



FINAL REPORT

MARCH 2023



FARM PROSPERITY SOLUTIONS

PROJECT

Scoping study on the Millet Value chain in Odisha and North Karnataka - Research and Documentation.



SELCO Foundation

FARM PROSPERITY SOLUTIONS PRIVATE LIMITED

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30/03/2023

To,

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Subject: Submission of Final Report for Scoping study on the Millet Value chain in Odisha and North Karnataka - Research and Documentation.

Dear Sir/Madam,

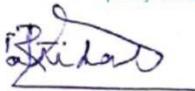
We are pleased to submit the Final Report for the Scoping study on the Millet Value chain in Odisha and North Karnataka - Research and Documentation.

We are thankful for all the support extended to us by the Selco Foundation Team.

Regards,

For Farm Prosperity Solutions Private Limited

For Farm Prosperity Solutions Pvt. Ltd.



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List of Abbreviations

CYSD	Centre for Youth and Social Development
FAO	The Food and Agriculture Organization

FAQ	Fair Average Quality
FGD	Focus Group Discussion
FPC	Farmer Producer Company
FPO	Farmer Producer Organization
IYOM	International Year of Millets
KMS	Kharif Marketing Season
LAMPCS	Large-sized Adivasi Multipurpose Cooperative Society
LS	Line Sowing
LT	Line transplant
MIP	Micro investment plan
M-PAS	Millet-Procurement Automation System
MSP	Minimum Support Price
NGO	Non-Governmental Organization
OMM	Odisha Millet Mission
ORMAS	Odisha Rural Development and Marketing Society
PACS	Primary Agricultural Credit Society
Q	Quintal
RRTS	Regional Research and Technology Transfer Station Sahyadri Community Development and Women Empowerment society
SCODWES	society
SDG	Sustainable Development Goals
SF	Selco Foundation
SHG	Self Help Groups
SKDRDP	Shri Kshethra Dharmasthala Rural Development Project
SMI	System of Millet Intensification
TDCCOL	Tribal Development Co operative Corporation Limited
UNGA	United Nation's General Assembly
WASSAN	Watershed Support Services and Activities Network

Acknowledgments

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The feedback on the work has helped us steer the study and derive at key insights. Furthermore this nature of work with intensive primary surveys, would not have been possible without the support of the communities and the enumerators who devoted their time for this study. We express our sincere gratitude for the cooperation of the local NGO partners, FPOs, and other key informants for sharing the valuable information with us that helped shape this project.

We look forward to bring value to the implementing organization with this report and play our part in impacting the lives of the communities bringing about the change and focus that is needed towards millets, in the International Year of Millets 2023.

Executive Summary

The objective was to do a Scoping study on the Millet Value chain in Odisha and North Karnataka. This research was intended to be done in a way that it captures not only the millet value chains that are existing in these selected geographies but also the ecosystem approach was followed to understand the scenarios in which these value chains operate. This has led to a thorough study about the current socio-economic scenario in these selected geographies and documentation of these practices. The government initiatives that are implemented and also the market access that is provided due to such schemes.

We found that millet is a part of the traditional diet and cultivation has been practiced over generations. The millet cultivation had taken a back seat after the green revolution and wide spread cultivation of paddy and wheat. The millet crops still have endured and are part of the traditions. This shows the resilience that they have shown over thousands of years in India. India being a major producer of millets, now the focus is back on millet cultivation as a climate resilient and less resource intensive crop. The innovation in terms of various technologies that are needed in these traditional systems are also explored in this study. The seed to retail journey of the millets has been broken down at various value chain nodes to understand the processes and the possible interventions.

It is seen that millet is a climate resilient and highly nutritious grain that has amazing variety in terms of the types of millets that has been part of the gamut of major and minor millets. The climate stress that is faced by the farmers in current times with droughts or erratic rains has put the millets as an alternative to resource intensive farming, being resilient to these stress to a high degree.

The millets are still largely unexplored in terms of market linkage to bigger markets in the urban areas or processing and value addition. The technologies in post-harvest processing in particular and value addition has a potential to bring to scale the millet cultivation in these areas. The farmers often face challenges in reliable energy sources, so the focus on renewable energy sources like solar for mechanization of these processes is imperative. The market linkage and training of SHGs and farmer collectives in enterprise building with millets will bring this change making it an economically rewarding crop for the farmers along with its climate resilience ensuring food security and improving nutritional profiles of the end users.

The study found that the mechanization of the post-harvest processing is where technology interventions can play an important role. The collectives like Farmer Producer Organizations (FPOs) and Self-Help Groups (SHGs) often lack the required support in terms of processing the millets like ragi into value added products like ragi flour, and ready to eat items. The small millets require much complicated processing in terms of millet rice making which is a major area in which technology interventions can play a role by increasing the farmer's earnings and making sure a

better share of the pie. The other challenges in terms of the ecosystem in which these value chains operate, is the lack of irrigation facilities and lack of market linkage. At the current scenario many government incentives and direct procurement is proving to be an enabler for the farmers encouraging them towards millet cultivation. Alternate channels will be needed to be established for more awareness about millet cultivation, to access to quality inputs, technology interventions for processing, focusing on use of renewable energy and market linkage for the products. So that each node is strengthened and favors of the farmers in the cultivation of millets with a better price realization.

Chapter 1

Introduction

Background: SELCO Foundation (SF) seeks to inspire and implement socially, financially, and environmentally inclusive solutions by improving access to sustainable energy. SELCO Foundation's key objectives are:

- Systematically identify diverse needs of the poor, understand and define the role of sustainable development, poverty alleviation, and decentralized energy.
- Create and deploy innovative solutions that positively impact the well-being, health, education, and livelihoods toward the alleviation of poverty
- Foster the development of enabling conditions or an ecosystem through holistic thought processes in technology, finance, entrepreneurship, and policy.

SELCO Foundation focuses on the nexus of energy for development, including well-being, healthcare, livelihoods, disasters, and so on.

Project Rationale: Traditionally the highly nutritious millets formed a substantial part of the diets and the cropping system in the tribal areas of Odisha. Millets require less water and are more resilient to climate vulnerability.

As Orissa and North Karnataka are known for millet cultivation, knowing about the different cropping patterns, on-farm technologies, market linkages, and post-harvest processing, would give an overall view of the current practices across the study area. Comparing the millet cultivation practices in the study area, with India and globally, and suggesting solutions that can be set as benchmarks for different requirements becomes critical for technology innovation driven by SDG 7 "affordable, reliable, sustainable and modern energy for all".

Specific Objectives of The Study: The project seeks to identify the potential for sustainable energy-driven millet-based Agri-livelihoods in Odisha and North Karnataka. It intends to derive the scope for technology innovation specific to the millet value chain in order to enable access to more sustainable, reliable, and affordable local infrastructure to the community needs.

The Agri livelihoods study includes the collection of the baseline data through various primary surveys and stakeholder interviews and its analysis to derive at key insights about current practices and resource availability. The millet value chain in particular, is then further broken down in several nodes/ key players to derive an understanding of the key processes and technology use. The possible interventions are then mapped around the energy needs of the end-users.

The study is broken down into two parts, first covering the supply side of the equation where the estimated production and availability of particular types of millets is done for the objective of identifying the value chains that have traction among farmers and can meet the demands of the

market. The second part of the value chain study is accessing the market side of the equation to derive at estimated market demands, current market linkages and prices, processing and value addition needs to make the commodity market ready.

Thus the two sides of the equation where supply and demand can be matched along with meeting the energy needs at various stages of the value chain, will help in curating and developing rewarding value chains that will benefit the communities of small and marginal farmers. This along with the analysis of adaptation quality of millets as climate resilient crops which are cultivated with low input usage, gives the well-rounded view of answering the specific research questions of: Why Millets? What particular millets in which regions? What processes? which energy needs? Meeting what demands of the market?

Scope: The scope of the present study includes the Following points:

1. Selecting the millets that are cultivated in Odisha and North Karnataka and which have a comparative advantage and potential for developing the value chain;
2. Undertaking a desk review of relevant activities conducted by government or other development partners on the millet value chains;
3. Undertaking a desk review of public-private engagement platforms for market-based value chain strategic planning;
4. Conducting value chain analysis for each of the selected millets. The value chain assessments entails: the agronomic production profiles (e.g., agricultural products, the flow of funds and information, etc.); functional analysis of each value chain (profiling of industry structure, adoption of skills, technology, and innovation); climate change implications; economic analysis of potential opportunities to add value along the chain; and policy and institutional conditions necessary to create the suitable enabling environment for value chain development;
5. Conducting assessments of demand and market conditions for products within selected millet value chains including analysis of input and output markets, their structure and dynamics between actors, procurement processes, related standards, the existence of monopolies, identification of lead firms, etc.
6. Based on the above tasks, identification of constraints and barriers (financial, technology, infrastructure, human resources/skills, marketing, regulatory, policy, institutional) that must be addressed to enable the development of the value chains;

Methodology for the Study

The entire value chain is broken in two parts. First is before harvesting and second is after harvesting. Before harvesting main objective is to understand the surplus availability of the produce to sale in market and the agri-inputs usage. After harvesting mainly market related aspects are covered.

To fulfil the objectives of the study, both quantitative and qualitative analysis methods have been employed to generate good recommendations. Analysis & report is structured in line with the objectives. It gives concise summaries of findings pertaining to project deliverables, clear conclusions and well thought out recommendations. The value chain study was carried out mainly through primary data collection and desk review by:

- Secondary Data
- Qualitative interviews of value chain participants
- Quantitative data through structured questionnaire

Chapter 2

Millets: A Brief Review

Millet an ancient crop

Millets are one of the oldest cultivated cereals from the Poaceae family. Two major millets that are generally used is pearl millet (*Pennisetum glaucum*) and finger millet (*Eleusine coracana*). These are used for animal feed and food. The origin of Pearl millet can be traced to sub-Saharan Africa, and of finger millet to the East African uplands (Gari, J., 2017) . The world's millet production and trade is dominated by these two major millets (FAO, 2017). The research that is aimed at the development of millets in recent times through various agricultural programmes, have a focus on pearl and finger millets. Dube et al.,2018 believe that this routing for millets and sorghum against the major cereal crops like maize is justified by the quality of millets being ecologically well-matched with semi-arid areas because of their ability to tolerate drought. The drought-tolerance and withstanding tough climates and harsh weather including ability to grow in nutrient-depleted soils, makes millet one of the most tolerant crops (Sharma et al.,2000).

In spite of these characteristics, there was a lack of attention given to millets as to positioning them as alternative crops. This had led to millets being termed as the 'lost crop' (FAO, 2017). In facing the current challenges regarding sustainable food production, climatic changes, and water scarcity, along with overpopulation, there has been a renewed interest regarding millets. This opens up new opportunities for farmers, nutritionists, and food and feed manufacturers for engaging in research for developing a better understanding of the nutritional and functional characterisation of millet grains. Although reviews in this area have been published comprehensively by Cisse et al., 1996, the recent research and review by Hassan et al., 2021, is comprehensive and provides important updates on the utilisation of pearl and finger millets in diets for humans and animals. This new research would help to turn around the focus on millets worldwide, where millets though are regarded as a significant grain, they are among the least exploited. The abundance of nutrients and phenolic compounds are just getting studied in new age research which will position millets as one of the most suitable grains for food and feed.

Nutritional significance:

The diversity of nutrients and phenolic compounds that are present in finger and pearl millet are good indicators that these varieties of millet are important in their use as food or feed. The phenolic properties found in millets comprise phenolic acids, flavonoids, and tannins, which are beneficial to human health. In terms of abundance and diversity of the phenolic profile, Finger millet has an exceptionally unique, more abundant, and diverse phenolic profile compared to pearl millet. It has been established in recent research that millet phenolic properties have high antioxidant activity. The presence of phytochemicals in millet grains has positive effect on human health by lowering the cholesterol and phytates in the body. The use of maize in multiple industries have resulted in the frantic demands on this crop and have also lead to the search for alternative

grains, to ease the pressure. It has been sown that when pearl and finger millets are substituted in the diets of different animals in place of maize, resulted in positive impact on the performance. Including these grains in the diet may improve health and decrease the risks of diseases. For example, Pearl millet in 50% or more proportion can be used in broiler diets without adversely affecting broiler performance or egg production. In recent times, millet grains have also been incorporated in other foods and used to make traditional beverages (Hassan et al., 2021).

Global Production Scenario:

The major bulk of the millet production in the world happens in India, Nigeria, Niger, Mali, Burkina Faso, Chad, and China. Finger millet (*Eleusine coracana* (L.) Gaertn), little millet (*Panicum sumatrense* Roth ex Roem. & Schult.), foxtail millet (*Setaria italica* (L.) P. Beauvois) and proso millet (*Panicum miliaceum* L.) are most the commonly found species among many other millet varieties that are cultivated around the world (Chandra et al., 2016). Millets are grown in around 131 countries and is part of the traditional diet for 59 crore people in Asia & Africa, more details given in the table below (Ministry of Agriculture & Farmers Welfare, 2022).

Table 1. Global Scenario of Millets

Millets area and production region wise (2019)		
Regions	AREA (lakh ha)	Production (lakh ton)
Africa	489	423
Americas	53	193
Asia	162	215
Europe	8	20
Australia & New Zealand	6	12
India	138	173
WORLD	718	863

(Source: FAO Stat 2021)

- India produces >170 lakh ton (80% of Asia's & 20% of global production)
- Global average yield: 1229 kg/ha, India (1239 kg/ha)

Background of millets in the context of India

In India, millets have been utilized from time immemorial, and has a place of symbolic significance in the culture of different communities, often rising to a sacred place for the farmers. The fulfilling nutritional quality of millets has also lead to their wide acceptance in traditional food and diets across the country. The production of millets was gradually reduced, hindered by the emergence of the Green Revolution and the high-yielding varieties of rice and wheat that were widely promoted at that time.

Important millet crops grown in India are Sorghum (Great millet), Bajra (Pearl millet), Ragi (Finger millet) and small millets viz., Korra (Foxtail millet), Little millet, Kodo millet, Proso millet and

Barnyard millet. These were often referred to as coarse cereals but realizing the nutrient richness of the grains they are now gazetted as “Nutricereals” by Government of India.

The major millets producing states in India are Rajasthan, Karnataka, Maharashtra, Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Tamil Nadu, Andhra Pradesh and Uttarakhand. Currently, together these ten states account for around 98 per cent in Millets production in India during the period 2020-21. Six states namely Rajasthan, Karnataka, Maharashtra, Uttar Pradesh, Haryana and Gujarat accounts for more than 83 per cent share in total millet production. Rajasthan contributes 28.61 per cent of the total millet production in India. Multiple varieties of millets are produced in India such as Pearl Millets, Sorghum, Finger Millet, Foxtail, Kodo, Barnyard, Proso, Little Millet and Pseudo Millets like Buckwheat and Amaranths. Pearl millet (Bajra), Sorghum (Jowar) and Finger Millet (Ragi) constitutes the largest share in India’s total production of millets (APEDA, Millet portal).

Some millets that are significant in terms of production, nutrition and future prospects are studied in some details below.

Finger Millet:

In India, finger millet occupy the largest area under cultivation among the small millets. Finger millet commonly known as ragi and mandua in India is one of the minor cereals. This millet is a native of Ethiopia, but is now grown extensively in various regions of India and Africa and has become part of the staple food that supply a major portion of calories and protein to large segments of the population in these countries especially for people of low-income groups (O’Kennedy et al.,2006). Karnataka is the leading producer of finger millet in India, accounting to 58% of its global production. The production area of finger millet in India is sixth after wheat, rice, maize, sorghum and bajra. Finger millet ranks fourth in importance among millets in the world, after sorghum, pearl millet and foxtail millet (Upadhyaya et al., 2007). Finger millet has a unique position among the cereals such as barley, rye and oats with its higher nutritional contents and has outstanding properties making it highly suitable as a subsistence food crop (Dida et al., 2008). It is rich in calcium (0.34%), dietary fiber (18%), phytates (0.48%), protein (6%–13%) minerals (2.5%–3.5%), and phenolics (0.3%–3%). Finger millet is also a rich source of thiamine, riboflavin, iron, methionine, isoleucine, leucine, phenylalanine and other essential amino acids. The health beneficial properties, such as anti-diabetic (type 2 diabetes mellitus), anti-diarrheal, antiulcer, anti-inflammatory, antitumorigenic (K562 chronic myeloid leukemia), atherosclerogenic effects, antimicrobial and antioxidant properties make it as an important alternative cereal and a nutritional powerhouse (Dinesh et al., 2016).

Barnyard Millet:

The millet that has shown a significant upsurge in production around the world is Barnyard millet (*Echinochloa* species), thus becoming one of the most important minor millet crops in Asia. The genus *Echinochloa* comprises of two major species, *Echinochloa esculenta* and *Echinochloa frumentacea*, which are predominantly cultivated for human consumption and livestock feed. The

millet varieties are hardy being less susceptible to biotic and abiotic stresses. The nutritional profile of Barnyard millet grain shows that it is a good source of protein, carbohydrate, fibre, and, most importantly, contains more micronutrients (iron and zinc) than other major cereals. The nutritional and agronomic benefits of barnyard millet still remain underutilized. Over the past decades, very limited attempts have been made to study the features of this crop (Gandhimeyyan et al. 2020). Barnyard millet (*Echinochloa* species) being an ancient millet crop grown in warm and temperate regions of the world and widely cultivated in Asia, particularly India, China, Japan, and Korea, deserves its place in the scientific research. Especially so, being the fourth most produced minor millet, providing food security to many poor people across the world. Globally, India is the biggest producer of barnyard millet, both in terms of area (0.146 m ha) and production (0.147 mt) with average productivity of 1034 kg/ha during the last 3 years (IIMR, 2018).

Foxtail Millet:

Foxtail millet (*Setaria italica* L.) is one of the earliest cultivated crops, extensively grown in the arid and semi-arid regions of Asia and Africa, as well as in some other economically developed countries of the world where it is more commonly used as bird feed. Foxtail millet nutritional profile shows high levels of protein, fiber, mineral, and phytochemicals. There are some anti-nutrients such as phytic acid and tannin that are present in this millet, but suitable processing methods can reduce it to negligible levels. The millet is also reported to possess hypolipidemic, low-glycemic index, and antioxidant characteristics. Like most millet varieties, foxtail millet remains under-utilized as a food source. It is however receiving increased research and commercial attention. In the foreseeable future it is surmised reasonably that foxtail millet will have a leading role to play in enhancing nutritional and food security (Elangovan et al., 2022).

Climate resilience and current prospects:

The tremendous pace of growth in agriculture leading to increased food production, has been witnessed globally and in India, in the recent decades to meet the growing population, however at the present times there is challenges such as climate change and malnutrition. In facing these challenges, millets can potentially be chosen as a replacement of the conventional crops in dry and marginal areas, due to their very important quality of hardy nature and climate resilience. Additionally, the nutrient rich grains with several vital micronutrients and vitamins is necessary for reducing malnutrition and providing multiple health benefits. The National Genebank at ICAR-NBPGR, New Delhi and Millets Genebank at ICAR-IIMR, Hyderabad has been conserving approximately one lakh accessions of millets germplasm which can be a great resource in identification and development of improved millets cultivars (Elangovan et al., 2022).

Government of India's proposal to United Nations for declaring 2023 as International Year of Millets (IYOM) was supported by 72 countries and United Nation's General Assembly (UNGA) declared 2023 as International Year of Millets on 5th March, 2021. As a mission Government of India is aspiring to make it a peoples' movement so that the Indian millets, recipes, value added products are accepted globally (Ministry of Agriculture & Farmers Welfare, IYoM- 2023).

References: References for this chapter is given in Annexure 1

Chapter 3

Millets in Odisha and North Karnataka

Millets are rain fed crops and are grown in regions with low rainfall and thus resume greater importance for sustained agriculture and food security. Based on area grown and its grain size the millets are classified as major millet and minor millets. The major millets include sorghum (jowar), pearl millet (bajra) and finger millet (ragi/mandua), minor millets include foxtail millet (kangni/Italian millet), little millet (kutki), kodo millet, barnyard millet (sawan/jhangora), proso millet (cheena/common millet), and brown top millet (korale).

3.1. North Karnataka Millets and District Selection

Karnataka has a long history of growing millets as a traditional crop. The current government schemes encouraging millet production is an additional boost in millet production in the state. Climatically Karnataka has also faced consecutive drought years in recent years. Millets being a crop that require less water suitable and thus suitable for arid regions having low input cost is an ideal crop for this region. Millets can also be used for fodder. The nutritional value also makes it a good dietary requirement to be included which is rich in fiber, iron, vitamins and minerals. Below tables show the data for different millets in area of production and production in tonnes (Source: <http://aps.dac.gov.in/>). The districts that fall under North Karnataka region are highlighted in each table for easy identification of the intended selection of study area for this particular project scope,

Table 2. Pearl Millet Area and Production in Karnataka Districts

Crop: Bajra (Pearl Millet)		
District	Area (Ha)	Production (Tonnes)
KOPPAL	106684	90789
BAGALKOTE	41952	69333
RAICHUR	57465	65268
BALLARI	32537	48423
VIJAYAPURA	50103	31379
BELAGAVI	19150	20832
YADAGIRI	12872	18855
KALABURAGI	7545	12696
GADAG	3042	2099
CHAMARAJANAGARA	888	2044
BIDAR	2080	2039
CHITRADURGA	3013	1901
DAVANGERE	754	566
CHIKKABALLAPURA	207	224
KOLAR	127	137
HASSAN	92	99
TUMAKURU	184	95

DHARWAD	75	82
HAVERI	67	72
CHIKKAMAGALURU	25	27
BENGALURU URBAN	18	19
MYSURU	17	18
UDUPI	14	15
MANDYA	11	12
SHIVAMOGGA	5	5
RAMANAGARA	4	4
UTTARA KANNADA	4	4

Table 3. Sorghum Millet Area and Production in Karnataka Districts

Crop: Jowar (Sorghum)		
District	Area (Ha)	Production (Tonnes)
BELAGAVI	143616	157244
KALABURAGI	100482	134829
RAICHUR	69420	131760
BAGALKOTE	76673	108768
BALLARI	34556	82310
VIJAYAPURA	104009	72804
GADAG	64026	53281
BIDAR	47577	47556
HAVERI	50770	34953
DHARWAD	39433	34377
KOPPAL	41466	32259
YADAGIRI	20114	31894
CHAMARAJANAGARA	28587	27916
HASSAN	16426	16201
CHITRADURGA	16211	14325
CHIKKABALLAPURA	10737	14058
TUMAKURU	9084	11891
MYSURU	18756	10524
DAVANGERE	4304	6653
BANGALORE RURAL	3446	4530
MANDYA	3485	4463
RAMANAGARA	2772	3681
KOLAR	2711	3519
BENGALURU URBAN	2008	2636
CHIKKAMAGALURU	2238	1832
UTTARA KANNADA	384	456
SHIVAMOGGA	337	451

Table 4. Finger Millet Area and Production in Karnataka Districts

Crop: Ragi (Finger Millet)		
District	Area (Ha)	Production (Tonnes)
TUMAKURU	143998	233250
RAMANAGARA	57709	133647
HASSAN	76389	121088
KOLAR	60591	119140

BANGALORE RURAL	46685	101562
CHIKKABALLAPURA	45808	92922
MYSURU	57350	82857
MANDYA	47991	73034
CHITRADURGA	46462	68583
CHIKKAMAGALURU	34222	44642
BENGALURU URBAN	18764	38175
BALLARI	19741	25088
DAVANGERE	9422	13557
CHAMARAJANAGARA	5610	10895
BELAGAVI	1112	1332
SHIVAMOGGA	529	835
HAVERI	339	340
VIJAYAPURA	199	318
RAICHUR	136	218
BAGALKOTE	122	188
KOPPAL	112	184
DHARWAD	108	170
KALABURAGI	105	169
GADAG	86	140
BIDAR	60	97
YADAGIRI	21	32
UTTARA KANNADA	21	31

Table 5. Small Millet Area and Production in Karnataka Districts

Crop: Small Millets		
District	Area (Ha)	Production (Tonnes)
CHITRADURGA	20343	21170
BALLARI	8351	3858
TUMAKURU	7428	3839
CHIKKAMAGALURU	1865	2301
KOPPAL	4762	1749
KOLAR	592	828
BELAGAVI	1628	734
RAICHUR	1510	569
HAVERI	656	525
VIJAYAPURA	1244	480
DHARWAD	561	467
HASSAN	762	414
BAGALKOTE	463	180
GADAG	320	172
DAVANGERE	521	170
CHIKKABALLAPURA	272	141
MYSURU	190	101
KALABURAGI	218	86
BIDAR	190	78
YADAGIRI	167	72
CHAMARAJANAGARA	106	54
MANDYA	56	24
RAMANAGARA	55	24
BENGALURU URBAN	47	19

BANGALORE RURAL	25	14
DAKSHINA KANNADA	26	10
SHIVAMOGGA	11	6

The above data (Source: <http://aps.dac.gov.in/>) in area and production of millets was analysed for the selection of districts and the type of millet for the study. The discussion and consultation with Selco team including the regional field inputs were done to arrive at the district selection. As we can see from the data that major districts of Millet production are Koppal, Vijayapura , Belagavi , Gadag, Koppal, Ballari , etc. The main millets that are grown in large acreage and high production is Jowar and Ragi. Apart from these Foxtail and Little millet are also grown in higher volumes.

The table below gives the identified districts and blocks in North Karnataka for the scope of this study. The Partner NGOs and the Farmer Producer Companies (FPCs) are also identified. The Millets that are cultivated in these particular districts are obtained from the primary data with the percentage of farmers that are growing particular millets. The percentages indicate the proportion of that particular millet cultivated in the study area (as per primary survey), only the millets that are majorly grown (with higher percentage of farmers growing it) are mentioned to get an understanding of the millets to be focussed on for that particular block.

