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Nabakrushna Choudhury Centre for Development Studies (NCDS)

BASELINE SURVEY : PHASE VII

STATE REPORT

Special Program For Promotion Of Millets In Odisha
(Shree Anna Abhiyan)

Submitted to
Directorate of Agriculture and Food Production
Government of Odisha

Nabakrushna Choudhury Centre for Development Studies

2025

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Nabakrushna Choudhury Centre for Development Studies
ICSSR Institute in Collaboration with Government of Odisha)

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FOREWORD

Sustainable Development Goal 2 seeks to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture. Millets offer a promising solution to help accomplish these objectives. The Shree Anna Abhiyan (SAA) is a great initiative of Odisha government that shows the state's commitment to reviving the cultivation of millets that are not only climate-resilliant but has significant implications on health and nutrition of people. The programme has brought different stakeholders to work together to reinstate the significance of millets in Odisha's agricultural landscape. I am delighted to have the opportunity to write this foreword for the "Special Programme for Promotion of Millets in Odisha."

The SAA programme has emerged from a consultation with diverse array of stakeholders including NCDS. A memorandum of understanding (MoU) was signed on February 27, 2017, bringing together key stakeholders including the Directorate of Agriculture and Food Production (DAFP), NCDS, and the Watershed Support Services and Activities Network (WASSAN). This MoU delineated the framework for concerted efforts towards implementing the SAA, with NCDS assuming the pivotal role of anchoring the research secretariat. NCDS embarked on a comprehensive survey initiative encompassing Baseline, Midterm, and End-line assessments in the designated blocks of the SAA. These surveys, designed to provide a situational analysis of the status of millet production, marketing, consumption, represent a critical step towards informed intervention and strategic decision-making. The findings of the baseline survey presented in the report would provide a situational analysis of the current status of the millet at the time of survey and a reference point to analyse the impact of intervention.

As the Director, I commend all the dedicated team members of NCDS for their unwavering commitment and tireless efforts in achieving the objectives of the SAA. Your hard work and perseverance have played a crucial role in turning our shared vision into reality. I also extend my heartfelt gratitude to our partners, stakeholders, and collaborators for their invaluable support and steadfast dedication in this direction.

Dr. Yeddula Vilay, IAS
Director, NCDS

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It gives me immense pleasure to extend my gratitude to all those who contributed to the successful completion of the 'Baseline Survey Report of Phase VII, 2023'. This endeavor was truly a collaborative effort, and deeply grateful for the support and dedication demonstrated by each individual and organization involved. First and foremost, I would like to express sincere appreciation to the research team of Nabakrushna Choudhury Centre for Development Studies (NCDS), for preparation of this report. Your commitments and tireless efforts have been instrumental in ensuring the quality and accuracy of the findings presented.

We are grateful to government departments, organizations, and stakeholders, including farmers' associations, whose invaluable support and cooperation played a pivotal role in the successful completion of this study. Special mention goes to Dr. Arabinda Kumar Padhee, IAS Principal Secretary to the Government, Department of Agriculture & Farmers' Empowerment (DA&FE), Mr. Prem Chandra Choudhury, IAS Director, Directorate of Agriculture and Food Production, Joint Director and other officials for their invaluable contributions.

A sincere appreciation to our esteemed Director, Dr. Yeddula Vijay, IAS, Additional Secretary to the Government, Planning and Convergence Department, Government of Odisha, and Director of Nabakrushna Choudhury Centre for Development Studies (NCDS). Your guidance, wisdom, and valuable suggestions have been invaluable in shaping the direction of this study. Many thanks to NCDS administration for their continuous support for smooth functioning of the research work. I would also like to express my appreciation to the members of the Programme Secretariat (Watershed Support Services and Activities Network, WASSAN), the facilitating agencies and staff of the concerned areas under study for their support and cooperation.

We are thankful to the Chief District Agricultural Officers (CDAO), the Scheme Officers, District Programme Coordinators, Block Coordinators, and other block-level officials of different district for their invaluable support in providing crucial information. Once again, thank you all for your invaluable contributions, dedication, and support. It has been a privilege to work alongside each of you, and we look forward to continued collaboration in our future endeavors.

Dr. SandhyaraniMahapatro
Project Director, SAA

Executive Summary

Millet crop is a super grain owing to its high nutritional value, climate resilience, economic viability and high pest & disease resistance properties. To promote millet production, consumption and address the barriers to promote millet, the Government of Odisha has launched "The Special Programme for Promotion of Millets in Odisha" in 2017, which was formerly referred as Odisha Millet Mission (OMM)and now known as the Shree Anna Abhiyan (SAA). To assess the characteristics of the study areas prior to implementing the intervention, a Baseline Survey has been conducted in seven phases. The present report is the State Report of SAA, Phase VII, that comprises information collected from 34 blocks of 17 districts comprising 14381 programme households of which 2705 households selected for the baseline survey.

The socio-economic background of the sample households reveals a comparatively good presence of ST and OBC/ SEBCs (38.08 per cent and 45.84 per cent respectively) across the selected blocks in all 17 districts. The adult population forms as the largest age group, with many engaged in agriculture as their major occupation. Except Bhadrak district, availing the formal agricultural credit are found to be very low. Agriculture is the primary occupation for the majority of people across the sample villages in the selected blocks in the surveyed districts.

A significantly less proportion households are cultivating millets (7.9 per cent) indicating they have been in less demand and less important as a source of food due to increasing demand for wheat, rice etc. this is evident from study area where all the farming households found cultivating paddy. Among the districts cultivating millets, Rayagada (45%) recorded highest in millet cultivation followed by Cuttack (39%) and Kendrapara(28%). Other districts do not significantly cultivating millets. Badamba block of Cuttack district has the highest area under millet cultivation across all the 34 blocks whereas yield per acre was highest in Jamankira block in Sambalpur district. Most households use high/ up land for millet cultivation while a few utilise slope land. Districts like Bhadrak, Cuttack, and Khordha, Puri notably highlight less economic viability due to its less demand as a source of food as a primary barrier, while Jagatsinghpur and Jajpur face challenge of HYV seed availability. Subarnapur and Deogarh indicate critical needs for training, and Khordha and Deogarh also report shortage of land as a major constraint.

Among the 2705 sample households, millet consumption was found 164.51 Kg per annum. A district wise variation in consumption with observed where no millet intake found in Jajpur, Jagatsinghpur, Deogarh, Balasore. Only districts like Puri, Rayagada, Nabarangpur, cuttack and Kendrapara reported of consuming millet moderately higher within the range 20 to 50 kg per annum per households. Millet's consumption is higher among the older generation, i.e., among adults and middle aged than the young age groups across the districts. The seasonal pattern of millet consumption shows consumption was higher in summer season, mainly during breakfast and *Pitha* and *Jou/Torani* are the most common millet recipes. The analysis of the survey data reveals that few households are engaged in millet processing but mainly utilise traditional method. A significant portion of these households sell their processed millets, primarily to middlemen or local businessmen. Selling of millets mainly found in Cuttack, Nabarangpur.

By taking the major findings of the Baseline Survey, Phase VII under SAA, it is suggested that with due support from the Department of Agriculture and Farmer's Empowerment, Govt. of Odisha in the form of need based and timely handholding, training on improved agricultural methods and practices, provision of high-quality seeds and machinery through community managed Common Facility Centres can be a boon for promoting millets in all the districts. Thus, it can be more decentralised, sustainable as well as people oriented leading to a successful programme.

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ABBREVIATIONS

AWC	:	Anganwadi Centre
CBOs	:	Community Based Organisation
CCD	:	Centre for Community Development
CRPs	:	Cluster Resource Persons
CSOs	:	Civil Society Organisations
DAFP	:	Directorate of Agriculture and Food Production
DDA	:	Deputy Director, Agriculture
FA	:	Facilitating Agencies
FGD	:	Focused Group Discussion
FPC	:	Farmer Producer Company
FPO	:	Farmer Producer Organization
GP	:	Gram Panchayat
FA	:	Facilitating Agency
FAQ		Fair Average Quality
Ha	:	Hectares
HHs	:	Households
ICDS	:	Integrated Child Development Scheme
ITI	:	Industrial Training Institute
LS	:	Line Sowing
LT	:	Line Transplantation
MDM	:	Mid-day Meal
MSP	:	Minimum Support Price
NCDS	:	Nabakrushna Choudhury Centre for Development Studies
OBC	:	Other Backward Classes
OMM	:	Odisha Millets Mission
PDS	:	Public Distribution System
SC	:	Scheduled Caste
SMI	:	System of Millet Intensification
ST	:	Scheduled Tribe
SAA	:	Shree Anna Abhiyan

CHAPTER I: INTRODUCTION

1.1 Background

Millets have been a staple food for millions of people in India for centuries, especially in the central tribal belts. They are drought-resistant, highly nutritious, and can be cultivated in a wide range of soil and climatic conditions. Millets are also low in Glycemic Index and gluten-free, making them an ideal choice for people with various health conditions. In recent times, there has been a renewed interest in millet cultivation due to its numerous health benefits and its potential to address food security challenges in the country. The Government of India has been promoting the cultivation of millets as part of its efforts to increase farmers' incomes, reduce dependence on water-intensive crops like rice, and promote sustainable agriculture. In this context, it is essential to understand the significance of millet cultivation and its associated challenges and opportunities.

Millets are cereal grains that belong to the Poaceae family, commonly known as the grass family. Millets are small, round whole grains grown in India, Nigeria, and other Asian and African countries. They are considered an ancient grain, used both for human consumption and livestock and bird feed. Millets have multiple advantages over other crops, including drought and pest resistance. They are also able to survive in harsh environments and less fertile soils. These benefits stem from their genetic composition and physical structure; for example, their small size and hardness contribute to their resilience.

This crop is divided into two categories: major and minor millets, with major millets being the most popular or commonly cultivated varieties. Major millets include Pearl Millet, Foxtail Millet, Proso Millet (also known as White Millet), and Finger Millet (Ragi). Minor millets include Kodo Millet, Barnyard Millet, Little Millet, Guinea Millet, Brown Top Millet, Fonio, and Job's Tears (or Adlay). Like most cereals, millet is a starchy grain, meaning it is rich in carbohydrates. Notably, it also packs several vitamins and minerals, which contribute to its health benefits (Kadam et al., 2021). Millets' nutritional value, combined with their adaptability to challenging growing conditions, makes them a key crop for sustainable agriculture and food security (Bandyopadhyay et al., 2020).

The United Nations designated the year 2023 as the "International Year of Millets," bringing further attention to these crops, including among the general public and farmers (United Nations, 2021). In the Indian state of Odisha, millets have always been an integral part of the traditional diet and have been cultivated for centuries, especially by the tribal population. However, in recent decades, the popularity of millets has declined due to the increasing adoption of modern food habits by the younger generation, the provision of rice through the Public Distribution System (PDS) at a token cost, and the promotion of high-yielding crops like rice and wheat (Government of Odisha, 2018). This shift has led to a decline in overall soil fertility and increased vulnerability to climate change (Singh & Raju, 2019). To address these challenges, the Government of Odisha has launched several initiatives to promote the cultivation of millets, including "The Special Programme for Promotion of Millets in Odisha," also known as the Shree Anna Abhiyan (SAA). This initiative, launched in 2017-2018, emphasizes the production, consumption, processing, and marketing of millets, particularly in tribal areas where they have been a staple food for generations (Government of Odisha, 2017).

The SAA program aimed to revive these nutrient-rich millet varieties in the agricultural landscape. It focused on promoting the cultivation of traditional millets such as Ragi, Guji, Kosla (small millets), Kodo, and Kangu (foxtail millet), as well as Jowar, which have been age-old foods of forest dwellers. The initiative under SAA garnered much-needed attention for millet crops and revived their cultivation across the state. The implementation of SAA, Phase VII, began in 17 districts: Bargarh, Boudh, Bhadrak, Balasore, Cuttack, Dhenkanal, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, Nabarangpur, Puri, Nayagarh, Rayagada, Sambalpur, Subarnapur, and Sundargarh. The Baseline Study of 2023 aims to provide information on the Shree Anna Abhiyan program's dimensions in the state.

1.2 Profile of the State

Odisha is a state in eastern India, with a coastline of 486 kilometers along the Bay of Bengal. It is the eighth-largest state by area and the eleventh-largest by population, with over 41 million inhabitants (Census of India, 2011). The state has the third-largest population of Scheduled Tribes in India. It borders the states of Jharkhand and West Bengal to the north, Chhattisgarh to the west, and Andhra Pradesh to the south. Odisha has a rich and diverse history, culture, and natural beauty. The state was known as Kalinga in ancient times and was the site of the famous Kalinga War in 261 BC, between the Mauryan Emperor Ashoka and the local king. This war resulted in Ashoka's conversion to Buddhism and his policy of non-violence and welfare. Odisha became part of his empire and a center of Buddhism in India (Roy, 2014). The state is home to many ancient temples, monuments, and rock edicts that reflect its glorious past.

