible but not yet fully translated into economic empowerment or leadership within livelihood systems.

Inclusion of Marginalised Groups

The inclusion of marginalized groups varies across dimensions, with moderate access to schemes but limited access to productive assets and sustainable livelihoods. Scheduled Tribe households, while better integrated into community systems, remain highly dependent on natural resources and vulnerable to ecological risks.

Table 77: Inclusion Matrix Across Social Groups

Inclusion Matrix Across Social Groups				
Group	Access to Livelihoods	Access to Schemes	Institutional Participation	Key Observations
Scheduled Tribes (STs)	Moderate	Moderate	Moderate	High dependence on natural resources
Scheduled Castes (SCs)	Moderate	Moderate	Low–Moderate	Limited asset ownership
Landless Households	Low	Moderate	Low	High dependence on wage labour
Women-headed Households	Low–Moderate	Moderate	Moderate	Higher vulnerability

Source: Primary Data

The inclusion of marginalized groups varies across dimensions, with moderate access to schemes but limited access to productive assets and sustainable livelihoods. Scheduled Tribe households, while better integrated into community systems, remain highly dependent on natural resources and vulnerable to ecological risks.

Secondary evidence from NITI Aayog and Tribal Development Reports highlights that tribal communities often face structural disadvantages in accessing markets, services, and institutional support, despite targeted programmes.

Field observations indicate that landless households and women-headed households face higher vulnerability due to limited livelihood options and asset ownership. While inclusion in SHGs has improved access to credit, it has not fully translated into economic empowerment.

Inclusion is improving at the institutional level but remains limited in economic terms.

Implications and Strategic Focus Areas

- Design targeted livelihood interventions for landless and ultra-poor households.
- Strengthen tribal livelihood systems (NTFPs, agroforestry, traditional crops).
- Ensure priority inclusion of vulnerable groups in schemes and institutional platforms.
- Promote asset creation programmes for marginalized households.

Gender Roles in Livelihood Systems

Women play a significant role in agricultural and allied activities, particularly in labour-intensive tasks such as sowing, weeding, harvesting, and livestock management. However, their participation in market interactions and financial decision-making remains limited.

Table 78: Gender Roles in Livelihood Systems

Activity	Women's Role	Men's Role	Observations
Agriculture	High (labour-intensive tasks)	Moderate (decision-making)	Gender imbalance in control vs labour
Livestock/Poultry	High	Low–Moderate	Women-led but low income returns
NTFP Collection	High	Moderate	Seasonal income source
Market Interaction	Low	High	Limited female market access

Source: Primary Data

Secondary evidence from FAO and Ministry of Agriculture gender studies indicates that women contribute substantially to agriculture but often lack recognition and control over productive resources.

Field observations highlight that women's involvement in livestock and NTFP activities provides opportunities for income generation, but these activities are not fully commercialized or supported by institutional systems.

There is a clear gap between women's contribution to livelihoods and their control over outcomes.

Implications and Strategic Focus Areas

- Promote women-centric value chains (livestock, NTFPs, micro-enterprises).
- Improve women's access to markets through collective platforms.
- Introduce skill development programmes tailored for women.
- Strengthen recognition of women as farmers and producers.

Barriers to Gender and Social Inclusion

Multiple barriers affect gender and social inclusion, with asset ownership and market access emerging as the most critical constraints. Social norms continue to restrict women’s mobility and participation in economic activities, particularly in certain regions.

Table 79: Key Barriers to Inclusion (Ranked Insights)

Key Barriers to Inclusion (Ranked Insights)			
Barrier	Severity	Affected Groups	Nature of Challenge
Limited Asset Ownership	High	Women, Landless	Structural constraint
Restricted Mobility	Moderate	Women	Social norms
Limited Market Access	High	Women, Small Farmers	Economic constraint
Lack of Awareness	Moderate	All groups	Information gap
Weak Institutional Capacity	Moderate	All groups	Systemic issue

Source: Primary Data

Secondary evidence from Ministry of Women & Child Development and UNDP reports highlights that structural inequalities in asset ownership and access to opportunities are key drivers of gender disparity in rural areas.

Field observations indicate that while institutional platforms exist, their effectiveness in addressing inclusion challenges varies. Awareness gaps and limited capacity further restrict participation.

Inclusion challenges are multi-dimensional, requiring both social and economic interventions.

Implications and Strategic Focus Areas

- Promote gender-sensitive programme design across all interventions.
- Strengthen awareness campaigns on rights, entitlements, and opportunities.
- Improve mobility and access through community-based support systems.
- Integrate gender and inclusion indicators in programme monitoring.

Institutional Pathways for Inclusion and Convergence

Institutional platforms provide significant opportunities for enhancing gender and social inclusion. SHGs, in particular, serve as strong entry points for engaging women and vulnerable groups.

Table 80: Institutional Inclusion Pathways

Institutional Inclusion Pathways			
Institution	Current Role	Inclusion Potential	Strategic Opportunity
SHGs	Financial inclusion	High	Platform for women-led enterprises
PGs/FPOs	Market linkage	Moderate	Scale up inclusion in value chains
Gram Panchayats	Governance	Moderate	Inclusive planning and convergence
Govt Schemes	Service delivery	High	Targeted inclusion of vulnerable groups

Source: Primary Data

Institutional platforms provide significant opportunities for enhancing gender and social inclusion. SHGs, in particular, serve as strong entry points for engaging women and vulnerable groups.

Secondary evidence from NRLM and SFAC reports highlights the potential of collective institutions in improving access to livelihoods and services. However, their effectiveness depends on capacity, governance, and convergence.

Field observations indicate that strengthening institutional linkages and improving coordination across schemes can significantly enhance inclusion outcomes.

Institutional convergence is critical for translating participation into empowerment.

Implications and Strategic Focus Areas

- Promote women-led and inclusive FPO models.
- Strengthen SHG federations as platforms for livelihood and social inclusion.
- Facilitate convergence of gender-focused schemes with livelihood programmes.
- Develop inclusive planning frameworks at village and cluster levels.
- Support capacity building of institutions for gender-sensitive implementation.

Consolidated Baseline Indicator Summary

To provide a consolidated view of key findings, the table below compiles major baseline indicators across thematic areas. This serves as a reference framework for monitoring progress and assessing programme impact during midline and endline evaluations.

Table 81: Baseline Indicators

Theme	Indicator	Sahibganj	Godda	Pakur	Bhadradi KG	Control Avg.
Socio-economic	% ST households	99%	29%	93%	99%	—
	% Female-headed HH	13%	10%	1%	14%	—
	% HH in kutcha housing	76%	53%	80%	27%	—
	% HH with toilet	27%	30%	9%	77%	—
	% HH with electricity	96%	96%	92%	99%	—
Livelihoods & Income	% HH below Rs 75,000 income	58%	50%	59%	72%	36-92%
	% HH with seasonal migration	60%	82%	86%	13%	9-98%
Agriculture	% HH — agriculture primary livelihood	98%	96%	100%	96%	86-100%
	% Landless HH	3%	6%	2%	3%	0-10%
	% HH with irrigation access	11%	1%	1%	4%	0-3%
	% HH — single crop only	40%	21%	25%	83%	29-97%
	% HH — double/multiple crop	60%	79%	75%	17%	3-88%
NRM	% HH rainfed only	89%	99%	99%	96%	100%
	% HH using water harvesting structure	7%	3%	13%	13%	2-13%
	% HH adopting any NRM practice	40%	21%	21%	53%	2-59%
	% HH perceiving soil fertility declined	25%	12%	5%	38%	3-34%
Institutions	% HH with MGNREGS job card	89%	80%	93%	96%	74-99%
	% HH with PDS access	100%	100%	99%	89%	79-100%
	% HH with SHG membership	35%	39%	37%	56%	22-74%
	% HH with Social pension	17%	19%	21%	8%	6-19%
Gender	% women owning land/assets	27%	17%	51%	55%	12-74%
	% HH with joint/female agricultural decisions	64%	73%	74%	72%	48-81%

Note: Control averages represent ranges across control villages and are indicative of baseline conditions in non-intervention areas.