Table 6. Selected Districts of North Karnataka for this study

State	Identified Districts	Identified Blocks	Partner	FPC	Millets cultivated (Primary data, % of farmers)
Karnataka	1. Koppal	Koppal	SKDRDP (Shri Kshethra Dharmasthala Rural Development Project)	Koppala Siri Farmers Producer company	Pearl Millet (Bajra)- 44% Kodo (Arka)- 28% Foxtail (Navane)- 28%
	2. Gadag	Mundargi	SCODWES (Sahyadri Community Development and Women Empowerment society)	Chandanavana Farmers Producer company Limited	Foxtail (Navane)- 50% Brown Top (Korale)- 22%
		Laxmeshwara	SCODWES (Sahyadri Community Development and Women	Laxmeshwara Farmer Producer Company Limited	Pearl Millet (Bajra)- 16%

			Empowerment society)		
	3. Chitradurga	Hoshdurg	SKDRDP (Shri Kshethra Dharmasthala Rural Development Project)	Durgada Millet farmer producing company	Finger Millet (Ragi)- more than 90%
Source: Primary Survey Data					

3.2. Odisha Millet and District Selection

The cultivation of millet is part of traditional culture of Odisha and recently the Gov. Initiatives including the procurement of Ragi is going on for Odisha Millet Mission (OMM) very efficiently. Organic cultivation of millet is practiced in most regions of the state with minimal use of chemical fertilizers or pesticides. The adoption of new techniques like System of Millet Intensification (SMI), Line transplant (LT), Line Sowing (LS) and to boost production capacity is a way of adding new scientific knowhow to the traditional systems. Millet cultivation is not resource intensive and different varieties of millets is promoting diversity of tastes and nutritional value. Below tables show the data for different millets in area of production and production in tonnes (Source: <http://aps.dac.gov.in/>).

Table 7. Pearl Millet Area and Production in Odisha Districts

Crop: Bajra (Pearl Millet)		
District	Area (Ha)	Production (Tonnes)
GAJAPATI	990	630
RAYAGADA	250	140
KORAPUT	200	130
GANJAM	110	70
NUAPADA	110	60
KANDHAMAL	70	40
KALAHANDI	60	40
MALKANGIRI	60	30
KENDUJHAR	10	10
SUNDARGARH	10	10

Table 8. Sorghum Millet Area and Production in Odisha Districts

Crop: Jowar (Sorghum)		
District	Area (Ha)	Production (Tonnes)
GAJAPATI	1550	980

SUNDARGARH	1270	810
GANJAM	850	520
RAYAGADA	630	420
KORAPUT	540	350
NUAPADA	230	150
MALKANGIRI	140	90
BALANGIR	130	80
KANDHAMAL	110	60
NAYAGARH	100	60
KALAHANDI	90	50
KENDUJHAR	80	50
NABARANGPUR	50	30
DEOGARH	30	20
SAMBALPUR	10	10

Table 9. Finger Millet Area and Production in Odisha Districts

Crop: Ragi (Finger Millet)		
District	Area (Ha)	Production (Tonnes)
KORAPUT	21802	16146.1
RAYAGADA	6347	4979.3
MALKANGIRI	2839	2342.1
GAJAPATI	1156	964.8
KALAHANDI	1058	492.5
GANJAM	495	420.1
NABARANGPUR	1312	410.2
MAYURBHANJ	149	105.7
SUNDARGARH	20	12.8
KENDUJHAR	3	0.8

Table 10. Small Millet Area and Production in Odisha Districts

Crop: Small Millets		
District	Area (Ha)	Production (Tonnes)
KORAPUT	12810	6650
RAYAGADA	5430	2820
NUAPADA	4210	2170
SUNDARGARH	2140	1100
KALAHANDI	1640	870
GAJAPATI	1550	810
GANJAM	1460	770
BALANGIR	1020	530
KANDHAMAL	860	450
MALKANGIRI	890	410
NABARANGPUR	290	130
MAYURBHANJ	210	100
NAYAGARH	200	100
DHENKANAL	90	50
KENDUJHAR	40	20
BOUDH	30	10

The above data (Source: <http://aps.dac.gov.in/>) in area and production of millets was analysed for the selection of districts and the type of millet for the study. The discussion and consultation with Selco team including the regional field inputs were done to arrive at the district selection. As we can see from the data that major districts of Millet production are Koraput, Rayagada, Kalahandi. The main millets that are grown in large acreage and high production is Ragi and small millets.

The below table shows the districts and blocks that were identified for the scope of this study. The primary survey that was done in the study region helped us identify the millets that are grown in the particular region and the percentage of farmers that are growing it. The Partner NGOs and the Farmer Producer Companies (FPCs) are also identified in consultation with Selco Foundation Teams.

Table 11. Selected Districts of Odisha for this study

State	Identified Districts	Identified Blocks	Partner NGO	FPC	Millets cultivated (Primary data, % of farmers)
Odisha	1. Kalahandi	Lanjigarh	Janasahajya	Anchalika Farmer Producer company	Major: Ragi- 84% Minor: Kosla-Little Millet- 7% Gurji- 3%
	2. Koraput	Baipariguda	CYSD	Sabujima Farmer Producer company Ltd	Major: Ragi- 80% Minor: Suan-Little Millet- 5%
Source: Primary Survey Data					

District: Gadag

Gadag district in the Karnataka State of India has a total area of 4,657 km². This includes 4,386.56 km² of rural area and urban area of 270.44 km². As per 2011 census, 64.37 % population of Gadag district lives in rural areas. The total population of Gadag living in rural areas is 685,261 of which the male population is 347,585 and female population is 337,676. The sex ratio in rural areas of Gadag district is 971 females per 1000 males. The child sex ratio data of Gadag district is 946 girls per 1000 boys. Literacy rate in rural areas of Gadag district is 71.86 % as per census data 2011. Gender wise literacy rates show male and female literacy of 82.83 and 60.62 percent respectively. Total of 429,673 people were literate of which 250,701 were male and 178,972 were female (Census 2011).

Major Crops:

in terms of acreage the major crops in Gadag district are Gram (1,18,774 hectares), Moong (Green Gram) 96,267 hectare, Maize (78,806 hectares). Jowar is the millet with comparatively higher acreage (64,026 hectare) but other Millets occupy a much smaller acreage like Bajra (3042 hectare) and Ragi (86 hectare). (Source: Ministry of Agriculture and Farmers Welfare, Government of India, Year- 2019-20)

Irrigation:

Barring north and north western part of the district which is irrigated by canals, the district depends largely on ground water recourse for irrigation. Nargund and Ron are covered by canal irrigation from Malaprabha project situated in the adjoining district. The net irrigated area to the net area sown is 19%. (Source: <https://gadag.nic.in/en/about-district/>)

Block: Mundargi

Total area of Mundargi block is 891 km² according to Census,2011 data. This includes 884.36 km² of rural area and 6.64 km² of urban area. The population of Mundargi is of 1,31,897 peoples, in which the urban population is 24,919 and the rural population is 1,06,978. Mundargi's population density is of 148 inhabitants per square kilometre.

62.71% population of Mundargi is literate, Male literacy rate is of 71.19% males and 54.00% is the female literacy rate. The number of villages in Mundargi block is about 58. (Census 2011)

District: Koppal

In Koppal 83.19 % population lives in rural areas according to 2011 census data. The rural population of Koppal district is 1,156,216 of which males and females are 582,958 and 573,258 respectively. The sex ratio in rural Koppal is 983 females per 1000 males. The child sex ratio of Koppal district is 955 girls per 1000 boys. The Literacy rate in rural areas Koppal district is 66.05 % as per census data 2011. Gender wise, male and female literacy stood at 77.12 and 54.85 percent

respectively. In absolute figures, 651,001 people were literate of which males and females were 382,270 and 268,731 respectively.

Major Crops:

in terms of acreage the major crops in Koppal district are Bajra (1,06,684 hectares), Rice (1,00,376 hectare), Gram (71,131 hectares). Jowar is the millet with comparatively higher acreage (41,466 hectare) but other Millets occupy a much smaller acreage like Ragi (112 hectare). (Source: Ministry of Agriculture and Farmers Welfare, Government of India, Year- 2019-20)

Irrigation:

Koppal district has facility for irrigation on 56733 ha in kharif season, 4350 ha during rabi season and 40550 ha during summer, in addition to horticultural irrigated area of 6283 ha. This is approximately 26.70% net irrigated area. (Source: <https://pmksy.gov.in/mis/Uploads/2016/20161224054236132-1.pdf>)

Block Koppal:

The area of Koppal block is 1,377 km² in which, 1,361.84 km² comprises of the rural area and 15.16 km² of urban area. The population of Koppal is 3,77,781 peoples, in which urban population is 79,370 while rural population is 2,98,411. The Koppal population density of Koppal is 274 inhabitants per square kilometre.

60.39% population of koppal is literate, in which the male literacy rate is 68.84% and female literacy rate of 51.76%. The number of villages in Koppal district is about 149 (Census, 2011).

District Chitradurga:

80.14 % population of Chitradurga district lives in rural areas. In absolute numbers, in Chitradurga district population living in rural areas is 1,329,923 of which males and females are 675,573 and 654,350 respectively. In rural areas of the district, the sex ratio is 969 females per 1000 males. The child sex ratio of Chitradurga district is 947 girls per 1000 boys. The literacy rate in rural areas of Chitradurga district is 70.68 %. In which the male literacy rate and female literacy rates are 79.19 and 61.91 percent respectively. In absolute numbers, 834,419 people were literate of which males and females were 474,285 and 360,134 respectively.

Major Crops:

in terms of acreage the major crops in Chitradurga district are Groundnut (1,19,091 hectares), Maize (95,494 hectare). In horticulture crops, coconut is grown in 50775 hectares. Ragi is the millet with comparatively higher acreage (46,462 hectare) but other Millets like Bajra (3013 hectare) occupy a much smaller acreage. (Source: Ministry of Agriculture and Farmers Welfare, Government of India, Year- 2019-20)

Irrigation:

Chitradurga district has a net irrigated area of 26.49% which is about 99971 hectares against the net sown area of 377357 hectares. (Source: <https://cdn.s3waas.gov.in/s3a8ecbabae151abacba7dbde04f761c37/uploads/2020/09/2020092591.pdf>)

Block Hoshdurg:

The total area of Hoshdurg Block is 1,438 km², comprising of 1,432.74 km² of rural area and 5.26 km² of urban area. The population of Hoshdurg is 2,35,116 peoples, where urban population is 28,370 while rural population is 2,06,746. The population density of Hoshdurg is 164 inhabitants per square kilometre.

65.71% population of Hoshdurg is literate, in which 72.29% is the male literacy and 58.95% is the female literacy. The number of villages in Hoshdurg Block is about 125.

4.2. Odisha Selected District and Block Profile

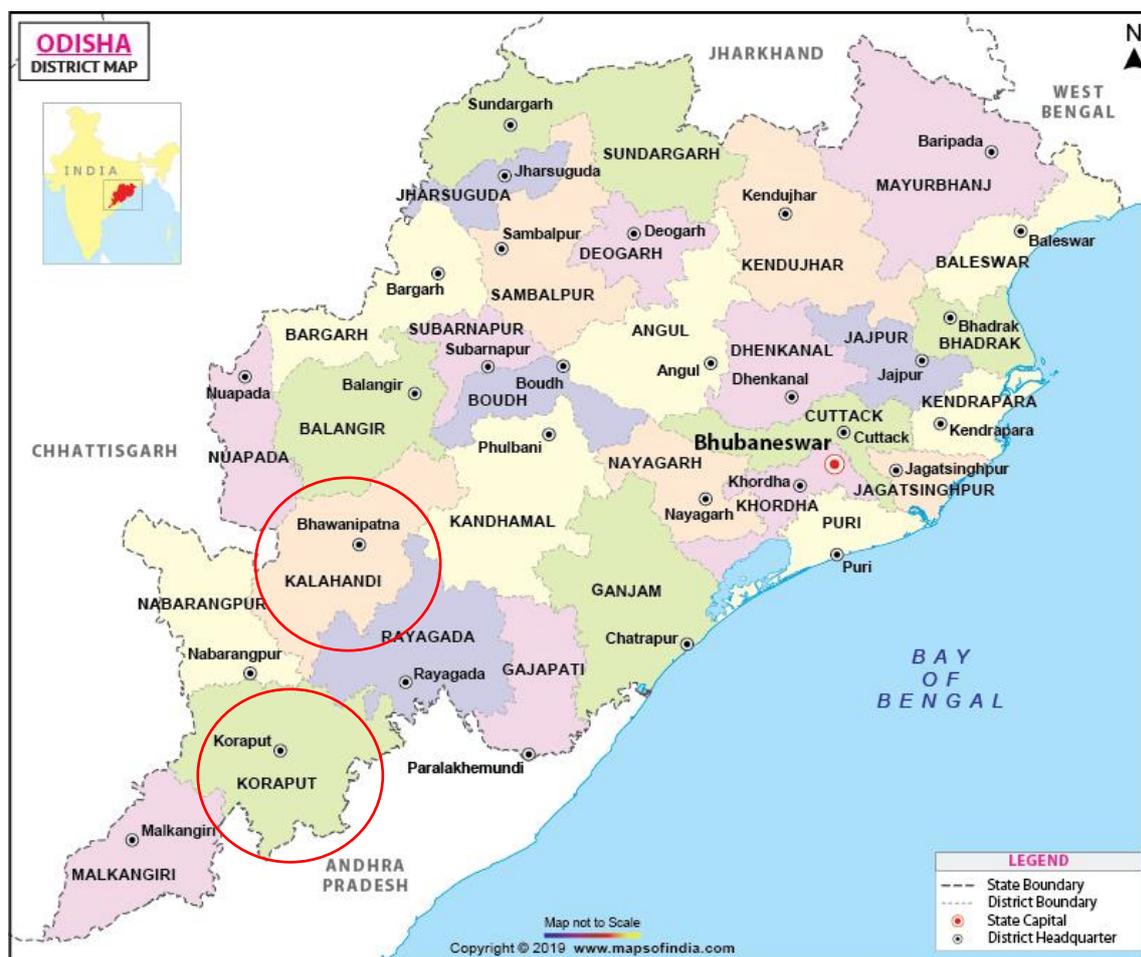


Figure 2. Districts and Blocks of Odisha Study Area

District Kalahandi

92.26 % population of Kalahandi district lives in rural areas of villages. The total population living in rural areas is 1,454,882, in which the number of males and females are 724,646 and 730,236 respectively. In rural Kalahandi, the sex ratio is 1008 females per 1000 males. The child sex ratio of Kalahandi district is 959 girls per 1000 boys. Literacy rate of rural Kalahandi district is 57.28 % as per census data 2011. Male and female literacy rates are 70.43 and 44.34 percent respectively. In absolute numbers, 713,762 people were literate of which literate males and females were 435,330 and 278,432 respectively.

Major Crops:

In terms of acreage the major crops in Kalahandi district are Rice (2,12,420 hectares), Cotton (59,800 hectares). Pulses like Arhar (19,350 hectare) and Moong (Green Gram) 16,817 hectare is also cultivated. Millets like Ragi (1058 hectare), Small millets (1640 hectare) is grown. (Source: Ministry of Agriculture and Farmers Welfare, Government of India, Year- 2019-20)

Irrigation:

The total cropped area in Kalahandi was 5.98 lakh hectares and the irrigated area is around 2 lakh hectares which amounts to 33.4% land under irrigation. The major source of water in agriculture is being used for cultivation of cereals like paddy and maize (Source: <http://www.dowrodisha.gov.in/DIP/2015-20/kalahandi.pdf>)

Block Lanjigarh:

Lanjigarh is a CD Block in Kalahandi District of Odisha. According to census 2011 information, total area of Lanjigarh Block is 434 km². Lanjigarh has a population of 47,451 peoples. The population density is 109.4 inhabitants per square kilometre.

36.85% population of Lanjigarh is literate, in which the male literacy rate is 48.43% and 25.43% is the female literacy rate. The number of villages are about 222 in Lanjigarh.

District Koraput

83.61 % population of Koraput district lives in rural areas. The total Koraput district population living in rural areas is 1,153,478. The male population is 563,771 and female population is 589,707. In rural Koraput, the sex ratio is 1046 females per 1000 males. The child sex ratio of Koraput district is 984 girls per 1000 boys. The literacy rate in rural Koraput district is 42.37 % in which the male literacy rate and female literacy rates are 54.14 and 31.26 percent respectively. In absolute numbers, 404,425 people were literate in which males and females were 250,926 and 153,499 respectively.

Major Crops:

In terms of acreage the major crop in Koraput district is Rice (1,25,630 hectares). Millets also occupy a large percentage of sown area with Ragi (21,802 hectares) and small millets (12,810 hectare). (Source: Ministry of Agriculture and Farmers Welfare, Government of India, Year- 2019-20)

Irrigation:

The official net sown area of Koraput ranges around 25% of the total area of the region, and is concentrated in plateaus and the wide river valleys. In the hilly areas, permanently cultivated areas can be as low as 10% of the landscape. 33% of cultivated area is irrigated. (Source: Odisha University of Agriculture and Technology)

Block Baipariguda:

The Baipariguda Block (CD) has a total area is 1,280 km². Baipariguda Block has a population of 1,25,337 peoples. The population density is 97.9 inhabitants per square kilometre. 31.00% population of Baipariguda is literate, in which 39.46% is the male literacy and 22.93% is the female literacy. There are about 306 villages in Baipariguda.

Chapter 5

Commodity: Major Millet- Finger Millet (Ragi)

Millets are one of the oldest foods known to humans & possibly the first among cereal grains to be cultivated for domestic purposes. Millets are small-seeded grasses that are hardy and grow well in dry zones as rain-fed crops, under marginal conditions of soil fertility and moisture. Millets are also unique due to their short growing season.

Following India's proposal to the Food and Agriculture Organization, 2023 will be observed as the 'International Year of Millets'.

Finger Millet (*Eleusine coracana*) is an important primary food especially for the rural populations of Southern India and East & Central Africa. The value chain of Finger Millet is studied in detail for this project in the context of mainly the Odisha region, as elaborated in the previous chapter on the selection of Finger Millet for this region of the study area.

Flow of the millet from production to processing until it reaches the end consumer

Value chain of Ragi (Finger Millet)

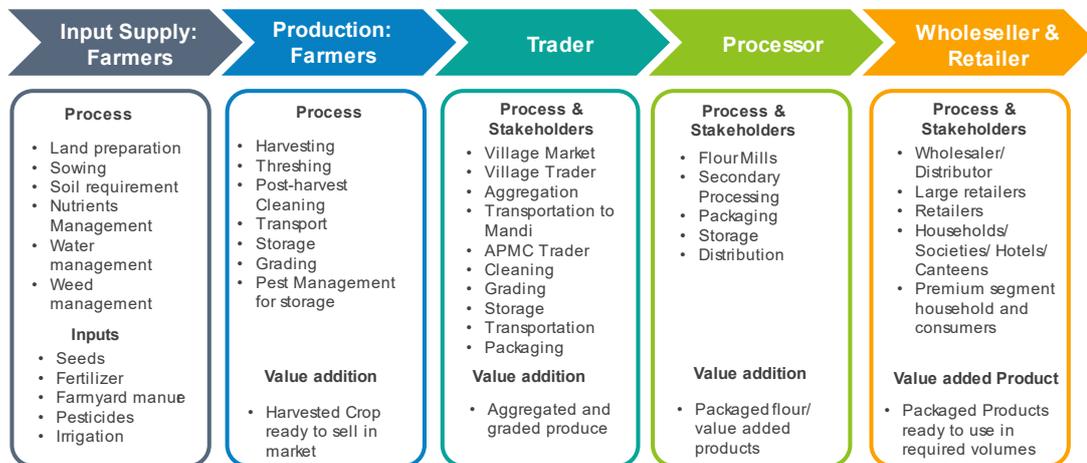


Figure 3. The value chain key players and the processes involved at each stage for Ragi (Finger Millet)

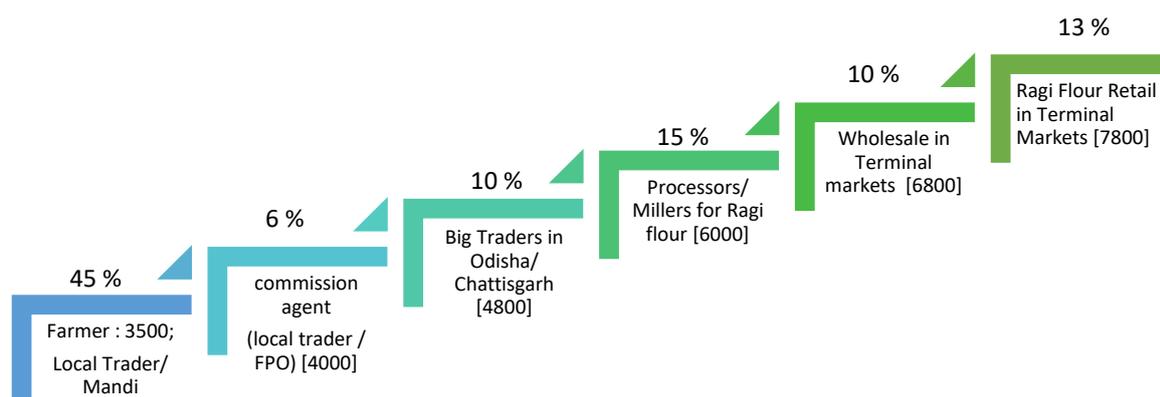


Figure 4. Nodes of the value chain with prices at each stage for Ragi Flour, % are share in retail price. Data Source: Primary survey data

The Cluster-specific scenario - Odisha and North Karnataka

Table 12. Total Arrival of Ragi in different major markets of Karnataka and Odisha (FY 2022-23)

Crop	State	District	Market	Arrivals (MT)
Ragi	Karnataka	Chitradurga	Hosadurga	4270
		Gadag	Gadag	1
		Koppal	Gangavathi	13
	Odisha	Rayagada	Gunpur	111
			Rayagada(Muniguda)	62.3

Source: Agmarknet.gov.in

The market price trends are plotted for Finger millet. The data availability of market prices is limited in Odisha. For Karnataka the price trend data shows that the average varied between Rs. 2000 per Quintal to 2500 per quintal. There are market fluctuations based on arrivals and demand and climatic scenarios along with market trends of the global trading of the commodity. The trend for Odisha is difficult to arrive at due to unavailability of reliable market data. Ragi mandis being the major channels for procurement from farmers, facilitated by OMM, which is discussed later in the subsequent sections of this study.

Note: in Figure 4, the value chain for Ragi is shown when the product moves from farmer to retail market. The MSP procurement is not shown in this diagram, where the Ragi after procurement moves to PDS for free distribution.

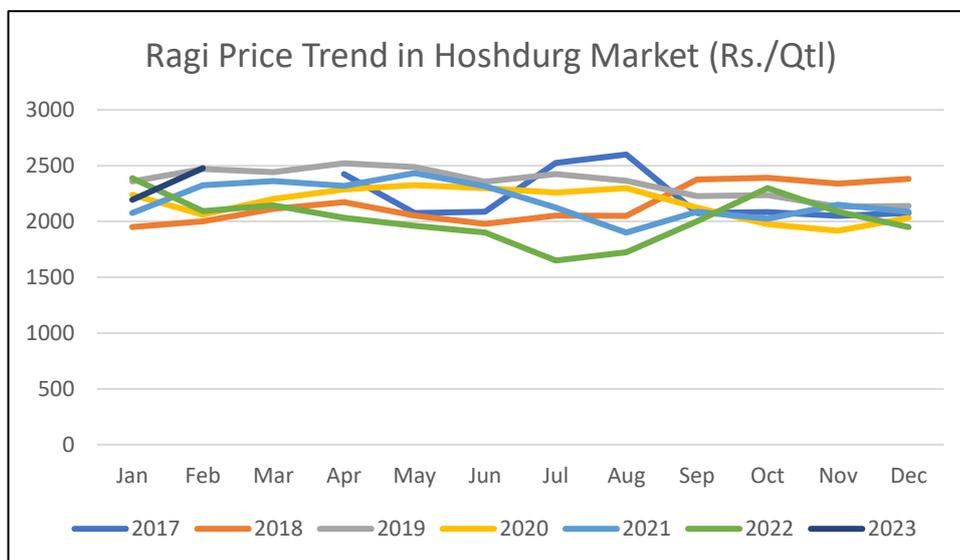


Figure 5. Market data for Ragi in Karnataka

5.1. Ecosystem mapping of Ragi in Odisha

Farmers: The Ragi crop is grown by farmers in the tribal regions in the state and by small and marginal farmers. The crop is grown in a very less resource intensive way. There is lack of irrigation facilities and the crop is mostly rainfed. The input of seeds is often got locally from FPOs or saved from last year's produce. Fertilizers are not used and the crop is grown in a traditionally organic way. In some areas the FPO/ NGO partner have facilitated the training of organic fertilizer manufacture at farm level which is used for the crop. The land is often prepared in a traditional way of ploughing the fields with bullocks as tractor is not easily available.

Gov incentives: Odisha Millet Mission (OMM): OMM aims to revive millets on farms and plates with simultaneous focus on Production, Processing, Consumption, Marketing, and Inclusion of Millets in Government schemes.

The program is to address the issues of food and nutrition security through the promotion of native millets. The major objectives of the Odisha Millets Mission (OMM) are increasing household consumption, setting up decentralized processing units at block level, increasing productivity of millets crops through improved agronomic practices, conservation and promotion of local landraces, better marketing of millets through farmer producer organizations and inclusion of millets in ICDS, MDM and PDS.

Capacity Building: the training of farmers is done by partner NGOs in seed treatment, soil preparation, organic fertilizer/ compost preparation, seedbed preparation. The SMI (System of Millet intensification), Line sowing (LS), Line Transplanting (LT), trainings are done also as a part of Gov. incentive schemes.

Technology use/ Processing Needs: the machinery used at different stages are

- Cultivation: Tractor, Weeder, sprayer
- Post- Harvest: **Thresher** is required in this stage and is often provided to the farmers through FPOs/ Partner NGOs.
- Processing: **Destoner, Grader:** Destoning and grading is done as part of the cleaning process for millets. This process of destoning and grading also becomes essential for procurement of Ragi by the Government channels, at the fixed MSP for that year. It is essential to maintain the FAQ norms for this procurement at MSP. The destoning and grading are done for meeting this specified FAQ. The machinery used for this is often electricity operated and generally capable of doing both the processes of destoning and grading operations in the same machine.
- Value Addition: **Pulveriser** is used when the Ragi is to be processed into Ragi flour. The pulverisers can be electricity or solar operated. The micro processing units with small pulverizing capacities are also in use (approx. 5kg/30 mins, 2 HP processing units).