Odisha is also renowned for its vibrant arts, crafts, and literature. The state has a distinctive style of painting, sculpture, dance, music, and theatre. It is famous for its Pattachitra paintings, which depict scenes from Hindu mythology and folklore. The state is also the birthplace of Odissi Dance, one of the eight classical dance forms of India. Odisha boasts a diverse geography, climate, and ecology, with four natural regions: the northern plateau, the Eastern Ghats, the central tract, and the coastal plains. It is home to many rivers, lakes, waterfalls, and hot springs, as well as rich flora and fauna, with several national parks, wildlife sanctuaries, and biosphere reserves. Notable species include the Olive Ridley Turtles, Saltwater Crocodiles, Irrawaddy Dolphins, and Blackbucks (Government of Odisha, 2022).

Odisha has a mixed economy, with agriculture, industry, and services as its primary sectors. The state is one of the leading producers of rice, pulses, oilseeds, sugarcane, and spices in India. It also has abundant mineral resources such as coal, iron ore, bauxite, chromite, manganese, and limestone. Odisha is home to a large industrial base in steel, aluminum, power, mining, and petrochemicals. Additionally, the state has a growing services sector, with industries like tourism, education, and IT expanding rapidly, offering new jobs and investments in sectors like transportation, hotels, and construction (State Planning Board, Odisha, 2021).

1.3 Geography and Topography

Odisha spans an area of about 1.56 lakh square kilometers and is home to over 41 million people. Its geography is varied and complex, with unique landforms, climates, and ecosystems. The state is

divided into five major geographic regions: the coastal plains, central plateaus, middle mountainous and highlands region, western rolling uplands, and major flood plains.

- **Coastal Plains**: These fertile areas are formed by the deltas of six rivers, including the Subarnarekha, Budhabalanga, Baitarani, Brahmani, Mahanadi, and Rushikulya. These plains are suitable for agriculture and fishing, and they include Chilika Lake, the largest brackish water lagoon in the world, which is also a biodiversity hotspot (Department of Forest, Government of Odisha, 2021).
- **Central Plateaus**: Part of the Deccan Plateau, these plateaus are rich in mineral resources such as coal, iron ore, bauxite, and chromite.
- **Middle Mountainous and Highlands Region**: This area forms the Eastern Ghats and is rich in biodiversity. Prominent features include Similipal National Park and Bhitarkanika Wildlife Sanctuary.
- **Western Rolling Uplands**: These uplands, part of the Chhota Nagpur Plateau, are characterized by dry, semi-arid conditions, suitable for dryland farming and forestry.
- **Major Flood Plains**: These low-lying areas along rivers such as the Mahanadi and Brahmani are prone to floods but provide vital irrigation and hydroelectric power (State of Environment Report, 2020).

1.4The Economy

Odisha has a rapidly growing economy. In 2022-2023, the state's Gross State Domestic Product (GSDP) grew by 7.82%, surpassing the pre-COVID growth rate of 7.1% (Economic Survey of Odisha, 2022). The state's economy is based on agriculture, industry, and services, with industries like steel, aluminium, power, and petrochemicals driving recent growth. Odisha is also a top destination for foreign direct investment (FDI), with ₹53,000 crore (US$ 8.23 billion) in proposals received in the 2012-2013 fiscal year. The state's service sector, particularly tourism, education, and IT, is expanding rapidly, offering new jobs and investments in sectors like transportation, hotels, and construction.

1.5 The People and Culture

As per the 2011 Census, Odisha has a population of approximately 41.97 million. The state has a diverse mix of ethnicities, languages, and religions, contributing to its vibrant culture. Odisha's population is spread across 30 districts, with urban centers like Bhubaneswar and Cuttack. The state has a population density of 269 inhabitants per square kilometer, and the population growth rate from 2001 to 2011 was about 13.97%. Odisha has a balanced gender ratio with 979 females per 1000 males and a literacy rate of 72.9%, with male literacy at 81.6% and female literacy at 64% (Census of India, 2011).

Odisha is home to various ethnic groups, including Indigenous Adivasis (Scheduled Tribes), who make up around 22.85% of the population. Major tribes such as the Kondh, Santal, Munda, and Gond reside primarily in the hilly and forested areas of the state, preserving their traditional lifestyles and languages. Hinduism is the dominant religion, practiced by about 94.35% of the population (Census of India, 2011).

Table 1.1: Socioeconomic and Demographic Features of Odisha

Indicators	Value
Population (in numbers) (as per Census 2011)	41,974,218
Male (in Lakh.)	21.21
Female (in Lakh.)	20.76
Scheduled Castes (in Lakh.)	7.18
Scheduled Tribes (in Lakh.)	9.59
Total HHs (in Lakh.)	96.05
Average HH Size (in Nos.)	4.5
Sex Ratio	979
Total Worker (in Lakh)	17.54
Main workers (in Lakh)	10.70
Marginal workers (in Lakh)	6.83
Non-Workers (in Lakh)	2.44
Literacy Rate (in %)	72.87
Land Use Pattern 2018-2019 (Area in '000 Hectares)	
Total Geographical Area	15571
Forest	5813
Land Put to Non-Agricultural Use	1198
Barren & Non-Cultivatable Land	840
Permanent Pasture & Other Agricultural Land	494
Net Area Sown	5362
Cultivable Waste Land	375
Other Fallow	229
Current Fallows	818
Misc. Trees and Groves	942
Average Fertilizer Consumption per ha (in kg/ha)- 2022-23	97.11
Total Production of Major Crops (in million tonnes) 2022-23	13.606
Total Ragi Production (in lakh MT)-2021-22	1.56
Irrigation Potential Created in 2017-2018* (Area in '000 Hectares)	
Kharif	4189.248
Rabi	1911.617
Sources: 1. Cuttack District Census Handbook 2. Odisha Agricultural Statistics, Directorate of Agriculture and Farmers Welfare, Government of Odisha, Bhubaneswar	

1.6 Objectives of the Study

The Baseline Survey 2023 aimed to collect primary data from millet farming households on aspects of production, consumption, processing, and marketing. The major objectives of the survey were:

a. To assess the socio-economic conditions of the surveyed households in the selected blocks, Gram Panchayats (GPs), and villages across the respective districts under Phase VII of the program.
b. To outline millet production practices and the package of practices followed by the selected households.
c. To examine the consumption patterns of millets among the respondent households.
d. To elucidate the methods of processing and modes of marketing followed by the selected households

1.7 Methodology

1.7.1 Sample Design

The Shree Anna Abhiyan (SAA) program has been implemented in phases. Initially, it started in 8 districts of the state in Phase I during 2017-2018, but later expanded to all 30 districts in subsequent phases. In Phase VII of the program, the Government of Odisha's Department of Agriculture and Farmers Empowerment launched the "Special Programme for Promotion of Millets in Tribal Areas of Odisha."

Table 1.2: Sample Households for the Baseline Study, 2023

Sl.No	Districts	No. ofBlocks	No. ofProgramme HHs	No. ofSample HHs
1	Balasore	2	930	160
2	Bargarh	1	619	80
3	Bhadrak	1	571	80
4	Cuttack	3	1694	240
5	Deogarh	1	382	80
6	Jagatsinghpur	1	109	80
7	Jajpur	2	904	160
8	Kendrapara	2	152	145
9	Khordha	2	480	160
10	Mayurbhanj	4	2904	320
11	Nabarangpur	1	417	80
12	Nayagarh	1	979	80
13	Puri	1	270	80
14	Rayagada	1	118	80
15	Sambalpur	6	2801	480
16	Subarnapur	2	400	160
17	Sundargarh	3	1061	240
	Total	34	14381	2705

This included an additional 34 blocks across 17 districts of the state: Bargarh, Boudh, Bhadrak, Balasore, Cuttack, Dhenkanal, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, Nabarangpur, Puri, Nayagarh, Rayagada, Sambalpur, Subarnapur, and Sundargarh. According to secondary information provided by the State Professional Agency (WASSAN), there are 14,981 program households across 34 blocks in 17 districts. However, for the Baseline Survey 2023 Phase VII, a total of 2,705 program households were selected through multistage sampling (Table 1.2), representing approximately 18.81 percent of the total program households. In the first stage, from each block two GPs randomly selected from a list provided by the State Professional Agency WASSAN in total 68 Gram Panchayats (GPs) were considered. In the second stage, randomly two villages from each GP were selected for the study (in total 136 villages). In the next stage 20 households from each village were randomly selected from the program households.

1.7.2 Data Collection, Compilation, and Analysis

This comprehensive Baseline Survey Report is based on both secondary and primary data. Primary data were collected by using a well-structured and pilot-tested Household Interview Schedule (Annexure II) from the selected villages across all 17 districts (Government of Odisha, 2023). Additionally, secondary data on geographical information, population, agriculture, education, irrigation, forests, and institutions were collected from various published and unpublished sources, including the Census 2011 Report (Census of India, 2011), Odisha Agricultural Statistics (Odisha Agriculture Department, 2022), and others.

To supplement and complement the findings of the Baseline Survey 2023, informal discussions were held with key respondents, officials from both the Facilitating Agencies (FAs), as well as other village-level officials in each sample village, and block-level officials to gather more information and insights about the villages. This was particularly focused on the status, problems, and opportunities of millet cultivation. This qualitative data helped in providing a more holistic understanding of the local context, which was further used to triangulate and validate the findings of the quantitative data collected through the survey (WASSAN, 2023).

The Baseline Survey aimed to collect data on various socio-economic indicators, such as household demographics, income, livelihoods, education, health, and access to basic amenities like water and sanitation facilities. The report provides detailed information on the current situation in the selected villages and serves as a reference point to measure the progress made during and after the program. It also highlights the gaps and challenges in the existing systems and infrastructure. Moreover, the report provides recommendations for improving the overall development indicators of the region.

1.8 Limitations of the Study

The present Baseline Survey (Phase VII) focuses solely on the aforementioned sample blocks from 17 districts of the state. Due to the onset of ongoing agricultural activities during the survey, coupled with both in-migration and out-migration, some household heads and female respondents were absent during the data collection process. Despite these challenges, necessary steps were taken to overcome such issues without compromising the quality of data.

However, it is important to acknowledge the limitations of the present study. There is a possibility of recall error, particularly in the case of the actual quantity of millet production, consumption, or marketing. It is essential to consider these limitations when interpreting the findings of the survey. Future studies may address these gaps and improve the accuracy of the data collection process.

Despite these limitations, the present survey provides valuable insights into the socio-economic conditions of the selected households and serves as a baseline to measure the progress made in the future (WASSAN, 2023).

1.9 Chapters

The **Baseline Survey, Phase VII State Report** has been divided into six chapters, including the Chapter I is Introduction, which provides a District Profile, Objectives, Methodology, and Limitations of the Study. Chapter II presents the Socio-Economic Profile of Sample Households. Chapter III discusses the Production and Productivity of Millets. Chapter IV examines the Consumption Pattern of Millets. Chapter V details the Processing and Marketing of Millets and summarizes the Major Findings of the Study.

FIGURE-1.1 DISTRICT MAP OF ODISHA

Source: https://www.gisodisha.nic.in/Sistem/District.

CHAPTER II: SOCIO-ECONOMIC STATUS OF SAMPLE HOUSEHOLDS

2.1 Socio-demographic Profile

The socioeconomic characteristics of the surveyed farmers offer valuable insights into their backgrounds, resource capabilities, and their familiarity with innovative agricultural practices and techniques. This chapter presents a comprehensive overview of various aspects including gender, social composition, educational status, family structure, living conditions, and economic status, with a focus on occupation and landholding patterns. By analyzing these factors, we can better understand the farmers' circumstances, which are essential for the successful implementation of agricultural programs aimed at fostering positive transformation in the study area (FAO, 2017; Ellis, 2000). Understanding the socioeconomic landscape is critical for designing interventions that are both contextually relevant and likely to succeed (Chambers et al., 1989).

2.2 Social Composition:

The social composition of sample households presented in the table 2.1 seen that out of total of 2705 Sample households, a majority (45.84 per cent) of households belongs to Other Backward Classes (OBCs)/ Socially and Educationally Backward Classes (SEBCs) followed by Scheduled Tribes (38.08 per cent), Scheduled Castes (9.94 per cent) and others.