The above indicators establish baseline benchmarks across districts and thematic areas, enabling systematic tracking of programme outcomes and impact over time.

Conclusion

Gender and social inclusion in the study districts reflect a complex interplay of progress and persistent challenges. While institutional platforms such as SHGs have significantly improved participation and access to financial services, deeper issues related to asset ownership, decision-making power, and market access continue to limit equitable outcomes.

Field-based insights indicate that women and marginalized groups are actively engaged in livelihood activities but face structural constraints that restrict their ability to benefit fully from these efforts. Social norms, economic barriers, and institutional gaps contribute to uneven access to opportunities and resources.

Addressing these challenges requires a multi-dimensional approach that integrates gender and inclusion into all aspects of programme design and implementation. Strengthening institutional platforms, promoting inclusive livelihoods, and enhancing convergence across schemes will be critical for achieving sustainable and equitable development outcomes.

For BRLF, this presents an opportunity to embed gender and social inclusion as a core principle across all interventions, ensuring that development efforts are not only effective but also inclusive and transformative.

Key Risks Identified from Baseline

- High dependence on rainfed agriculture
- Increasing input cost and chemical dependency
- Unsustainable contract farming practices
- Weak market systems and price realization
- Underutilization of NTFP potential
- Limited financial literacy and gender inequality
- Climate variability and dual risk (drought + flooding)
- Institutional gaps in convergence and governance

These risks must be addressed through integrated programme design.

Cross-Cutting Insights from FGDs and KIIs

The qualitative findings from FGDs and KIIs provide important cross-cutting insights across all thematic areas:

- Water availability is the most critical constraint affecting agriculture and livelihoods
- Increasing input costs and chemical dependency are emerging risks
- Contract farming models are exposing farmers to financial vulnerability
- NTFP-based livelihoods have high potential but remain underdeveloped
- Haat bazaars function as key economic and social institutions
- Women's participation is strong in SHGs but limited in financial decision-making
- Migration continues to be an important coping mechanism
- Climate risks are increasing and affecting productivity and income stability

These insights reinforce the need for integrated and context-specific programme design.

Synthesis of Qualitative Insights (FGDs and KIIs)

The qualitative findings from FGDs and KIIs highlight several cross-cutting issues:

- Water scarcity is the most critical constraint across all locations
- Agriculture is becoming input-intensive and cost-heavy
- Contract farming introduces dependency and uneven benefit distribution
- SHGs are active but limited to financial functions
- NTFP and livestock have strong potential but remain underdeveloped
- Market access is constrained by small volumes and lack of aggregation
- Migration remains a key coping mechanism

These findings reinforce the need for integrated programme design.

Comparative Insights: Sample vs Control Villages

The inclusion of control villages in the baseline study enables a structured comparison of key livelihood and resource indicators between intervention and non-intervention areas. While baseline studies are not designed to establish causal attribution, such comparisons provide an important reference point for assessing programme impact during endline evaluation.

A comparative analysis of sample and control villages highlights the following key patterns:

- **Irrigation and Natural Resource Access:** Irrigation access remains uniformly low across both sample and control villages, with control villages reporting negligible irrigation coverage. This confirms that both sets of villages operate under similar rainfed conditions, strengthening the validity of the control group as a counterfactual.
- **Livelihoods and Income Levels:** The distribution of households across income categories shows broadly similar patterns between sample and control villages, with a high proportion of households falling in the lower income brackets (below ₹75,000 annually). This indicates comparable levels of economic vulnerability across both groups.
- **Cropping Patterns and Agricultural Practices:** Cropping intensity in control villages is largely characterised by single or double cropping under rainfed conditions, similar to sample villages. This suggests that agricultural constraints related to water availability are consistent across both groups.
- **Migration as a Coping Strategy:** Seasonal migration is prevalent across both sample and control villages, particularly in rainfed areas. While minor variations exist across districts, migration continues to function as a key livelihood strategy in response to limited local employment opportunities.
- **Overall Comparability:** Across key indicators including irrigation access, income distribution, and migration patterns, control villages exhibit characteristics similar to intervention villages. This supports their suitability as a comparison group for assessing programme outcomes during subsequent evaluation stages.

In summary, the control villages provide a credible baseline reference against which future changes in livelihood outcomes, resource access, and institutional engagement can be assessed during midline and endline evaluations.

Chapter 13: Baseline Indicator Framework

A robust baseline indicator framework is essential for tracking progress, measuring outcomes, and guiding evidence-based decision-making throughout the project lifecycle. Based on the findings presented in Chapters 4 to 12, this framework identifies key indicators across thematic areas including socio-economic conditions, livelihoods, agriculture, natural resource management, climate resilience, food security, market access, institutions, and inclusion.

The framework has been designed to align with the project's broader objectives of strengthening livelihoods, enhancing natural resource management, promoting climate resilience, and improving institutional convergence. It also reflects the interlinkages between different thematic areas, ensuring that indicators capture both direct outcomes and systemic changes.

The baseline values derived from the study provide a reference point against which future progress can be measured.

Approach to Indicator Development

The selection of indicators is guided by the following principles:

- **Relevance:** Indicators are aligned with key findings and programme priorities.
- **Measurability:** Indicators are quantifiable and can be tracked over time.
- **Comparability:** Indicators allow comparison across districts and intervention areas.
- **Actionability:** Indicators support programme planning and decision-making.

The framework integrates:

- Household-level indicators (HH)
- Village-level indicators (VL)
- Institutional and system-level indicators

Thematic Indicator Framework

Socio-economic and Demographic Indicators

Table 82: Socio-Economic & Demographic Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% of households in low-income category (<₹1.5 lakh)	High concentration	% households	Economic vulnerability
% of female-headed households	Low–Moderate	% households	Gender inclusion
% of households with access to basic services	Moderate–High	% households	Living standards
Average household size	Medium (3–6 members)	Number	Dependency patterns

Source: Primary Data

These indicators reflect the socio-economic context within which livelihoods operate. High levels of low-income households indicate vulnerability and limited resilience capacity.

Livelihood and Income Indicators

Table 83: Livelihood & Income Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% households dependent on agriculture	Very High	% households	Livelihood dependence
% households engaged in non-farm income	Moderate	% households	Diversification
% households reporting seasonal migration	High (Jharkhand)	% households	Distress indicator
Average annual household income	Low concentration	INR range	Economic status

Source: Primary Data

The indicators highlight dependence on agriculture and limited diversification, with migration serving as a coping mechanism.

Agriculture and Productivity Indicators

Table 84: Agriculture & Productivity Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
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% households practicing mono-cropping	High	% households	Low diversification
% households with irrigation access	Low–Moderate	% households	Productivity constraint
% households using improved inputs	Moderate	% households	Technology adoption
Cropping intensity (single vs multiple crops)	Low	% households	Production potential

Source: Primary Data

These indicators capture the structural constraints affecting agricultural productivity.

Natural Resource Management Indicators

Table 85: Natural Resource Management Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% land under rainfed cultivation	High	% land	Resource dependency
% households adopting soil conservation practices	Low	% households	Sustainability
% functional water structures	Moderate–Low	% villages	Resource utilisation
Access to common property resources	High	% households	Livelihood support

Source: Primary Data

NRM indicators reflect the condition and utilisation of natural resources critical for livelihoods.

Climate Resilience Indicators

Table 86: Climate Resilience Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% households aware of climate risks	Moderate	% households	Awareness level
% households adopting climate-resilient practices	Low	% households	Adaptation capacity
% households exposed to climate shocks	High	% households	Vulnerability
% households practicing diversified farming	Low–Moderate	% households	Risk mitigation

Source: Primary Data

These indicators highlight the gap between awareness and actual resilience.

Food and Nutrition Security Indicators

Table 87: Food & Nutrition Security Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% food-secure households (year-round)	Moderate	% households	Stability
Dietary diversity score	Low–Moderate	Composite	Nutrition quality
% households facing seasonal food stress	Moderate–High	% households	Vulnerability
Access to PDS and ICDS	High	% households	Safety net

Source: Primary Data

These indicators reflect both food availability and nutritional adequacy.