Market Linkages and Ownership Models:

Cultivator and Aggregator: The Ragi crop in Odisha is usually procured by the Gov. at Minimum Support Price (MSP) conforming to Fair Average Quality (FAQ) norms. This is to facilitate promotion of millet production in a sustainable manner through assured market support. The Quantity to be procured is capped at 5 quintals per Hectare (2 Quintals per Acre) as per OMM, but it was observed that (in primary survey), the FPOs procure up to 10 quintals of ragi per farmer to meet the target supply for PDS. This is advantageous for farmers as the available quantity of Ragi for selling, after self-consumption, is completely sold at MSP to the FPO.

Individual willing to sell Ragi has to register by submitting their personal, land and bank account details as per the pre-designed registration form available online under M-pAS portal at respective Primary Agriculture Cooperative Societies (PACS) / Large Area Multi-purpose Cooperative Societies (LAMPCS) / Farmer Producer Organisation (FPO) / Self Help Group Federation (SHG Federation).

The PACS/ LAMPCS/ FPO/ SHG Federation encourage small and marginal farmers to register themselves for Ragi procurement and will digitize farmers' applications for registration in the online Millet-Procurement Automation System (M-PAS) portal.

Procurement through Gov Agencies:

The detailed quality specification of Ragi as laid down by the Government of India is followed for the State FAQ (Fair Average Quality). Farmers training on FAQ and awareness is done by facilitated by FPO/ SHG. Moisture meters are provided beforehand at the agencies for maintaining the quality.

TDCCOL is the State Procurement Agency for Ragi. Thus, the TDCCOL procures Ragi with the support of PACS / LAMPCS / FPO / SHG Federation as per FAQ specification. TDCCOL procures Ragi in all the blocks under Odisha Millets Mission and other potential Ragi growing blocks of 15 identified districts namely Angul, Bargarh, Bolangir, Ganjam, Keonjhar, Sundergarh, Nabarangpur, Mayurbhanj, Malkangiri, Rayagada, Gajapati, Nuapada, Kalahandi, Kandhamal and Koraput.

Minimum Support Price of Ragi (MSP): The Government of India had announced the minimum support price for Ragi at Rs.3578.00 (Rupees Three Thousand Three Hundred Seventy-Seven) only per quintal conforming to Fair Average Quality (FAQ) norms for KMS 2022-23 (Ministry of Agriculture & Farmers Welfare, GoI). This is revised for every year of Kharif Crops. The State Govt. had set a target of 6,00,000 (Six lakh quintals) quintals for KMS-2022-23 for 19 Ragi growing districts.

Procurement Period: Ragi (Kharif Crop) will be procured from 15th November 2022 to March 2023 which is extended if necessary.

Jurisdiction of the PACS/LAMPCS/ FPO/ SHG/ Federations: Each of the PACS / LAMPCS/ FPO/ SHG Federation selected may have one or more designated place for procuring Ragi.

Location of Ragi Procurement Centres (Mandis): Ragi Procurement Centres (Mandi points) are ideally within 5 km of production clusters.

Payment of farmers: Payment of cost of Ragi at MSP is made to the accounts of the farmers through online bank transfer within 3 days.

Table 13. Procurement of Ragi by OMM

Year	Total Districts	Quantity Procured	Value	Farmers Involved
2021-22	15	323019 Qtl	Rs. 10908 Lakh	41286
2020-21	14	203844 Qtl	Rs. 6717 Lakh	24941
2019-20	14	94745 Qtl	Rs. 2983 Lakh	20328
2018-19	8	17986 Qtl	Rs. 521 Lakh	5740
Source: OMM				

Table 14. Ragi in Public Distribution System (PDS)

Year	Districts Covered	Quantity of Supply (in Quintals)	Card Holders Benefited
2021-22	14	402500.85	11376521.00
2020-21	14	92219.56	5060460.00
2019-20	7	17500.31	1601206.00
Source: OMM			

Other Marketing Channels: The ragi that is surplus is sold to local traders in the region. The ragi crop is then cleaned and graded and further processed into different value-added products for the consumers in the retail market. The SHGs often play a part in value added product making like Laddos, biscuits, snacks, etc. the marketing channels for these products are exhibitions and fairs in Bhubaneshwar or district headquarters. The retail outlets are also there for some partner NGOs like Janasajya in Bhawanipatna. The pulverized ragi is the ragi flour that is packaged and sold through retail outlets. Some local brands are also there like Ruchi who are producing the value added products.

Specification for FAQ Ragi

The Ragi shall be dried and matured grains of *Eleusine coracana*. It shall have uniform size, shape and colour. It shall be in sound merchantable condition and also conforming to PFA standards. (Note: This is the language specified by Warehousing Development and Regulatory Authority Department of Food and Public Distribution, Government of India)

Ragi shall be sweet, hard, clean, wholesome and free from moulds, weevils, obnoxious smell, *Argemone mexicana* and *Lathyrus sativus* (Khesari) in any form, colouring matter, admixture of deleterious substances and all other impurities except to the extent indicated in the schedule below:

Table 15. Schedule Of Specification

S.No	Refractions	Maximum Limits(%)
1	Foreign matter*	1.0
2	Other foodgrains	1.0
3	Damaged grains	1.0
4	Slightly damaged grains.	2.0
5	Moisture content	12.0

1. Not more than 0.25% by weight shall be mineral matter and not more than 0.10% by weight shall be impurities of animal origin.

5.2. Diagnostic Study of Identified FPO: Kalahandi District for Supply Estimation

Background of FPO:

Company and member information: Anchalika Agri Producer Company LTD., is located in Lanjigarh Block of Kalahandi district of Odisha having 943 members in 53 village. The FPO was incorporated on 18th May 2016. The paid-up capital of the FPO is Rs.100000.00 (Rupees one Lakh only). The

authorized share capital of the company is Rs.1000000/- (Rupees ten lakh only). Divided in to 10000 (Ten thousand) equity shares of Rs.100/- (Rupees one Hundred only). The FPO has leased land of about 5 acres for 15 years at Rs. 2500 per year with a paid advance of Rs.5000. The members of the FPO have a combined acreage of 2015.1 acres in 6 Gram Panchayats of Bandhapari, Bedagaon, Kankutru, Kumkhal, Lanjee and M.Rampur . The board of the FPO constitute of 10 directors and a full time CEO. The POPI is Janasahajya with its secretary Sita Devi as the contact person for this project.

Table 16. Organizational information of the FPO

Sr. No	Particulars	Details
1	Name of FPO	ANCHALIKA AGRI PRODUCER COMPANY LTD., LANJIGARH
2	Address	At – Bandhapari, Via – Biswanathpur, Block – Lanjigarh Dist. – Kalahandi Odisha, INDIA PIN - 766020
3	Name of POPI	JANASAHAJYA
4	Registration (Incorporation date/ year)	18.05.2016
5	Number of Primary Producers / Farmers (Membership Size)	943

The agronomic practices that are incentivized by the Odisha government under the Odisha Millet Mission (OMM) are followed by Anchalika Agri PCL, like System of Millet Intensification (SMI), line transplanting (LT), line sowing (LS) and intercropping of ragi with mung.

The FPO serves as a facilitator for millet (Ragi) procurement and awareness building activities for promotion of millets. The Gov. incentivises the methods to increase productivity of millets, for The System of Millet Intensification (SMI) farmer receives Rs. 10,000 per hectare, for Line Transplanting (LT) and Line Sowing (LS) methods Rs. 7500 per hectare is given to farmers. This incentives are given for the first 3 years of millet cultivation to the farmers.

It is seen from the table below that for the FPO the targeted area under millet cultivation and the acreage achieved under millets has been increasing every year from 2017 till date. The number of farmers has also grown starting from 36 farmers in 2017-18 to 3051 in 2021-22. The types of incentivised systems for increasing the productivity and the number of farmers practicing these good practices shows that farmers are increasingly adopting these practices. It is clear from the data that, the generation of awareness about cultivating millets has been rising steadily. There is a

potential to grow further with interventions targeted around processing and market linkage, which will also encourage farmers to bring more land under millet cultivation.

Table 17. Year-wise crop coverage of the farmers under the FPO

Year	Area Target (in ha.)		Area Achievement (in ha.)		Total Farmers in Nos	
2017-18	Kharif (Ragi)	30.00	Kharif (Ragi)	8.80	28	
	Rabi (Ragi)	15.00	Rabi (Ragi)	3.20	8	
	Total	45.00		12.00	36	
2018-19	Kharif	150.00	Kharif (Little Millet)	131.40	254	
	G.Total	195.00		143.40	290	
	Kharif (Ragi) & Little Millet	471.30	Kharif (Ragi)	131.30	497	
			Kharif (Little Millet)	145.40	246	
	G.Total	471.30		276.70	743	
2019-20	SMI	199.40	SMI	48.40	135	
	Line Transplanting	150.00	Line Transplanting Ragi	106.60	429	
	Line Sowing	252.80	Line Sowing Ragi	46.80	183	
	Intercropping	135.00	Intercropping (Ragi + Mung)	63.60	117	
			Foxtail Millet	13.40	17	
			Sorghum	4.80	8	
			Little Millet	134.80	418	
		G.Total	737.20		418.40	1307
	Year	Area Target (in ha.)		Area Achievement (in ha.)		Total Farmers in Nos
	2020-21	Ragi SMI	654.40	Ragi SMI	603.60	1582
Ragi LT		43.00	Ragi LT	27.20	58	
Ragi LS		53.00	Ragi LS	63.80	125	
Total Ragi		750.00	Total Ragi	694.60	1765	
Little Millet		490.00	Little Millet	483.60	858	
Foxtail Millet		10.00	Foxtail Millet	2.60	3	
		G.Total	1250.00	G.Total	1180.80	2626
2021-22	Ragi SMI	730.00	Ragi SMI	721.00	1859	
	Ragi LT	80.00	Ragi LT	80.00	199	
	Ragi LS	70.00	Ragi LS	79.00	134	
	Total Ragi	880.00	Total Ragi	880.00	2192	
	Little Millet	496.00	Little Millet	496.00	836	
	Foxtail Millet	2.00	Foxtail Millet	2.00	3	
	Sorghum Millet	4.00	Sorghum Millet	4.00	6	
	Pearl Millet	4.00	Pearl Millet	4.00	6	
Kodo Millet	4.00	Kodo Millet	4.00	8		

G.Total	1390.00	G.Total	1390.00	3051
Till date Total Millet Crop Coverage			3409.30	8017

Cost Economics for Ragi (Based on Primary Data):

- Cost of cultivation is Rs. 5000-6000/acre. Gov. Incentive of around 7000/acre (1st to 3rd year of cultivation). Effective cost 0/ acre for first 3 years.
- Yield considered as 6 Q/acre
- Income from Ragi per acre = 5 Q * Rs.3578/Q (MSP Procurement) = Rs.17,890;
- 1 quintal kept for self-consumption- not considered in income
- The profit is total of Rs. 17,890/ acre for the first 3 years when getting Gov Incentives.
- Profit per acre = Rs. 17,890 - Rs.5000 (Income – expenses) = Rs.12,890 /Acre. (from 4th year onwards)

The various types of millets that are grown in this region is given in the following section. The data collected is through primary survey facilitated by the partner NGO Janasahajya and FPO Anchalika in Kalahandi.

Ragi (Finger Millet)

- Ragi is mostly grown in large quantities as compared to other millets.
- It is locally called Mandia.
- The variety that is grown extensively is Bada Mandia and Telenga Mandia in Kharif.



Figure 6. Varieties of Ragi in Kalahandi

Kangu (Foxtail Millet)

- The procurement by FPO is low for this millet with only 2-4 Quintals being procured from farmers yearly.
- low capacity of processing and non-availability of market linkage presently.
- processed currently into rice manually by traditional methods.
- FPO does not have any machinery available for dehulling.
- processed into seeds and sold to local farmers on subsidy



Figure 7. Varieties of Foxtail Millet and millet rice and seeds

Little Millet (Kosla/ Kutki/ Gurji)

- This millet is also grown extensively in the villages and is 2nd only to Ragi cultivation in Kharif season.
- This millet is also processed into rice and the seeds are sold to local farmers at subsidized price.
- The processing is all manually done currently.



Figure 8. Varieties of Little Millet (Kosla) and millet rice and seeds

Kodo Millet

- Kodo millet is grown in villages but at smaller quantities
- procurement by the FPO has been only around 2 quintals per year.
- This millet is also processed into rice and seeds, currently done manually.



Figure 9 . Kodo Millet rice and seeds

Pearl Millet (Bajra)

- Pearl millet is not grown extensively and
- only procured by the FPO in small quantity of around 1 quintal yearly for
- processing into seeds to be sold to local farmers.



Figure 10 . Pearl millet varieties and seeds

Sorghum Millet (Jowar)

- sorghum is grown in small quantities
- procured by the FPO mainly for processing into seeds and
- value-added product sorghum popcorn.
- 2-4 quintal per year is the quantity procured.



Figure 11 . Sorghum millet seeds

Value-added Products

- value addition is done after procurement of different types of millets.
- This is done with the help of women SHG members who have been trained by Janasahajya.
- Anganwadi members are also trained by Janasahajya for making different ready to eat food items for children.
- The products are Ragi flour, Laddoo, Dantkili, ragi biscuits, Sorghum popcorn, etc.



Figure 12 . Value-added products that are made from Millets

Chapter 6

Commodity: Small Millets- Foxtail Millet

The small millets comprising five species, namely, little millet (*Panicum sumatrense*), Italian or foxtail millet (*Setaria italica*), barnyard millet (*Echinochloa crusgalli*), proso millet (*Panicum miliaceum*) and kodo millet (*Paspalum scrobiculatum*) are grown in about 2 million ha area in India. These crops are hardy and quite resilient to varied agro-climatic adversities and play important role in marginal agriculture more common

in hilly and semi-arid regions as important source of food grain as well as highly valued fodder. Many kinds of traditional foods and beverages are made from these grains in different regions and hence have important role in the local food culture. Nutritionally, they have high micronutrient content, particularly calcium and iron, high dietary fibre, higher amount of essential amino acids and low glycemic index and thus play an important role in the food and nutritional security of the poor.

Foxtail Millet (*Setaria italica*) grains are very similar to paddy rice in grain structure. They contain an outer husk, which needs to be removed in order to be used. Foxtail millet is fairly tolerant of drought; it can escape some droughts because of early maturity. Due to its quick growth, it can be grown as a short-term catch crop. It is adapted to a wide range of elevations, soils and temperatures it cannot tolerate water logging. The value chain of Foxtail Millet is studied in some detail in this section, mostly contextualized for the North Karnataka study region.

Flow of the millet from production to processing until it reaches the end consumer

Value chain of Foxtail Millet

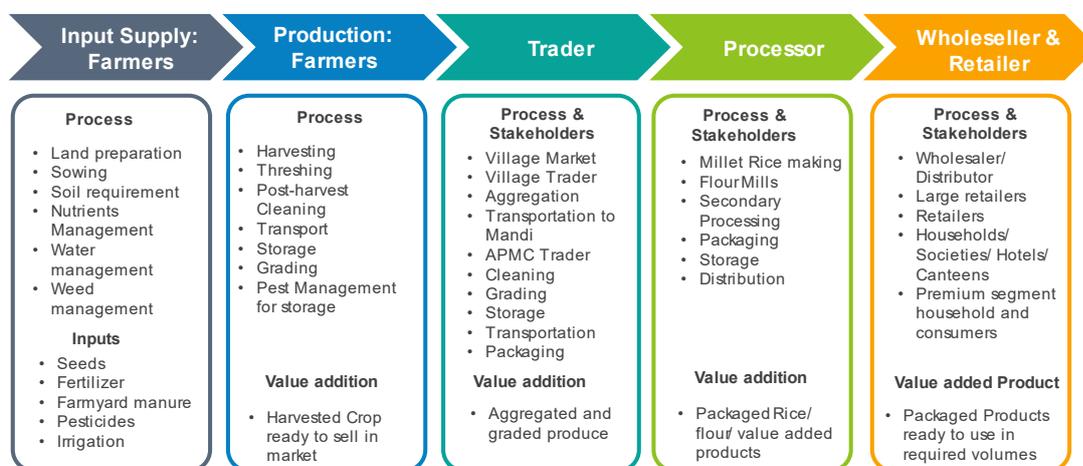


Figure 13. The value chain key players and the processes involved at each stage for Foxtail Millet

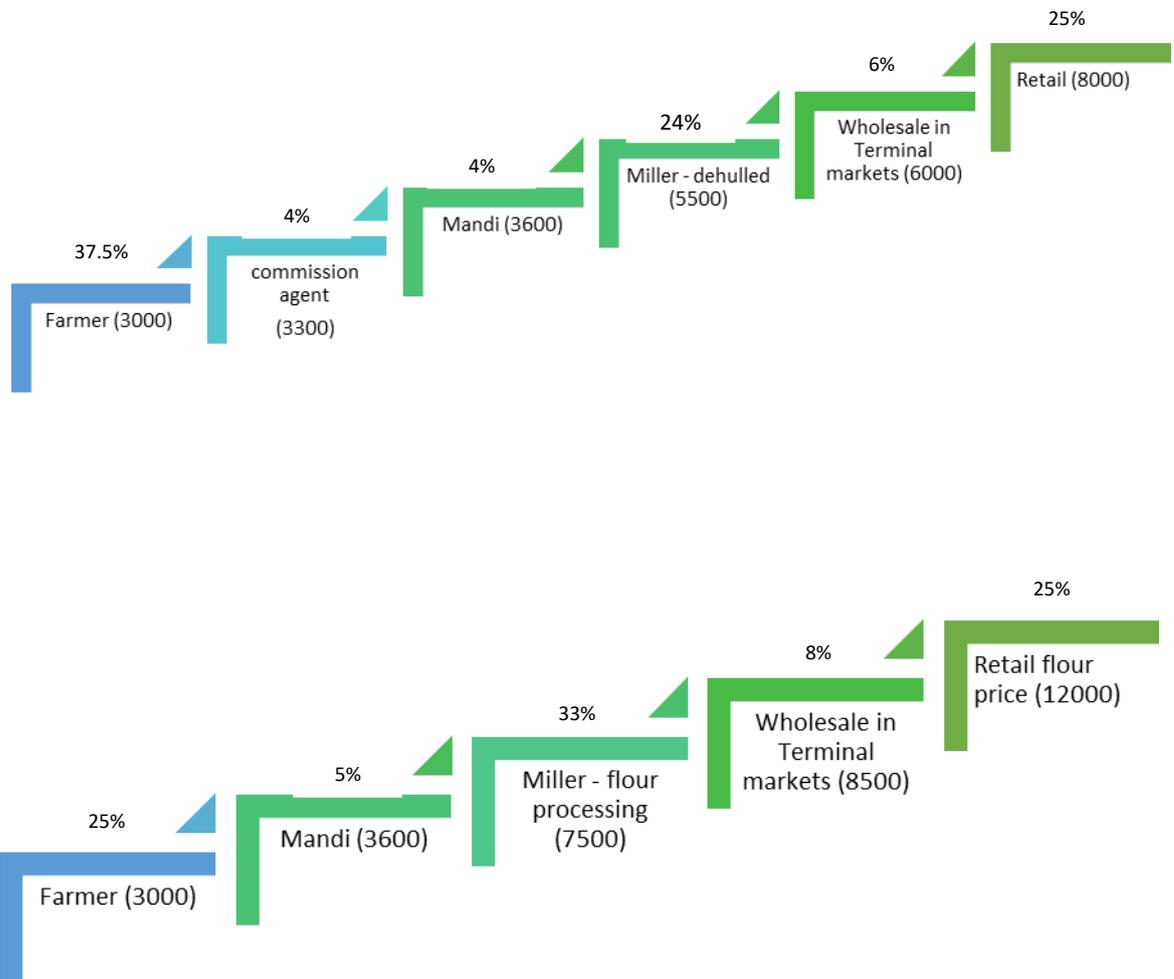


Figure 14 . Nodes of the value chain with prices at each stage for Foxtail Millet and Flour, % are share in retail price.
Source: Primary Survey Data

The above diagrams show the value chain nodes for Foxtail Millet. The millet can be sold as millet rice, which is dehulled form of the grain or it can be processed further into millet flour. In each stage there is a price differentiation and a share of the price is realized by that particular player in the value chain as illustrated in the above two diagrams.

The Cluster-specific scenario - Odisha and North Karnataka

Table 18. Total Arrival of Foxtail Millet in different major markets of Karnataka (FY 2022-23)

Crop	State	District	Market	Arrivals (MT)
Foxtail millet	Karnataka	Chitradurga	Hosadurga	65
		Gadag	Laxmeshwar	4
		Koppal	Gangavathi	490
			Kustagi	841
	Odisha	No Data		

Source: Agmarknet.gov.in

There is variation in the average price of Foxtail Millet which has shown a steady increase from 2018 as evident in the graph below. The average price of Rs.1500 in 2018 increasing to Rs. 2500 in 2022.

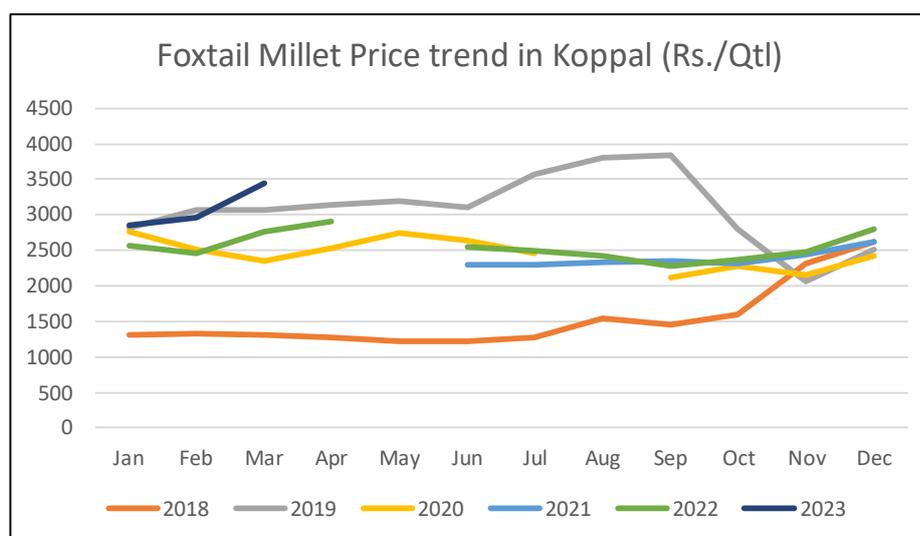


Figure 15. Market data for Foxtail Millet in Kustagi Koppal, Karnataka

6.1. Ecosystem mapping of Foxtail Millet in North Karnataka

Farmers: The crop is mostly grown by small and marginal farmers in the state. The crop is grown in a very less resource intensive way. There is lack of irrigation facilities and the crop is mostly rainfed. the input of seeds is often got locally from FPOs or saved from last year's produce. Fertilizers are not used and the crop is grown in a traditionally organic way. In some areas the FPO/ NGO partner have facilitated the training of organic fertilizer manufacture at farm level which is used for the

crop. The land is often prepared in a traditional way of ploughing the fields with bullocks as tractor is not easily available.

Gov incentives: Initiatives for Millets as “The Food of the Future” (incentive to farmers Rs . 10000/ha for cultivation of Organic farming & millet promotion. Karnataka Raitha Siri Scheme, Karnataka’s state government gave millet producers Rs 10,000 per acre under this plan. This plan provides financial assistance to the farmers and agricultural laborers in Karnataka state. Karnataka state government has allotted 250 crore Rs for agricultural ponds to save water for dry land farmers. This work was done under the state’s Krushi Bhagya Yojana. Organized National and International trade fair for millet promotion. Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme (PMFME), The scheme is a centrally sponsored scheme that is designed to address the challenges faced by the micro-enterprises and to tap the potential of groups and cooperatives in supporting the upgradation and formalization of these enterprises.

Capacity Building: the training of farmers is done by partner NGOs in seed treatment, soil preparation, organic fertilizer/ compost preparation, seedbed preparation.

Technology use/ Processing Needs: the machinery used at different stages are

- Cultivation: Tractor, Weeder, sprayer
- Post- Harvest: **Thresher** is required in this stage and is often provided to the farmers through FPOs/ Partner NGOs.
- Processing: **Destoner, Grader:** Destoning and grading is done as a cleaning process. The destoner and graders are often electricity operated. This is generally one machinery that is capable of doing this function.
- Value Addition: **Dehuller:** Removal of outer husk of grain is done in an electricity operated machine, which creates the product of millet rice. Dehulling ratio is 60:40 depending on quality.
- **Pulveriser** is used when the millet is to be processed into flour. The pulverisers can be electricity or solar operated. The micro processing units with small pulverizer capacities are also in use.

Market Linkages and Ownership Models:

Cultivator and Aggregator: Most of the farmers sell the raw pre-cleaned seeds. Very few processing units are there in Yelburga, Kustiga etc. Dehusking, destoning is the only processing activity. Value addition in Flour form is not practised.

Rate of Raw small millets – Rs. 20-30/Kg. The rate of processed products in flour form is Rs.100-130/Kg. Rate of dehulled and ready to cook millet is Rs. 50-60/kg at farmer level.

Other Marketing Channels:

Koppal: The raw material will go to the processing unit present in Darwad (Siri millet). Progressive farmers go to forward contract with some traders and processors. Most of processing units situated in Haveri, Raichur, Darwad etc.

Apart from Retail stores in Koppal, the commodity is moved to different areas in Bangalore and other cities.

Gadag: There is value addition in Ragi as Ragi Papad but no value addition in small millets. The millet Flour, Idli, Dosa, millet biscuits, Millet Lado etc. are other products that are sold. KVK in Hulikot has processing equipment and a store is also present within KVK named “Ethnic Food Cafe”.