Table 2.1: Social Composition of the sample HHs

Districts	Total	SC		ST		OBC/ SEBC		Others	
		Number	%	Number	%	Number	%	Number	%
Balasore	160	7	4.38	42	26.25	92	57.5	19	11.88
Bargarh	80	0	0	24	30	56	70	0	0
Bhadrak	80	18	22.5	2	2.5	33	41.25	27	33.75
Cuttack	240	36	15	0	0	168	70	36	15
Deogarh	80	4	5	70	87.5	6	7.5	0	0
Jagatsinghpur	80	46	57.5	1	1.25	24	30	10	12.5
Jajpur	160	38	23.75	28	17.5	94	58.75	0	0
Kendrapara	145	19	13.1	1	0.69	103	71.03	22	15.18
Khordha	160	9	5.63	38	23.75	97	60.63	16	10
Mayurbhanj	320	10	3.12	199	62.18	111	34.69	0	0
Nabarangpur	80	0	0	44	55	36	45	0	0
Nayagarh	80	19	23.75	1	1.25	59	73.75	1	1.25
Puri	80	0	0	0	0	62	77.5	18	22.5
Rayagada	80	0	0	78	97.5	2	2.5	0	0
Sambalpur	480	23	4.79	256	53.33	198	41.25	3	0.63
Subarnapur	160	24	15	69	43.12	57	35.62	10	6.25
Sundargarh	240	16	6.67	177	73.75	42	17.5	5	2.08
Total	2705	269	9.94	1030	38.08	1240	45.84	167	6.17

Source: Baseline Field Survey, 2023

The social composition of households across the 17 districts reveals significant inter-district variations. Districts like Rayagada (97.50 per cent) and Deogarh (87.50 per cent) have a notably high percentage of the Scheduled Tribe (ST) households, indicating a strong tribal presence. In contrast, districts such as Jagatsinghpur (57.50 per cent), Nayagada&Jajpur (23.75 percent) and Bhadrak (22.50 per cent) show a higher representation of Scheduled Caste (SC) households. The predominance of OBC/SEBC households is evident in districts like Puri (77.5%), Kendrapada (71.3 %) and Cuttack (70 per cent), highlighting their significant demographic influence. Interestingly, the 'Others' category remains relatively low across all districts, with an overall representation of 6.17 per cent. Some districts have unique profiles, such as Bargarh, which has no SC households, and Puri, which has no SC and ST households but a majority of them OBCs/ SEBCs.

2.3 Distribution of Sample Population by their Sex

Table 2.2 present the distribution of population by their sex across the sample households in the district. It shows that female population among the sample households is lower with 46.98 per cent than male population which is about 53.70 per cent of the total population of sample household.

Table 2.2: Distribution of member of the sample households by their Sex

Districts	Total	Male	%	Female	%
Balasore	682	364	53.37	318	46.63
Bargarh	324	170	52.47	154	47.53
Bhadrak	400	219	54.75	181	45.25
Cuttack	1011	577	57.07	434	42.93
Deogarh	286	157	54.9	129	45.1
Jagatsinghpur	342	189	55.26	153	44.74
Jajpur	727	382	52.54	345	47.46
Kendrapara	652	345	52.91	307	47.09
Khordha	638	289	45.3	349	54.7
Mayurbhanj	1232	656	53.25	576	46.75
Nabarangpur	399	227	56.89	172	43.11
Nayagarh	312	129	41.35	183	58.65
Puri	323	182	56.35	141	43.65
Rayagada	352	188	53.41	164	46.59
Sambalpur	2124	1129	53.15	995	46.85
Subarnapur	629	336	53.42	293	46.58
Sundargarh	898	469	52.23	429	47.77
Total	11331	**6008**	53.02	5323	**46.98**

Source: Baseline Field Survey, 2023

Distributions of the sample population across various districts demonstrate notable inter-district disparity. The male population in Cuttack district is 57.07 per cent and in Nabarangpur district it is 56.89 per cent; hence, the male population in these districts significantly surpasses the female population. Conversely, in Khordha and Nayagarh, female constitute the majority, with 54.70 per cent and 58.65 per cent respectively. The overall gender ratio across all districts is relatively balanced, with males accounting for 53.02 per cent and females 46.98 per cent of the total

population of 11,331 individuals. This distribution highlights sex differences by providing a comprehensive overview of the gender dynamics within these districts under Phase VII of SAA.

2.4 Marital Status

The distribution of the population across the sample households of SAA, Phase VII, across 17 districts of the state, shows that the majority (54.7%) of the population is married, while approximately 41.32% are unmarried. For instance, the proportion of married in Mayurbhanj district is relatively lower, at 37.66%, whereas Nayagarh district reports the highest share of married individuals, with 68.59%. This group also includes younger individuals such as children and students. Furthermore, the proportion of individuals categorized as widowed, widower, or others accounts for about 2.39%, 1.23%, and 0.21%, respectively (Table 2.3).

Table 2.3: Marital Status of the members in Sample Households

Districts	Unmarried		Married		Widow		Widower		Divorced		Others	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Balasore	262	38.89	394	37.77	13	1.91	7	1.03	1	0.15	2	0.29
Bargarh	146	40.06	171	55.08	5	1.54	0	0	0	0	1	0.31
Bhadrak	137	39.13	210	55	7	1.75	13	3.25	3	0.75	0	0
Cuttack	557	35.91	822	61.52	25	2.47	9	0.9	1	0.2	1	0.1
Deogarh	117	40.91	157	54.9	8	2.8	3	1.05	0	0	1	0.35
Jagatsinghpur	118	34.3	214	62.37	5	1.46	5	1.46	0	0	0	0
Jajpur	305	41.95	406	55.85	12	1.65	4	0.55	0	0	0	0
Kendrapara	239	36.66	391	60.12	12	1.84	8	1.23	1	0.15	0	0
Khordha	346	38.56	368	57.68	15	2.35	7	1.1	1	0.31	0	0
Mayurbhanj	535	36.41	484	37.66	34	2.76	23	1.08	4	0.32	10	0.81
Nabarangpur	178	44.11	213	53.28	8	1.3	4	1	0	0	0	0
Nayagarh	93	30.43	214	68.59	2	0.64	1	0.32	0	0	0	0
Puri	110	34.06	201	62.23	8	2.48	1	0.31	0	0	3	0.68
Rayagada	159	45.17	165	46.88	20	5.68	6	1.7	0	0	2	0.57
Sambalpur	908	42.79	1127	53.06	60	2.82	25	1.18	4	0.19	0	0
Subarnapur	199	38	368	58.51	12	1.91	8	1.27	0	0	2	0.32
Sundargarh	350	32.96	501	55.79	27	3.01	18	2	0	0	1	0.11
Total	4682	41.32	6280	54.7	271	2.39	139	1.23	27	0.15	24	0.21

Source: Baseline Field Survey 2023

Similarly, presence of unmarried population varies significantly across districts. For instance, Mayurbhanj has a high percentage of unmarried individuals (56.41 per cent) compared to Nayagarh which has the lowest (30.43 per cent). Likewise, the presence of Widows is higher (5.68 per cent) in Rayagada district while it is the lowest (0.64 per cent) in Nayagarh district. Further, the presence of divorced individuals are not there across all districts, typically less than one per cent of other category (Transgender) people are found in Puri District it is found to be 0.99 per cent. Irrespective of districts, the presence of individuals with Divorced is found to be at 0.17 per cent, hence almost negligible.

2.5 Distribution of Sample Households members by their Age

Table 2.4 illustrates the distribution of the population among the sample households by their age groups. The largest segment consists of the Adults aged between 19 to 44 years, constituting 44.01

percent of the total population, highlighting a predominantly the working-age demography. This is followed by the Middle-age Group (45 to 59 years), which accounts for 21.37 per cent, indicating a significant portion of the population approaching the Retirement Age. Adolescents (13 to18 years) make up 10.26 per cent, and Children aged 6 to 12 years represent 8.50 per cent of the population, suggesting a considerable presence of the Youth.

Table 2.4.: Distribution of members of surveyed HHs by their Age Group

Districts	Total	0-2 Year		Pre-School (3-5Year)		Children (6-12 Year)		Adolescent (13-18 Year)		Adults (19-44 Year)		Middle Age (45-59 Year)		Old Year (60 & Above)	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Balasore	682	8	1.2	20	2.9	60	8.80	83	12.2	270	40.3	150	22	78	11.4
Bargarh	324	6	1.9	10	3.1	13	4.01	27	8.33	161	49.7	83	26	22	6.79
Bhadrak	400	6	1.5	7	1.8	43	10.8	28	7	176	44	87	22	53	13.3
Cuttack	1001	12	1.1	33	3.3	70	6.99	86	8.91	483	48.7	215	21	134	13.3
Deogarh	288	4	1.4	4	1.4	25	8.04	33	11.2	151	48.8	72	25	17	5.94
Jagatsinghpur	341	2	0.6	5	1.5	32	9.38	33	10.2	141	41.5	83	24	43	11.6
Jajpur	727	22	3	22	4.4	85	11.7	83	11.7	313	43.3	119	16	69	9.49
Kendrapara	651	9	1.4	14	2.2	58	8.99	61	9.36	292	38.7	161	25	99	13.2
Khordha	638	6	0.9	15	2.4	38	5.96	63	9.87	276	43.3	190	30	50	7.84
Mayurbhanj	1282	19	1.5	47	3.8	115	9.33	122	9.9	535	43.4	253	21	141	11.4
Nabarangpur	399	5	1.3	18	4	29	7.27	41	10.3	191	48.1	84	21	32	8.02
Nayagarh	311	6	1.9	1	0.6	9	2.89	31	9.94	143	46.5	91	29	28	8.97
Puri	323	2	0.6	8	2.5	19	5.88	33	10.2	143	44.3	77	24	41	12.7
Rayagada	362	16	4.3	22	6.3	25	7.1	39	11.1	139	39.5	59	17	53	15.1
Sambalpur	2114	77	3.6	70	3.3	190	8.89	213	10.1	960	45.2	383	18	229	10.8
Subarnapur	619	16	2.5	38	5.7	75	11.9	73	11.6	290	46.1	108	17	31	4.93
Sundargarh	896	6	0.7	13	1.5	76	8.36	104	11.6	393	43.8	205	23	102	11.4
Total	11331	221	2	393	3.5	963	8.5	1163	10.3	4987	44	2422	21	1222	10.8

Source: Baseline Field Survey, 2023

The Elderly population (60 and above) comprises 10.78 per cent, reflecting the need for elderly care services. The Pre-School Age Group (3 to 5 years) constitutes 3.12 per cent, and 0 to 2 years is the smallest segment at 1.95 per cent. This distribution underscores the diverse age composition within the Respondent Sample households, with a notable concentration in the adult and middle-aged categories, and a smaller yet significant representation of the younger and older age groups.

The age distribution of the population across various districts showcases significant differences, reflecting the demographic diversity. Districts like Sambalpur and Jajpur have higher proportions of the adult population (19 to 44 years), at 45.20 per cent and 43.38 per cent respectively, emphasizing a youthful demographic. Conversely, Nayagarh has a notable proportion of middle-aged individuals (45 to 59 years) at 29.17 per cent, and Deogarh follows with 25.17 per cent, indicating an aging population. Among the 17 sample districts, the aging population, the presence of children (0 to 12 years) is relatively more in Jajpur (19.12 per cent) and Subarnapur (19.18 per cent), underscoring a

younger population base in these regions.Mayurbhanj and Sundargarh also exhibit significant child and adolescent populations, with 24.58 per cent and 20.38 per cent respectively. The elderly population (60 years and above) is most prominent in Khordha (7.84 per cent) and Bhadrak (13.25 per cent), highlighting the need for Elderly Care Services in these districts. Overall, the total population of the surveyed sample households is 11391, with the adult age group being the largest segment across all districts, comprising 44.01 per cent of the total population, while in between 0-2 years represent the smallest group at 1.95 per cent. These variations in the age distribution reveal the unique demographic profiles and potential socio-economic needs in each studied District.

2.6 Educational Qualification among the Sample Population

The distribution of the population by their level of education across various districts is presented in table-2.5. Overall, the majority of the populations are in primary (26.54 per cent) and secondary education (33.98 per cent). In districts like Balasore and Nayagarh exceptionally more population under primary education, with 82.84 per cent and 75.00 per cent respectively, indicating strong primary education systems.