Market Access and Value Chain Indicators

Table 88: Market Access & Value Chain Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% households selling to local traders	High	% households	Market limitation
% households accessing formal markets	Low–Moderate	% households	Market integration
% households engaged in value addition	Low	% households	Income enhancement
% households reporting post-harvest losses	Moderate	% households	Efficiency gap

Source: Primary Data

These indicators capture inefficiencies in market systems and value chains.

Institutional and Convergence Indicators

Table 89: Institutional & Convergence Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% households part of SHGs	High	% households	Institutional reach
% households part of FPOs/PGs	Low–Moderate	% households	Economic institutions
% households accessing govt schemes	Moderate	% households	Service delivery

% convergence across schemes	Limited	% villages	System effectiveness
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Source: Primary Data

These indicators reflect institutional strength and convergence gaps.

Gender and Social Inclusion Indicators

Table 90: Gender & Social Inclusion Indicators

Indicator	Baseline Insight	Measurement Unit	Relevance
% women participating in SHGs	High	% households	Inclusion entry point
% women involved in decision-making	Moderate–Low	% households	Empowerment
% vulnerable households accessing schemes	Moderate	% households	Equity
% women engaged in income activities	Moderate	% households	Economic role

Source: Primary Data

These indicators highlight inclusion gaps despite participation gains.

Alignment with Project Objectives and Theory of Change

The baseline indicators align with the project's Theory of Change, which links inputs, activities, outputs, and outcomes across multiple thematic areas.

Key Linkages

- NRM + Agriculture → Increased Productivity
 - Indicators: Irrigation access, soil practices, cropping intensity
- Livelihood Diversification → Increased Income
 - Indicators: Non-farm income, migration reduction
- Climate Resilience → Reduced Vulnerability
 - Indicators: Adoption of resilient practices
- Institutional Strengthening → Improved Service Delivery
 - Indicators: SHG/FPO participation, scheme convergence
- Market Access → Better Price Realisation
 - Indicators: Market linkage, value addition

- Gender Inclusion → Equitable Outcomes
 - Indicators: Women’s participation, decision-making

Suggested Monitoring Framework

To operationalize the baseline indicators, the following monitoring structure is recommended:

1. Monitoring Levels

- Household level (HH surveys)
- Village level (VL tracking)
- Institutional level (SHGs, FPOs)

2. Frequency

- Annual tracking for outcome indicators
- Midline and endline assessments
- Quarterly monitoring for key programme indicators

3. Tools

- Digital MIS systems
- Community-based monitoring
- Periodic field assessments

Outcome Linkage Matrix Across Thematic Areas

This matrix highlights the interlinkages between key thematic areas and their influence on livelihood outcomes. It provides a systems-level understanding of how constraints in one domain affect multiple outcomes.

Table 91: Outcome Linkage Matrix

Outcome Linkage Matrix			
Domain	Key Baseline Finding	Linked Outcome Area	Nature of Linkage
Irrigation Access	Low irrigation coverage, especially in Jharkhand districts	Cropping intensity & diversification	Limited irrigation restricts multi-season cultivation
Cropping Systems	Predominantly paddy monocropping	Income enhancement	Low diversification reduces income potential
Soil Health	Moderate to low fertility, rising degradation	Agricultural productivity	Poor soil reduces yield and input efficiency

NRM Practices	Low adoption of soil and water conservation	Climate resilience	Weak resource management increases vulnerability
Livelihood Diversification	High dependence on agriculture and wage labour	Income stability	Lack of diversification increases risk exposure
Migration	High seasonal migration in Jharkhand districts	Local livelihood development	Migration reflects lack of local opportunities
Market Access	High dependence on local traders	Price realization	Weak market linkage reduces farmer earnings
Post-Harvest Systems	Limited storage and value addition	Income enhancement	Immediate sale leads to lower price realization
Institutional Strength	Strong SHGs but weak FPOs/PGs	Collective economic activities	Limited aggregation affects scale and bargaining
Gender Inclusion	High participation but low decision-making power	Equitable outcomes	Participation not translating into empowerment
Food Security	Moderate food security but low dietary diversity	Nutrition outcomes	Limited diversification affects nutrition
Climate Risks	High exposure to erratic rainfall and drought	Livelihood resilience	Climate variability directly impacts production

Conclusion

The baseline indicator framework provides a comprehensive and structured approach to tracking progress across multiple dimensions of rural livelihoods and development. It reflects the interconnected nature of socio-economic conditions, agriculture, natural resource management, climate resilience, and institutional systems.

The indicators highlight critical gaps, including low income levels, limited livelihood diversification, inadequate irrigation, weak market access, and gaps in institutional convergence. At the same time, they identify areas of strength, such as strong SHG presence and access to basic services.

For BRLF, this framework serves as a strategic tool for planning, monitoring, and evaluation. By aligning interventions with these indicators, the programme can ensure targeted, measurable, and impactful outcomes.

A well-implemented monitoring system based on this framework will enable continuous learning, adaptive management, and evidence-based decision-making, ultimately contributing to sustainable and inclusive rural development.

Chapter 14: Findings, Implications for Programme Design, and Way Forward

This chapter consolidates the baseline evidence to define how programme interventions should be structured across districts. The analysis brings together findings from livelihoods, agriculture, natural resources, income patterns, and institutional systems to identify where and how interventions should be prioritised.

The baseline establishes clear starting conditions:

- More than 85–95 percent of households depend on agriculture, largely rainfed
- Median annual household income is clustered around ₹75,000 across all districts
- 50–72 percent of households fall below ₹75,000, indicating concentration in lower income brackets
- Irrigation access is extremely limited (1–11 percent in sample villages; 0 percent in control villages)
- Migration remains high in Jharkhand (60–86 percent of households in some districts)

These conditions define both the constraints and the entry points for intervention.

Baseline Establishes

Livelihoods and Income Structure

Agriculture continues to be the primary livelihood across all districts, but it does not generate sufficient income on its own. Households rely heavily on wage labour and migration to supplement earnings. The income distribution shows that upward mobility is limited, with less than 4 percent of households crossing ₹1.5 lakh annually.

The regression analysis confirms that land access and livelihood diversification (especially wage labour and migration) are the strongest drivers of income variation, while irrigation does not show statistical significance due to its extremely low coverage in the sample.

Agriculture and Natural Resource Dependence

Agriculture is predominantly rainfed, with low cropping intensity and limited diversification. In districts such as Sahibganj, irrigated households show significantly higher multiple cropping (94 percent vs 5 percent for rainfed households), indicating the direct impact of water access.

Despite the presence of ponds and water structures, functionality remains low due to poor maintenance and absence of local management systems. This creates a gap between resource availability and actual utilisation.

Income–Poverty Relationship

The poverty index and income analysis show strong alignment in Jharkhand districts

- **Pakur:** 62 percent multidimensionally poor; 59 percent below ₹75,000
- **Sahibganj:** 50 percent poor; 58 percent below ₹75,000

Bhadradi Kothagudem presents a different pattern:

- Only 5 percent multidimensionally poor
- But 72 percent below ₹75,000 income

This indicates that improvements in basic services do not translate into higher incomes, shifting the focus from infrastructure to income generation.

Migration as a Structural Outcome

Migration is not incidental but embedded in the livelihood system.

- Jharkhand districts show migration rates of 60–86 percent
- Bhadradi shows lower migration (8–13 percent) due to local labour absorption

This establishes migration as a response to income instability rather than lack of awareness or opportunity alone.

Markets and Institutional Systems

Market participation remains limited in Jharkhand, with dependence on local traders and weak aggregation. In contrast, Bhadradi shows stronger integration with commercial crops and market systems.

SHGs are present across all districts, but their role remains confined to savings and credit. Their transition into livelihood and enterprise institutions is limited.

Implications for Programme Design

The baseline does not point to a single constraint—it shows a linked system of constraints:

- Low irrigation → low cropping intensity → low farm income
- Low farm income → dependence on wage labour → migration
- Weak market systems → low price realisation → limited income growth
- Limited institutional capacity → weak convergence → fragmented outcomes

Interventions therefore need to operate across these links rather than in isolation.