Most of the processing units are situated in Haveri, Raichur, Darwad etc. Retail stores named “Satwik” and “Kamentha kerana” present in Gadag.

Chitradurga: Despite of higher acreage in the district, the availability of processing units is very poor. So, farmers sell the produce directly to APMC. Few processing units in a Mallinalli, Kangolli etc. However, the processing capacity per day is 2.5 quintals only in average.

Cost of dehulling around Rs.4/Kg. 75% of main product is extracted after processing and 25% is bran. Processors keep this bran with themselves and discounts the price of processing. As per the farmers, there is huge marketing problem for these millets. The Raw material is transported to Dharwad, Haveri and Bangalore as well for processing.

Specification for FAQ Foxtail Millet

The Foxtail Millet shall be dried and matured grains of *Setaria italica*. It shall have uniform size, shape and colour. It shall be in sound merchantable condition and also conforming to PFA standards.

Foxtail Millet shall be sweet, hard, clean, wholesome and free from moulds, weevils, obnoxious smell, *Argemone mexicana* and *Lathyrus sativus* (Khesari) in any form, colouring matter, admixture of deleterious substances and all other impurities except to the extent indicated in the schedule below:

Table 19. Schedule Of Specification

S.No	Refractions	Maximum Limits(%)
1	Foreign matter*	1.0
2	Other foodgrains	1.0
3	Damaged grains	1.0
4	Slightly damaged grains.	2.0
5	Moisture content	12.0

2. Not more than 0.25% by weight shall be mineral matter and not more than 0.10% by weight shall be impurities of animal origin.

6.2. Diagnostic Study for Supply Estimation

Chitradurga

Chitradurga has the highest millet acreage in Karnataka. Moreover 70-75% of millet acreage is in Hosdurg Block. In Hosdurg and Hiriya Blocks, the region is dry and shallow land so most of the farmers cultivate millets. Apart from millet, Arecanut plantation crop is also in higher acreage.

Major crops in Kharif are Groundnut, Maize, Ragi, small millets and few parts of the district is also cultivating Cotton and onion. Naune (Foxtail), Little millet (Saame) is occupying higher acreage. Major Crops in Rabi are Jowar, Bengal gram, safflower.

Table 20. Millet acreage estimation in Chitradurga

Chitradurga Millet Acreage Data (in Acre): Kharif 2022						
Block	Barnyard Millet	Haraka	Navane	Ragi	Saave	Grand Total
Hosadurga	6.3	1.8	140.1	31584.5	682.0	32414.7
Holalkere	2.0		3.7	2981.5	6.4	2993.6
Hiriya	0.4	47.6	67.2	1314.8		1430.1
Chitradurga	2.3	1.2	10.1	1065.6		1079.2
Molakalmur	1.8		290.6	303.7		596.1
Challakere	0.4		187.3	244.6	4.3	436.6
Grand Total	13.3	50.6	698.9	37494.7	692.8	38950.4

Source: Agriculture Office

Package of Practices In small millets:

- I. **Seed availability:** Grains of previous season is used as a seed mostly. FPOs also provide Seed to farmers.
- II. **Sowing:** Many farmers use tractor driven drillers for sowing activity. few uses bullock driven Korgi (seed drill).
- III. **Intercultivation:** Intercultivations such as weeding is practised. Farmers using mechanical weeders for weeding.
- IV. **Fertilizer and pesticide usage:** Fertilizers and pesticides are not used.
- V. **Harvesting:** there are combined harvestors for harvesting.
- VI. **Winnowing:** most of the farmers using traditional method for cleaning. In few regions, there is availability of destoner, precleaner etc.
- VII. **Labour:** availability is poor and higher daily wage rates

Yield per acre: 4-6 qtl/Acre.

Cost Economics for Small Millets:

- Cost of cultivation is Rs. 10-12000/acre, Labour and machinery charges is high.
- Income from small millets per acre = 6 Q * Rs.3000/Q = Rs.18000.

- Profit per acre = Rs. 18000 - Rs.10000(Income – expenses) = Rs.8000/Acre.
- Rate of Raw small millets – Rs. 30/Kg (all the millets rates are in this range) and Rs. 60-80/kg in retail stores. The rate of processed products in flour form is Rs.100-130/Kg.
- Rate of dehulled and ready to cook millet is Rs. 50-60/kg at farmer level.

Gadag

In Gadag, few parts have irrigation facility and most of the areas poorly irrigated. For Millet crops, the water requirement is low however no moisture availability doesn't produce good yield. Major crops in Kharif are Cotton, Maize and Dry chilli, groundnut and sunflower and onion is majorly cultivated in few areas. Jowar is grown extensively and Ragi is not a majorly cultivated. Area under small millets is very low.

Major Crops in Rabi Jowar, Bengal gram, Safflower. Millets like Foxtail, Little millet, Brown top millet also grown. Foxtail millet (Naune) is majorly cultivated among minor millets.

Table 21. Millet acreage estimation in Gadag

Gadag Millet Acreage Data : Kharif 2022					
Block	Bajra	Jowar	Navane	Ragi	Blockwise total Millet Acreage
Gajendra Nagar	246	15.5	3	2	266.5
Mundergi	69	54.5	7	0	130.5
Shirahati	0	16	15	3.4	34.4
Ron	14.5	6	0	6.2	26.7
Gadag	4	9.4	6	4	23.4
Laxmeshwar	2	9.5	6	0	17.5
Naragund	2	5	0	2	9
Total Acreage	337.5	115.9	37	17.6	508
Source: Agriculture Office					

Package of Practices In small millets:

- I. **Seed availability:** Grains of previous season is used as a seed mostly. FPOs, KVK also provides seed to farmers. There are no improved seeds/ varieties available in small millets. In Darwad, research going on improved varieties.
- II. **Sowing:** few uses bullock driven Korgi (seed drill). Shallow seed sowing as seeds are tiny.
- III. **Intercultivation:** no intercultivation such as weeding, spraying etc. few farmers used manual labour for intercultivation.
- IV. **Fertilizer and pesticide usage:** Fertilizers and pesticides are not used.
- V. **Harvesting:** Manual Harvesting. Average land holding per farmer is low so no usage of combined Harvester.
- VI. **Threshing:** Threshing is done with bullocks or placed on roads where grains separated while vehicles pass through them.
- VII. **Winnowing:** winnowing traditional method but there is high loss during winnowing due to less weight of seeds. Collection of seeds is also difficult task by farmers.

Yield per acre: 4-6 qtl/Acre.

Cost Economics:

- Cost of cultivation is Rs. 5000/acre (manual labour in intercultivation and harvesting). In few regions it is less than Rs.5000.
- Income from small millets per acre = 5 Q * Rs.3000/Q = Rs.15000.
- Profit per acre = Rs. 15000 - Rs.5000(Income – expenses) = Rs.10000/Acre.
- Rate of Raw small millets – Rs. 20-30/Kg (all the millets rates are in this range) and Rs. 60-80/kg in retail stores. The rate of processed products in flour form is Rs.100-130/Kg.
- Rate of dehulled and ready to cook millet is Rs. 50-60/kg at farmer level.

Koppal

In Koppal, most of the area is unirrigated. Major crops in Kharif are Maize, Groundnut, Dry chilli and sunflower and onion in few areas. Small millets also grown in the region. Major Crops in Rabi Jowar, Bengal gram. Millets like Foxtail, Little millet, Brown top millet also grown. Foxtail millet (Naune is highly cultivated).

Package of Practices In small millets:

- I. **Seed availability:** Grains of previous season is used as a seed mostly. FPO in the region also provides the seed.
- II. **Sowing:** sowing is through manual labour and Korgi.
- III. **Intercultivation:** no intercultivation such as weeding, spraying etc. few farmers used manual labour for intercultivation.
- IV. **Fertilizer and pesticide usage:** Fertilizers and pesticides are not used.
- V. **Harvesting:** Combined harvester in few areas mostly Manual labour.
- VI. **Threshing:** Threshing is done with bullocks or placed on roads where grains separated while vehicles pass through them.
- VII. **Winnowing:** winnowing traditional method but there is high loss during winnowing due to less weight of seeds. Collection of seeds is also difficult task by farmers.

Yield per acre: 4-6 qtl/Acre.

Cost Economics:

- Cost of cultivation is Rs. 5000/acre (manual labour in intercultivation and harvesting). In few regions it is less than Rs.5000.
- Income from small millets per acre = 5 Q * Rs.3000/Q = Rs.15000.
- Profit per acre = Rs. 15000 - Rs.5000(Income – expenses) = Rs.10000/Acre.
- Rate of Raw small millets – Rs. 20-30/Kg (all the millets rates are in this range) and Rs. 60-80/kg in retail stores. The rate of processed products in flour form is Rs.100-130/Kg.
- Rate of dehulled and ready to cook millet is Rs. 50-60/kg at farmer level.

Comparative Analysis of Millets in the Study Districts (Based on Primary Survey Data)

Table 22. Comparative Analysis of Millets in the Study Districts (Based on Primary Survey Data)

Parameters	State: N. Karnataka					State: Odisha				
	District Gadag	Koppal			Chitradurga		District Kalahandi		Koraput	
Millet Name	Foxtail Millet (Navane or Navanakki)	Pearl Millet (Bajra)	Kodo Millet (Arka, Varagu)	Foxtail Millet (Navane or Navanakki)	Little Millet (Saame)	Finger Millet (Ragi)	Finger Millet (Raagi)	Kosla	Finger Millet (Raagi)	Little Millet (Suan)
% of farmers growing it	50	44	28	28	3	90	84	7	80	5
Yield (Quintal/Acre)	6	10	3	5	8	8	5	4	6	7
Av. Acreage per farmer	1	2	4	3	3	2	1	.5	1	1
Production per farmer (Quintals)	6	20	12	15	24	16	6	2	6	7
Self-Consumption (%)	17	16	4	9	35	30	20	70	10	8
Sold (%)	83	82	96	91	65	70	80	30	90	92
Market Access (Majorly)	FPO, Local Market	APMC	APMC	APMC	Local Market	Local Market	FPO	Local Trader	FPO	Local market
Rate Sold (Rs/ Q)	2700	2150	5000	2300			3578	3500	3578	6000

The above table shows the different types of millets that are cultivated in the identified blocks where the primary survey was conducted. The percentage of farmers growing that particular millet to acreage and market access is covered. The objective being to get a snapshot of the millet profile of the region and the rationale behind choosing to cover Foxtail millet in the context of North Karnataka and Finger Millet in the context of Odisha. These two types of millets are highlighted in the table for ease of understanding.

Chapter 7

Stakeholder Mapping for Millet Value Chain

Odisha:

The FPS team visited the different stakeholders after consultation with the Selco Team operating from the district office in Bhawanipatna, Kalahandi. The key stakeholders for the millet value chain were mapped and given in the following table.

Table 23. Odisha Key Stakeholders

Enduser and facilitators/ Stakeholder Mapping		
Financial stakeholders		
NABARD	DDM Kalahandi	
MFIs	SSFL (Spandan Spurti Financial)	
SFAC	N.A.	
Government Schemes		
OMM	Dist Agri Departments	WASSAN, capacity building exercises for farmers and FPOs
ORMAS	Dist office ORMAS	
Mission Shakti	DPC- Mission Shakti	Millet Café, Tiffin center
RRTTS	Regional Research and Technology Transfer Station	
Input Agencies		
Companies	For manufacture of inputs like seeds, fertilizers and pesticides	
Distributor	For supply of the manufactured products to retailers	
Retailers	The customers get access to inputs through these retailers	
Output Institutions		
OMM	Procurement of millets from FPOs and farmers	
Startups	N.A.	
Institutional Players	FPC, Govt Mandi, TDCCOL	
Processor/Miller	N.A.	
Small Local Mills	Micro processor in GhumerGuda/ CYSD	
Traders	The traders buy the raw products at farm-gate for processing and value addition	
Extension Services		
KVK	KVK, is an integral part of the National Agricultural Research System (NARS), aims at assessment of location specific technology modules in agriculture	
DATC	District Agriculture Training Centre	
End User Collectives		
Agri Cooperatives	From catchment villages	
SHGs	From catchment villages	
Federation	From catchment villages	
Farmer producer	Anchalika Producer Company (Kalahandi)	

groups (FPOs)	Sabujima Producer Company (Koraput)	
Local NGOs	Janasahajya, CYSD (Koraput)	DAPTA
Technology		
Energy Entrepreneurs	Narayaneer Enterprise	
Tech Enterprises	Enterprise providing access to technology and machinery for post harvest processing and value addition	

The key insights from the different stakeholder meetings in Odisha:

A. NGO

1. **CYSD (Koraput):** it was established in 1995. They work in broad thematic areas of sustainable rural livelihoods (Rainfed Agriculture), livestock, integrated farming practices, etc. the NGO operations has impact on 8000 farmer households.

2. **Jana Sahajya (Kalahandi):** this NGO was established in 1989 and now works in 2200 villages. the different activities undertaken are of livelihood, natural resource management, agriculture, among others. The impact of the NGO is about 20,000 farmers.

B. FPO

1. **Sabujima Producer Company:** registered in 2017. This FPC has 1640 members in 15 GPs and 92 villages. the FPO facilitates cultivation of millet, mango, banana etc. for millet specifically they are working with 4026 farmers. They provide input support in seeds of Ragi and Little millet and also provides training and capacity building for farmers. Custom hiring center is also being operated by them. They have also done engagement of SGHs with Millet Tiffin Centers, 2 are operational in the region.

2. **Anchalika Producer Company:** They facilitate farmers for millet cultivation. Organic cultivation is encouraged and capacity building is being done for the same. There are 10 villages having organic certification under them. Different typed of input support (seed, weeder, sprayer, etc), marketing support (mandi registration), post-harvest management and value addition is done.

C. **SHGs:** in the catchment villages , in Lanjigarh the NGO supports 80 SHG groups. Specifically, 20 SHGs were working in millet value addition and engaged with initiatives like millet café (Mission Shakti). In Koraput 20-25 SHGs are directly involved in millet value chain.

D. **Govt. Officials from Mission Shakti, Odisha Livelihood Mission, WASSAN, RRTTS, ORMAS:**

The regional center for excellence in RRTTS had stressed on the importance of availing scientific knowledge for millet cultivation by the farmers. The dissemination can happen through field level functionaries. The awareness about soil testing and discussion and awareness on crop diversification was also stressed upon.

Mission Shakti: Mission Shakti (OLM) also helping farmers in the region with processing of ragi into ragi flour. Different snacks like cakes, pakora, laddoo, upma, pitha, lassi is prepared in this mission sakti operated cafes/ tiffin centers. Ragi, little millet , Gurji and Kodo millet is mainly used because of adequate availability. The awareness programs to improve the consumption of millets is also undertaken. There is planning of outlets for millet products by SHGs in Gram Panchayats. Processing mill is also being planned. The cluster can be developed by loans and funding support and MIP (Micro investment plan).

WASSAN and ORMAS: the monitoring and capacity building exercises for farmers and FPOs in different technology use and maintaining of market standards like FAQ norms. Millet awareness in food festival that are held in blocks around 5 festivals held in a year. The diversification from Ragi to other millets is also planned. Marketing and awareness campaigns to promote consumption other than the PDS distribution channels. They want to engage 70 SHGs in the Tiffin centers and 136 SHGs in planning for upcoming years. The funding support of 61 lakhs for IMY is planned to be utilized in scaling up.



Figure 16. Stakeholder Meetings and interviews in Odisha

E. Processing Units: The micro processing units is what people are mostly using in the region. Some solar powered processing unit for Ragi is also there. The capacity of these units are small 4-5 kg at one time running of 30 mins (2 HP unit).

Processing facilities for little millet (for millet rice making/ dehulling) is not available in the region. The farmers sell little millet (with hulls) at Rs. 33-35/ kg. Raipur is a processing hub for little millets where the millet processing is done after the traders procure the millet from farmers in Kalahandi. After processing the dehulled millet is sold at the rate of Rs. 130-140/kg.



Figure 17. Micro processing Unit for Millets in Bhawanipatna, Destoner and Grader in CYSD Boipariguda

The Need Assessment from Stakeholders:

Technology needs:

1. Solar Irrigation support: Continuous and reliable electricity supply is not available in the region of both Lanjigarh and Boipariguda. The area is rainfed and there is no water lifting pumps available for any existing perennial sources of water. The solar water lifting pumps

can be integrated with rain-water harvesting structures like farm ponds for providing irrigation facilities to farmers.

2. Post harvest processing: The post-harvest machinery like thresher, grader, destoner and even value addition needs like pulverizer or dehuller operated and powered by renewable sources of energy (like solar), is the need of the hour in this region.
3. Threshing needs: Thresher powered by Solar energy with higher efficiency of processing larger volumes (high kg/hour rates) is needed. The threshers currently used are often reported to be too slow with lower efficiency of processing, thus disadvantageous to farmers to use them at the current mode of operations as it takes lot of time for them to thresh even smaller quantities.
4. The Grader and Destoner machines are also needed even for basic quality norms maintenance for government procurement channels like OMM. All this post-harvest cleaning machinery needs an overhaul in terms of higher efficiency and efficient renewable energy use like solar.
5. Dehuller for Little millet is a pressing need for processing of small millets into millet rice.
6. Solar powered storage (cooling unit/ refrigeration) for value added products for FPOs can provide the products a longer shelf-life and ensure better control over prices.
7. Ragi biscuit machine, cookie and cake machines for SHGs and FPOs. These machines are often electricity operated suitable for the baking needs for cookies or cakes. The solar powered machines will ensure smooth operations in terms of reliable and continuous energy availability.
8. There is potential for solar cooking in millet cafes/ tiffin centers supported by Mission Shakti. This would mean use of solar cookers of different kinds and capacities, according to the need for the specific tiffin center.
9. Millet on Wheels (Food Truck) is an opportunity for solar powered refrigerators. This would ensure fresh meals and reduce spoilage/food wastage of ready-to-eat meals served on these food trucks.

Marketing Needs:

1. The market linkage for value added products manufactured by the FPOs is a requirement that came up in the study. The focus has to be for small millets as Ragi has some established channels of marketing through government support schemes like OMM, but more support is needed for other small millets to establish market linkages for them as well.
2. Packaging and branding for these value-added millet products is required. The hygienic built units for packaging and use of vacuum packaging technology will greatly improve the shelf-life as well as give a better reach and appeal for the consumers. The products can be sold over platforms like amazon/flipkart/other millet-based startups.
3. The FPO in Koraput has need of own retail outlet for millet products. The retail outlets will help in selling the products to regular customers locally other than sales through exhibitions.

Karnataka

Table 24. Karnataka Key Stakeholders

Enduser and facilitators/ Stakeholder Mapping		
Financial stakeholders		
NABARD	Making access to credit available to farmers/ collectives	
MFIs	Microfinancing options for small businesses	
SFAC	An exclusive Society focused on increasing incomes of small and marginal farmers through aggregation and development of agribusiness	
Government Schemes		
Rythi Siri	Dist Agri Departments, Joint Director of Agriculture, Assistant Director of Agriculture	
PMFME	Dist Agri Departments	
Input Agencies		
Companies	For manufacture of inputs like seeds, fertilizers and pesticides	
Distributer	For supply of the manufactured products to retailers	
Retailers	The customers get access to inputs through these retailers	
Output Institutions		
Startups	N.A.	
Institutional Players	Farmer Producer Organizations/ Companies	
Processor/Miller	Matru Foods (Koppal)	
Small Local Mills	Micro processors	
Traders	The traders buy the raw products at farm-gate for processing and value addition	
Retail	Satwik organics (Gadag) is a retailer in the region	
Extension Services		
KVK	Dr. L.G. Hare gowda, Hulihoti (Gadag)	
DATC	District Agriculture Training Centre	
End User Collectives		
Agri Cooperatives	From catchment villages	
SHGs	From catchment villages	
Federation	From catchment villages	
Producer Groups	Basanna Gowda, Champion farmer	
FPOs	Chandanavana FPC, Mundergi Block (Gadag) Laxmeswara FPC, Laxmeshwara block (Gadag) Ksherasvrdhini FPC (Koppal) Koppala siri FPC (Koppal) Durgada Millet processors FPC (Chitradurga)	Ethnic food cafe, Hulikoti (Gadag)
Local NGOs	SCODWES (Sahyadri Community Development and Women Empowerment society) (Gadag) SKDRDP (Koppal, Chitradurga)	
Technology		
Energy Entrepreneurs	The entrepreneurs addressing the energy needs like focus on renewable energy like solar	

Tech Enterprises	The enterprises providing the various machinery of processing	

The key insights from the different stakeholder meetings in North Karnataka study region:

A. NGO

- 1. Priyadarshini Self-Employment Training and Rural Sector (Gadag):** It was established in 2005. The NGO works on Agriculture and Non-Agriculture domains where they give trainings to farmers and rural youth and women on different incoming generating activities such as sustainable agriculture, marketing the products, packaging, handicrafts etc. They work with nearly 2000 farmers spreading over 25 villages. The NGO also impact nearly 100 SHGs.
- 2. Sarvodaya Integrated Rural Development Society (Koppal):** It was established in 1994. The NGO works on agriculture and Rural development activities such as Integrated Farming activities, rural development, health and livelihood. The NGO extended its activities across 50000 farmers in 26 villages. It also provides Advisory services, training, promotional and exposure visits. The NGO work with 360 SHGs where the SHGs members participating in Millet processing, Agarbatti making, tailoring, Organic pesticides Handi crates. The NGO helps in the marketing products prepared by SHG members.
- 3. Nisarga social work Centre (Hoshdurg):** Nisarga is the biggest NGO in the Hosdurg, established in 2001. It is benefitting 25000 farmers covering over 17-19000 Ha in 246 villages and also 426 SHGs are under this NGO. The NGO giving the trainings, demonstrations and also exposure visits on millet cultivation and enterprises. They are working on watershed development. Currently they are involved in the groundnut processing and market linkage.

B. FPO:

- 1. Chandanavana Farmer Producer company Ltd (Dambal, Gadag):** The FPC registered in 2021. This FPC has 900 members where it facilitates in cultivation of major crops in the region including millets. They provide millet seed, pesticides, fertilizers to the farmers. They also facilitate in custom hiring of machinery for cultivation practices. They also procure the millets after harvesting and do packing of raw produce and sells in the market. Women in the FPC participate processing of small quantity of millets and selling in the market.
- 2. Laxmeshwara Farmers producer Company (Laxmeshwara, Gadag):** The FPC registered in 2021 and benefitting around 900 members covering in 20 villages. This FPC currently working on Vegetables and Millets where it provides inputs such as seed, Pesticides and

fertilizers to farmers. The FPC going to take license for taking up of procurement activity of millets.

3. **Koppala Siri Farmers Producer company (Koppal):** The FPC registered in 2020 where it is benefitting around 1000 Farmers. The FPC is covering around 800 acres of small millets acreage. The FPC is organised by SKDRDP, Darwad. The FPC participate in input and Output business such as Seed, pesticide and fertilizer supply to Farmers and procure the output produce directly from farmer and supply for processing to Siri millet of SKDRDP where the raw material is further processed to different ready cook forms.
4. **Ksheravardhini Farmers producer company (Koppal):** This FPC registered in 2022. The FPC is in initial period and currently procuring of Licenses for input business and output business.
5. **Durgada millet farmer producer company (Hoshdurg):** It was registered in 2021, benefitting around 1000 farmers. The FPC is providing the inputs such as seed, fertilizers, pesticides, gunny bags and Sprayers also. The FPC Facilitating farmers by supplying inputs from custom hiring centre. The FPC is covers nearly 1166 Acres under small millets and produces around 350 Quintals of Millets annually. They have recently installed a solar based millet processing equipment having a processing capacity around 2.5 quintal/day.

C. SHGs:

Vedavathi Sai Sanjeevani (Hoshdurg): The SHG is formed by Pranati NGO and NABARD and it consists of 30 members. 5 out of 30 members are involved in the primary processing, secondary processing and marketing activities. They don't have their own equipment for precleaning, dehulling and flour processing. They take the raw produce to processing unit in Malinahalli village. Further, they make processed products such as Papads, laddoo and chekke and other Snacks. Annually they process around 6 quintals of millets. They sell in the stores, exhibitions in Bangalore, Chitradurga etc. They got financed by Shree shakti Scheme.

D. Govt Officials from Agriculture department JDA, ADA, KVK: Schemes of PMFME & Rythi Siri.

1. **KVK (Hulikoti, Gadag)** – Collected information on Major crops in the region and the cropping pattern of region. KVK giving exposures to farmers on the technology usage, Trainings, Post-harvest Processing, promotions and Market linkage. KVK has also started a millet enterprise “Ethnic Foods” in the KVK itself.
2. **Joint Director of Agriculture (Gadag):** Given the information on schemes such as PMFME (Prime Minister Formalization of Micro Food processing Enterprises), where Credit linked subsidy @ 35% to individual, proprietorship firms, partnership firms, FPOs, NGOs, SHG, Co-operatives Pvt. Ltd. Companies under the scheme with additional 15%Topup Subsidy from State Government, Maximum subsidy of Rs.15 Lakhs or 50%

whichever is less. Seed Capital Support of maximum Rs. 40,000 per SHG member involved in processing for working capital and Purchase of small tools and Maximum Rs. 4 Lakh per SHG. And also credit linked subsidy @35% for common infrastructure with maximum ceiling of Rs.3 crore subsidy to a maximum project cost of 10 Crores and even 50% grant for Marketing and branding related activities.

3. **Rythi Siri:** This scheme is to promote the millet cultivation where it provides Rs.10000/Ha/annum to millet cultivating Farmer.
4. **Assistant Director of Agriculture (Hiriyur):** The department have given information regarding climate and available resources for cultivation practices in Chithradurga. The technology transfer especially tools and equipment's given by them in cultivation of crops.



Figure 18. Stakeholder meetings in KVK, NGO Sarvodaya

E. Progressive Farmer (Koppal)

Basanna Gowda belongs to the village Itagi in Kukkonuru block. He himself cultivates small millets in 160 acres. The Produce is sold to market players as forward contract.