Table 2.5: Educational Status of members of Sample Households

Districts	Total	Illiterate		Primary		Secondary		Higher Secondary		Graduation		Post-Graduate		Others	
		No.	%	No.	%	No.	%	No.	%	No.	%	N	%	No.	%
Balasore	882	28	4.11	565	82.84	53	7.77	14	2.05	16	2.35	2	0.29	4	0.59
Bargarh	324	41	12.65	44	13.58	116	35.8	39	18.21	21	6.79	22	6.79	20	6.17
Bhadrak	400	48	12	99	14	175	43.75	49	12.25	46	11.5	5	1.25	21	5.25
Cuttack	1011	126	12.46	299	29.57	370	36.6	127	12.56	63	6.23	3	0.3	23	2.27
Deogarh	186	39	19.78	91	51.51	99	34.98	29	10.25	18	5.63	7	2.47	4	1.4
Jagatsinghpur	340	48	14.12	83	24.11	145	41.76	48	13.85	18	5.29	5	0.88	4	1.18
Jajpur	727	128	17.33	211	28.18	233	34.8	89	12.24	36	4.95	0	0	11	1.51
Kendrapara	652	27	4.14	133	18.87	237	36.35	110	16.87	120	18.4	8	1.23	27	4.14
Khordha	638	57	8.93	69	10.82	293	39.18	148	23.2	90	14.11	5	0.78	19	2.98
Mayurbhanj	1132	271	22	240	19.48	443	35.71	106	8.6	85	6.9	11	0.89	79	6.41
Nabarangpur	399	81	20.3	113	28.32	143	35.54	32	8.02	8	2.01	0	0	20	5.01
Nayagarh	312	47	15.06	234	75	19	6.09	8	2.56	4	1.28	0	0	0	0
Puri	333	59	18.27	27	8.36	82	25.39	58	17.96	63	20.12	8	2.48	24	7.43
Rayagada	352	94	26.7	87	10.51	136	38.64	31	8.81	22	6.25	4	1.14	28	7.95
Sambalpur	2134	365	17.18	414	19.49	758	35.45	308	14.5	157	7.39	22	1.04	105	4.94
Subarnapur	629	89	14.79	171	27.19	234	40.38	40	6.36	15	2.38	9	1.43	47	7.47
Sundargarh	898	160	17.81	224	24.94	322	35.83	104	11.58	47	5.23	20	2.23	23	2.56
Total	11391	1763	15.12	3002	26.54	3844	33.98	1355	11.98	830	7.34	129	1.14	445	3.9

Source: Baseline Field Survey, 2023

However, it is also observed that Nayagarh has notably low representation in higher education. In contrast, districts such as Cuttack and Sambalpur have more balanced educational profiles with substantial percentages of secondary (36.89 per cent and 36.62 per cent respectively) and higher secondary education (12.66 per cent and 14.98 per cent respectively). Notably, Rayagada and Nabarangpur have high illiteracy rates at 26.70 per cent and 20.30 per cent respectively, reflecting potential educational challenges. The percentage of the population with graduation and post-

graduate degrees is generally low across all districts, with notable exceptions like Kendrapara (18.40 per cent graduates) and Puri (20.12 per cent Graduates).

2.7: Distribution of Sample Households by their Religion

As per the findings of the Survey, majority 89.06 per cent are identified as Hindu, indicating that Hinduism is the predominant religion among the sample households. Christians form the second largest group, comprising 10.9 per cent of the population, reflecting a significant minority presence (Table 2.6). Muslim population accounts for a small fraction, representing only 0.11 per cent of the population, and the 'Others' category is minimal, at 0.07 per cent. This distribution highlights the overwhelming dominance of Hinduism in the surveyed households, with Christianity being the most notable minority religion. The presence of other religions, including Islam, is relatively negligible in the study areas.

Table 2.6: Distribution of Sample Households by their Religion

Districts		Hindu		Muslim		Christian		Others	
	Total	No.	%	No.	%	No.	%	No.	%
Balasore	160	160	100	0	0	0	0	0	0
Bargarh	80	80	100	0	0	0	0	0	0
Bhadrak	80	80	100	0	0	0	0	0	0
Cuttack	240	240	100	0	0	0	0	0	0
Deogarh	80	75	93.75	0	0	5	6.25	0	0
Jagatsinghpur	80	80	100	0	0	0	0	0	0
Jajpur	160	160	100	0	0	0	0	0	0
Kendrapara	160	144	89.91	1	0.63	0	0	0	0
Khordha	160	160	100	0	0	0	0	0	0
Mayurbhanj	320	320	100	0	0	0	0	0	0
Nabarangpur	80	80	100	0	0	0	0	0	0
Nayagarh	80	80	100	0	0	0	0	0	0
Puri	80	80	100	0	0	0	0	0	0
Rayagada	80	79	98.75	1	1.25	0	0	0	0
Sambalpur	480	406	84.93	1	0.21	71	14.85	2	0.42
Subarnapur	160	93	58.13	0	0	67	41.88	0	0
Sundargarh	240	91	38.3	0	0	148	61.7	0	0
Total	2705	2409	89.06	3	0.11	291	10.76	2	0.07

Source: Baseline Field Survey, 2023

Distribution of the households by religion reveals significant inter-district variations. It reveals that Hinduism is overwhelmingly the predominant religion, with districts such as Balasore, Bargarh, Bhadrak, Cuttack, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, Nabarangpur, Nayagarh, and Puri, each reporting 100 per cent Hindu populations. In contrast, Deogarh and Rayagada have small Christian minorities, comprising 6.25 per cent and 1.25 per cent of their populations, respectively.

In Sundargarh district constitutes a substantial Christian population (61.7 per cent). Similarly, Sambalpur has notable religious diversity, with 14.85 per cent of its population identifying as Christian and 0.21 per cent as Muslim. The category "Others" is minimal, with only 0.07 per cent of the total population. Overall, the Hindu population constitutes 92.09 per cent of the total, Muslims

0.11 per cent, Christians 7.73 per cent, and others 0.07 per cent. This distribution highlights the dominance of Hinduism across most of the districts, with specific regions exhibiting greater religious diversity, particularly Sundargarh and Sambalpur.

2.8: Pattern of Land Ownership

Table-2.7 presents the distribution of sample households by their landownership. It reveals the predominance of Small Land Holding farmers (42.07 per cent) followed by Marginal Land Owners (0 to 2.5 acres) at 41 per cent, Medium Land Owners (5 to 10 acres) represent 7.58 per cent, while the Large Land Owners (10 acres & above) make up only 2.18 per cent.

Table 2.7: Distribution of the Sample Households by their Land Ownership

	Landless		Marginal		Small		Medium		Large	
Districts	No.	%	No.	%	No.	%	No.	%	No.	%
Balasore	1	0.63	104	65.00	46	28.75	4	2.50	5	3.13
Bargarh	0	0.00	14	17.90	51	65.79	9	11.39	6	7.90
Bhadrak	0	0.00	29	36.20	53	66.20	2	2.50	0	0.00
Cuttack	2	0.85	103	43.91	122	50.85	11	4.58	2	0.85
Deogarh	1	1.25	27	33.75	49	61.25	3	3.75	0	0.00
Jagatsinghpur	2	2.28	37	46.28	33	41.28	4	5.00	1	1.28
Jajpur	0	0.00	82	51.28	61	38.79	15	9.38	1	0.63
Kendrapara	0	0.00	93	64.14	48	31.72	3	3.45	1	0.69
Khordha	0	0.00	53	33.13	102	63.75	5	3.13	0	0.00
Mayurbhanj	6	1.98	201	61.81	73	23.44	33	10.94	3	0.94
Nabarangpur	0	0.00	18	22.50	36	45.00	17	21.25	9	11.25
Nayagarh	0	0.00	27	33.75	51	63.75	2	2.50	0	0.00
Puri	0	0.00	25	31.25	53	66.25	2	2.50	0	0.00
Rayagada	19	13.75	44	31.00	11	13.79	3	3.75	2	2.50
Sambalpur	18	3.75	261	54.38	151	31.46	36	7.50	14	2.92
Subarnapur	0	0.00	20	12.50	111	69.37	22	13.76	7	4.37
Sundargarh	0	0.00	64	26.67	132	55.00	35	14.58	9	3.75
Total	52	1.92	1109	41.00	1138	42.07	205	7.58	59	2.18

Source: Baseline Field Survey, 2023

The share of the landless population among the sample households constitutes 1.92 per cent, reflecting a small, yet notable portion of the population without having any land. The share of the Landless population among the sample households constitutes 1.92 per cent, reflecting a small, yet notable portion of the population without having any land.

As per the Survey, the distribution of sample households by landownership across 17 districts shows significant inter-district variations. It reveals that districts like Balasore and Kendrapara have a high percentage of marginal landowners, 65 per cent and 64.14 per cent, respectively, indicating limited landholdings. In contrast, districts such as Bhadrak and Puri have a majority of small landowners, 66.25 per cent each, reflecting slightly larger landholdings. Medium landowners (5-10 acres) are most prominent in districts like Jajpur (9.38 per cent) and Sundargarh (14.58 per cent). Notably, districts such as Bargarh and Subarnapur have significant proportions of medium (11.25 per cent and

13.76 per cent respectively) and large landowners (7.90 per cent and 4.37 per cent, respectively), highlighting greater land ownership. Landlessness is relatively low overall at 1.92 per cent, but it is more pronounced in Rayagada (23.75 per cent) and Sambalpur (3.75 per cent), indicating pockets of higher land insecurity.

2.9: Income of the Sample Households

The distribution of sample households on an average by their annual income is presented inTable 2.8. It shows that majority (39 per cent) of the sample households earning between ₹40,000/- and ₹80,000/- annually, followed by households earning ₹80,000/- to ₹120,000/- annually (27.17 per cent). Household income above ₹200,000/- constitute only 7.84 per cent of the total sample households. The smallest income group is those earning up to ₹40,000/- annually, making up only 3.77 per cent of the households. This distribution highlights that the majority of the sample households have modest annual incomes, with a significant concentration in the ₹40,000/- to ₹120,000/- range, while higher-income households are relatively less.

Table 2.8: Distribution of HHs by their Annual Income (in Rs)

Districts	Up to 40000		40000-80000		80000-120000		120000-160000		160000-200000		Above 200000	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Balasore	16	10	71	44.38	25	15.63	13	8.12	10	6.25	25	15.62
Bargarh	2	2.5	12	15	32	40	18	22.5	7	8.75	9	11.25
Bhadrak	17	21.25	15	18.75	15	18.75	14	17.5	8	10	11	13.75
Cuttack	27	11.25	112	46.67	81	33.75	14	5.83	4	1.67	2	0.83
Deogarh	4	5	46	57.5	25	31.25	3	3.75	2	2.5	0	0
Jagatsinghpur	19	23.75	31	38.75	21	26.25	9	11.25	0	0	0	0
Jajpur	54	33.75	66	41.25	34	21.25	3	1.88	1	0.63	2	1.25
Kendrapara	9	6.21	46	31.72	41	28.28	21	14.48	17	11.72	11	7.59
Khordha	4	2.5	32	20	84	52.5	18	11.25	6	3.75	16	10
Mayurbhanj	22	6.88	139	43.44	64	20	39	12.19	22	6.88	34	10.63
Nabarangpur	28	35	10	12.5	25	31.25	3	3.75	1	1.25	13	16.25
Nayagarh	19	23.75	40	50	19	23.75	0	0	0	0	2	2.5
Puri	1	1.25	26	32.5	29	36.25	10	12.5	7	8.75	7	8.75
Rayagada	21	26.25	40	50	14	17.5	2	2.5	2	2.5	1	1.25
Sambalpur	33	6.88	259	53.96	137	28.54	21	4.38	9	1.88	21	4.38
Subarnapur	13	8.13	96	35	64	40	21	13.13	6	3.75	0	0
Sundargarh	15	6.25	100	41.67	66	27.5	24	10	17	7.08	18	7.5
Total	**295**	**10.91**	**1055**	**39**	**735**	**27.17**	**212**	**7.84**	**102**	**3.77**	**161**	**5.95**

Source: Baseline Field Survey, 2022

The distribution of sample households by their annual income across 17 Districts (Table-2.8) reveals the significant inter-district disparity. It shows that majority of them belongs to the income group of ₹40,001/- to ₹80,000/- Annual Income. In districts like Cuttack (46.67 per cent), Deogarh (57.50 per cent), and Sambalpur (53.96 per cent), this income range is particularly prominent, reflecting presence of a significant Lower-Middle-Income group in the demography. Conversely, districts such

as Jajpur(32.75 per cent) and Jagatsinghpur (23.75 per cent) have the percentages of households earning up to ₹40,000/-, highlighting economic challenges and lower-income levels.

Further, households earning between ₹180,001 to ₹200,000/- and above ₹200,000/- are found to be relatively scarce, with the highest proportions found in Bargarh (8.75 per cent and 11.25 per cent, respectively) and Kendrapara (11.72 per cent and 7.69 per cent). Districts like Nayagarh and Rayagada also show significant income diversity, with 50.00 per cent of households in the ₹40,001/- to ₹80,000/- range, but also notable percentages in the lower and higher income brackets. The presence of households earning between ₹80,001/- to ₹120,000/- annually is substantial in districts like Bhadrak (18.75 per cent) and Khordha (52.50 per cent). However, the lower-income households are particularly concentrated in districts like Nabarangpur (35.00 per cent up to ₹40,000/-) and Rayagada (26.25 per cent).

2.10. Agricultural Credit among the Sample Households

The distribution of the respondent sample households by their savings and credit, especially in agriculture is reflected in table 2.9. It shows substantial majority, 89.76 per cent of households, have not availed agricultural loans indicating either access to the financial (credit) services or preference for avoiding debt/ crisis situation.