District-Level Strategy for Intervention

Sahibganj

- Irrigation access at ~11 percent with strong response to irrigation (high multiple cropping among irrigated households)
- Moderate poverty (50 percent) but high migration

Strategy Direction:

- Focus on small-scale irrigation expansion and water management systems
- Introduce multi-cropping and crop diversification models
- Reduce migration through agriculture-led local employment.

Godda

- Very low irrigation
- More balanced income distribution but high migration (~80 percent in some areas)

Strategy Direction:

- Prioritise irrigation and cropping intensity improvement
- Promote livelihood diversification beyond agriculture
- Strengthen local wage and enterprise opportunities

Pakur

- Highest deprivation (62 percent multidimensionally poor)
- High dependence on NTFPs and forest resources

Strategy Direction:

- Focus on basic livelihood stabilisation (NRM + food security)
- Develop NTFP-based value chains (tamarind, mahua)
- Target most vulnerable households (including PVTGs)

Bhadradi Kothagudem

- Better infrastructure and low deprivation (5 percent)
- High income vulnerability (72 percent below ₹75,000)
- Lower migration due to local labour market

Strategy Direction:

- Shift from infrastructure to income enhancement and market-led growth
- Strengthen value chains (chilli, cotton, horticulture)
- Support aggregation, processing, and enterprise development

Programme Design Priorities

Based on baseline evidence, interventions should be structured around the following priorities:

- **Water and Irrigation Systems**
 - Expand irrigation coverage through revival of ponds, check dams, and lift irrigation
 - Establish community-based water governance systems
- **Agricultural Transition**

- Move from single-crop to multi-cropping systems
- Promote low-cost, climate-resilient practices to reduce input dependency
- **Income Diversification**
 - Strengthen livestock and allied activities
 - Promote non-farm livelihoods and rural enterprises
- **Market Systems**
 - Build aggregation platforms (PGs/FPOs)
 - Enable local-level processing and value addition
 - Improve price discovery and market access
- **Institutional Strengthening**
 - Transition SHGs from financial groups to livelihood institutions
 - Strengthen convergence with NRLM, PMKSY, and agriculture programmes
- **Migration Reduction through Local Opportunity**
 - Increase local employment through agriculture intensification
 - Align livelihood planning with seasonal migration cycles

Way Forward

The baseline provides a clear reference point for tracking change across income, livelihoods, agriculture, and resource access. It establishes that livelihood outcomes are shaped by a combination of water access, income opportunities, and market linkages.

Programme implementation should follow a district-differentiated approach, where:

- Jharkhand districts focus on resource access and livelihood stabilisation
- Bhadradi focuses on income enhancement and market systems

The inclusion of control villages provides a structured basis for comparison over time. Future assessments should track changes in irrigation access, cropping intensity, income distribution, and migration patterns to measure programme impact.

A phased approach is required:

- Phase 1: Strengthen resource base and reduce vulnerability
- Phase 2: Diversify livelihoods and improve productivity
- Phase 3: Build market systems and enterprise scale

This progression aligns with the baseline conditions and provides a clear pathway for improving income stability and reducing livelihood risk across the study areas.

Annexures

Indicators Definitions

Indicator	Definition
Access to Common Property Resources	Extent to which households use or depend on community-managed resources such as forests, grazing lands, ponds, rivers, and village commons for livelihoods and subsistence needs.
Access to Formal Markets	Proportion of households selling agricultural or forest produce through organised, regulated, or institutional market channels rather than local intermediaries.
Access to Government Schemes	Extent to which households receive benefits from government welfare, agriculture, livelihood, food security, employment, or social protection schemes.
Access to Irrigation	Availability and utilisation of any irrigation source such as canals, borewells, ponds, lift irrigation, or water harvesting structures for agricultural cultivation.
Access to PDS and ICDS	Household access to Public Distribution System (PDS) and Integrated Child Development Services (ICDS) for food and nutrition support.
Adoption of Climate-Resilient Practices	Extent to which households practice climate-adaptive agricultural methods such as drought-resistant crops, water conservation, crop diversification, mulching, agroforestry, or mixed farming.
Annual Household Income	Total estimated yearly income earned by a household from agriculture, livestock, wage labour, migration, non-farm enterprises, forest produce, and other livelihood sources.
Awareness of Climate Risks	Degree to which households recognise and understand climatic changes such as droughts, erratic rainfall, floods, heat stress, and their impact on livelihoods and agriculture.
Cropping Intensity	Frequency with which agricultural land is cultivated within a year, indicating whether land is used for single, double, or multiple cropping cycles.
Dependence on Local Traders	Extent to which households rely on village-level traders or intermediaries for selling agricultural or forest produce.
Dietary Diversity Score	Composite measure reflecting the variety of food groups consumed by a household within a specified reference period, indicating nutritional adequacy.
Diversified Farming Practices	Adoption of multiple farming activities such as mixed cropping, horticulture, livestock, agroforestry, or integrated farming systems to reduce livelihood risks.
Exposure to Climate Shocks	Incidence of households experiencing livelihood or agricultural losses due to climatic events such as droughts, floods, crop failure, or extreme weather conditions.
Food Security Status	Extent to which households have adequate and reliable access to sufficient food throughout the year.
Functional Water Structures	Availability and operational status of water-related infrastructure such as ponds, check dams, wells, canals, lift irrigation systems, and water harvesting structures.

Household Size	Total number of members residing within a household and sharing common living and consumption arrangements.
Improved Input Usage	Extent to which households use improved agricultural inputs such as certified seeds, fertilisers, pesticides, farm mechanisation, or scientific farming methods.
Income Category Distribution	Classification of households into different income brackets based on annual household earnings.
Institutional Participation	Degree of household engagement in community institutions such as Self-Help Groups (SHGs), Farmer Producer Organisations (FPOs), cooperatives, and village committees.
Irrigation Coverage	Share of cultivated land receiving irrigation support through any source during agricultural seasons.
Landholding Size	Total area of agricultural land owned, leased, or cultivated by the household.
Livelihood Diversification	Extent to which households engage in multiple income-generating activities across farm and non-farm sectors to reduce economic vulnerability.
Market Integration	Degree of household participation in formal value chains, organised markets, aggregation systems, or institutional buyers.
Migration Duration	Average period for which household members migrate for employment or livelihood purposes during a year.
Migration Incidence	Proportion of households with one or more members migrating seasonally or permanently for livelihood and employment purposes.
Mono-Cropping Dependence	Extent to which households cultivate only a single crop during the agricultural year, reflecting limited diversification.
Multidimensional Poverty	Composite assessment of deprivation across dimensions such as income, housing, education, food security, services, and assets.
Participation in SHGs	Extent of household or women's membership and engagement in Self-Help Groups for savings, credit, and collective activities.
Participation in FPOs/Producer Groups	Extent of household membership in Farmer Producer Organisations (FPOs), producer collectives, or farmer groups aimed at improving market access and collective bargaining.
Post-Harvest Losses	Quantity or proportion of agricultural produce lost during storage, handling, transportation, or post-harvest management.
Rainfed Cultivation Dependence	Extent to which agricultural production relies exclusively on rainfall rather than assured irrigation systems.
Seasonal Food Stress	Incidence of households facing temporary shortages or reduced access to food during specific periods of the year.
Seasonal Migration	Temporary migration undertaken by household members during lean agricultural or employment periods to secure wage income.
Soil Conservation Practices	Adoption of land and soil management measures such as bunding, contour farming, mulching, trenching, or erosion control practices.
Value Addition Activities	Household engagement in processing, grading, packaging, storage, or transformation of agricultural and forest products to enhance market value.
Vulnerable Household Access to Schemes	Extent to which socially and economically vulnerable households such as SC, ST, PVTG, women-headed households, and landless families benefit from public schemes and services.

Wage Labour Dependence	Degree to which households rely on casual or daily wage employment as a primary or supplementary source of livelihood income.
Women Engaged in Income Activities	Extent of women's participation in paid work, farm operations, enterprises, livestock activities, or other income-generating engagements.
Women's Participation in Decision-Making	Extent to which women are involved in household decisions related to agriculture, finances, livelihoods, education, health, and resource use.
Women's Participation in SHGs	Degree of women's involvement in Self-Help Groups and collective institutional activities related to savings, credit, livelihoods, and social mobilisation.
Year-Round Employment Availability	Extent to which households have access to continuous livelihood or employment opportunities throughout the year without seasonal interruptions.