F. Processing unit (Koppal):

The processing unit was established in 2020. It is having capacity of 2.5 MT/8hr. It is Jowar based processing unit where the processed products are packed and sold to different players in the market. The Entrepreneur selling his processed products with brand named “Matru foods”. He is selling directly to customers in different districts apart from stores and distributors.

G. Retail Store (Gadag):

Satwik is the retail store contains different millets and in various forms. He is procuring raw material directly from farmers and processing in different forms and selling in the market.

As per him consumption demand is not picking up among customers in small millets so inspite of high prices the millet cultivation and processing is still not improving.

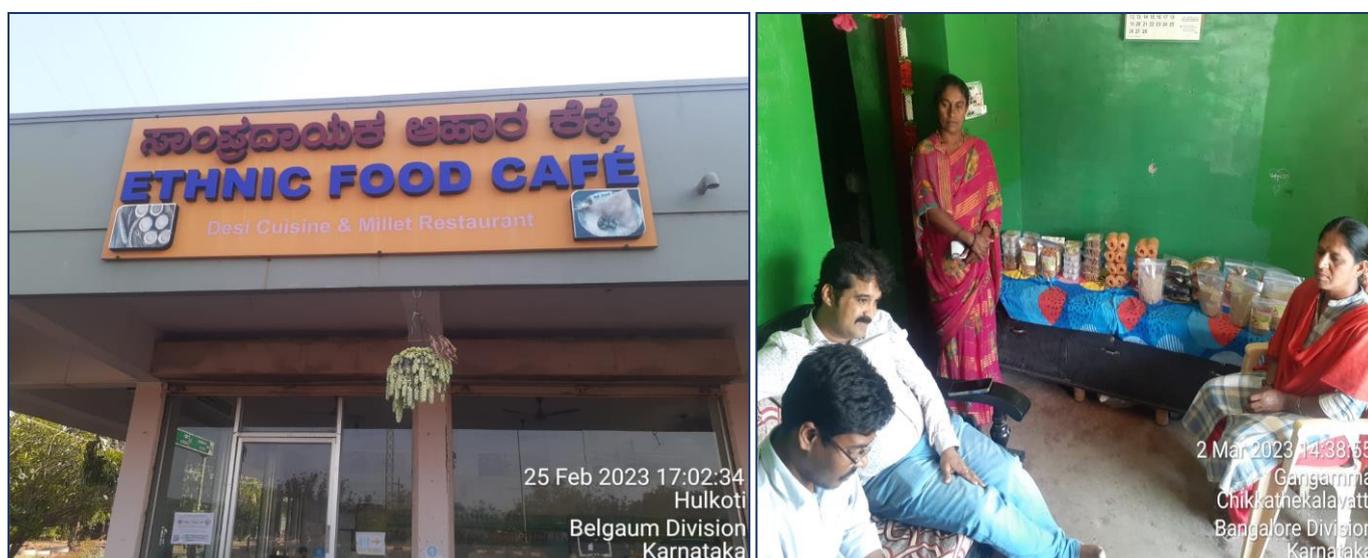


Figure 19. Millet based café in KVK Campus and SHG in Chikkatekalavetti village for value added products making

The Need Assessment from Stakeholders:

Technology Needs:

- Cleaning: During winnowing more wastage is observed due to its small and lighter seeds. There is a need for good pre-cleaner machines.
- Dehulling: There are very few dehullers available for the farmers in small millet processing. Solar dehullers can be explored.
- Many SHGs are working on millet processing and value-added products. Solar-operated machines and refrigeration would be useful for scaling up production and increasing self-life.

Marketing needs:

- Awareness on millet usage and their health benefits would improve consumer demand. Packaging, branding, and promotions are needed for retail channels of FPOs and SHGs.
- Encouraging the set up of more cafes for millet-based products.
- Government procurement also can improve the production and processing activities.

Chapter 8

End User Mapping: Household Baseline Survey

8.1. Survey Methodology and Sampling

The following section provides a broad overview of the techniques and methodologies adopted for the study. The survey is based on primary data collected through farmer household survey using close ended questionnaire. Focused Group Discussions (FGD) and Key Informant interviews were also conducted to get qualitative data related to the villages covered under the project. Additionally, secondary data was also used to get the geographical information, population detail, agricultural and food practices through a comprehensive desk review of literature. The survey methodology comprised of following steps:

Secondary research: As part of the study, desk research was done to gather the information on crop data, production practices, water resources, marketing streams, potential of the region and the challenges to be addressed.

Primary research: This step involved designing survey questions, collecting, collating and analyzing the data collected to get better understanding of the ground. The key activities are:

Sample selection: The baseline for the need assessment study covered farmer households from approximately 10 villages from each selected district. The determination of the overall sample size is governed by several considerations, including key indicators, the availability of resources, and logistical considerations. A total of 100 farmers were interviewed for the study from each of the selected districts. With the community participatory exercise of FGDs and KII were also done according to the stakeholder mapping.

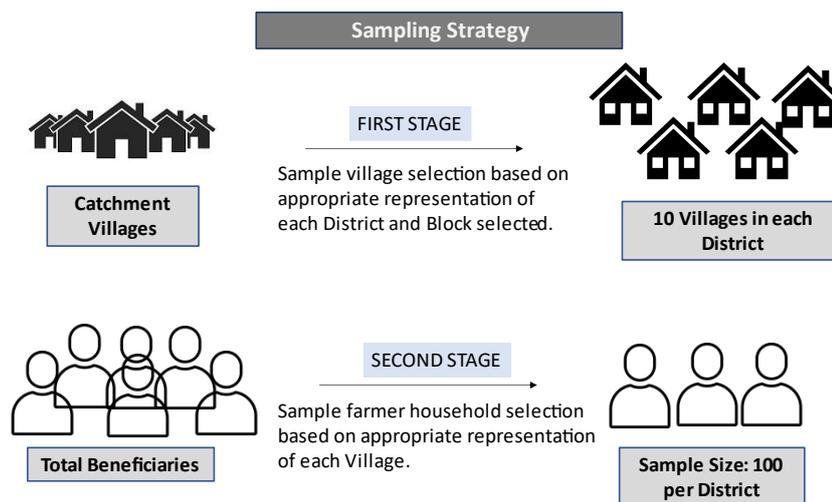


Figure 20. Sampling Strategy for the project villages and beneficiary farmer households

- **Identification & formation of Project Team:** FPS deployed 1 experienced local project lead and 2 enumerators per Block selected for each district with necessary qualifications. Centrally a project coordinator and project lead were assigned.
- **Survey Instrument:** Questionnaire for Quantitative and Qualitative surveys were finalized in coordination with the Selco team. The questionnaires for each stakeholder was created for qualitative surveys. The individual face to face farmer interviews was done on digital survey tool Kobo Collect. The community level participatory exercises were done in Focused Group Discussions in the villages selected.
- **Pre- survey planning:** Developing, testing, and finalizing the HH data entry survey was done before conducting the interviews in the field. Prior to roll-out, a field survey schedule was prepared with the help of Selco Team to be implemented for the quantitative data collection teams and community surveys for the location selected.
- **Rollout of the survey:** the quantitative household surveys and Community FGD surveys, KIIs, were rolled out according to the field survey schedule. The quantitative survey consisted of in-person interviews with men and women farmers.
- **Monitoring and Quality check:** During the survey period, regular updates about status during fieldwork was shared with the Selco Team along with other data collection concerns for quick resolution.
- **Generation of cleaned data:** The raw data generated from the survey was cleaned for errors and the cleaned data sets from the survey households were then analyzed.
- **Data compilation, analysis and report preparation:** Key findings and observations were derived using the clean data sets, which was analyzed through tabular analysis, graphs & charts, etc. The findings of the survey analysis are presented in the subsequent headings.

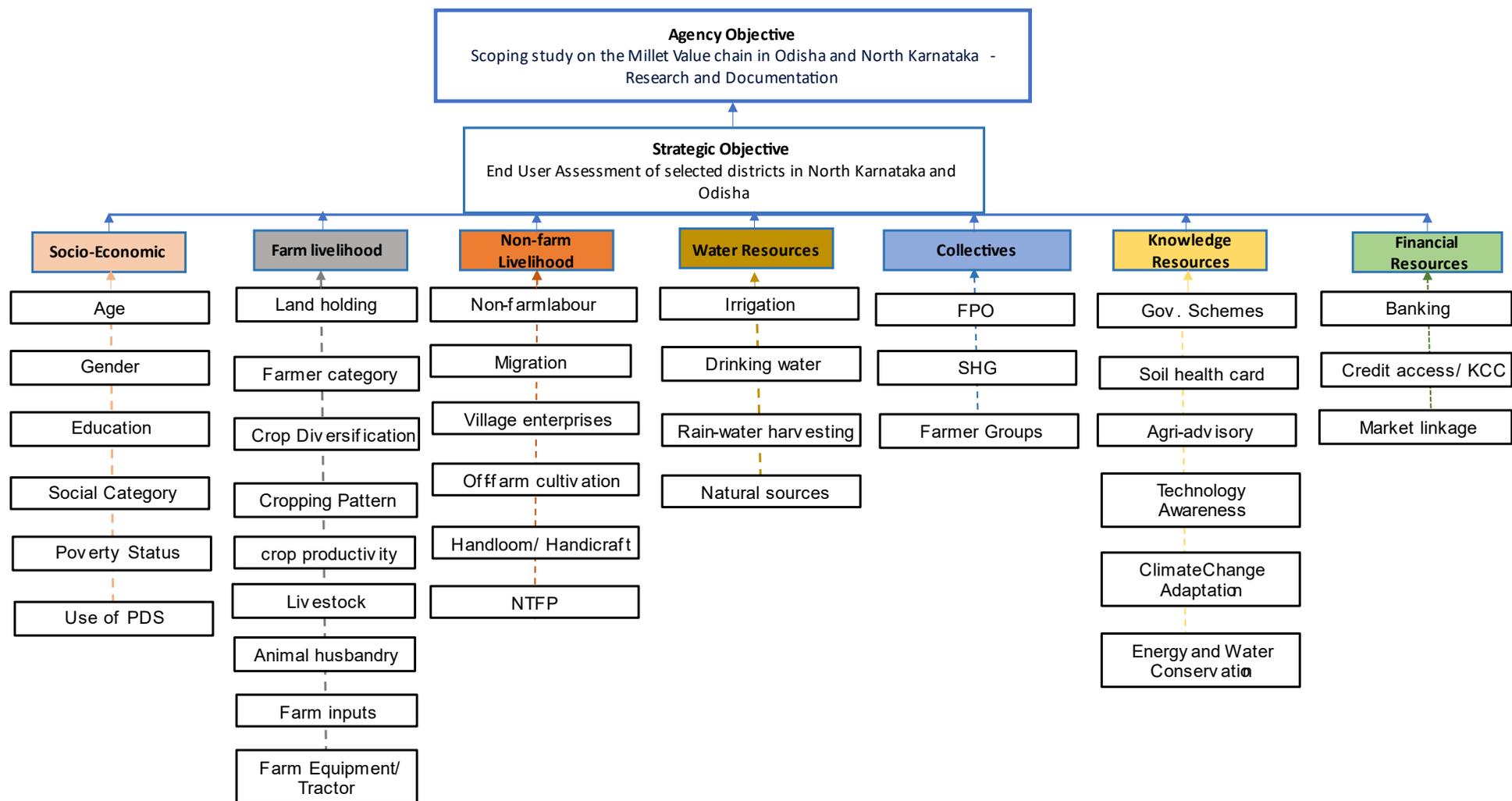


Figure 21. Framework of Indicators for Enduser Profile Study for Farmers

Sampling done in Districts of Karnataka and Odisha

Table 25. Sampling for North Karnataka

District	Block	Village	Respondants
Gadag	Laxmeswara	Adarkatti	11
		Haradagatti	10
		Laxmeswara	9
	Mundargi	Dambal	10
		Doni	10
Koppal	Kokkunuru	Mangalore	10
		Mannapur	10
	Koppal	Indaragi	10
		Kamanur	10
		Kokkunapalli	10
Chitradurga	Hiriyur	Arisinagundi	10
		Dindvara	10
		Dugganihatti	10
		Karekenchayyanahatti	10
		Yalladakere	11
	Hoshudurg	Heggere	10
		Kachapura	10
		Kadavigere	10
		Kurubarahalli	10
		Sujikallu	12
Grand total			203

Table 26. Sampling for Odisha

District	Block	Village	Respondents
Kalahandi	Lanjigarh	Bandhapari	21
		Bengaon	10
		Dangajore	10
		Ghoda Pakhari	11
		Gudanga	8
		Kubari	7
		Padmathopa	16
		Rajendrapur	10
		Talbora	10
Total			103

Koraput	Boipariguda	Banagud a	10
		Bendragu da	10
		Bhejagud a	10
		Dabugud a	10
		Dadhapa dar	10
		Dumurig uda	10
		Khangarp ar	10
		Minarbali	10
		Musapad ar	10
		Udalagud a	10
			Total
Grand Total		203	

8.2. Socio- Economic Profile

This section portrays complete information about the profile of the respondents' surveyed, i.e., different social category, educational profile, activity profile of household members, etc. Here, it should be noted that analysis is done based on the data that was captured through farmer household survey questionnaire.

8.2.1. Age of Respondents

As depicted in the graph below, Majority of the farmers (35%) were in the age range 41-50 in Karnataka, while 28% of the farmers were in the age range of 39-48 years in Odisha. Thus, the farmer demographics is similar across both states surveyed.

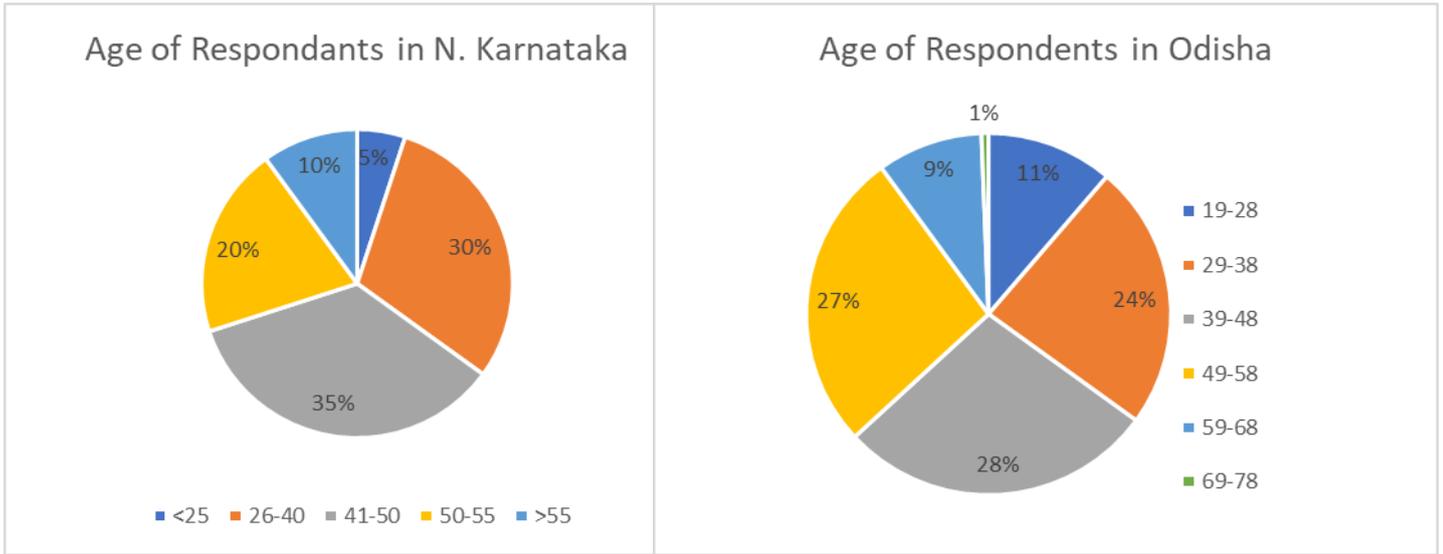


Figure 22. Age of respondents

8.2.2. Gender of Respondents

Majority of respondents were Male representing 72- 90% of the total sample population in Odisha districts. In Odisha it was seen in FGD that there is good participation of women in farming activities and also in activities of running the household. 90-93 % respondents were male in Gadag and Koppal, all in Chitradurga.

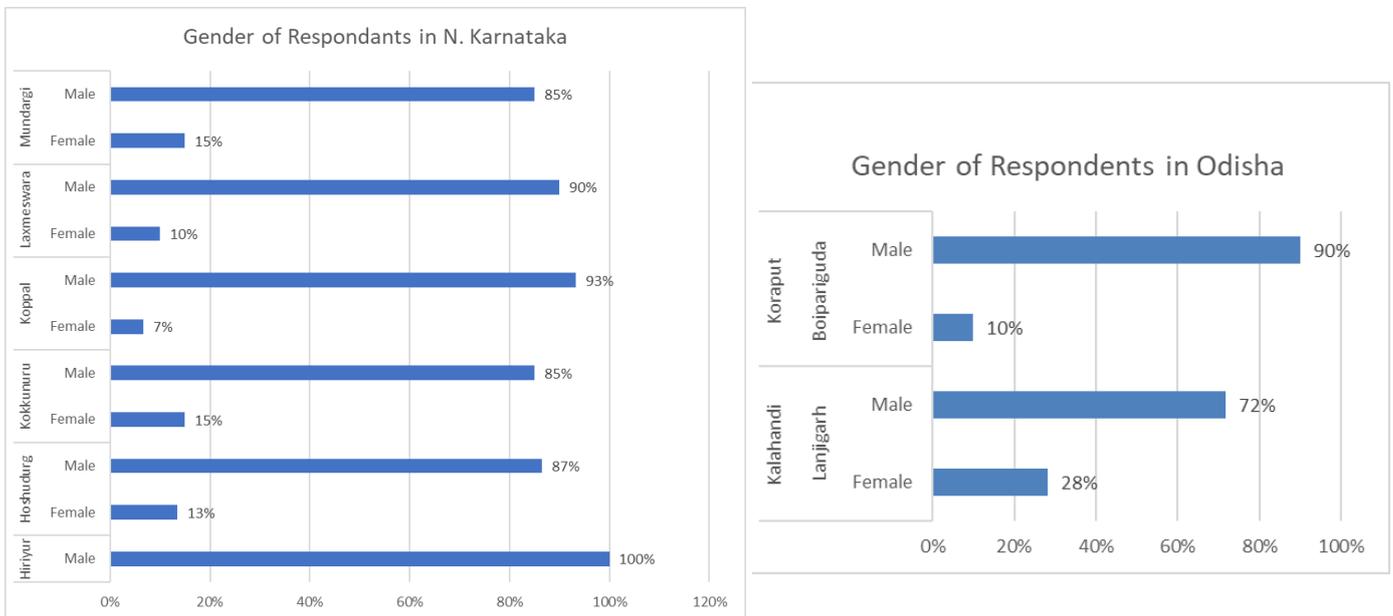


Figure 23 . Gender of Respondents

8.2.3. Education Profile of Respondents

Here, as shown in below graph, the education levels of the respondents were analyzed divided into the selected blocks. It was noted that majority of the respondents had studied till Primary school across all the villages in Odisha. It was interesting to note that there are high illiteracy rates in Kalahandi (50%) and Koraput (43%) suggesting that even primary education completion is a challenge in this region.

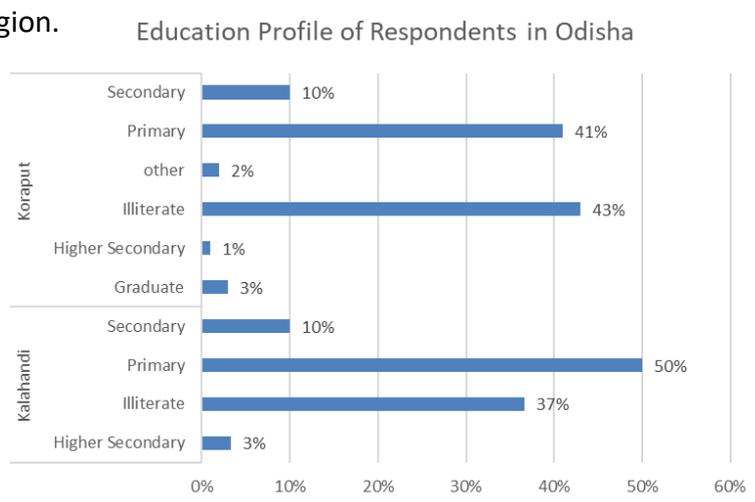


Figure 24. Education Profile of Respondents

8.2.4 Social Category Profile

With reference to the social categories of households surveyed in the study, it can be seen that in Kalahandi and Koraput the ST category is highest as Tribal population is predominant. In Karnataka OBC category is highest followed by SC. The details are given in the graphs below.

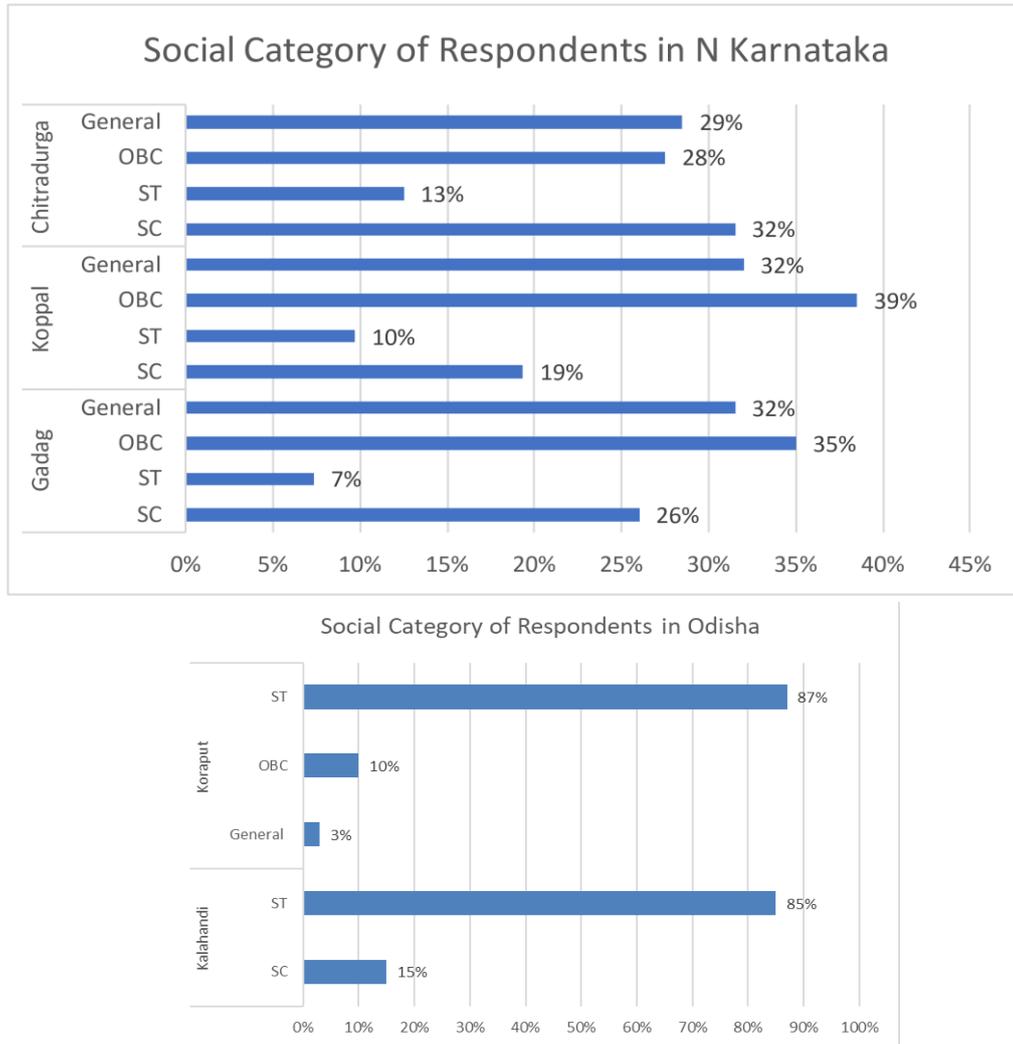


Figure 25. Social Category of Respondents

8.2.5. Poverty Status

It is noted from the below graph that the maximum percentage of respondents are below poverty line (BPL) in Kalahandi and Koraput. In Gadag people are below poverty line and in Koppal only one block has better status in terms of 45% being in BPL category.

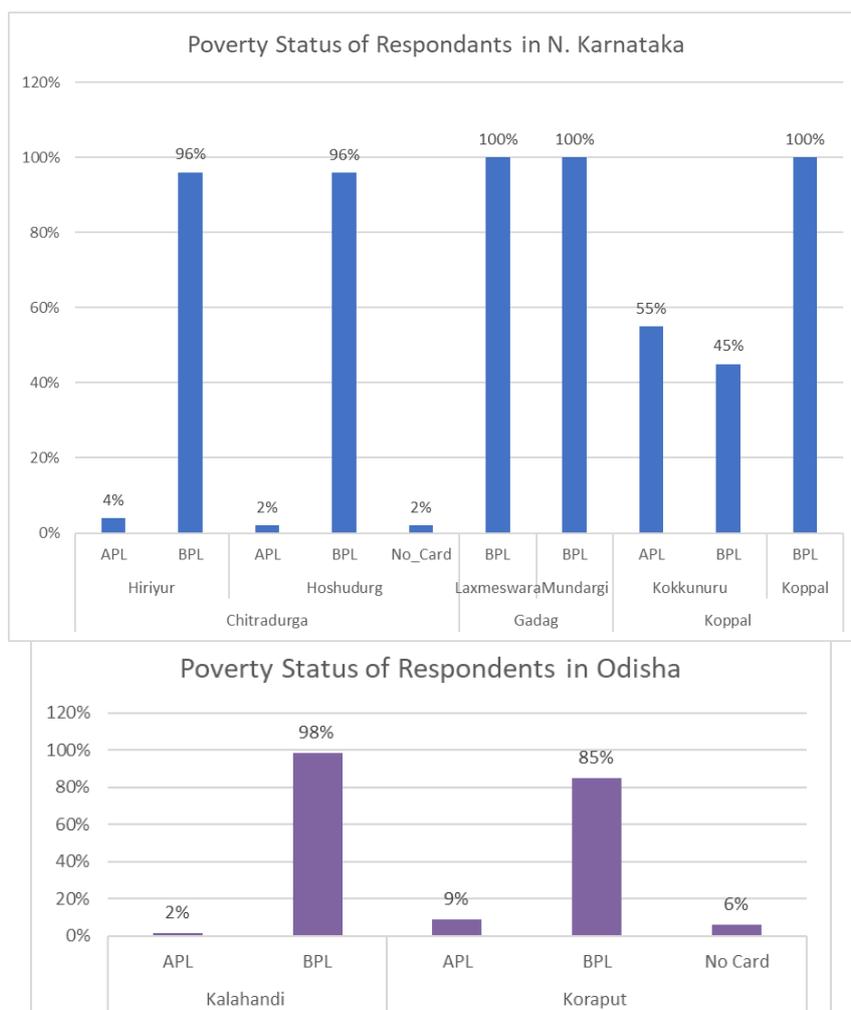


Figure 26. Poverty status of Respondents

8.2.6. Use of Public Distribution System (PDS)

The use of the Public distribution system is high across all villages in Odisha. The average household size being of 5 members. The BPL category of farmers being the majority in all the blocks of N. Karnataka, the respondents used PDS across all blocks.