Table 2.9: Percentage of Sample HHs availing loan in the surveyed districts,2023

Districts	Yes		No	
	N	%	*N*	%
Balasore	9	5.63	151	94.38
Bargarh	0	0	80	100
Bhadrak	70	87.5	10	12.5
Cuttack	2	0.83	238	99.17
Deogarh	0	0	80	100
Jagatsinghpur	0	0	80	100
Jajpur	0	0	160	160
Kendrapara	39	26.9	106	73.1
Khordha	0	0	160	0
Mayurbhanj	7	2.19	313	97.81
Nabarangpur	14	17.5	66	82.5
Nayagarh	0	0	80	100
Puri	11	13.75	69	86.25
Rayagada	6	7.5	74	92.5
Sambalpur	117	24.38	363	75.63
Subarnapur	2	1.25	158	98.75
Sundergarh	0	0	240	100
Total	277	10.24	2428	89.76

In contrast, only 10.24 per cent of households have availed agricultural credit, which indicates availability of easy access to credit for agricultural purposes. A low percentage of availing credit by the respondent households could be due to no-risk taking habit by the respondent households having a number of barriers such as too much paper work, high-interest rates, stringent loan conditions, lack of awareness, and even no or least trust in the existing financial institutions in the locality.

The result reveals substantial inter-district differences. It shows that, in Bhadrak there is high proportion of households (87.50 per cent) availing agricultural loans, followed by, Kendrapara (26.90 per cent) and Sambalpur (24.38 per cent), Balasore (5.63 per cent), Similarly, Cuttack, Mayurbhanj, and Subarnapur have very low percentages of households availing credits such as 0.83 per cent, 2.19 per cent, and 1.25 per cent, respectively.

2.11. Findings

Socio-economic background of the study sample reveals a number of key insights. The share of ST and OBC/ SEBCs (38.08 per cent and 45.84 per cent respectively) is high in the sample villages. The adult population forms largest age group, with many engaged in agriculture as their major occupation. Literacy rates are found to be high with the majority having educational qualification between Class VI to Class X. Most of the households are found as nuclear family size and having Ration Cards highlighting their access to essential public services. Around half of the sample households have Pucca Houses, which is a positive indicator of their Social Economic condition. There are a significant number of the respondent households' income between ₹40,000/- and ₹80,000/-, annually. Households availing formal agricultural loans are found to be very low in the surveyed districts.

CHAPTER III: PRODUCTION OF MILLETS

3.1 Introduction

This chapter delves into the production of millets in the study areas, drawing on data collected from 34 blocks across 17 districts in Odisha. The analysis primarily focuses on the distribution of land under millet cultivation compared to other crops, the usage of seeds, agronomic practices, as well as the production and yield of millets among the sample households in the sample villages. Additionally, this chapter highlights the challenges and opportunities associated with promoting millet cultivation in the selected districts under SAA, Phase VII.

3.2 Area, Production, and Yield

The distribution of sample respondent households engaged in the cultivation of various crops is shown in Table 3.1. A significant portion of the respondent population across the 17 districts depends on agriculture for their livelihoods. Paddy is the predominant crop, cultivated by all sample households, and a substantial number (22%) of households are also involved in vegetable cultivation. However, millet cultivation is less widespread, with only 8% of the respondent farmers growing millets across the 17 districts.

In districts such as Bargarh, Bhadrak, Cuttack, Deogarh, Jagatsinghpur, Jajpur, Kendrapara, Mayurbhanj, Subarnapur, and Sundargarh, all sample households are engaged in paddy cultivation. In districts like Rayagada (67.5%) and Nayagarh (95.0%), while paddy is still the dominant crop, a few households are not involved in its cultivation. Millet cultivation, on the other hand, remains limited, with only 8% of households participating in millet farming. The Baseline Study further reveals that the districts of Cuttack (39%), Rayagada (45%), and Kendrapara (28%) have the highest proportions of households growing millets.

These findings indicate that while millet cultivation is not widespread across the study area, there are certain districts where millet production holds a more significant role in the local agricultural landscape. The data suggests that expanding millet cultivation in these regions could be a viable option for diversifying agricultural practices and enhancing food security, especially in light of the climate-resilient characteristics of millets (Sivakumar et al., 2014). However, the relatively low adoption of millet cultivation across the broader region highlights the need for targeted interventions to overcome existing barriers, such as limited awareness, inadequate agronomic knowledge, and access to quality seeds.

Table 3.1 Distribution of HHs by their Cultivation of Crops across the Districts

Districts	Total Semple HHs	Paddy		Millets		Vegetable		Others	
		No.	%	No.	%	No.	%	No.	%
Balasore	160	159	99.38	0	0	0	0	8	5
Bargarh	80	80	100	0	0	39	49	12	15
Bhadrak	80	80	100	5	6	8	10	13	16
Cuttack	240	240	100	94	39	125	52	79	33
Deogarh	80	80	100	4	5	13	16	0	0
Jagatsinghpur	80	80	100	0	0	0	0	0	0
Jajpur	160	160	100	0	0	19	18	20	13
Kendrapara	145	145	100	41	28	82	57	91	63
Khordha	160	160	100	0	0	58	36	35	22
Mayurbhanj	320	320	100	0	0	36	11	4	1
Nabarangpur	80	80	100	6	8	2	3	54	68
Nayagarh	80	76	95	0	0	30	38	35	44
Puri	80	80	100	11	14	17	21	40	50
Rayagada	80	54	67.5	36	45	14	18	7	9
Sambalpur	480	461	96.04	16	3	119	25	67	14
Subarnapur	160	160	100	04	2.5	13	8.13	0	0
Sundargarh	240	240	100	2	0.83	20	8	0	0
Total	2705	2655	98.15	219	8	585	22	465	17

Source: Baseline Field Survey, 2022

Vegetable cultivation is significantly high in districts like Kendrapara (57 percent), Cuttack (52 percent), and Bargarh (49 percent) of the total households growing vegetables. This indicates a secondary but important role for vegetable farming, providing nutritional diversity and potential income sources. Other crops (including lemon trees, sunflower, maize, etc.) are grown by 17 percent of the households, with districts like Kendrapara (63 percent), Nabarangpur (68 percent), and Puri (50 percent) leading in diversification. These regions show notable engagement with varied agricultural practices beyond paddy cultivation.

Table 3.2 provides the distribution of area, production, and yield of millets among sample households across the 17 districts. It shows that Cuttack has the largest area under millet cultivation (98.94 acres) and the highest production (89.3 quintals), resulting in a yield of 1.65 quintals per acre. Kendrapara (145 sample households), though having a smaller area (24.79 acres), exhibits one of the highest yields at 3.01 quintals per acre, with a production of 74.6 quintals. Among the selected blocks, Badamba Block in Cuttack district has the highest area of land under millet cultivation, while the highest yield rate is found in Jamakira Block of Sambalpur. Districts such as Balasore, Bargarh, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, and Nayagarh reported that none of the sample households are cultivating millets.

Table 3.2 Area, Production and Yield of Millets by the surveyed HHs

Districts	Total sample HHs (in numbers)	Area (in acre)	Production (in Qtl)	Yield (Qtl. /Acre)
Balasore	160	0	0	0
Bargarh	80	0	0	0
Bhadrak	80	2.9	18	6.21
Cuttack	240	58.94	89.3	1.69
Deogarh	80	1	2.2	0.55
Jagatsinghpur	80	0	0	0
Jajpur	160	0	0	0
Kendrapara	145	24.79	74.6	3.01
Khorda	160	0	0	0
Mayurbhanj	320	0	0	0
Nabarangapur	80	8	12.5	1.56
Nayagarh	80	0	0	0
Puri	80	7.6	18.6	2.44
Rayagada	80	38.55	43.1	1.12
Sambalpur	480	6.8	16	2.35
Subarnapur	160	1	4	2
Sundargargh	240	0.75	1	1.33
Total	2705	152.33	274.3	1.8

Source: Baseline Field Survey, 2023

Overall, across the 17 districts (2705 sample household covering 34 Blocks) it is found that the total area under millet cultivation is 152.33acres, with a combined production of 274.3quintals, resulting in an average yield of 1.8 quintals per acre.

3.3 Types of Land being used for Millets Cultivation

Normally millets are cultivated in low fertile, tribal & rain fed and mountainous areas. Table 3.3 presents the district-wise distribution of types of land used for millet cultivation across 17 districts. It shows that out of the total land used for millets cultivation the share of slope land area is higher in Sambalpur district. In Nabarangpur district all the household are cultivating millet in slope land. The other districts where mostly slope land reused Rayagada (62.30per cent), Kendrapara (28.24 percent), Bhadrak (44.83 percent). Whereas all the millet cultivated surveyed HHs of Puri, Subarnapur, Sundargarh and Deogarh used upper land. Besides this, the use of upper land is more common in Cuttack, Kendrapada and Bhadrak.

Table 3.3 Distribution Type of Land (in Acre) for Millets Cultivation across districts

Districts	Total	Upper Land		Slope Land	
	Area	Area	%	Area	%
Balasore	0	0	0	0	0
Bargarh	0	0	0	0	0
Bhadrak	2.9	1.6	55.17	1.3	44.83
Cuttack	58.94	54.55	92.55	4.39	7.45
Deogarh	2	2	100	0	0
Jagatsinghpur	0	0	0	0	0
Jajpur	0	0	0	0	0
Kendrapara	24.79	17.79	71.76	7	28.24
Khorda	0	0	0	0	0
Mayurbhanj	0	0	0	0	0
Nabarangapur	8	0	0	8	100
Nayagarh	0	0	0	0	0
Puri	7.6	7.6	100	0	0
Rayagada	38.55	14.5	37.61	24.05	62.39
Sambalpur	6.8	2.59	38.09	4.19	61.62
Subarnapur	2	2	100	0	0
Sundergargh	0.75	0.75	100	0	0
Total	152.33	103.38	67.87	48.93	32.12

3.4 Type of Millets Seeds Use

The data in Table 3.4 highlights the types of millet seeds used by farmers across different districts of Odisha. Out of the total 219 millet-growing farmers surveyed, a substantial majority196 farmers (89.5%)reported using local seeds for cultivation. This indicates a strong preference for traditional or farmer-saved seed varieties, which may reflect factors such as familiarity, easy availability, low cost, or limited access to improved seeds.

In contrast, the use of certified seeds and high-yielding variety (HYV) seeds remains quite low. Only 10 farmers (4.57%) used certified seeds, and 13 farmers (5.94%) used HYV seeds. Notably, districts like Cuttack, Deogarh, Nabarangpur, Puri, and Rayagada reported 100% reliance on local seeds, suggesting limited seed replacement and minimal penetration of formal seed systems in these areas.

The seeds used for millet production are of local seeds, certified seeds and HYV seeds. Table 3.4 shows that in Cuttack, Deogarh, Naborangpur, Puri and Rayagada all the sample millet farmers use local seeds. Kendrapara showed that a mix 51.22 per cent local, 24.39 percent certified and 24.39 HYV seeds were used. Similarly, Bhadrak had a higher percentage of local seeds (60 percent) compared to HYV (40 percent) and Sambalpur had 93.75 percent local and 6.25 percent HYV Seeds.

Table 3.4 Type of Millet Seeds used across the districts

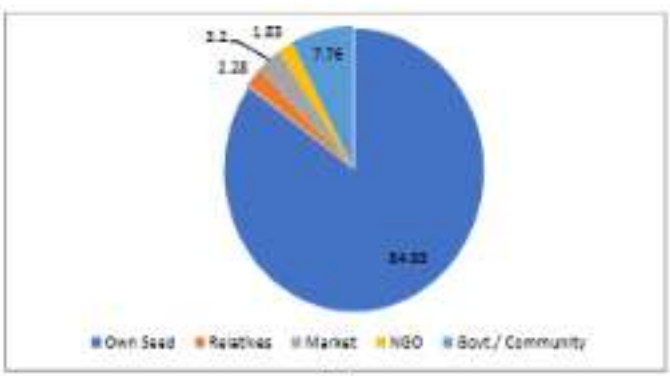
Districts	Total	Local Seeds		Certified Seeds		HYV Seeds	
		No.	%	No.	%	No.	%
Balasore	0	0	0	0	0	0	0
Bargarh	0	0	0	0	0	0	0
Bhadrak	5	3	60	0	0	2	40
Cuttack	94	94	100	0	0	0	0
Deogarh	4	4	100	0	0	0	0
Jagatsinghpur	0	0	0	0	0	0	0
Jajpur	0	0	0	0	0	0	0
Kendrapara	41	21	51.22	10	24.39	10	24.39
Khordha	0	0	0	0	0	0	0
Mayurbhanj	0	0	0	0	0	0	0
Nabarangpur	6	6	100	0	0	0	0
Nayagarh	0	0	0	0	0	0	0
Puri	11	11	100	0	0	0	0
Rayagada	36	36	100	0	0	0	0
Sambalpur	16	15	93.75	0	0	1	6.25
Subarnapur	4	4	0	0	0	0	0
Sundargarh	2	2	0	0	0	0	0
Total	219	196	89.50	10	4.57	13	5.94

Source: Baseline Field Survey, 2023

3.5 Sources of the Millet Seeds Used

The different sources of millet seeds are Govt./ Community, NGO, Market, Relatives and Own seed. The pie chart (Fig.3.1) illustrates the sources of millet seeds used by millets cultivating sample households. It shows that majority (84.93%) of them use own seeds, the sources of millet seeds used in the cultivating households reveals notable inter-district variations. 7.76 percent used the seed which collected from government sources and different communities. Very less depend on market and NGOs.