Detailed Sampling Framework

The sampling framework for the baseline study was designed to ensure adequate representation of socio-economic, agro-ecological, and livelihood diversity across the project geography while maintaining comparability between intervention and control areas.

The study adopted a multi-stage stratified sampling approach, integrating purposive and structured household selection methods to capture variations in livelihood systems, agricultural conditions, natural resource access, and institutional participation across the selected districts.

The sampling design was aligned with the objectives of the baseline study, particularly to:

- establish benchmark indicators across thematic areas,
- capture variation across districts and livelihood groups,
- support future comparison during midline and endline evaluation,
- and ensure representation of vulnerable and marginalised populations.

Stage 1: Selection of Districts and Blocks

The study covered four districts:

- Sahibganj, Godda, and Pakur in Jharkhand
- Bhadrachalam in Telangana

These districts were selected based on the operational geography of the BRLF-supported programme and their relevance to integrated natural resource management and climate-resilient agriculture interventions.

The selected districts represent:

- predominantly rural and tribal populations,
- high dependence on rainfed agriculture,
- varying levels of irrigation access,
- significant reliance on forests and natural resources,
- and differing degrees of market integration and climate vulnerability.

Within each district, programme blocks were identified in consultation with implementation teams to ensure representation of diverse ecological and livelihood conditions.

Stage 2: Selection of Villages

The village selection process aimed to ensure representation across varying livelihood and ecological contexts relevant to programme interventions.

A total of:

- 40 intervention villages, and
- 14 control villages

were included in the study.

- Villages were selected to reflect diversity in:
- irrigation access and water availability,
- agricultural production systems,
- tribal population concentration,
- dependence on migration and wage labour,
- forest and NTFP dependence,
- market connectivity,
- and institutional presence such as SHGs, PGs, and FPOs.

Control villages were selected from geographically comparable areas outside direct programme intervention coverage. Selection criteria included similarity in:

- agro-ecological conditions,
- livelihood systems,
- tribal population composition,
- landholding patterns,
- and rainfed agricultural dependence.

The inclusion of control villages was intended to strengthen future impact assessment by enabling comparative analysis during midline and endline evaluations.

Stage 3: Selection of Households

Household selection within villages followed structured sampling procedures to ensure adequate representation of different livelihood and social categories.

The sampling process prioritised inclusion of:

- small and marginal farmers,
- tribal households,
- women-headed households,
- landless and wage-dependent households,
- households dependent on migration,
- and forest/NTFP-based livelihood households.

Village-level household listings, local institutional records, and community verification processes were used to support respondent identification and selection.

Where required, additional households were surveyed during fieldwork to compensate for incomplete or inconsistent responses identified during quality assurance and data validation.

Sample Size and Coverage

As per the inception framework, the study initially proposed a sample of approximately 800 households across intervention villages along with households from control villages.

Following field validation and data quality checks, the final analytical sample included:

- 817 households from intervention villages
- 219 households from control villages

All validated responses meeting analytical and quality standards were retained for final analysis.

The achieved sample size ensured:

- adequate district-level representation,
- inclusion of different livelihood categories,
- representation of vulnerable groups,
- and sufficient variation for comparative analysis across thematic indicators.

Qualitative Sampling Framework

The qualitative component included:

- Focus Group Discussions (FGDs)
- Key Informant Interviews (KIIs)

Respondents were selected purposively to capture institutional, gender, livelihood, and community perspectives relevant to the study objectives.

FGDs included:

- women SHG members,
- farmers,
- migrant households,
- tribal and NTFP-dependent communities,
- and youth groups.

KIIs included representatives from:

- agriculture departments,
- livelihood missions,
- forest departments,
- financial institutions,
- NGOs,
- and producer organisations.

The qualitative sampling approach ensured contextual understanding of:

- livelihood challenges,
- institutional functioning,
- climate-related risks,
- market systems,
- and community perceptions regarding natural resource management and agriculture.

Sampling Rationale and Analytical Relevance

The sampling framework was designed not only to generate representative baseline indicators but also to support future programme monitoring and comparative evaluation.

The stratified and multi-stage approach enabled analysis across:

- districts,
- intervention and control villages,
- livelihood categories,
- irrigation conditions,
- and socio-economic groups.

This framework strengthens the analytical reliability of the baseline and provides a robust foundation for assessing programme outcomes during subsequent evaluation stages.

List of Sample and Control Villages

Sample/Control	State	District	Block	Village
Sample	Jharkhand	Godda	Mahegama	Bajinathpur
Sample	Jharkhand	Godda	Mahegama	Ghat Garhaiya
Sample	Jharkhand	Godda	Mahegama	Gorantia
Sample	Jharkhand	Godda	Mahegama	Hasanpur
Sample	Jharkhand	Godda	Mahegama	Khutehri
Sample	Jharkhand	Godda	Maherma	Amor
Sample	Jharkhand	Godda	Maherma	Chhit Daria Chak
Sample	Jharkhand	Godda	Maherma	Gajanda
Sample	Jharkhand	Godda	Maherma	Lilatori
Sample	Jharkhand	Godda	Maherma	Parsa
Sample	Jharkhand	Godda	Maherma	Saharpur
Sample	Jharkhand	Pakur	Littipara	Domeria
Sample	Jharkhand	Pakur	Littipara	Patrapara
Sample	Jharkhand	Pakur	Littipara	Phulpahari
Sample	Jharkhand	Pakur	Littipara	Talpahadi
Sample	Jharkhand	Sahibganj	Mandro	Batutola
Sample	Jharkhand	Sahibganj	Mandro	Bhurkunda
Sample	Jharkhand	Sahibganj	Mandro	Ghatiari
Sample	Jharkhand	Sahibganj	Mandro	Gobindpur
Sample	Jharkhand	Sahibganj	Mandro	Heth Chatra
Sample	Jharkhand	Sahibganj	Mandro	Komodari
Sample	Jharkhand	Sahibganj	Mandro	Paraya
Sample	Jharkhand	Sahibganj	Mandro	Ranidih
Control	Jharkhand	Godda	Mahegama	Chuna Chak
Control	Jharkhand	Godda	Mahegama	Hemcha chak
Control	Jharkhand	Godda	Maherma	Kharthi
Control	Jharkhand	Godda	Maherma	Khirondha
Control	Jharkhand	Pakur	Littipara	Gohanda
Control	Jharkhand	Pakur	Littipara	Navadih

Control	Jharkhand	Sahibganj	Mandro	Kobhora
Control	Jharkhand	Sahibganj	Mandro	Pindra
Sample	Telangana	Bhadradi Kothagudem	Charla	Bathinapalli
Sample	Telangana	Bhadradi Kothagudem	Charla	Erraboru
Sample	Telangana	Bhadradi Kothagudem	Charla	Ganavaram colony
Sample	Telangana	Bhadradi Kothagudem	Charla	Kurnnapally
Sample	Telangana	Bhadradi Kothagudem	Charla	thippapuram
Sample	Telangana	Bhadradi Kothagudem	Charla	Uiyyaalyamdugu
Sample	Telangana	Bhadradi Kothagudem	Charla	Upparigudem
Sample	Telangana	Bhadradi Kothagudem	Dummugudem	Battigudem
Sample	Telangana	Bhadradi Kothagudem	Dummugudem	Dabbanutuhlla
Sample	Telangana	Bhadradi Kothagudem	Dummugudem	K.Veerabhadrapuram/ komaramvarigumpu
Sample	Telangana	Bhadradi Kothagudem	Dummugudem	Koya Narasapuram
Sample	Telangana	Bhadradi Kothagudem	Dummugudem	Lachigudem
Sample	Telangana	Bhadradi Kothagudem	Dummugudem	Narayanarao Peta
Sample	Telangana	Bhadradi Kothagudem	Karakagudem	Anantharam
Sample	Telangana	Bhadradi Kothagudem	Karakagudem	Chirumalla
Sample	Telangana	Bhadradi Kothagudem	Karakagudem	Lakshmipuram
Sample	Telangana	Bhadradi Kothagudem	Karakagudem	Regallo
Control	Telangana	Bhadradi Kothagudem	Charla	Danavaipeta
Control	Telangana	Bhadradi Kothagudem	Charla	Kaliveru
Control	Telangana	Bhadradi Kothagudem	Dummugudem	Chinnabandru
Control	Telangana	Bhadradi Kothagudem	Dummugudem	Parnashala/Musala maduku
Control	Telangana	Bhadradi Kothagudem	Karakagudem	Barlagudem
Control	Telangana	Bhadradi Kothagudem	Karakagudem	Thummalagudem

Consent Protocol and Ethical Considerations

The baseline study adhered to standard ethical research practices throughout the data collection process. Prior to each household interview, respondents were informed about the purpose and scope of the study, the nature of information being collected, and the intended use of the findings for programme planning and evaluation purposes.