8.3. Mapping Livelihood Streams

This section portrays information about the current livelihood streams in the study area, the economic returns of various activities reported by the respondents surveyed. The mapping of the livelihood streams of households and the community also brings out the issues faced in the current scenario thus creates scope for interventions to alleviate the condition. Here, it should be noted that analysis is done based on the data that was captured through farmer household survey questionnaire and complimented by qualitative data collected through participatory exercises like FGDs.

8.3.1. Agriculture and Allied Activities

Agriculture is the main livelihood source of the study region as evident from the farmer interviews and FGD conducted in the villages. Own farm activities are the major livelihood also almost everyone is engaged in farm-casual labor work when available. The average income from farming is around Rs.30,000 per annum in the Odisha districts and Rs. 50,000 in Karnataka districts.

8.3.1.1 Land holding

The average landholding is around 4 acres in Koraput and Kalahandi. In N. Karnataka 5- 7 acres is the average land holding. The cultivable land is on average 3 acres across the blocks in Odisha and 4 acres in N. Karnataka. Most farmers in the study area are small and marginal farmers.

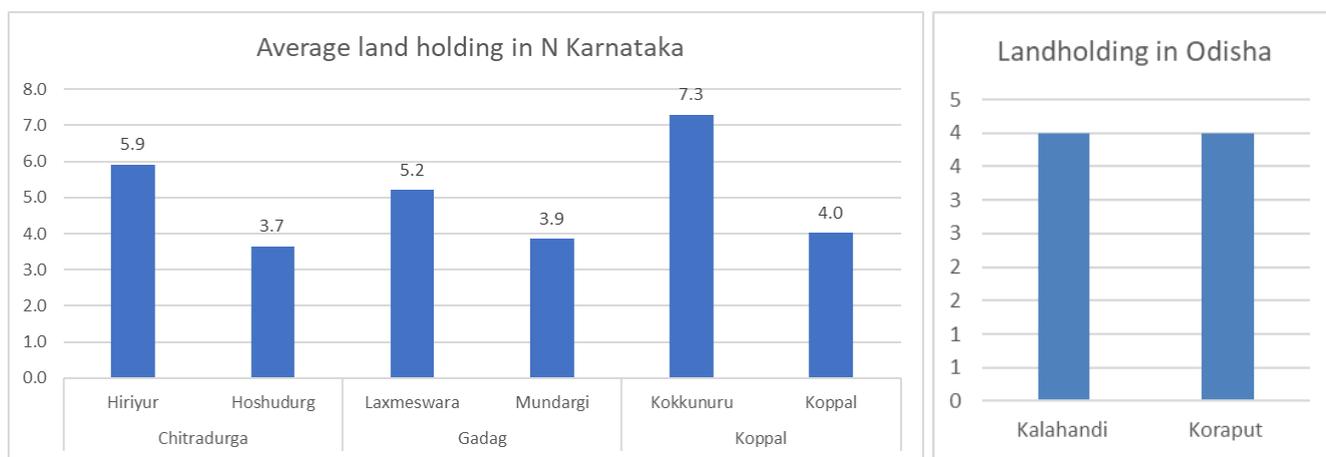
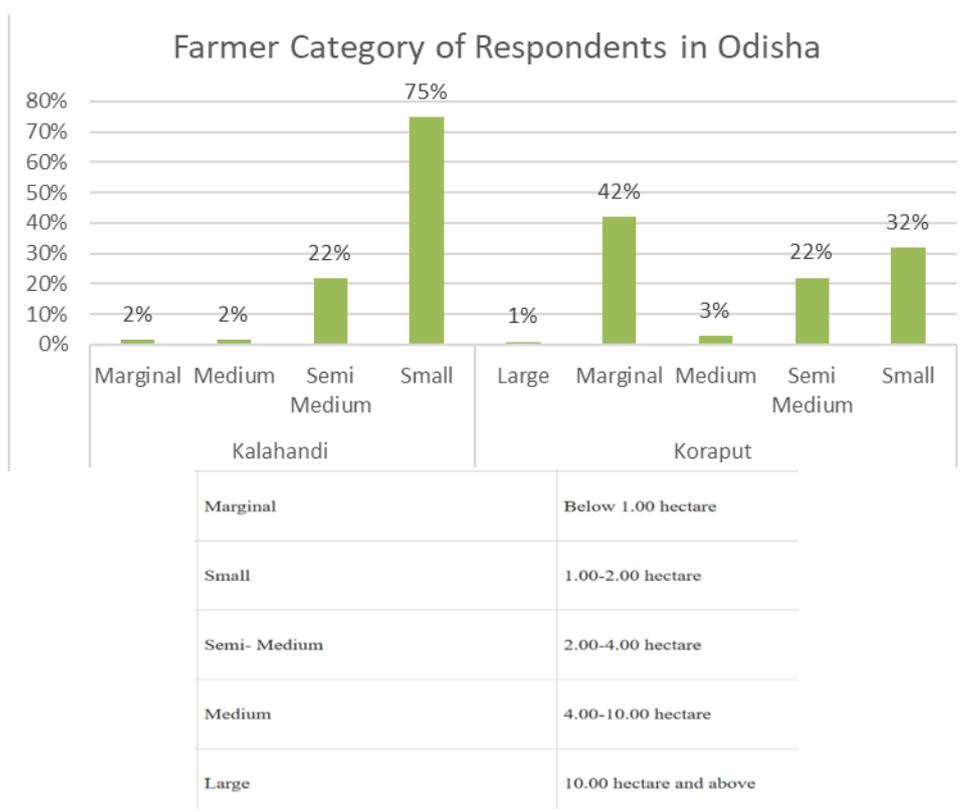


Figure 27. Average landholding in the study area



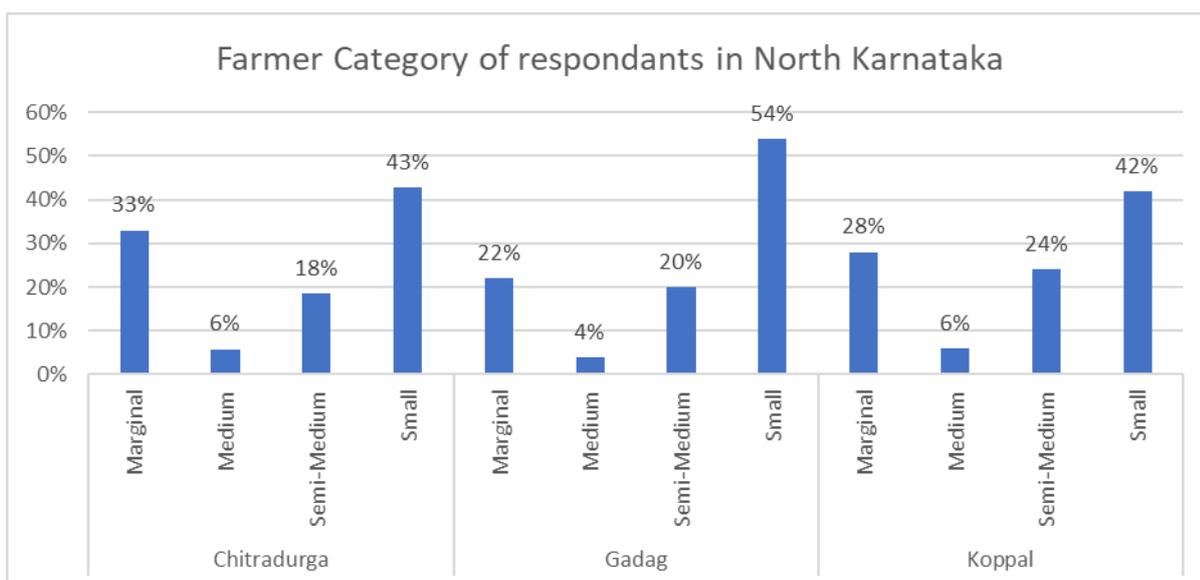


Figure 28. Farmer categories in the study area

8.3.1.2. Crop Diversification

For any intervention to increase productivity of the crops, a potentially rewarding cropping pattern or its diversification is essential. It is therefore, necessary to understand this aspect. It was seen that most farmers grow on average 2 crops in Koraput and 3 in Kalahandi. Paddy is also majorly grown in the Kharif season from July to December months. Millets and Groundnut being the major crops in Karnataka.

Kharif Crops:

Table 27. Kharif Crops in N. Karnataka

District	Block	Crops
Koppal	Kokkunuru	Bajra, Naune, Ark, Korli, Udhalu
	Koppal	Bajra, Maize, Ark, Nuane
Gadag	Laxmeswara	Groundnut, chilli, onion, Millets, Vegetables, Sunflower, Greengram, Cotton.
	Mundargi	Onion, Chilli, Sugarcane, Sunflower, Maize, Naune, Groundnut
Chitradurga	Hiriyur	Ragi, Chilli, Naune, Cotton, Onion
	Hoshudurg	Ragi, Saame, Horse gram, coconut, arecanut

Table 28. Kharif Crops in Odisha

District	Crops
Kalahandi	Paddy, Gurji, Ragi, Kosla, Biri, Kulot
Koraput	Paddy, Ragi, Urad, Suan

Rabi Crops:

Table 29. Rabi Crops in N. Karnataka

District	Block	Crops
Koppal	Kokkunuru	Bajra, Naune, Korli, Maize
	Koppal	Bajra, Maize, Ark, Nuane
Gadag	Laxmeswara	Maize, Jowar, wheat, Bengal gram, same (little millet)
	Mundargi	Bengal Gram, Jowar, Naune, Saame
Chitradurga	Hiriyur	Cotton Sorghum , Ragi, Naune, Onion
	Hoshudurg	gram, millet, groundnut

Table 30. Rabi Crops in Odisha

District	Crops
Kalahandi	Vegetables and little millet
Koraput	No crops, or some vegetables

Zaid Crops:

Crops are not grown in Zaid

8.3.1.3. Livestock Ownership

The villages mostly have livestock with People owning cows and buffaloes. Few people have goats and rear poultry. But they do not practice animal husbandry commercially.

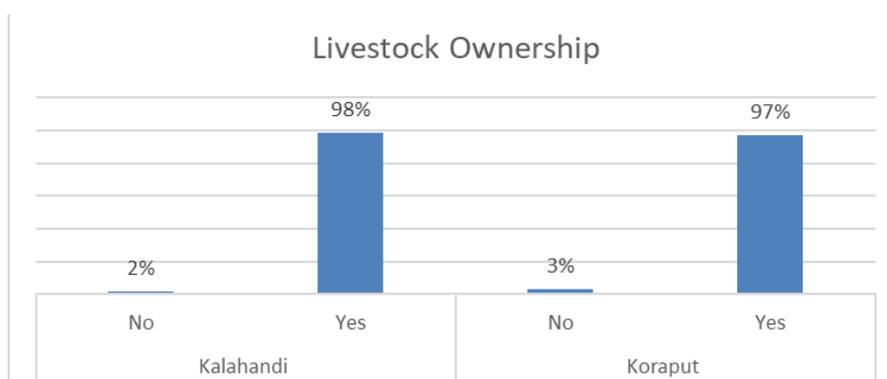


Figure 29. Livestock Ownership in Odisha

8.3.2. Non-Farm sources of livelihood

Negligible percentage of respondents are involved in business/trading, very few have salaried jobs. Other sources of income like driving, working as a mechanic or pottery. Almost no-one follows any Handloom/ Handicraft based livelihoods.

The other sources of livelihood are NTFP Collection like Mohua, Char and Tendu leaves. Some people have grocery shops in the villages which are often the only enterprises that were available.

8.4 Mapping availability of Resources

This section portrays information about the different resources currently available in the study area, understanding access to these resources and current practices. The mapping of the resources for the households and the community also brings out the issues faced in the current scenario thus creates scope for interventions to alleviate the condition. Here, it should be noted that analysis is done based on the data that was captured through farmer household survey questionnaire and complimented by qualitative data collected through participatory exercises like FGDs.

8.4.1 Water Resources

Water availability and accessibility is of utmost importance in improving the standard of living of households including access to resources for irrigation. We have detailed out the current scenario in the sections below.

8.4.1.1. Irrigation

None of the farmers in Kalahandi and Koraput have access to irrigation sources, agriculture is rainfed here. In N. Karnataka there is some irrigation available through borewells and canals.

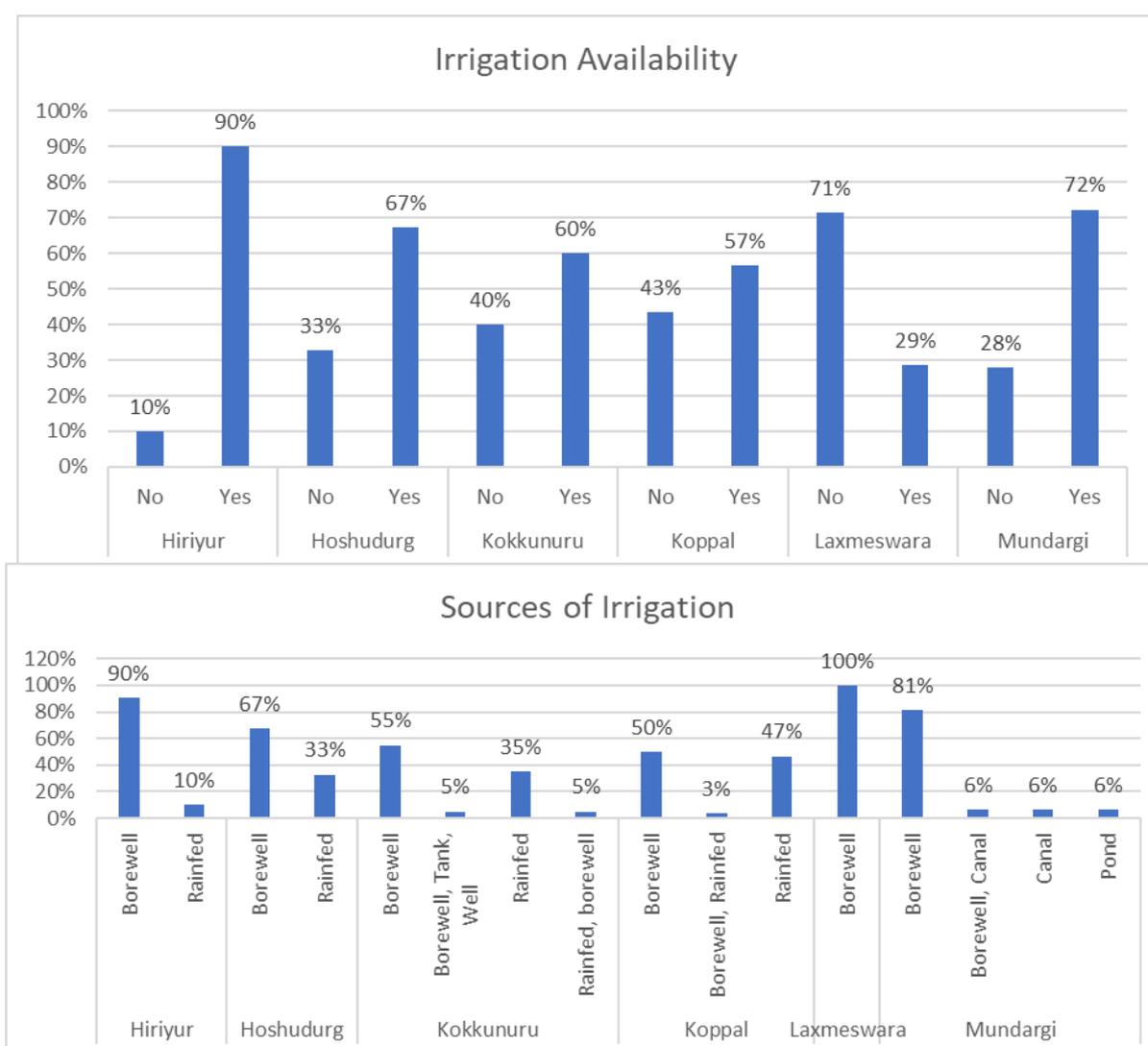


Figure 30. Access to irrigation for farmlands in N. Karnataka

8.4.1.2. Drinking water

Handpumps and wells are major sources of drinking water. Generally, it is available in the village and do not have to travel for it. But in some villages, there is scarcity during the summer months.

8.4.2. Collectives (FPO & SHG)

Farmer Producer Organization (FPO)

It was found that the respondents in Koraput were not members of Farmer Producer Organisations. In Kalahandi most of the respondents were member of the FPOs. Though Farmers agreed that collective buying & selling would augment the bargaining power of the farmers and it would

certainly increase the profitability of the farmers, more awareness was needed to build more such farmer groups.

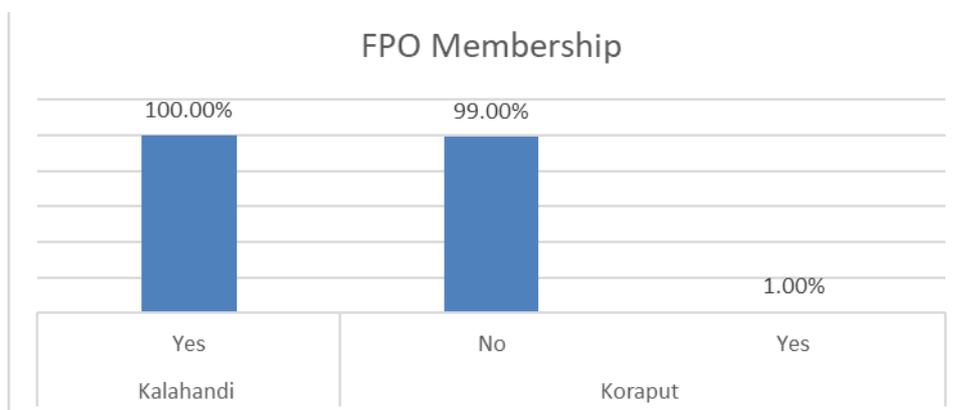


Figure 31. FPO membership of respondents

Women’s Self-Help Groups (SHG)

It was seen that a high percentage of respondents in Kalahandi were part of Self-Help Groups, in which either they themselves or someone in the household was a SHG member. In Koraput the membership of SHGs among respondents were 49%.

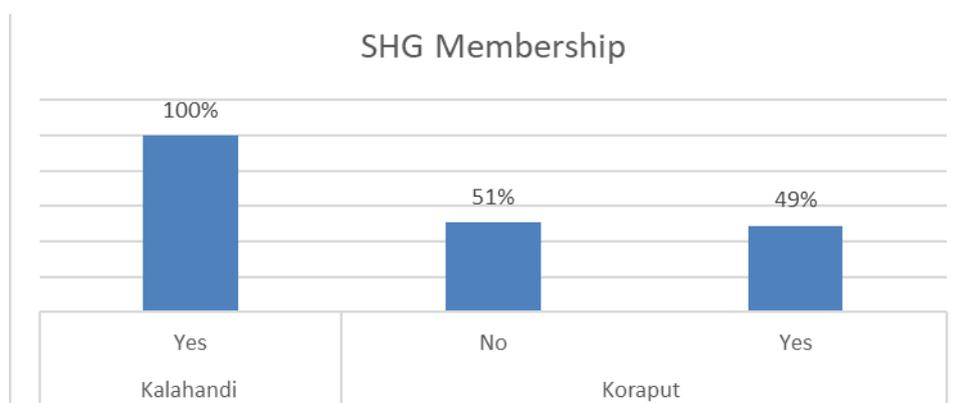


Figure 32. SHG membership of respondents

8.4.3. Farm Inputs and Equipment

The villages are not doing resource intensive farming and use less inputs like chemical fertilizers or pesticides in both Kalahandi and Koraput.

8.4.3.1. Farm Input Sources

The beneficiaries reported getting farm inputs like seeds, pesticides and fertilizers from nearby town shops or in village shops, some reported getting the inputs from government shops, this is for all crops and not specific for millets. The rates for different kinds of inputs varied from crop to crop. The highest percentage of inputs from nearby towns were availed in Koraput (99%), whereas other sources like gov. shops are also availed in Kalahandi.

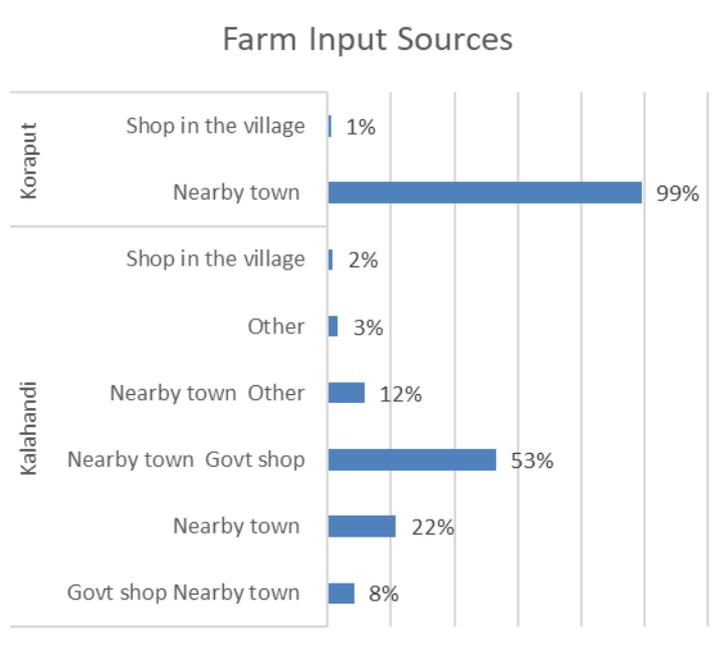


Figure 33. The farm input sources availed in the study area in Odisha

8.4.3.2. Tractor ownership

It is very rare for the farmers to own tractors as evident from the data with only 5% in Kalahandi and 1% respondents in Koraput owning tractors.

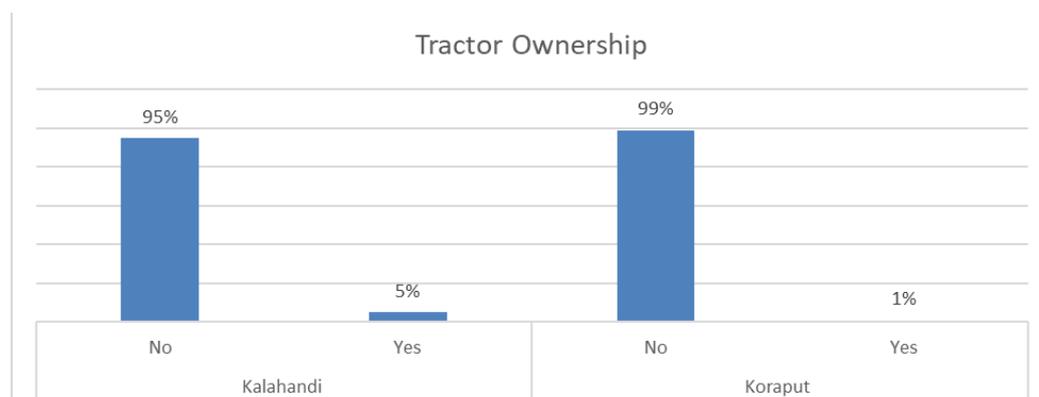


Figure 34. The farm input sources availed in the study area in Odisha

8.4.4. Government Schemes and Financial Services

8.4.4.1. Schemes

The availing of government schemes is found to be high in the study area. The below graph shows that 100% people avail it in Kalahandi and 94% avail in Koraput. For the respondents who avail

these schemes, PM Kisan Yojana and Krushak Assistance for Livelihood and income Augmentation (Kalia) Yojana of the Gov. of Odisha, Odisha Millet Mission (OMM), Promotion of Agriculture Production Clusters (APCs) is what they are availing.

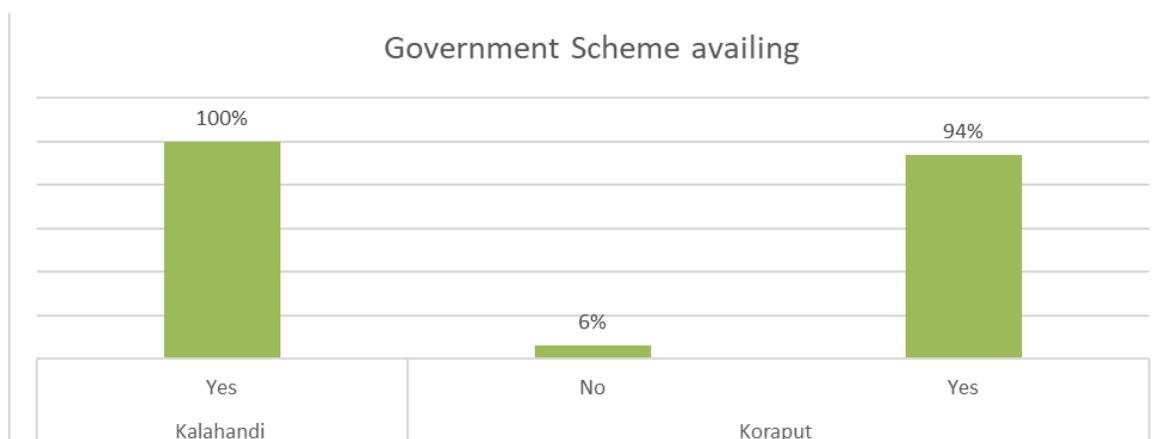


Figure 35. Availing of Gov. Schemes in the study area in Odisha

8.4.4.2. Soil Health Card

Soil testing is not prevalent in the study area. About 50% respondents had soil health cards that were got after soil testing done, facilitated by the NGOs in Kalahandi. In Koraput 90% respondent farmers did not have soil health cards and was not aware of the soil testing facilities.