Fig 3.1 Sources of the Millet Seeds of the Sample Households



The predominant reliance on own seeds is evident across most districts, with Cuttack, Sambalpur, Nabarangpur, Puri, and Rayagada exclusively using their own seeds. This trend is reflected in the overall data. In contrast, districts like Kendrapara exhibit a more diversified seed source. While 84.15 percent of Kendrapara's seeds come from their own stock, a significant 41.46% are sourced from government or community programs, highlighting a strong dependence on these external sources compared to other surveyed districts.

Bhadrak (40 %) and Rayagada (5.56%) are the only districts reporting noticeable reliance on relatives for their seed requirement. Overall, seeds from relatives constitute only 2.8 % of the total seed. The shares of market-purchased seed are also infrequent, accounting for 3.2 per cent to the total seed usage. Kendrapara again stands out with 14.63% of its seeds bought from the market, while Rayagada contributes 2.78%. NGO-provided seeds played even a smaller role, making up just 1.89% of the total. Only Sambalpur (6.25%) and Kendrapara (7.32%) report any reliance on NGO sources.

Table 3.5 Distribution of Millet Cultiveting HHs by their Sources of Seeds

Districts	Total millet Farmers	Own Seed		Relatives		Market		NGO		Govt./ Community	
		No.	%	No.	%	No.	%	No.	%	No.	%
Balasore	0	0	0	0	0	0	0	0	0	0	0
Bargarh	0	0	0	0	0	0	0	0	0	0	0
Bhadrak	3	3	60	2	40	0	0	0	0	0	0
Cuttack	94	94	100	0	0	0	0	0	0	0	0
Deogarh	4	4	100	0	0	0	0	0	0	0	0
Jagatsinghpur	0	0	0	0	0	0	0	0	0	0	0
Jajpur	0	0	0	0	0	0	0	0	0	0	0
Kendrapara	41	14	34.15	1	2.44	6	14.63	3	7.32	17	41.46
Khordha	0	0	0	0	0	0	0	0	0	0	0
Mayurbhanj	0	0	0	0	0	0	0	0	0	0	0
Nabarangpur	6	6	100	0	0	0	0	0	0	0	0
Nayagarh	0	0	0	0	0	0	0	0	0	0	0
Puri	11	11	100	0	0	0	0	0	0	0	0
Rayagada	36	33	91.67	2	5.56	1	2.78	0	0	0	0
Sambalpur	16	15	93.75	0	0	0	0	1	6.25	0	0
Subarnapur	4	4	0	0	0	0	0	0	0	0	0
Sundargarh	2	2	0	0	0	0	0	0	0	0	0
Total	239	186	84.93	5	2.28	7	3.20	4	1.83	17	7.76

Source: Baseline Field Survey, 2023

3.6 Quality of the Millet Seeds

The quality of millet seeds is important as it deals with nutritional value, germination rate and overall suitability for production and consumption. The data presents the distribution of millets cultivating sample households by their perceptions about the quality of millets seed they used. It reveals that in Deogarh and Sundargarh, all sample households found it as good. Besides this,

majority farmers of Rayagada, Sambalpur, Puri, Cuttack, kendrapada and Nabrangpur also perceive their seed quality as good. While, in Bhadrak only 40 percent surveyed farmers expressed that the used seed are good and other of households rates their seeds as good while a significant 60 per cent considers it bad. This district stands out for its high dissatisfaction level compared to others. Kendrapara and Nabarangpur had some variation, with 14.63 per cent and 16.67 per cent of households, respectively, rates the seeds as average.

Table 3.6 Perception on the Quality of Millets Seeds across the districts

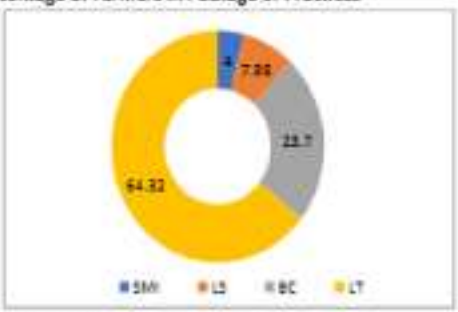
Districts	Total Farmers	Good		Average		Bad	
		N	%	N	%	N	%
Balasore	0	0	0	0	0	0	0
Bargarh	0	0	0	0	0	0	0
Bhadrak	5	2	40	0	0	3	60
Cuttack	94	82	87.23	6	6.38	6	6.38
Deogarh	4	4	100	0	0	0	0
Jagatsinghpur	0	0	0	0	0	0	0
Jajpur	0	0	0	0	0	0	0
Kendrapara	41	35	85.37	6	14.63	0	0
Khordha	0	0	0	0	0	0	0
Mayurbhanj	0	0	0	0	0	0	0
Nabarangpur	6	5	83.33	1	16.67	0	0
Nayagarh	0	0	0	0	0	0	0
Puri	11	10	90.91	1	9.09	0	0
Rayagada	36	34	94.44	1	2.78	1	2.78
Sambalpur	16	15	93.75	0	0	1	6.25
Subarnapur	4	3	75	1	25	0	0
Sundargarh	2	2	100	0	0	0	0
Total	219	192	87.67	16	7.31	11	5.02

Source: Baseline Field Survey, 2023

3.7: Package of Agronomic Practices

The package of agronomic practices Fig 3.2 represents the agronomic practices followed by the millet-cultivating sample households. It is seen that majority of the millet cultivated farmers (64.32 per cent) use linetransplantation (LT), followed by line sowing (LS) which is applied by 7.98 per cent surveyed farmers. Whereas only 4 percent farmers practiced System of Millets Intensification (SMI) is the least adopted method and broadcasting (BC) is practiced by 23.7 per cent of the total farmers.

Fig 3.2: Percentage of Farmers in Package of Practices



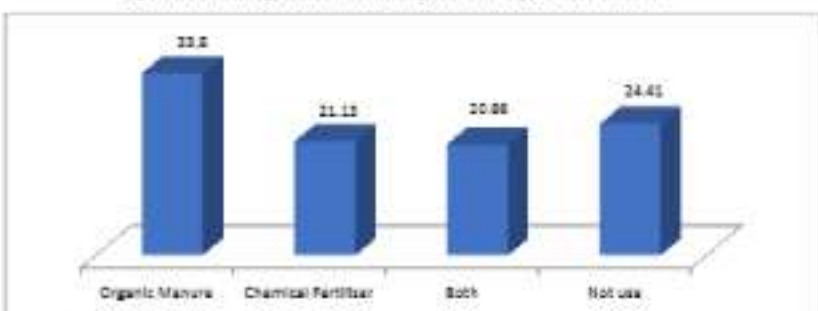
Source: Baseline Field Survey, 2023

3.8:Use of Fertilizers and Pesticides

Land fertility and pest control are crucial part of the agricultural practice, especially for the growth and production of the crops. Farmers use various methods to increase their land fertility and crop protection; these methods are mainly divided in to two categories, viz. organic and chemical (inorganic) methods. Organic methods of fertilizers include organic manure such as cow dung, goat and sheep manure while the pest control in organic methods include different oils, for example neem oil and pesticides made from organic ingredients such as cow urine, extract of different plants etc. Although, millets cultivation requires minimum fertilizers and pest control unlike other major crops like rice, wheat and maize, this section try to capture the trends and patterns about the use of fertilizer and pesticides in the sample households of the district.

Fig 3.3illustrates the types of fertilizers and pesticides used by millet-cultivating households. It is very interesting to know that 24.41 per cent of farmers do not use any fertilizer or pesticides the majority (33.80 per cent) of farmers use organic manure, indicating a strong preference for natural and sustainable farming practices. Whereas, chemical fertilizer is used by 21.13 per cent of the total surveyed farmers. A combination of both organic manure and chemical fertilizers is utilized by 20.66 per cent of households, while.

Fig 3.3: Percentage of farmers using different types of fertilizer:



Source: Baseline Field Survey, 2023

3.9: Storage of Seeds

To preserve the quality of seeds and reduce the wastage from damage proper storage of seeds is important for further production process. Table 3.7 illustrates the various seed storage methods employed by millet-cultivating households. It shows that majority (71.69 per cent) of them use jute bags, followed by Open hanging (6.85 per cent), earthen pot (5.48 per cent) and bamboo basket (0.91 per cent). While about 14.61 per cent of them store their millets seed using other methods which includes plastic bag and tarpaulin.

Table 3.7: Storage of Seeds by the Sample HHs across the Districts

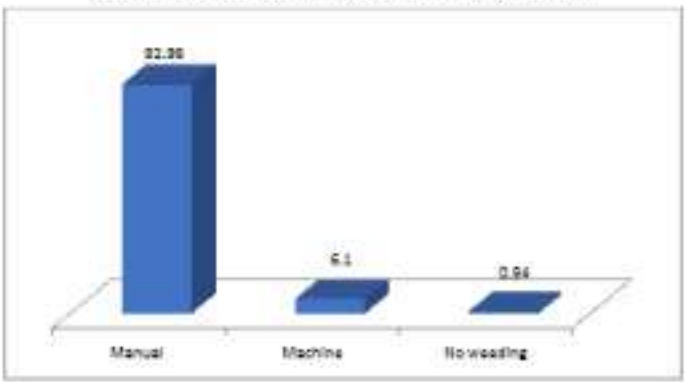
Districts	Total Farmers	Jute Bag		Earthen Pot		Bamboo Basket		Pura		Open Hanging		Others	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Bargarh	0	0	0	0	0	0	0	0	0	0	0	0	0
Balasore	0	0	0	0	0	0	0	0	0	0	0	0	0
Bhadrak	5	4	80	1	20	0	0	0	0	0	0	0	0
Cuttack	94	60	63.83	0	0	0	0	0	0	13	13.83	21	22.34
Deogarh	4	2	50	2	50	0	0	0	0	0	0	0	0
Jagatsinghpur	0	0	0	0	0	0	0	0	0	0	0	0	0
Jajpur	0	0	0	0	0	0	0	0	0	0	0	0	0
Kendrapara	41	41	100	0	0	0	0	0	0	0	0	0	0
Khordha	0	0	0	0	0	0	0	0	0	0	0	0	0
Mayurbhanj	0	0	0	0	0	0	0	0	0	0	0	0	0
Nabarangpur	8	8	100	0	0	0	0	0	0	0	0	0	0
Nayagarh	0	0	0	0	0	0	0	0	0	0	0	0	0
Puri	11	11	100	0	0	0	0	0	0	0	0	0	0
Rayagada	36	14	38.89	6	16.67	2	5.56	1	2.78	1	5.56	11	30.56
Sambalpur	16	15	93.75	1	6.25	0	0	0	0	0	0	0	0
Subarnapur	4	2	50	2	50	0	0	0	0	0	0	0	0
Sundergarh	2	2	100	0	0	0	0	0	0	0	0	0	0
Total	219	157	71.69	12	5.48	2	0.91	1	0.46	15	6.85	32	14.61

It is seen that Jute bags are the predominant seed storage method, with high usage in districts such as Cuttack and Kendrapara. Whereas, open hanging is noticeable use in Rayagada, suggesting some reliance on this method despite potential risks from exposure to pests and environmental conditions. Earthen pots highlighting a traditional storage method that provides good insulation and protection against moisture, particularly in districts like Deogarh and to some extent in Bhadrak. Bamboo baskets are the least used, which is only used in Rayagada district (2 HHs) reflecting limited capacity or lesser protective qualities. Other methods, which include plastic bag and Tarpaulin, were used in Rayagada (30.56 per cent) and Cuttack (22.34 per cent) districts respectively.

3.10: Weeding Practices by the Sample HHs

Weeding practices by sample households (HHs) involve various methods to remove unwanted plants (weeds). These practices can be broadly categorized into manual, and mechanical. Fig.3.4 illustrates the methods of weeding practiced by millet-cultivating households. It shows that the majority of households (92.96 per cent) prefer to use manual weeding, while mechanical weeding is applied by 6.10 per cent HHs. Only 0.94 per cent of them are not doing any type weeding.