“Participation in the survey was entirely voluntary, and respondents were informed that they could decline to answer any question or withdraw from the interview at any stage without any consequence.”

Enumerators obtained verbal informed consent from all respondents before initiating interviews. Confidentiality and privacy of the respondents were maintained throughout the process, and no personal identifiable information was disclosed in analysis or reporting. Data collected during the study were used strictly for research and programme purposes and were securely managed during data processing and analysis. Ethical safeguards were also followed during FGDs and KIIs to ensure respectful participation and inclusion of women, tribal households, and vulnerable groups.

Village-Level Survey Questionnaire

Section A

1.	Name of the respondent (Sarpanch Name)	
2.	Designation:	
3.	Mobile Number:	
4.	District Name	
5.	Name of the Tehsil/Block	
6.	Name of the Panchayat	
7.	Name of the Village	

Section B

8.	Total Population of the village (March 2025)					
9.	Total Population (Social group of %) (March 2025)	GN	OBC	ST	SC	Total
						100%
10	Total Number of Households in the Village (March 2025)	APL		BPL		Total
11	Total Number of farmer households in the village					
12	Total number of Self-help group (SHG) currently active in this village (Name of the Group __)	1. 2. 3. 4.				
13	Main approach road to village [Pucca Road=1, Kuccha Road=2, Both=3, Others (Specify=3]					
14	Nearest Primary School (distance from Village, state '0' if it is in the village)					
15	Nearest Secondary School (distance from Village, state '0' if it is in the village)					
16	Nearest College (distance from Village, state '0' if it is in the village)					
17	Nearest Primary Health Centre (PHC) (distance from Village, state '0' if it is in the village)					
18	Distance from District Hospital (distance from village, state '0' if it is in the village)					

19	Nearest pharmacy shop (<i>distance from Village, state '0' if it is in the village</i>)			
20	Nearest Financial Institute (<i>distance from Village, state '0' if it is in the village</i>)			
21	Nearest Post office (<i>distance from Village, state '0' if it is in the village</i>)			
22	Nearest Fertilizer/Seed Shop (<i>distance from Village, state '0' if it is in the village</i>)			
23	Nearest Mandi/Market for Vegetable and Fruit, Milk & Products, Egg, Fish, Mutton (<i>name and distance from Village, state '0' if it is in the village</i>)			
24	Facilities available in the village	Credit Cooperative Society	Yes	No
		Agricultural Cooperative Society	Yes	No
		Milk Cooperative Society	Yes	No
		Fishermen's Cooperative Society	Yes	No
		Computer Kiosk/ e-chaupal /	Yes	No
25	Major sources of drinking water facility in the village [<i>Tube well=1, Well=2, River=3, Pond=4, Tap water=5, Others (Specify _____)=6</i>]			
26	Status of power supply [<i>Very Inadequate=1, Just adequate=2, Adequate=3, None=4</i>]			
27	Status of Transport Facility available in the village for goods [<i>Very Inadequate=1, Just adequate=2, Adequate=3, None=4</i>]			
28	State three Major crops grown in the village during Kharif season (July to October):	1.		
		2.		
		3.		
29	State three Major crops grown in the village during Rabi season (October to March):	1.		
		2.		
		3.		
30	State three Major crops grown in the village during Zaid season (February to May):	1.		
		2.		
		3.		
31	What is the cost of agriculture wage labour? (per day per person) in the village.	Male:		
		Female:		

Section C

Sl. No.	Particulars	Unit	2020
1.	Average depth of water level pre-monsoon & post-monsoon	m	Pre-monsoon _____ Post-monsoon _____
2.	Source of Irrigation (<i>select all that apply</i>) (Borewell=1, Dugwel=2, Canal=3, River/Lift irrigation=4, Check-dam=5, Pond/Farm pond=6, Rainfed only=7, Others=8)		XXXXXXX
3.	Availability of water from all sources across the year (months per year) (0-3=1, 4-6=2, 7-9=3, 10-12=4)		
4.	Area under irrigation	Ha	
5.	Land use pattern		
	a. Area under Crops	Ha.	
	b. Area under plantation/forest cover	Ha.	
	c. Area of Horticulture crop	Ha.	
6.	On an average, in your village, for how many months do households find employment or livelihood engagement in the following activities? a. Agricultural b. Non-agricultural c. Ancillary activities (fishery, poultry, rural craftsmanship etc.)	Man days	
7.	Number of milch cattle	Nos.	
8.	Milk production	Liter/Year	
9.	Migration from rural to urban area in the village (nos.) (approx.)	Nos.	
10.	Annual mean household income (less than Rs.75000=1, Rs.75000-Rs.1 Lakh=2, Rs.1 Lakh-Rs.1.5 Lakh=3, Rs. 1.5 Lakh-Rs.2Lakh=4, Rs.2 Lakh-Rs.3 Lakh=5, More than Rs.3 Lakh=6)	INR	<75,0000 75-1l 1-1.5 1.5-2 2-3 >3L

Section D

Village Ecology, Climate Risk, Institutions & Convergence

Sl. No.	Particulars	Response
D1: Ecological and Land-use Status		
1	Predominant soil type in the village (Red=1, Lateritic=2, Sandy=3, Mixed=4, Don't know=5)	
2	Current soil fertility status (as perceived by village representatives)	

	<i>(Improving=1, Stable=2, Declining=3)</i>	
3	Status of vegetation/tree cover in the village over last 5 years <i>(Increased=1, No change=2, Decreased=3)</i>	
4	Presence of common natural resources in the village (Multiple responses allowed) <i>(Common land=1, Forest patch=2, Grazing land=3, Water bodies=4, None=5)</i>	
D2. Climate Risks and Exposure		
1	Major climate risk faced by the village in last 5 years <i>(Drought=1, Erratic rainfall=2, Heat stress=3, Flooding=4, None=5)</i>	
2	Frequency of climate shocks in last 5 years <i>(None=1, Once–twice=2, Almost every year=3)</i>	
3	Main livelihood affected by climate events <i>(Agriculture=1, Livestock=2, Forest-based=3, Wage labour=4, None=5)</i>	
D3. Natural Resource Management & Agroecology		
1	Availability of NRM assets created through government/community efforts <i>(Check dam=1, Farm Pond=2, Watershed structures=3, None=4)</i>	
2	Community-level practice promoted in the village <i>(Seed bank=1, Nursery=2, Mixed cropping=3, None=4)</i>	
3	Is Gram Sabha involved in planning or managing NRM assets? <i>(Yes=1, No=2)</i>	
D4. Institutions and Governance		
1	Gram Sabha meetings held on agriculture/NRM issues in last 1 year <i>(None=1, 1–2 times=2, 3 or more times=3)</i>	
2	Participation of women in village-level meetings related to livelihoods/NRM <i>(Low=1, Moderate=2, High=3)</i>	
3	Active community institutions in the village (Multiple responses allowed) <i>(SHG=1, Producer Group=2, FPO=3, None=4)</i>	
D5. Convergence with Government Schemes		
1	Major schemes implemented in the village in last 3 years. (Multiple responses allowed) <i>(MGNREGS=1, PMKSY/Watershed=2, FRA=3, Agriculture/Horticulture schemes=4, None=5)</i>	
2	Overall effectiveness of scheme convergence at village level <i>(Good=1, Average=2, Poor=3)</i>	