8.4.4.3. Banking and Access to Credit

The respondents were aware of the banking facilities and majority of them (99%) have accounts in commercial banks in both Kalahandi and Koraput. While accounts in cooperative banks are the second most preferable option. The access to credit is low with very small percentage having Kisan Credit Cards (KCC). Negligible percentage have accounts in agri-cooperative societies. Some utilize the credit access through SHGs.

8.4.5. Agri- Advisory

Almost all farmers reported not receiving timely and quality agri-advisory for their farming concerns. Most farmers relied on their past experience and took advice from fellow farmers, but experience sharing was low. Rest depended on the advice given by retailers of farm inputs. The members of FPOs had better access to agri advisory in terms of contact to NGO staff and FPO staff for advice. Drought and Irrigation is the major issues faced by farmers in cultivation.

8.4.6. Issues in Millet Cultivation and Market Linkage

The millet cultivation issues and market linkage challenges were mapped based on the responses of the farmers in the study region in Odisha. It is seen from the graph below that the transportation is

a major issue for the farmers along with delayed payments and accessing crop insurance in case of damage to the crops.

Difficulty in Millet cultivation

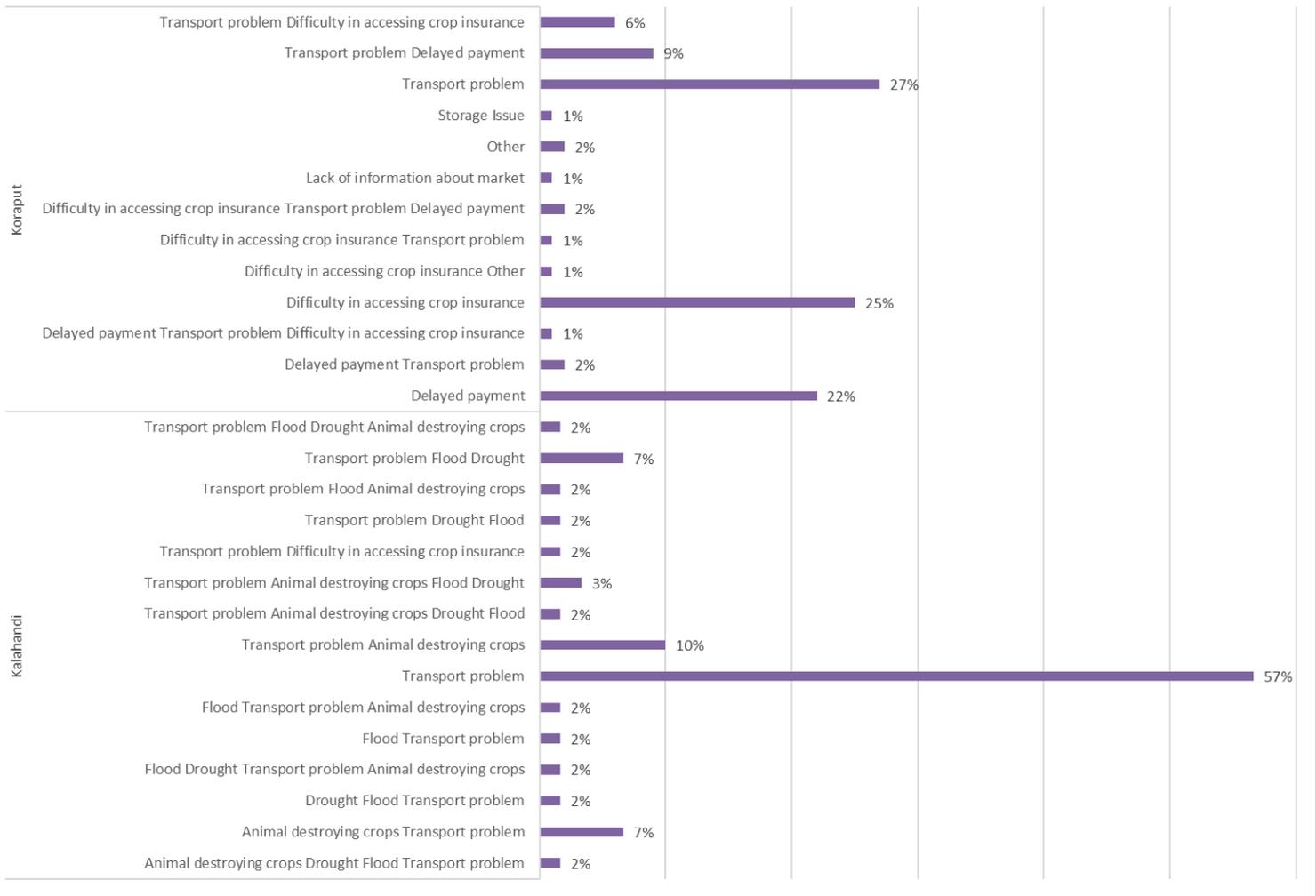


Figure 36. Challenges in millet cultivation

Chapter 9

Climate risks, Livelihood, Socio-economic vulnerability

The many challenges of the 21st century like climate change, the scarcity of water resources, compounded by the population increase globally, the inflation in food prices, and other socioeconomic impacts together are expected to have a great impact on agriculture and food security worldwide, especially posing a threat for the most economically disadvantaged people who live in harsh climatic zones like arid and subarid regions. This is also a challenge and an opportunity for investigating possible ways of producing, processing, and utilizing other potential food sources to address and reduce hunger and poverty. Cereals have a significant role as the most important source of food for the world being the major part of human diet. The cereal grain that has the most important inherent quality of drought-resistance and hardy nature are millets. Millets are cultivated widely in the semiarid regions of Africa and Asia and plays a role as major source of carbohydrates and proteins for people living in these densely populated areas. The potential contribution of millets in providing national food security and health benefits, has renewed the interest in this ancient grain and new opportunities for food scientists, technologists, and nutritionists to explore.

Karnataka Climatic Conditions

The average annual rainfall in Karnataka is 1248 mm. The State is divided into three meteorological zones viz. North interior Karnataka, South interior Karnataka and Coastal Karnataka. Coastal Karnataka with an average annual rainfall of 3456 mm is one the rainiest regions in the country. Contrasting this, the region of south Interior Karnataka and North Karnataka receive only 1286 and 731 mm of average annual rainfall.

The average annual Rainfall in the districts of Karnataka varies from 562 mm in the Bagalkot district to 4119 mm in the Udupi District. Bagalkot, Chitradurga and Koppal are the districts which receive the least rainfall whereas Udupi, Dakshina Kannada, Uttara Kannada, Hasan, Kodagu, Chickmagalur and Shivamogga districts receive the heaviest rainfall. (<https://nammakpsc.com/affairs/rainfall-in-karnataka/>)

Karnataka has two major rainfall deficit areas within its territory. Both these areas are situated in the North Interior Karnataka. One covers east Belgaum, Bijapur, the west Raichur districts and north-east Dharwad while the other covers east Bellary and Chitradurga district and a small region of Tumkur district. These two areas receive annual rainfall of 500-600 mm only. Challekere in the district of Chitradurga receives the lowest rainfall in the state with less than 500 mm annual rainfall.

The rainy season in Karnataka is of four months (June to September) in the coastal areas, Western Ghats, Malnad areas and in Bidar district. In the maidan areas the rainfall spreads over a period of five to seven months. The districts of Chitradurga, Hassan, Tumkur and Mysore have more rainy months spreading over five to seven months. The major part of Karnataka receives one-third of the

annual rainfall during the months of September and October.

<https://www.karnataka.com/profile/rainfall/>

- Chitradurga – 573 mm rainfall
- Gadag – 612 mm Rainfall
- Koppal – 572 mm Rainfall

Odisha Climatic Conditions

Kalahandi, Bolangir and Koraput districts are economically backward districts of Odisha. The climate of these districts is extreme and on an average these experience monsoon variety of climate. Summer season is intensely hot and winter is very cold.

The whole year is divided into four seasons. The hot season starts from March to May followed by the South–West monsoon from June to September. October and November constitute the post-monsoon season. The cold season is from December to February.

The average annual rainfall is 1,350 mm. The southwest monsoon is the principal source of rainfall in the districts. About 80% of the total rainfall is received during the period from June to September. The variation in the annual rainfall and temperature from year to year is not very large. About 80 to 85% of the total rainfall is received during the period from June-September.

Droughts are quite common in the district. Block-wise average annual rainfall varies from 1111.8 mm to 2712.9 mm. The climate of the districts is sub-tropical with hot and dry summer and pleasant winter. The average relative humidity in the district varies from 27% to 80% throughout the year.

Climate Vulnerability

The lack of Irrigation Resources: Water availability and accessibility is of utmost importance in improving the standard of living of households including access to resources for irrigation. In our study we found that none of the farmers in Kalahandi and Koraput have access to irrigation sources, agriculture is rainfed here. In N. Karnataka there is some irrigation available through borewells and canals. There is lack of sustainable energy resources like solar and pumps are often run on diesel if at all used.

Energy: Electricity availability is erratic in Odisha with major power cuts in these districts. The technology use to reduce drudgery like threshers, graders or pulverizers is hindered due to lack of reliable energy resources.

Poverty: Most farmers in the region are marginal or small farmers with very small land holdings. The people are mostly below poverty line and at much risk about climate risks and vulnerability is high due to their socio-economic conditions. The livelihood is mostly farm dependent and is not diversified.

Access to Markets: there is a lack of awareness about market linkage and access to bigger terminal markets. The dependency on local/ intermediary traders and middlemen puts them at risk. There is untapped potential for them to access better share of the market pie due to lack of value added products that are market ready.

Education and Awareness: Illiteracy levels are high in the study region of both Odisha and Karnataka. This also hinders the awareness about government schemes and other benefits that they can avail. The illiteracy levels are even higher in female population.

Access to Credit: There is limited access to credit with 2-3% availing some form of credit through cooperative banks or SHGs. The Kisan Credit Cards, Agriculture Credit Society cards or Crop insurance availing is negligible. People do have bank accounts and debit cards, but access to credit is low.

Climate Perception Study

Qualitative study was done in the study area with participatory tools of FGDs with the village community. The salient points that came up in the study and insights are given below.

Observed Changes: Change in rain patterns and less rainfall in general. The untimely rains and unseasonal weather are observed by the community. This change has been gradual over the last ten years.

Problems faced: climate change is causing challenges in agriculture in terms of affecting productivity and increasing pest attacks.

Perception of Responsibility: the community feels that deforestation is causing these changes in their area. So, the anthropogenic activities and their impacts is perceived.

Solutions suggested: Afforestation would solve some of the climatic problems is what they think. The forest departments being proactive in planting new trees is suggested, but no proactive action was noted in community climate mitigation or adaptation measures.



Figure 37. Village Padmathopa in Kalahandi Odisha

Chapter 10

Energy Mapping

In the value chain study, we mapped the energy/ technology use at each stage of the millets studied and the basic energy needs, cooling needs and tried to come up with potential solutions/ interventions as discussed in this chapter. Keeping with the goal of the project of identification of the potential for sustainable energy-driven millet-based Agri livelihoods in Odisha and North Karnataka, the intention is to derive the scope for technology innovation specific to the millet value chain in order to enable access to more sustainable, reliable, and affordable local infrastructure to the community needs.

Sustainable Development Goal 7 is one of 17 Sustainable Development Goals established by the United Nations General Assembly in 2015. It aims to "Ensure access to affordable, reliable, sustainable and modern energy for all.

Technology use/ Processing Needs: the machinery used at different stages in Millets are as follows:

- Cultivation: Tractor, Weeder, sprayer
- Post- Harvest: **Thresher** is required in this stage and is often provided to the farmers through FPOs/ Partner NGOs.
- Processing: **Destoner, Grader:** Destoning and grading is done as a cleaning process. This is also done in case of Gov procurement on MSP. The FAQ norms maintaining is essential for this process. The destoner and graders are often electricity operated. This is generally one machinery that is capable of doing both the functions of destoning and grading.
- Value Addition: **Dehuller:** Removal of outer husk of grain is done in an electricity operated machine, which creates the product of millet rice. Dehulling ratio is 60:40 depending on quality.
- Value Addition: **Pulveriser** is used when the Ragi is to be processed into Ragi flour. The pulverisers can be electricity or solar powered. The micro processing units with small pulverizer capacities are also in use.

Technology needs:

1. Solar Irrigation support: Continuous and reliable electricity supply is not available in the region of both Lanjigarh and Boipariguda. The area is rainfed and there is no water lifting pumps available for any existing perennial sources of water. The solar water lifting pumps

can be integrated with rain-water harvesting structures like farm ponds for providing irrigation facilities to farmers.

2. Post harvest processing: The post-harvest machinery like thresher, grader, destoner and even value addition needs like pulverizer or dehuller powered by renewable sources of energy (like solar), is the need of the hour in this region.
3. Threshing needs: Thresher powered by Solar energy with higher efficiency of processing larger volumes (high kg/hour rates) is needed. The threshers currently used are often reported to be too slow with lower efficiency of processing, thus disadvantageous to farmers to use them at the current mode of operations as it takes lot of time for them to thresh even smaller quantities.
4. The Grader and Destoner machines are also needed even for basic quality norms maintenance for government procurement channels like OMM. All this post-harvest cleaning machinery needs an overhaul in terms of higher efficiency and efficient renewable energy use like solar.
5. Dehuller for Little millet is a pressing need for processing of small millets into millet rice.
6. Solar powered storage (cooling unit/ refrigeration) for value added products for FPOs can provide the products a longer shelf-life and ensure better control over prices.
7. Ragi biscuit machine, cookie and cake machines for SHGs and FPOs. These machines are often electricity operated suitable for the baking needs for cookies or cakes. The solar powered machines will ensure smooth operations in terms of reliable and continuous energy availability.
8. There is potential for solar cooking in millet cafes/ tiffin centers supported by Mission Shakti. This would mean use of solar cookers of different kinds and capacities, according to the need for the specific tiffin center.
9. Millet on Wheels (Food Truck) is an opportunity for solar powered refrigerators. This would ensure fresh meals and reduce spoilage/food wastage of ready-to-eat meals served on these food trucks.

Current Vendors:

Currently there are very few energy entrepreneurs in Kalahandi / Koraput districts and most machinery is imported from Tamil Nadu. Some solar based enterprises like Narayaneer Enterprises are there in Odisha study region.



Figure 38. Energy use in Millets in different processing needs

Table 31. Energy Mapping of Millet Processes and Opportunities for Technology Intervention

Value chain	Activity	Description	Current way of working	Energy Source	Intervention Opportunity
Pre Harvesting	Land preparation	Field tillage, cultivator, leveling etc	Tractor, Bullock	Diesel, Animal	No opportunity
	Seed Sowing	Sowing of millets	Tractor with sowing attachment, Bullock	Diesel, Animal	No opportunity
	Weeding	Removing of weeds & unwanted plants	Bullock, Manual, Spraying of weedicides	Manual, Animal, Battery for spraying pump	No opportunity
	Inputs application	Fertilizer for plant growth, Pesticides for disease prevention	Broadcasting of fertilizer, Spraying of pesticides	Manual, Battery for spraying pump	No opportunity
	Irrigation	Watering of crop	Electric pumps & pipes (Open wells, Tube wells, Canals)	Electric power	Solar pumps are possible to provide
Post Harvesting	Harvesting	Cutting of ready crop from the field	Manual	Manual	No opportunity
	Threshing	Removing of grain from stalks and husk	Thresher, Manual	Electric power, Manual	Solar Thresher
	Hulling	Removing of chaff & outer husk of grain	Hulling machine	Electric power	Solar powered Hulling machine can be provided
	Flour Making	Grinding operation to prepare flour of the grains	Pulverizer machine	Electric power	Solar powered Flouring machine can be provided
	Value added products	Products like Cookies, laddoos, Namkeens, Oats, Papad etc	Mostly manual operations	Electric power, Manual	Solar powered processing machines can be provided along with refrigeration

Chapter 11

Challenges: Findings of the Study

11.1. Challenges & Bottlenecks

As we explored the farming activities mapping out the millet value chain, we also analysed the main challenges or issues faced by the farmers in the region. The ecosystem approach gave us key insights on challenges faced that are climate-related, energy-related or other non-energy processes. Based on the findings of the study, some of the key challenges faced by majority of the farmer respondents are as below:

Lack of irrigation resources: The biggest challenge to cultivation in the region is availability of water resources for irrigation. The study area falls in a drought prone region, so though there are no problems related to flooding, there is acute scarcity of water for irrigation. 70-100% respondents in all the blocks had the issue to irrigation facilities not being available.

Lack of farm input: Farmers don't have access to good quality seeds and other input material at reasonable prices, which impacts on yield output.

Processing: Processing facilities for millets is a major problem faced by farmers. The post-harvest processing technologies is lacking in the millet value chain and there is need for reliable energy for such machinery to operate at optimum levels.

Value addition: Value added product manufacturing would help farmers realize greater market share in the retail market. These are few initiatives like SHGs making some millet based products but the scale of operation and related machinery, capacity building and development of enterprises is needed.

Market needs: Market linkage is a major challenge faced by farmers leading to dependency on middle men which often translated into much lesser bargaining power with the farmers.

Storage: the storage of products that would enhance the capacity of farmers to realize better prices of their produce is completely lacking. The farmers depend on FPO channels and that happens right after the harvest. The storage of value-added products like millet flour or ready to eat products like millet ladoos, cookies or cakes is also not available currently. This might lead to distress sales.

Lack of diversification of market: the farmers often rely mostly on procurement through gov schemes and cultivation of crops that are incentivised. The lack of other channels prohibits the diversification of crops and increases risk in case of change of gov policies.

Awareness: There is lack of awareness about Crop insurance, Soil testing & other Government schemes and are not being properly availed by the farmers.

Climate Change: Farmers also faced problems like unfavourable weather conditions including floods and droughts. Untimely and erratic rainfall caused crop damage.



Figure 39. SWOT Analysis for the study area

Chapter 12

Recommendations: Future Road Map and Way Forward

The findings of the survey indicate a need to develop initiatives and interventions related to creating better resources for farming and then create institutional systems to augment farm productivity and net incomes of the small and marginal farmers of the study area. Some key points are discussed as follows:

Water Resources development (Irrigation): 4-5 months in the summer there is severe scarcity of water in the region. Borewells are there in some parts of N. Karnataka, but the reliance is only on ground water. The sustainable sources of irrigation can be developed along with rain-water harvesting structures like Farm Ponds. The Solar water lifting methods can then be integrated with such sustainable irrigation sources.

Crop diversity promotion: the cultivation of crops can be diversified into crops other than resource intensive paddy cultivation. The millet crops grown can be diversified to include different major and minor millets to increase the acreage under millet cultivation.

Drought resistant cultivation: Drought prone regions like N. Karnataka and Odisha districts of Kalahandi and Koraput is ideal for millet cultivation since it has been part of traditional agricultural systems.

Processing: the post-harvest processing right from threshing, pre-cleaning destoning and grading processes needs to be mechanized with reliable and sustainable source of energy like solar. There is lack of proper machinery for efficient processing of millets and lack of reliable electricity supply. Both these problems can be addressed through such innovation and interventions in sustainable technology.

Market linkage: The promotion of millet is needed in terms of better market linkage for the produce for better price realization and bargaining power of farmers. The FPOs can be strengthened for this purpose.

Enterprise development: Though there are many **SHGs** in the villages, they are not doing any commercial production of commodities. Except a few villages where millet-based products are made by them. There can be more entrepreneurial training, capacity building and access to credit made available for more successful enterprises.

FPO: Farmer Producer Organisation (FPO) is a formal organization which is owned and managed by the farmers themselves and has the potential to serve as a single window for delivery of agriculture services and provide external linkages including local value addition and marketing of surplus produce. Better processing facilities, market linkage, access to credit and capacity building will truly help them into better run bodies for farmers to benefit through such collectives.

Selection of End Users for Technology Interventions:

A farmer typically needs 3 core services –

- 1) Buying of agri inputs - seed, pesticide, fertilizer, agri equipment, animal feed etc
- 2) Farmer advisory – regarding judicious & optimal usage of agri inputs
- 3) Sale of agri produce – better price realization for the harvested crop

All these 3 services can very well be executed under the FPO platform. To strengthen the operations of the FPOs, interventions in sustainable technology and increasing the efficiency and scale is of utmost importance.

Below are the suggested interventions/ initiatives with the tentative timeframe to execute the same. The step-by-step augmentation of services has to be done so as to take the calculated & firm steps towards building a robust business proposition for the FPO in alignment with SDG7 goals. The possible interventions has been mapped around the energy needs of the end-users, this is detailed in the following table.

Table 32. Tentative timelines for Intervention Activities

S. No	Activity	Target Beneficiary	Description	Timeframe
1	Post- Processing Machinery based on Solar Energy <ul style="list-style-type: none"> • Thresher • Destoner • Grader • Dehuller 	FPO, Village Entrepreneur	<ul style="list-style-type: none"> • Collaboration with NGO Partner, Energy entrepreneurs. • Finalizing technology and vendors. 	Immediate
2	Mechanization of Value addition processes with solar <ul style="list-style-type: none"> • Pulveriser • Biscuit/ cookie/ cake machines 	FPO, SHGs	<ul style="list-style-type: none"> • Collaboration with NGO Partner, Energy entrepreneurs. • Finalizing technology and vendors. 	Immediate
3	Storage/ Cold storage with Solar <ul style="list-style-type: none"> • Storage for millet grains • Storage for millet value added products (Flour/rice) 	FPO	<ul style="list-style-type: none"> • Collaboration with NGO Partner, Energy entrepreneurs. • Finalizing technology and vendors. 	Within 6-8 months
4	Solar Refrigeration <ul style="list-style-type: none"> • Ready to eat products in Millet cafes • Millet on wheel food trucks 	Cafes, SHGs	<ul style="list-style-type: none"> • The Cafes supported by Gov. Schemes • Local entrepreneurs • Gov bodies like KVK 	Within 6-8 months
5.	Infra Building: Developing	Farmer	<ul style="list-style-type: none"> • In collaboration with 	After 1 year

	of sustainable water resources for irrigation like farm ponds and solar water lifting devices	Community	NGO partners, Gov bodies and target community	onwards
3	Diversification of crops to different types of major and minor millets	Farmers	<ul style="list-style-type: none"> • Capacity building with exposure to new techniques and crops to increase productivity. • Identification of millets to be promoted. 	After 1 year onwards
4	Market linkages for the above mentioned introduced crops	FPOs	enterprise development	2 year onwards

Annexure 1

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Annexure 2

2.1. Questionnaire for farmer interview

Selco Millet Scoping Study

<https://ee.kobotoolbox.org/preview/i/bH7KipGn>

Selco Millet Scoping Study

Date of Survey

yyyy-mm-dd

Surveyor Name

Name of District

Name of Block

Name of Village

Name of Farmer

Mobile Number

Gender

Male

Female

Age

Number of Household members currently residing

Poverty Status

APL

BPL

No Card

Do you use PDS Shop

- Yes
- No

Do you have soil health card?

- Yes
- No

Are you member of any FPO (farmer's group)?

- Yes
- No

Are you/ family member part of any SHG?

- Yes
- No

Highest education

- Illiterate
- Primary
- Secondary
- Higher Secondary
- Graduate
- Post Graduate
- Technical / Diploma (ITI)
- Drop Out
- other

Other education

Do you have bank account?

- Yes
- No

Social Category

- General
- OBC
- SC
- ST

What is your primary source of income?

- Own Farm Activities
- Tenant farming Activities
- NTFP Collection
- Farm Casual Labor
- Non-farm Casual Labor
- Business/Trading
- Job
- Tailoring
- Handicrafts
- Animal husbandry
- Other

Other income source?

What is your secondary source of income?

- Own Farm Activities
- Tenant farming Activities
- NTFP Collection
- Farm Casual Labor
- Non-farm Casual Labor
- Business/Trading
- Job
- Tailoring
- Handicrafts
- Animal husbandry
- Other

Annual income from Farming?

Annual income from non-farming?

Annual Savings?

For how long have you been practicing farming? (years)

Do you have own land?

- Yes
- No

What is the landholding? (Own land)

landholding unit

- Acre
- Bigha
- Hectare

Do you rent land?

- Yes
- No

Size of land rented in 2022?

rented unit

- Acre
- Bigha
- Hectare

Total land area under cultivation in 2022? (cultivable land, including rented land)

cultivable land unit

- Acre
- Bigha
- Hectare

Is any of your land irrigated?

- Yes
- No

What is the source of irrigation?

- borewell
- Well
- Canal from River
- River
- Canal from Dam
- Using neighbour's source of irrigation
- Farm Pond
- Solar based irrigation
- Other

Other source of irrigation

Do you use pump for irrigation

- Electric
- Diesel
- Solar
- Do not use

Size of land irrigated?

Unit land irrigated

- Acre
- Bigha
- Hectare

No of months for which water availability is there for irrigation (write in number)

Do you own livestock?

- Yes
- No

What livestock do you own?

- Cow
- Buffalo
- Goat
- Hen
- Pig
- Sheep
- Bullock
- Others

Other livestock?

Do you practice animal husbandry for income purpose?

- Yes
- No

Type of animal husbandry for income purpose?

- Dairy
- Goatery
- Poultry
- Pig rearing
- Do not practice

Do you have income from Handloom/Handicraft?