FIG.3.4: PERCENTAGE OF HHS USING DIFFERENT WEEDING METHOD



3.11: Reasons for not Cultivating Millets by the Respondent HHs

There are several factors for not cultivating millet by the sample HHs (Table 3.8). The data reveals a number of key barriers to millet cultivation, highlighting both economic and logistical challenges faced by farmers across the surveyed districts. The most prominent reason for not cultivating millets is the perception that millet farming is "Not Profitable." In Jajpur district all the farmers are opined that due to non-profitable and non-availability of seeds they are not cultivating millet. Non-Profitable reason is most pronounced in districts such as Balasore (86.9%), Nabrangpur (83.8%), Khordha (82.10%)and Bhadrak (78.8%), reflecting strong economic deterrents in these areas. These figures suggest that farmers may perceive millet cultivation as less economically viable compared to other crops, particularly paddy, which is more widely cultivated and yields higher profits.

Another major barrier is the "Non-availability of Seed," which is a critical issue in districts like Jagatsinghpur (98.68%), Balasore (77.5 %) and Sambalpur (65.95%). This highlight significant challenges in accessing quality seeds, which is essential for ensuring a successful millet crop. The lack of reliable seed supply may be limiting the adoption of millets, despite their climate resilience and nutritional benefits. "Irrigation" is another key constraint, with issues of insufficient water resources being particularly severe in Subarnapur (33.13%) and Deogarh (33.33%). These districts are heavily reliant on irrigation for crop production, and the lack of adequate irrigation infrastructure poses a significant challenge for millet farming, which is typically more water-demanding during its early stages of growth.

"Shortage of Land" emerges as a notable barrier in Puri (37.5%), Deogarh (46.67%), and Khordha (41.10%) suggesting that limited land availability is hindering the expansion of millet cultivation in these districts. Land constraints may be due to urbanization, shifting agricultural priorities, or other land-use pressures, making it difficult for farmers to allocate sufficient area for millet crops. Finally, "Other reasons," including unaware about the SAA programme, its financial & physical benefits, millets nutritional benefits etc. are particularly high in districts like Mayurbhanj (86.38%),Mayurbhanj (86.4%) and Cuttack (85.5) suggesting that these areas face unique, local challenges that need further investigation. These reasons may encompass a range of factors, including cultural practices, market access, or regional agricultural policies that influence farmers' decisions.

Table 3.8: Reason for not Cultivating Millets across the Districts

Districts	*Not Profitable*		*Shortage of Land*		*Non-availability of Seed*		*Lack of Irrigation*		*Others*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*N*	*%*
Balasore	139	86.9	0	3.8	124	77.5	0	0.0	32	20.0
Bargarh	17	21.3	3	0.6	47	58.8	13	16.3	0	99.1
Bhadrak	62	73.8	0	5.4	8	10.8	6	8.1	8	10.8
Cuttack	15	10.3	12	26.3	0	75.5	0	0.0	119	81.5
Deogarh	26	34.2	21	46.7	14	31.1	15	33.3	0	0.0
Jagatsinghpur	0	0.0	0	0.0	75	98.7	0	0.0	1	1.3
Jajpur	160	100.0	0	0.0	160	100.0	0	0.0	0	0.0
Kendrapara	49	47.1	28	26.9	17	16.4	10	9.6	0	0.0
Khordha	120	82.2	60	41.1	0	0.0	0	0.0	119	81.5
Mayurbhanj	48	13.1	2	0.5	0	0.0	0	0.0	317	86.4
Nabarangpur	62	83.8	4	5.4	0	0.0	0	0.0	8	10.8
Nayagarh	69	43.3	21	14.4	62	42.5	0	0.0	0	0.0
Puri	59	75.0	4	37.5	6	8.7	0	0.0	0	0.0
Rayagada	22	48.9	0	0.0	8	17.8	6	13.3	9	20.0
Sambalpur	139	30.0	142	30.6	306	66.0	47	10.1	5	1.1
Subarnapur	18	11.3	1	0.6	88	55.0	53	33.1	0	0.0
Sundargarh	115	40.9	0	0.0	45	16.0	20	7.1	101	35.9
Total	**1114**	**34.2**	**298**	**9.1**	**960**	**29.4**	**170**	**5.2**	**719**	**22.0**

Source: Baseline Field Survey, 2023

3.12: Conclusions

Agriculture remains the primary occupation for the majority of people in the surveyed districts, with paddy being the dominant crop. However, millet cultivation also plays a significant role among the sample households. A notable portion of these households are engaged in millet farming, investing an average amount annually in cultivation and achieving moderate yields per acre. The majority of households grow millets on upper land, while a smaller proportion utilize slope land for millet production.

For households that are not cultivating millets, the primary reasons cited include a lack of profitability, non-availability of seeds, insufficient irrigation, and a shortage of land. Districts such as Bhadrak, Cuttack, and Khordha highlight economic unavailability as a significant barrier, with farmers in these regions perceiving millet cultivation as less profitable compared to other crops, particularly paddy. In contrast, districts like Jagatsinghpur and Jajpur face considerable challenges with the availability of quality seeds, a critical factor for successful millet farming.

Subarnapur and Deogarh experience critical shortages in irrigation infrastructure, which poses a significant challenge for millet cultivation, especially in the absence of sufficient water resources during the crop's growing season. Moreover, both Khordha and Deogarh report land shortages as a major constraint, limiting the area available for millet cultivation.

CHAPTER IV: CONSUMPTION OF MILLETS

4.1 Introduction

The focus of this chapter is to analyse patterns of millet consumption among the sample households across the districts. The Chapter also explores the quantity of millet consumed by households; types of millet & recipes consumed by the sample households. By doing so, the chapter aims to provide a comprehensive picture about the patterns of millets consumption and preferences among the sample households in the surveyed districts under Shree Anna Abhiyan.

4.2 Millet Consumption of sample households

Millets are considered to be the next super food or nutri-cerealsof the world because of their high nutritional content. They can be useful as a sustainable means for nutritional security. Table 4.1 presents the district-wise distribution of sample household by quantity of millet consumed per year. However, the quantity consumed millet does not follow the same pattern as more households reported of tasted millets; the average quantity consumed is lower in some of the districts. For example, while Kendrapara, more than half of the sample households reported consuming millets, the quantity consumption was around 15.5 kg per annum. In the survey, none of the households in Balasore, Jagatsingpur, Jajpur none of the households have consumed millet in last one year preceding the survey.

Table 4.1: Average AnnualConsumption of Millets by the Sample Hlts (in Kgs)

Districts	Avg. Annual Consumption (in kg)
Balasore	0
Bargarh	0.67
Bhadrak	7.75
Cuttack	15.49
Deogarh	0.68
Jagatsingpur	0
Jajpur	0
Kendrapada	15.5
Khordha	0.57
Mayurbhanj	2.44
Nabarangpur	17.11
Nayagarh	12.97
Puri	6.7
Rayagada	28.48
Sambalpur	5.07
Subarnapur	2.97
Sundargarh	2.53

Source: Baseline Survey, 2023

It has been reflected in the figure, in Rayagadathe average quantity consumption of HH is 28.48 Kg per annum, followed by Nabarangpur 17.11 kg per annum per HH. Though Rayagada District is a tribal dominated area, as it is observed in the Ramanaguda Block on an average around 28.48 Kg of millets are being consumed by the respondent households, annually.

4.3: Age distribution of household's members consuming Millet

The distribution of household members taking millets, in different age group is presented in table 4.2. It is highest among the old population, i.e., 37.89 percent, followed by adults (36.21 per cent), middle aged (34.97 per cent), and adolescent (29.92 per cent). It is 29.75 per cent among pre-school children, 25.86 per cent among children and lowest among the 0-2 years with 21.72 per cent.

In Balasore, Jagatsingpur and Jajpur districts, not a single person consume millet. In contrast, Rayagada exhibits exceptionally high consumption rates, with cent percent millet consumption by old age people. Kendrapara also demonstrates high millet consumption, particularly among adults (70.63 per cent) and the elderly (60.61 per cent), reflecting a strong preference for millets in older demographics. Conversely, districts like Khordha and Subarnapur have consistently low consumption rates across all age groups, with Khordha peaking at only 16 per cent among the elderly.

Districts such as Cuttack and Sambalpur show moderate to high consumption rates, with Cuttack having a balanced distribution across age groups, peaking at 55.97 per cent among the elderly. Sambalpur follows a similar trend, with a significant increase among the middle-aged (62.40 per cent) and elderly (58.08 per cent). This inter-district and inter age group analysis reveals distinct regional and age-related preferences for millet consumption. Older populations in some districts such as Rayagada and Nabarangpur districts show high rate of millet consumption, possibly due to traditional dietary practices or health benefits associated with millets. In contrast, some districts display negligible consumption, indicating varying cultural, agricultural, or economic influences on dietary choices.

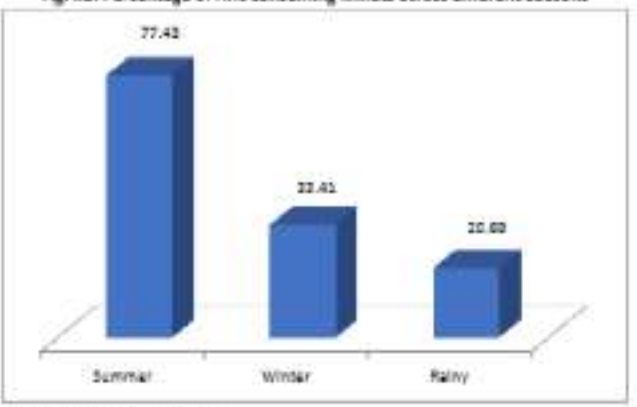
table x.1: million Consumption by different age Group

Particulars	0-5 years		Preschool (6-10 years)		Children (11-15 years)		Adolescent (16-20 years)		Youth (21-30 years)		Middle Age (31-60 Years)		Old (61 and above)		Total	
	Total No.	Percent Consuming Milk	Total No.	Percent Consuming Milk	Total No.	Percent Consuming Milk	Total No.	Percent Consuming Milk	Total No.	Percent Consuming Milk	Total No.	Percent Consuming Milk	Total No.	Percent Consuming Milk	Total No.	Percent Consuming Milk
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Balasore	6	5	6.00	12	5	9.09	11	8.08	8.08	85	5	5.88	473	5	5.00	132	5	5.00	76	5	5.00	800	5	5.00
Bargarh	5	4	10.00	10	5	10.00	13	7	56.00	57	11	11.35	141	73	51.77	91	58	63.74	55	36	65.45	371	193	51.15
Bhadrak	6	4	6.66	7	4	71.43	10	10	10.00	68	10	14.70	373	79	21.18	97	61	62.89	66	44	66.66	630	203	32.22
Balliali	10	4	11.27	14	10	71.43	73	48	67.11	66	38	57.58	334	203	60.78	254	147	57.87	161	73	54.97	1,004	388	38.75
Dhenpal	6	3	5.00	6	3	5.00	24	3	8.70	85	6	11.76	161	20	18.63	72	28	38.89	57	8	17.52	388	94	18.75
Jagatsinghpur	9	4	8.88	9	4	8.88	15	9	9.09	66	9	8.88	145	9	8.88	98	9	8.88	58	9	8.88	548	9	8.88
Jajpur	10	4	8.88	10	4	8.88	16	9	8.88	66	9	8.88	145	9	8.88	98	9	8.88	58	9	8.88	797	9	8.88
Kendrapara	8	3	5	11	5	11.28	11	10	20.47	51	30	51.85	211	173	73.58	121	103	85.83	89	65	73.31	744	394	51.99
Khordha	9	5	9.00	11	5	11.28	14	9	7.69	58	5	8.75	213	35	7.16	105	18	8.82	65	5	12.82	980	99	7.08
Mayurbhanj	19	4	11.79	17	5	11.77	111	5	8.18	111	6	7.81	211	15	8.00	224	11	8.80	111	19	11.18	1,011	104	9.77
Nabarangpur	5	3	5.00	10	3	47.00	35	18	50.70	11	77	53.33	109	107	98.13	91	91	91.78	60	55	91.18	388	761	58.93
Nayagarh	9	3	11.07	9	5	9.82	9	8	88.88	11	10	10.88	115	33	28.83	91	18	19.79	58	5	17.11	111	107	19.81
Puri	6	3	6.66	8	4	14.88	18	8	44.79	88	37	34.66	218	98	38.84	77	38	38.61	76	44	58.88	888	284	38.91
Sambalpur	10	4	38.88	14	10	71.78	44	34	88.88	88	31	35.27	448	161	35.94	98	48	58.84	88	48	58.84	888	384	38.84
Sundargarh	77	38	38.88	78	44	51.88	188	111	58.88	111	111	33.78	887	333	33.11	884	388	45.48	338	188	55.58	2,111	2,111	38.74
Subarnapur	10	3	8.88	10	3	8.88	73	8	10.87	78	8	10.88	188	38	18.87	188	38	18.87	86	3	14.88	888	88	18.88
Sundargarh	8	3	8.88	18	8	8.88	74	8	10.88	188	38	18.88	888	188	27.78	888	88	38.88	888	48	47.88	888	188	22.88
Total	111	48	11.71	888	111	24.73	888	318	33.88	1,888	818	28.88	1887	1,888	88.11	2,111	887	44.87	1,888	888	47.28	11,888	8887	34.14

4.4: Millets Consumption across Seasons

The data in fig 4.1 shows the distribution of millets consuming sample households during different seasons in the study area. It reveals that millets consume by 700 HHs in total which is higher (77.43 per cent) during summer season, followed by 302 HHs in winter season (33.41 per cent). During rainy season overall consumption drops to 20.69 per cent by only 187 HHs.