Household-Level Survey Questionnaire

SECTION A: Household Identification & Socio-Economic Profile

Sl. No.	Particulars	Responses
1.	District	
2.	Block	
3.	Gram Panchayat	
4.	Village	
5.	Name of the Respondent	
6.	Gender of the Respondent (M/F)	
7.	Age (in years)	

A1: Socio-Economic Profile

Sl. No.	Particulars	Responses
1	Social category of household (ST=1, SC=2, OBC=3, General=4)	
2	Household size (Number of members ____)	
3	Gender of household head (Male=1, Female=2)	
4	Age of household head (Years ____)	
5	Education level of household head (Illiterate=1, Primary=2, Upper Primary=3, Secondary=4, Higher Secondary=5, Graduate & above=6)	
6	Type of dwelling (Kutcha=1, Semi-pucca=2, Pucca=3)	
7	Ownership status of dwelling (Owned=1, Rented=2, Used without rent=3, No dwelling=4)	
8	Primary source of drinking water (Tap=1, Handpump/Tubewell=2, Well/Pond=3, River/Canal=4, Tanker=5, Others=6)	
9	Electricity connection in the house (Yes=1, No=2)	
10	Primary cooking fuel used (Firewood=1, Crop residue/dung=2, LPG=3, Electricity=4, Biogas=5, Others=6)	
11	Toilet facility available (Yes=1, No=2)	

SECTION B: Livelihoods, Employment & Income Security

Sl. No.	Particulars	Responses
1	Primary livelihood source of the household	

	(Agriculture=1, Livestock=2, Wage labour-farm=3, Wage labour-non-farm=4, NTFP=5, Small business=6, Service=7, Others=8)	
2	Secondary livelihood source (if any) ((Agriculture=1, Livestock=2, Wage labour-farm=3, Wage labour-non-farm=4, NTFP=5, Small business=6, Service=7, Others=8, Not applicable=9)	
3	Months of livelihood engagement in a year (all sources combined) (<6 months=1, 6–9 months=2, 10–12 months=3)	
4	Annual household income (approx.) (<₹75,000=1, ₹75,000–1.5 lakh=2, ₹1.5–3 lakh=3, >₹3 lakh=4)	
5	Does any household member migrate for work seasonally? (Yes=1, No=2)	
6	If yes, duration of migration in last year (<3 months=1, 3–6 months=2, >6 months=3)	
7	Main reason for migration (Lack of local work=1, Crop failure=2, Low wages=3, Debt=4, Others=5)	

SECTION C: Land Ownership, Access & Cropping Pattern

Sl. No.	Particulars	Responses		
1	Total land accessed by household (acres) (Enter total ____)			
2	Land access pattern (Owned only=1, Leased-in only=2, Both owned & leased-in=3, No land=4)			
3	Land leased-out by household (Yes=1, No=2)			
4	Landholding category (based on owned land) (Landless=1, <1 acre=2, 1–2 acres=3, 2–5 acres=4, >5 acres=5)			
5	Season-wise land cultivated (acres)			
	Season	Owned	Leased-in	Leased out
	Kharif			
	Rabi			
	Zaid			
6	Cropping intensity of household (Single crop=1, Double crop=2, Multiple crops=3)			
7	Major crop groups cultivated (last year – multiple responses) (Cereals=1, Millets=2, Pulses=3, Oilseeds=4, Vegetables/Fruits=5, Mixed crops=6)			

SECTION D: Agriculture Practices, Inputs & Technology Use

Sl. No.	Particulars	Responses
1	Type of seeds mainly used (Local/traditional=1, Improved/HYV=2, Both=3)	
2	Use of fertilizers (Chemical only=1, Organic only=2, Both=3, Not used=4)	

3	Use of pesticides/plant protection (<i>Chemical=1, Bio-inputs=2, Both=3, Not used=4</i>)	
4	Has soil testing ever been done for your land? (<i>Yes=1, No=2</i>)	
5	If yes, did you receive and use Soil Health Card recommendations? (<i>Used fully=1, Used partially=2, Not used=3, Did not understand=4</i>)	
6	Use of farm machinery or tools (<i>Manual only=1, Small tools=2, Tractor/power tiller=3, Custom hiring=4</i>)	

SECTION E: Water, Irrigation & Natural Resource Management (NRM)

Sl. No.	Particulars	Responses
1	Main source of irrigation (<i>Rainfed only=1, Well/Borewell=2, Canal/Lift=3, Farm pond/Check dam=4, Multiple sources=5</i>)	
2	Months of assured irrigation availability (<i>0-3=1, 4-6=2, 7-9=3, 10-12=4</i>)	
3	Does your household use any water harvesting structure? (<i>Yes=1, No=2</i>)	
4	NRM practices adopted by household (multiple responses) (<i>Contour bunding=1, Mulching=2, Compost/FYM=3, Agroforestry=4, Soil moisture conservation=5, None=6</i>)	
5	Perceived change in soil fertility over last 5 years (<i>Improved=1, Same=2, Declined=3, Severely declined=4</i>)	

SECTION F: Climate Risks, CRA & Agro-Ecology

Sl. No.	Particulars	Responses
1	In last 3 years, has your household faced any climate shocks? (multiple responses) (<i>Irregular rainfall=1, Drought=2, Flood/heavy rain=3, Pest/disease=4, Heat stress=5, None=6</i>)	
2	Main impact of climate shocks (multiple responses) (<i>Crop loss=1, Livestock loss=2, Reduced income=3, Migration increase=4, Food shortage=5, No major impact=6</i>)	
3	Climate-resilient / agro-ecological practices adopted (multiple responses) (<i>Intercropping=1, Crop diversification=2, Organic inputs=3, Local seeds=4, Integrated livestock=5, Mulching=6, None=7</i>)	
4	Main barriers to adopting CRA/agro-ecology (<i>Lack of awareness=1, Labour shortage=2, Financial constraints=3, Risk perception=4, Not suitable land=5</i>)	

SECTION G: Livestock, Forest Use & Commons

Sl. No.	Particulars	Responses
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1	Does the household own livestock? (Yes=1, No=2)	
2	Primary purpose of livestock (Home consumption=1, Income=2, Both=3)	
3	Does your household collect Non-Timber Forest Produce (NTFP)? (Yes=1, No=2)	
4	If yes, main forest products collected (multiple responses) (Mahua=1, Tendu=2, Firewood=3, Fruits/seeds=4, Medicinal plants=5, Honey=6, Others=7)	
5	Does your household use any common property resources? (multiple responses) (Common grazing land=1, Forest for NTFP/fuelwood/fodder=2, Village pond/water body=3, Common agricultural land=4, Do not use commons=5)	

SECTION H: Market Access, Post-Harvest & Barriers

Sl. No.	Particulars	Responses
1	Does your household sell any agricultural or forest produce? (Yes=1, No=2)	
2	Main type of market accessed (Local village market=1, Weekly haat=2, Mandi=3, Trader/agent=4)	
3	Distance to nearest market (<3 km=1, 3–6 km=2, 7–10 km=3, >10 km=4)	
4	Main challenges in accessing markets (multiple responses) (Poor roads=1, Transport cost=2, Price information gap=3, Middlemen dominance=4, Small volumes=5)	
5	Any post-harvest storage or processing done? (Storage only=1, Processing only=2, Both=3, None=4)	

SECTION I: Institutions, Schemes & Convergence

Sl. No.	Particulars	Responses
1	Is any household member part of the following institutions? (multiple responses) (SHG=1, Producer Group/FPO=2, Watershed Committee=3, Gram Sabha/Village Committee=4, None=5)	
2	Participation in Gram Sabha meetings (Regular=1, Occasional=2, Rare=3, Never=4)	
3	Does the household have MGNREGS job card? (Yes=1, No=2)	
4	Number of days worked under MGNREGS in last 12 months (0 days=0, <30=1, 30–60=2, 61–100=3, >100=4)	
5	Access to government schemes (multiple responses) (PDS=1, PM-KISAN=2, Crop insurance=3, FRA-IFR/CFR=4, Social pension=5, None=6)	