- Yes
- No

Do you have access to credit?

- Commercial Bank
- Cooperative Bank
- ATM/Debit Card
- Self Help Groups
- FPO
- Informal Sources- Money Lenders
- Kisan Credit Card
- Agriculture Cooperative Society
- Solar Pump Loan
- Do not have

Do you avail any Gov. scheme?

- Yes
- No

Government scheme you avail for?

- Old-age
- Widow
- Disability
- MGNREGA
- Agriculture
- Animal Husbandy
- Housing Scheme
- Skill Development
- Credit Linkage
- Other

Name of Gov scheme availed?

Do you own tractor?

- Yes
- No

Where do you get your farm inputs from? (seeds, fertilizers, pesticides, etc)

- Shop in the village
- Nearby town
- Govt shop
- Other

Other source of farm input?

Are you able to get timely & quality agri advisory service (Yes or No)

- Yes
- No

Where do you get the advice regarding crop management

- Past experience
- Fellow farmer
- Retailer advice
- Company staff
- TV/Newspaper
- Facebook/youtube
- Agriculture Department
- Krishi Vigyan Kendra (KVK)
- Other

Other source of crop advisory

Number of crops grown in Kharif 2022 (last year)

- 0
- 1
- 2
- 3
- More than 3

Major Crop Names of last Karif season 2022 (Top 3)

Select 3

- Paddy
- Ragi
- Kosla
- Urad
- Bajra
- Other

Other crop name kharif?

1 Number Major Millet grown in Kharif

select 1

- Ragi
- Kosla
- Other

Other Millet Crop Name

Major Millet Crop 1 kharif Area (in acres)

Major Millet Crop 1 Kharif Yield (Quintal/Acre)

Method of farming Major Millet Crop 1 in kharif?

- Chemical
- Semi Organic (chemical fertlizer, but no pesticide)
- Organic

Did you sell Major Millet Crop 1 in 2022?

- Yes
- No

Quantity for self Consumption of Major Millet Crop 1? in Kg

Quantity sold of Major Millet Crop 1 Quintal in 2022

Where did you sell your produce of Major Crop 1?

- Haat
- Local market
- PACS
- Mandi
- Local traders
- FPO
- Online Platforms
- Companies

2nd Top Millet Kharif Crop Name

Select 1

- Ragi
- Kosla
- Other

Other 2nd Millet crop name

2nd Top Millet Crop Kharif Area (in acres)

2nd Top Millet kharif Crop Yield (Quintal/Acre)

Method of farming 2nd Top Millet kharif Crop?

- Chemical
- Semi Organic (chemical fertlizer, but no pesticide)
- Organic

Did you sell 2nd Top Millet kharif Crop in 2022?

- Yes
- No

Quantity for self Consumption of 2nd Top Millet kharif Crop? in Kg

Quantity sold of 2nd Top Millet kharif Crop Quintal in 2022

Where did you sell your produce of 2nd Top Millet kharif Crop?

- Haat
- Local market
- PACS
- Mandi
- Local traders
- FPO
- Online Platforms
- Companies

Do you do NTFP Collection

- Yes
- No

Number of crops grown in Rabi 2021 (last to last year as this year harvest is not done yet)

- 0
- 1
- 2
- 3
- More than 3

Major Crop Names of last Rabi season 2021 (last to last year as this year harvest is not done yet) TOP 2

Select top 2 major crops

- Mustard
- Wheat
- Gram
- Millet
- Other

Other crop Rabi?

1 Number Major Rabi Crop Name

Select 1

- Mustard
- Wheat
- Gram
- Millet
- Other

Other Major Rabi Crop Name

Millet name grown in Rabi

1 Number Major Rabi Crop Area (in acres)

1 Number Major Rabi Crop Yield (in Quintal per acres)

Method of farming 1 Number Major Rabi Crop ?

- Chemical
- Semi Organic (chemical fertlizer, but no pesticide)
- Organic

Did you sell 1 Number Major Rabi Crop in 2021?

- Yes
- No

Quantity of 1 Number Major Rabi Crop for self consumption in kg?

Quantity sold 1 Number Major Rabi Crop ? (Quintal in 2021)

Where did you sell your produce of 1 Number Major Rabi Crop ?

- Haat
- Local market
- PACS
- Mandi
- Local traders
- FPO
- Online Platforms
- Companies

2nd Number Major Rabi Crop Name

- Mustard
- Wheat
- Gram
- Other

Other Major 2nd Crop Rabi

2nd Major Crop Rabi Area (in acres)

2nd Major Crop Rabi Yield (Quintal/Acre)

Method of farming 2nd Major Crop Rabi?

- Chemical
- Semi Organic (chemical fertilizer, but no pesticide)
- Organic

Did you sell 2nd Major Crop Rabi in 2021?

- Yes
- No

Quantity of 2nd Major Crop Rabi for self consumption in kg?

Quantity sold 2nd Major Crop Rabi? (Quintal in 2021)

Where did you sell your produce of 2nd Major Crop Rabi?

- Haat
- Local market
- PACS
- Mandi
- Local traders
- FPO
- Online Platforms
- Companies

Any post harvest processing activity undertaken for Millet ?

- Threshing
- Destoning
- Grinding
- Millet rice making
- Other

Other activity

Any value addition activity undertaken for Millet ?

Product making like Ragi Ladoo, Snacks, etc

- Yes
- No

What value addition do you do?

What are the main problems faced by you in cultivation? (Select multiple)

- Quality and availability of inputs (seeds, fertilizers, pesticides)
- Irrigation
- Pest management
- Animals harming crops
- Flood
- Drought
- Lack of training
- Other

Other problem faced in cultivation?

What are the main problems faced by you in selling of crops (market linkage)?

- Do not get good price
- Transport problem
- Lack of information about market
- Delayed payment
- Difficulty in accessing crop insurance
- Storage Issue
- Drought
- Flood
- Pest Attack
- Animal destroying crops
- Post harvest processing
- Other

Other problems in seling crops?

What are the main problems faced by you in Millet crops ?

- Do not get good price
- Transport problem
- Lack of information about market
- Delayed payment
- Difficulty in accessing crop insurance
- Storage Issue
- Drought
- Flood
- Pest Attack
- Animal destroying crops
- Post harvest processing
- Other

Other problems/ needs in Millet cultivation?

2.2. Questionnaire for FGD

FOCUSSED GROUP DISCUSSION

The questions are aimed to collect the village level information on the agricultural scenario and the problem faced and other market issues. The questions are to be asked in a group of 5-6 farmers.

1. Date of Survey:
2. Name of District:
3. Name of Block:
4. Name of Village:
5. Name of Gram Panchayat:
6. Number of houses in the village?

7. General sources of livelihood in the village?

8. Social demographic (mention percentages)
 - SC:
 - ST:
 - OBC:
 - General:

9. What are the sources of irrigation in the village? Mention about rainwater harvesting structures if present/ Solar irrigation methods

10. Is there a scarcity of water for irrigation? In which months? What is the source of irrigation in scarcity months?

11. Drinking water source of village?

12. Is electricity available for irrigation?

13. Is there a PDS shop in the village?

14. Do people use PDS shop?

15. Road access to the village? (Good road or not)

16. Nearest Town?

17. Commercial Bank used by the villagers?

18. Cooperative Bank used by the villagers?

19. The government schemes used by villagers?

20. Where do you buy Agri- inputs from? INCLUDE Millets

- Seed
- Fertilizers
- pesticides

21. Unit of land measurement used here? (Bigha, acre, etc.)

22. Average landholding in village?

23. What crops are grown in the village? Focus On Millets (Cropping Calendar)

Crop Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yield	Rate

24. Is Millets grown by farmers in the village in large quantities? (Yes/No)
25. What are the types of millets grown? (Give percentages in terms of production)
26. Are inorganic fertilizers used extensively? Mostly for which crops?
27. Are pesticides used extensively? Mostly for which crops?
28. Is organic/ traditional cultivation practiced in the village? Which crop?
29. What inputs/ methods you use for organic/traditional cultivation?
30. Is tractor available in the village?
31. Is there any FPO in the village? (Write names)
32. What are the activities of the FPO?
33. Is there any SHG in the village? (Write names and number of members)
34. Any SHG enterprises in the village?
35. Any Input Technologies
- Soil Testing Kit
 - Seed Treatment Unit
 - Bio fertilizer/ Bio fermenter
36. Any post-harvest processing activity undertaken for Millet? For each mention Technology used/ Manually done.

- Threshing
- Pre-cleaning
- Destoning
- Grading
- Grinding to flour
- Millet rice making (Dehulling)
- Other activity

37. Do you do any value addition in crops? Specially millets value-added products like laddu/biscuits, etc.

38. Any animal husbandry in the village? (Diary, poultry, goatery)

39. Do people migrate from the village? For what purpose?

40. What are the main problems in cultivation? (floods, droughts, input availability, pest, animals destroying crops, irrigation, etc.)

41. What are the main problems in selling of crops? (Right price, transport, lack of information about market)

42. Name of market location where you sell Millets produced from the village?

43. What are the specific problems in millet cultivation?

- Inputs availability and Quality- Seeds, fertilizers, Pesticides:
- Climate- Drought, Floods, etc.

- Labour
- Irrigation
- Weeding
- Post Harvest- Threshing, destoning, flour, rice making
- Storage (Any loss/ wastage due to lack of)
- Selling of crops- Rates not good, transport, etc.
- Other Problems:

44. Do you need information/training about millets? (Capacity Building)

Climate change perceptions

1. What kind of climatic changes have you observed in the past ten years?
2. What kind of climatic problems have you faced and what impacts it has caused to the farming?
3. Do you know who is responsible for these changes?
4. Have you devised any method or mechanism to reduce the impact of the climatic problems?

Other Information Notes:

2.3. Questionnaire for Stakeholders

Additional Questions for NGO

1. What is the name of the NGO
2. When was it registered
3. The activities undertaken by you:
4. How many villages do you work with
5. How many farmers and directly and indirectly impacted by you
6. What are the challenges that you face
7. What are the specific activities you undertake for millets (cultivation, processing, value addition)
8. Do you have organic cultivation in the villages for millets?
9. Do villages have organic certification? How many?

Additional Questions for Processor

1. What is the name of the Processor/Miller
2. When was it started
3. What are the millets processed
4. Capacity of the milling unit
5. What are the quantities of millets being processed
6. Where do you do the procurement from
7. What is the amount procured in millets and in which months?
8. What are the challenges that you face
9. Where do you sell the processed products

Additional Questions for FPOs/ FPCs

1. What is the name of the FPO/FPC
2. When was it registered
3. Number of BODs
4. Number of members
5. The activities undertaken by you:
6. What the benefits that the farmers perceive due to this FPO/ FPC
7. What are the challenges that you face
8. What are the specific activities you undertake for millets (cultivation, processing, value addition)
9. What kinds of capacity building exercises do you do for your members and Farmers
10. What kind of role women play in the activities of the FPO/FPC
11. What are the technology used for millets in different stages (shift from manual activities in cultivation and processing, value added products, etc.)

12. What kind of technology would help in millet cultivation processing and storage

13. Do you have specific needs for market linkage for millet

14. What kind of support do you need specifically for millets

15. Custom hiring centre (Machinery, Rental rate, usage)

Additional Questions for Gov. Departments

1. What are the main activities/schemes for Millet
 - Cultivation (Input, Agri-advisory, Capacity Building, Awareness)
 - Processing
 - Value Addition
 - Customer Awareness
 - Retail
2. What kinds of millets you are promoting and why
3. What is the role of OMM/ Millet in PDS/ Millet Shakti Mission/ Café
4. What is the plan regarding millets as a way forward
5. What are the plans for Lanjigarh Block in Kalahandi/ Baipariguda in Koraput/ N. Karnataka Blocks

Annexure 3

Minutes of Meetings with Stakeholders

Minutes of Meetings for Kalahandi and Koraput Districts, Odisha.

FGD- Village Padmathopa. District- Kalahandi. Date: 21/2/2023

1. The FGD was conducted this this village with male and female farmers. There were SHG members also present in the focus group
2. The questionnaire for FGD was followed to collect primary data
3. The number of households is around 150. The general livelihood sources are agriculture and farm and non-farm labour.
4. This village had SC majority.
5. The irrigation sources are not available in this village.
6. There is scarcity of water faced other than the monsoon season
7. Electricity availability is very limited
8. The population is mostly below poverty line and access the public distribution system for ration.
9. The road access is good.
10. People have bank accounts in commercial banks like State Bank of India.
11. Government schemes like OMM, Kaliya Yojna, PM Kisan are used.
12. The input shops availed are from nearby towns
13. Paddy, Ragi, Flaxseeds, Gurji, Kosla Cotton are some crops grown
14. Other details were discussed around use of pesticides
15. The collectives were discussed like FPOs and SHGs
16. Enterprises that might be existing shows that mushroom cultivation, vegetable farming was practiced.
17. In millets no post-harvest technology is used
18. No value addition is done at the individual farmer level.
19. Market linkages and specific issues were also discussed around cultivation in general and millets in particular.
20. Climate change perception study also involved discussion around the observed changes and the challenges that the community faces, any adaptation or mitigation measures that they might have taken.

FGD: Village Dadiapadar, GP. Boipariguda, Koraput. Date. 20/2/22

1. The FGD was done with men and women farmers of this village
2. The number of households is about 60 in this village
3. The general sources of livelihood was agriculture and daily wage labourers.
4. This village had a majority of ST population

5. The irrigation sources were not present in this village
6. 2 ponds are there but the water is not sufficient to be used for irrigation.
7. The drinking water source is wells and handpumps.
8. The people are using PDS and are Below Poverty Line.
9. The bank accounts are in commercial banks and cooperative banks.
10. Paddy, Ragi, Flax seeds, Black Gram, Little millet (Suan) are mostly cultivated.
11. The different issues in cultivation were discussed and the needs of the community.
12. The climate perception of the farmers was also discussed to arrive at key insights.

FPO- Dokin Women's Farmer Producer Company- Kalahandi. Date: 21/2/22

1. Discussion with the FPO under DAPTA (Development Agency for Poor and Tribal Awakening)
2. The questionnaire for FPOs was followed for this meeting
3. This is a women's FPO with 10 female Board of Directors
4. The number of members is 502.
5. The activities undertaken by the FPO like millet, pulses, vegetable cultivation and value addition were discussed
6. The benefits of working in this collective and the challenges were also discussed.
7. The capacity building exercises for the farmers for millet cultivation
8. The technology use in specific stages of the cultivation and processing was discussed
9. The market linkage and support needed specifically for millets was discussed to arrive at key insights.

Micro Processing Unit: Ghumer Guda, Bhawanipatna. Date: 18/2/22

1. Spoken to Sudarshan Dandsena, the person who is running the unit. This runs under the Dokini FPC.
2. The unit has been operational for 1 year 4 months.
3. The grains processed are wheat, Ragi, Pulses, Paddy, etc.
4. The unit runs on solar and has a capacity of 5kg at a time running for an hour. 2 HP unit.
5. The people from nearby villages use this unit for their daily needs. They process at the rate of Rs.5/kg.

NGO: Jana Sahajya (Kalahandi), Date: 21/2/22

1. The NGO contact person Sita Devi was the key informant for this interview
2. This NGO was established in 1989 and now works in 2200 villages.
3. the different activities undertaken are of livelihood, natural resource management, agriculture, among others.
4. The impact of the NGO is about 20,000 farmers.
5. The different challenges that the NGO was facing was also discussed.

6. The key activities under the NGO that are undertaken for millet cultivation, processing and value addition was discussed.
7. The key needs that the NGO has specific for millet include technology, marketing and support in crop protection against animals like solar fencing.

NGO: DAPTA , Bhawanipatna, Date: 19/2/22

1. The DAPTA team was present along with Mr. Raju Sharma who is the key Informant for this meeting.
2. This NGO was registered in 1990. They work in various sectors like women empowerment, healthcare, livelihood and food security.
3. The reach is 272 panchayats of Kalahandi and also in Deogar and Nuapada.
4. Specific activities undertaken for millet cultivation and processing, value addition sowed the energy needs and capacity building needs.
5. The technology needs that came up were mainly about Ragi biscuit making machine, processing machine for little millets (dehulling).
6. Market linkage was needed for value added products for this support was required in terms of retail units.

FPO: Sabujima Producer Company, Koraput, Boipariguda, Date: 20/2/22

1. The key informant for this interview was Trinath, the CEO of this FPO.
2. This FPO was registered in 2017. It has 1640 members in 15 GPs and 92 villages.
3. the FPO facilitates cultivation of millet, mango, banana etc.
4. for millet specifically they are working with 4026 farmers.
5. They provide input support in seeds of Ragi and Little millet and also provides training and capacity building for farmers.
6. Custom hiring center is also being operated by them.
7. They have also done engagement of SGHs with Millet Tiffin Centers, 2 are operational in the region.
8. The different challenges and needs were discussed.
9. The technology and mechanisation need for millet post processing came up.
10. This FPO directly procures from farmers and supplies to the Ragi mandi, does grading and destoning for this purpose, ensures FAQ standards for OMM.

FPO: Anchalika Producer Company, Kalhandi, Date: 21/2/22

1. They facilitate farmers for millet cultivation, under the NGO Janasahajya.
2. Organic cultivation is encouraged and capacity building is being done for the same.
3. There are 10 villages having organic certification under them.
4. Different typed of input support (seed, weeder, sprayer, etc), marketing support (mandi registration), post-harvest management and value addition is done.

5. The challenges and needs were discussed to derive at key insights.

Govt. Officials

The regional centre for excellence in RRTTS, Bhawanipatna, Date: 22/2/22.

1. Dr. B.S. Nayak (ADR, RRTTC) was the key informant for this interview.
2. RRTTC had stressed on the importance of availing scientific knowledge for millet cultivation by the farmers.
3. The dissemination can happen through field level functionaries.
4. The awareness about soil testing and discussion and awareness on crop diversification was also stressed upon.

Mission Shakti, Bhawanipatna, Date: 22/2/22

1. Ms. Pankajini Tarasi, BPM, Mission Shakti was the key informant for this interview.
2. Mission Shakti under Odisha Livelihood Mission (OLM) also helping farmers in the region with processing of ragi into ragi flour.
3. Different snacks like cakes, pakora, laddoo, upma, pitha, lassi is prepared in this mission sakti operated cafes/ tiffin centers.
4. Ragi, little millet, Gurji and Kodo millet is mainly used because of adequate availability.
5. The awareness programs to improve the consumption of millets is also undertaken.
6. There is planning of outlets for millet products by SHGs in Gram Panchayats.
7. Processing mill is also being planned.
8. The cluster can be developed by loans and funding support and MIP (Micro investment plan).

WASSAN and ORMAS, Date: 22/2/22

1. The key informants were officials from WASSAN and ORMAS Office in Bhawanipatna.
2. Mr. Jitu Nayak was the key informant for WASSAN being the district coordinator.
3. The monitoring and capacity building exercises for farmers and FPOs in different technology use and maintaining of market standards like FAQ norms is undertaken.
4. Millet awareness in food festival that are held in blocks around 5 festivals held in a year.
5. The diversification from Ragi to other millets is also planned.
6. Marketing and awareness campaigns to promote consumption other than the PDS distribution channels.
7. They want to engage 70 SHGs in the Tiffin centers and 136 SHGs in planning for upcoming years.
8. The funding support of 61 lakhs for International Year of Millets, 2023 (IMY) is planned to be utilized in scaling up.

Minutes of Meetings for Gadag, Koppal and Chitradurga Districts, Karnataka.

NGO: Priyadarshini Self-Employment Training and Rural Sector, District – Gadag, 26/02/2023.

1. The NGO contact person Vijay was the key informant for this interview.
2. The NGO was established in 2005 and now working with 2000 farmers spreading around 25 villages.
3. The different activities undertaken are of Sustainable agriculture, marketing of products, Livelihood improving activities etc.
4. The climate conditions, major crops grown and key challenges in Millet cultivation was discussed.
5. The major villages undertaking this millet cultivation and their cultivation practices were also discussed.

NGO: Sarvodaya Integrated Rural Development Society, District – Koppal, 28/02/2023.

1. The contact Person Nagaraj Desai was the key informant for this interview.
2. The NGO was established in 1994 and now working with 50,000 farmers in 26 villages.
3. The activities undertaken are of Integrated farming activities, Rural development, Health and Livelihood.
4. Discussed on climatic and crop conditions in Koppal and cultivation practices of Millet.
5. Also discussed on the technology usage in millet farming and Post production activities.
6. There was discussion on processing activities taken by SHGs and their marketing problems.

NGO: Nisarga Social working Centre, District – Chitradurga, 02/03/2023.

1. The Contact Person Sister Smitha was the key informant for this interview.
2. The NGO was established in 2001 and now working with 25000 farmers in 246 villages.
3. The Activities undertaken are of Watershed development, integrated farming activities, livelihood improvement. Also giving trainings and exposure visits on the enterprises.
4. The climatic conditions, major crops, technology usage in millet cultivation was discussed.
5. There was also discussion about the post-production activities, processing units and enterprises developed in around the villages.
6. Also discussed on millet crop economics from Farming to Processing and market conditions.

FPC: Chandanavana Farmer Producer company Ltd, District – Gadag, 26-02-2023.

1. The contact person Basavaraj was the key informant for this interview.
2. The FPC it was registered in 2021 and currently benefitting around 900 members.
3. The FPC is major working on millet farmers and providing seed, machinery during farming and also facilitating in the marketing of millet produce.
4. Discussed on the technology usage in millet processing activities, marketing aspects of millet produce.
5. There was also discussion over processing units in the region and marketing of processed products.

6. Discussed on the millet enterprises by the women farmers.

FPC: Laxmeshwara Farmers producer Company – Gadag, 26-02-23:

1. The Contact person is Somashekar was the key informant for this interview.
2. The FPC was registered in 2021 and working with 900 members in 20 villages.
3. Discussed on the major crops cultivated in the block and also millet cultivation by farmers.
4. There was also discussion on processing units in the region.
5. The FPC future plans with millet farmers where it is going to take license for procurement of millets.

FPC: Koppala Siri Farmers Producer company, District – Koppal, 27/02/2023.

1. The Contact person is Manjunath was the key informant for this interview.
2. The FPC was registered in 2020 and working with 1000 Farmers.
3. Discussed on the millet cultivation practices and technology usage in different farming practices.
4. Discussed over major villages where millet cultivation is high.
5. There is also discussion on processing units and market condition of the millet in the region.
6. Discussion on the activities and facilities provided by FPC to farmers on technology, processing and market.
7. Discussed on the SKDRDP activities in millet marketing.
8. And also discussed on the future plan of FPCs in processing and marketing of products.

FPC: Ksheravardhini Farmers producer company, District – Koppal, 27/02/2023.

1. The FPC is one year old.
2. Working on license to start the business aspects of FPC.
3. It future plans on Millet activities such as seed, procurement and processing activities.

FPC: Durgada millet farmer producer company, District – Chitradurga, 02/02/2023.

1. The contact person Shivakumar was the Key informant for this interview.
2. The FPC was registered in 2021 and working with 1000 Farmers.
3. Discussed on the activities under taken by FPC and most specifically for millet farmers.
4. Discussed on major crops grown in the region and millet cultivation practices and technology usage in different farming practices.
5. There is also discussion on processing units and market condition of the millet in the region.
6. Discussion on the activities and facilities provided by FPC to farmers on technology, processing and market.
7. The FPC installed a solar based processing equipment with capacity 2 quintal/day.

SHG: Vedavathi Sai Sanjeevani, District – Chitradurga, 02/02/2023.

1. The SHG is formed by Pranati NGO and NABARD and it consists of 30 members.
2. Discussed on the activities undertaken by women in the SHGs.
3. Challenges in millet cultivation was discussed
4. Discussed about millet processing activities in the region and available resources.
5. The challenges in millet processing were also discussed.

6. The marketing aspects of different products discussed.

Govt. officials: KVK, District – Gadag, 25/02/2023.

1. The contact person Dr. Sudha was key informant for this interview.
2. Discussed on the climatic conditions prevailing in the region and major crops cultivating.
3. Discussed on major millets growing in the region and their importance in nutritional value.
4. Further discussed on the Schemes such as Rythi siri and PMFME.
5. The Trainings, exposure visits and KVK activities in promoting the Millet cultivation was discussed.
6. Also discussed on the enterprises in the region and also about their Ethnic foods enterprise.
7. Discussed on Marketing aspects of millets and challenges.

Govt Officials: Joint Director of Agriculture, District -Gadag, 26-02-2023.

1. The Contact person Ravi Kumar for this interview.
2. Discussed on the millet farming conditions and the technology usage aspects.
3. Collected information on the schemes for promoting millet cultivation.

Govt Officials: Assistant Director of Agriculture, Chitradurga, 03-02-2023.

1. The Contact person Umesh was key informant for this interview.
2. Discussed on Climatic conditions prevailing Chitradurga and cropping pattern in the region.
3. There was discussion on technology usage by the farmers and their challenges during cultivation.
4. There was also discussion on processing and marketing aspects followed by farmers.

Progressive Farmer, District Koppal, 28-02-2023.

1. The contact person is Basanna Gowda for this interview.
2. There was discussion on millet acreage in the region and with himself.
3. The production aspects and technology usage by him is discussed.
4. Discussed on the processing aspects and marketing of the produce where he is going for contract farming.
5. Challenges in the millet cultivation practices.

Processing unit, District – Koppal, 28-02-23:

1. The contact person is Krishna Kulkarni is key informant for this interview.
2. The processing unit is established in 2020 where it is jowar based millet processing.
3. Discussed on the processing aspects such as capacity and products prepared.
4. Further discussed on market side of processed products and the challenges faced by him.

Retail Store: Satwik, District – Gadag, 27-02-2023.

1. The retail store selling various millet products in different forms.
2. The challenges in millet marketing and farmers cultivation practices were discussed.

3. Also discussed on the processing units available in the region.

3.1. List of partners/NGO/Champions contact & address

Link : https://docs.google.com/spreadsheets/d/1SzmZuhgNaiMrr62fKzGicRRE_FP4YP0l/edit#gid=162764828