6	Major barriers in accessing schemes (multiple responses) (<i>Lack of information=1, Documentation issues=2, Delayed payments=3, Implementation gaps=4, No barriers=5</i>)	
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SECTION J: Gender Inclusion & Decision-Making

Sl. No.	Particulars	Responses
1	Does any woman in the household own land or productive assets? (<i>Yes=1, No=2</i>)	
2	Who mainly decides on agricultural activities? (<i>Male=1, Female=2, Both jointly=3</i>)	
3	Who controls income from agriculture/livestock? (<i>Male=1, Female=2, Both jointly=3</i>)	
4	Women's participation in institutions (<i>Active member=1, Passive member=2, Not a member=3</i>)	

SECTION K: Technology Use & Future Readiness

Sl. No.	Particulars	Responses
1	Access to mobile phone in household (<i>Basic phone=1, Smartphone=2, No phone=3</i>)	
2	Use of mobile/internet for agriculture-related information (<i>Yes regularly=1, Occasionally=2, Never=3</i>)	
3	Interest in adopting new technologies in future (irrigation, seeds, digital advisory) (<i>High=1, Medium=2, Low=3</i>)	
4	Main support required to adopt new technologies (<i>Training=1, Financial support=2, Inputs availability=3, Demonstration=4</i>)	

Key Informant Interview Guide

Respondent Profile and Institutional Context

Sl. No.	Particular	Response
1	Designation of respondent	
2	Department / Institution (Agriculture, Horticulture, PRI, CBO, Others – specify)	
3	District, Block, Villages covered	
4	Years of experience in the area (<2 years=1, 2–5 years=2, 6–10 years=3, >10 years=4)	

Livelihood Systems and Socioeconomic Context

Sl. No.	Particular	Response
5	What are the dominant livelihood sources in this area? (Crop cultivation=1, Livestock=2, Forest/NTFP=3, Wage labour=4, Migration-based work=5, Non-farm enterprise=6, Others=7)	
6	Have you observed any major changes in livelihood patterns over the last 3–5 years? (Yes=1, No=2)	
7	If yes, what factors have driven these changes? (Climate variability/shocks=1, Changes in cropping practices=2, Market access/prices=3, Project interventions=4, Government schemes=5, Migration trends=6)	

Agriculture, Productivity, and Technology Adoption

Sl. No.	Particular	Response
8	How would you assess current levels of agricultural productivity and yield stability? (High and stable=1, Moderate and stable=2, Moderate but unstable=3, Low and unstable=4)	
9	Which improved agricultural practices are commonly adopted by farmers? (Improved/climate-tolerant seeds=1, Soil testing=2, Balanced fertiliser use=3, Integrated nutrient management=4, Integrated pest management=5)	
10	What is the main support required for farmers to adopt new technologies? (Training=1, Financial support=2, Inputs availability=3, Demonstration=4)	
11	What are the key constraints limiting adoption of improved practices?	

	<i>(High input costs=1, Limited awareness/skills=2, Risk perception=3, Limited access to inputs=4, Weak extension support=5, Credit constraints=6)</i>	
12	Are there observable differences in farming practices or outcomes between project-supported farmers and non-project farmers? (Yes=1, No=2)	

Natural Resource Management and Landscape Conditions

Sl. No.	Particular	Response
13	What key natural resources support livelihoods in this area? (Agricultural land=1, Forest/NTFP=2, Grazing land=3, Water bodies=4, Groundwater sources=5, Common lands=6, Others=7)	
14	How would you describe the current condition of these resources? (Improving=1, Stable=2, Degrading=3, Seasonally stressed=4)	
15	Are there community institutions or rules governing the use of common property resources? (Yes=1, No=2)	
16	If yes, how effective are these management arrangements? (Very effective=1, Somewhat effective=2, Not effective=3)	

Climate Risks and Resilience

Sl. No.	Particular	Response
17	What major climate-related shocks affect agriculture and livelihoods in this area? (Drought=1, Erratic rainfall=2, Floods=3, Heat stress=4, Pest/disease outbreaks=5)	
18	How do farmers typically cope with these climate-related shocks? (Crop diversification=1, Change in sowing patterns=2, Migration=3, Distress sale of assets=4, Government relief/support=5)	
19	In your opinion, what are the key barriers to strengthening climate resilience at household and community levels? (Probe on: finance, institutions, infrastructure, knowledge)	

Institutional Support and Convergence

Sl. No.	Particular	Response
20	How effective are SHGs and FPOs in supporting livelihoods, access to inputs, credit, and markets? (Very effective=1, Somewhat effective=2, Not effective=3)	

21	In which areas do institutions currently provide support? (<i>Credit and savings=1, Input procurement=2, Market access=3, Capacity building=4, Others=5</i>)	
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Markets and Value Chains

Sl. No.	Particular	Response
22	What are the main channels through which farmers access markets? (<i>Local traders=1, Weekly/mandi markets=2, FPO-led aggregation=3, Direct buyers/processors=4</i>)	
23	Are FPOs or other collectives facilitating aggregation, collective marketing, or value addition? (<i>Yes=1, No=2</i>)	

Outcomes, Sustainability, and Way Forward

Sl. No.	Particular	Response
24	Are there gaps in skills or institutional capacity that may affect programme outcomes? (<i>Technical skills=1, Field-level staffing=2, Institutional capacity=3, Financial gaps=4, Digital access=5</i>)	
25	What changes, if any, have you observed in livelihoods, farming practices, or natural resources since programme initiation?	
26	Which interventions appear most promising or impactful? (<i>NRM works=1, Climate-resilient agriculture practices=2, Institution building=3, Market linkages=4, Capacity building=5</i>)	
27	What risks could affect sustainability of outcomes beyond the project period? (<i>Climate risks=1, Weak institutions=2, Funding/resource constraints=3, Market volatility=4</i>)	
28	What recommendations would you suggest to strengthen programme design, implementation, or scaling?	
29	Any additional observations or examples you would like to share?	

FGD Guidelines

Purpose of the FGD

To collectively understand livelihood realities, agricultural and NRM practices, climate risks, institutional support, gender inclusion, and early changes observed in the village, and to triangulate household- and institutional-level findings.

FGD Composition and Duration

Group size: 6–8/10 participants

- Women/Men community members
- CBO leaders (FPO/VO/SHG)
- CSO / SPMU team
- Duration: 60–90 minutes

Discussion Guide

1. Livelihoods and Changes Over Time

- 1.1. What are the main livelihood activities in this village today?
- 1.2. Have these changed in the last 3–5 years? In what ways?
- 1.3. What are the main reasons for these changes?

(Probe: climate, markets, government schemes, migration, project support)

2. Agriculture Practices and Technology Adoption

Participatory exercise: Listing or show-of-hands

- 2.1. What crops and farming practices are most common now?
- 2.2. What new or improved practices have people started using?
- 2.3. Who is adopting these practices more and who is not? Why?

Key probe: What main support is required to adopt new technologies? (Training=1, Financial support=2, Inputs availability=3, Demonstration =4)

3. Natural Resources and Commons

Participatory exercise: Resource mapping (verbal or simple sketch)

- 3.1. Which natural resources are most important for livelihoods here?
- 3.2. How is the condition of land, water, forests, and commons now compared to earlier?

- 3.3. Are there any local rules or groups managing these resources? How well do they work?

4. Climate Risks and Coping

Participatory exercise: Problem ranking

- 4.1. What climate-related problems affect farming and livelihoods most?
4.2. How do households usually cope during bad years?
4.3. Who is most affected and why?

5. Institutions, Groups, and Collective Action

Participatory exercise: Institutional mapping

- 5.1. Which groups or institutions are active in the village (SHGs, FPOs, VO, PRI)?
5.2. How useful are they for credit, inputs, markets, or information?
5.3. Are women and vulnerable households able to participate meaningfully?

6. Markets and Value Chains

Open discussion

- 6.1. Where do farmers usually sell their produce?
6.2. Do collectives help in getting better prices or reducing risks?
6.3. What are the main market-related challenges?

7. Changes, Sustainability, and Way Forward

Reflection round

- 7.1. What positive changes have you noticed in recent years?
7.2. What are the biggest risks to sustaining these changes?
7.3. What should be done differently or strengthened going forward?