Fig.4.1: Percentage of HHs consuming Millets across different Seasons



Source: Baseline Survey,2023

The district-wise distribution of HHs for millets consumption during different seasons is presented in Table-4.3. It is seen that district wise also the consumption of millet among the HHs is more in summer, compared to other seasons. All the HHs of districts Bhadrak, Khordha, Puri, Nabarangpur, Nayagarh and Sundargarh are consuming millet in summer season. In contrast, not a single HH from Balasore, Jagatsingpur and Jajpur district take millet in their diet in any of the season. Whereas, including summer the millet intake in the Bhadrak, Mayurbhanj district in winter season is also good. In rainy season consumption is generally low across most districts, indicating a seasonal decline in millet preference or availability. This seasonal and inter-district analysis highlights the varying dietary patterns and cultural preferences influencing millet consumption.

Table 4.3: District-wise Millet consumption HHs in different Seeson (in %)

Districts	Consumption in Different Seasons						Total No. of HH Consume Millet
	Winter		Summer		Rainy		
	No.	%	No.	%	No.	%	
Balasore	0	0	0	0.00	0	0	0
Bargarh	12	44.44	24	88.89	10	37.04	27
Bhadrak	24	85.71	28	100.00	6	21.43	28
Cuttack	41	30.83	74	55.64	31	23.31	133
Deogarh	6	50.00	8	66.67	3	25.00	12
Jagatsinghpur	0	0.00	0	0.00	0	0.00	0
Jajpur	0	0.00	0	0.00	0	0.00	0
Kendrapara	61	42.07	71	48.97	24	16.55	145
Khordha	0	0.00	15	100.00	0	0.00	15
Mayurbhanj	14	77.78	17	94.44	4	22.22	18
Nabarangpur	11	14.67	75	100.00	4	5.33	75
Nayagarh	0	0.00	37	100.00	0	0.00	37
Puri	22	45.83	48	100.00	15	31.25	48
Rayagada	24	30.00	51	63.75	22	27.50	80
Sambalpur	56	26.92	182	87.50	53	25.48	208
Subernapur	10	40.00	17	68.00	0	0.00	25
Sundargarh	21	39.62	53	100.00	15	28.30	53

Source: Baseline Survey, 2023

4.5 Consumption of Millets in Different Meals of the Day

The distribution of millets consuming households by their millet's consumption in different meals of the day is presented at table 4.4. It shows that majority (62.6 per cent) of them consuming it during breakfast, followed by lunch (46.7 per cent), evening snack (24.7per cent), while lowest in dinner (3.32 per cent). Across districts, the distribution of millets consumption during different meals of the days shows that significant variability in consumption patterns between different districts and meal times.

In Bhadrak, Khordha, Nayagarh and Subarnapur all the HHs consume millet only in breakfast. In Mayurbhanj district all the 18 HHs take millet in their lunch and 14 HHs (77.8 %) include millet in their breakfast. Districtwise it is also seen no districts take millet in dinner except Rayagada (20%) and very less in the districts like Mayurbhanj (11.1%), Sambalpur (4.33%) and Cuttack (2.26%).

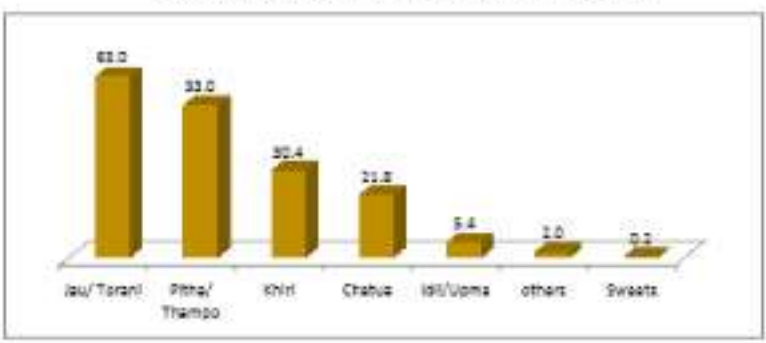
Table 4.4: Hills Millets Consumption in Different Meals of a Day

Districts	Breakfast		Lunch		Evening Snacks		Dinner	
	No.	%	No.	%	No.	%	No.	%
Balasore	0	0.0	0	0.0	0	0.0	0	0
Bargarh	14	51.9	9	33.3	3	11.1	0	0
Bhadrak	28	100.0	23	82.1	8	28.6	0	0
Cuttack	114	85.7	36	27.1	70	52.6	3	2.26
Deogarh	8	66.7	5	41.7	2	16.7	0	0
Jagatsinghpur	0	0.0	0	0.0	0	0.0	0	0
Jajpur	0	0.0	0	0.0	0	0.0	0	0
Kendrapara	68	46.9	48	33.1	33	22.8	0	0
Khordha	15	100.0	0	0.0	0	0.0	0	0
Mayurbhanj	14	77.8	18	100.0	8	44.4	2	11.11
Nabarangpur	40	53.3	44	58.7	49	65.3	0	0
Nayagarh	37	100.0	0	0.0	0	0.0	0	0
Puri	42	87.5	13	27.1	8	16.7	0	0
Rayagada	49	61.3	52	65.0	10	12.5	16	20
Sambalpur	78	37.5	126	60.6	25	12.0	9	4.33
Subarnapur	25	100.0	19	76.0	0	0.0	0	0
Sundargarh	34	64.2	29	54.7	7	13.2	0	0
Total	566	62.6	422	46.7	223	24.7	30	3.32

4.6:Millet Recipes Consumed

Figure 4.2 reveals the distinct preferences among millet-consuming households for various millet-based recipes. Jau/ Torani emerge as the most popular, consumed by 69.0 per cent of households, indicating its significant cultural or dietary importance. Pitha/ Thampo is favoured by 53 per cent of households, suggesting it is also a traditional and well-loved dish. Khiri is moderately popular, with 30.4 per cent consumption, while Chhatua is preferred by 21.8 per cent of households, showing a notable but lesser use.

Fig 4.2: Millet Recipes Consumed by the Sample Households



In contrast, contemporary recipes like Idli/ Upma and sweets have minimal consumption rates of 5.4 per cent, indicating that not widely accepted or preferred among millet consumers. Overall, traditional recipes like Jau/ Torani and Pitha/ Thampo dominate millet-based diets across generations, reflecting their deep-rooted cultural significance, while newer or less traditional recipes have yet to gain widespread popularity.

Table 4.5: Percentage of Sample HHs consume different Millet Recipes across the Districts

Districts	*Pitha/ Thampo*		*Chhatua*		*Jau/ Torani*		*Khiri*		*Idli/ Upma*		*Sweets*		*Others*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Balasore	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bargarh	12	44.4	9	33.3	8	29.6	2	7.4	2	7.4	0	0.0	0	0.0
Bhadrak	27	96.4	11	39.3	17	60.7	8	28.6	2	7.1	0	0.0	0	0.0
Cuttack	80	60.2	28	21.1	80	60.2	17	12.8	6	4.5	2	1.5	0	0.0
Deogarh	4	33.3	3	25.0	2	16.7	3	25.0	0	0.0	0	0.0	0	0.0
Jagatsinghpur	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Jajpur	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Kendrapara	76	52.4	53	36.6	61	42.1	59	40.7	28	19.3	0	0.0	0	0.0
Khordha	0	0.0	0	0.0	15	100.0	0	0.0	0	0.0	0	0.0	0	0.0
Mayurbhanj	12	66.7	9	50.0	8	44.4	2	11.1	0	0.0	0	0.0	0	0.0
Nabarangpur	62	82.7	0	0.0	73	97.3	59	78.7	0	0.0	0	0.0	0	0.0
Nayagarh	0	0.0	13	26.1	37	100.0	0	0.0	0	0.0	0	0.0	0	0.0
Puri	16	20.5	6	7.7	45	57.7	5	6.4	0	0.0	0	0.0	0	0.0
Rayagada	62	77.5	1	1.3	76	95.0	9	11.3	4	5.0	0	0.0	15	18.8
Sambalpur	91	43.8	23	11.1	121	58.2	96	46.2	6	2.9	0	0.0	4	1.9
Subarnapur	16	64.0	19	76.0	19	76.0	15	60.0	1	4.0	0	0.0	0	0.0
Sundargarh	39	73.6	29	54.7	28	52.8	10	18.9	2	3.8	0	0.0	0	0.0

Source: Baseline Field Survey, 2023

Table 4.5 illustrates the distribution of millet-consuming households across various districts by the popular recipes they consumed, highlighting significant regional and recipe-specific preferences. *Pitha/ Thampo* is notably popular in districts like Bhadrak (96.4 per cent), Nabarangpur (82.7 percent), Rayagada (77.5 percent) and Mayurbhanj (66.7 per cent),whereas, least consumption in Puri.

Highest consumption of *Chhatua* is observed in Subarnapur (76 percent) followed by Sundargarh (54.7 per cent) while no one from Khordha district. It is very interesting to see that in Khordha and Nayagarh district all the millet consuming HHs, intake Jau/Torani in their diet schedule. Besides this, it is also widely included in the millet recipe of Nabrangpur and Nayagarh district. Including this Khiri, Idli/Upma, Sweets and others also present in the millet recipe of HHs. As previously we see there is not single sample HH consuming millet so there is also no millet recipe in the Balasore, jagatsingpur and Jajpur district.

4.7 Findings

Millet consumption as evident from the data found to be low in the study area. The Rayagada district has the highest average consumption, i.e., 28.48 kg. While, in half of the implementing districts millet consumption is nil or less than 5 kg per annum. Further, millet consumption in different age group shows that the older generation, i.e., adults and middle aged consumes more than other age groups. The seasonal pattern in millet consumption signifies higher consumption of millet in summer and majority of the millets consuming households consume it from their own production. *Pitha*/ *Pitha* and Jau/ *Torani* are the most common millet recipe among the millets consuming households as all of them consume it.

CHAPTER-V: PROCESSING AND MARKETING OF MILLETS

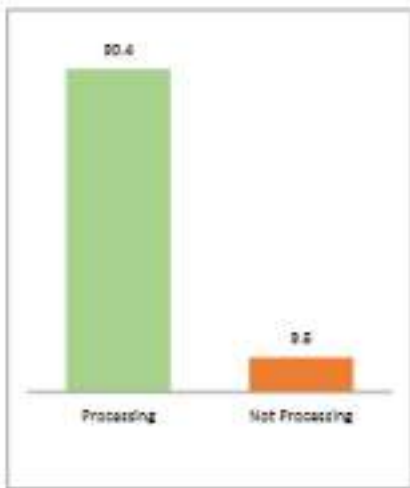
5.1 Introduction

The processing and marketing of millets encompass the transformation of millet into value-added products, enhancing its nutritional value, and promoting the use of millets and their products through improved access to markets. The *Baseline Survey 2023* aimed to examine the current practices of processing and marketing among sample households across 43 blocks in 17 districts of the state. The goal of the survey was to identify key insights that could inform the development of effective strategies and innovations during the implementation phase.

The primary objective of this chapter is to assess the status of millet processing and marketing within the sample areas and to identify the challenges and opportunities for enhancing the millet value chain. It explores various practices employed by the sample households in processing millets, including dehulling, milling, roasting, and popping. It evaluates the availability and accessibility of processing units within the study areas, as well as the factors influencing the selection of processing methods. Furthermore, the chapter analyses the diverse modes of millet sales, including direct sales, cooperatives, middlemen, and online platforms. It also examines logistical considerations, such as the distance to selling points and the associated transportation costs.

5.2 Processing of Millets

Fig 5.1: Percentage of Sample HHs Processed HH



Processing is a crucial step in the production of millets, as it helps to increase their self-life, improve their quality, and increase their value. It is found that (Fig 5.1) in total from 219 production HHs 90.4 percent, i.e., 198 HHs Processed the millets whereas 9.6 percent HHs are not adopted any method for processing.

Table 5.1 reveals that districts like Bhadrak, Deogarh, Nabarangpur, Puri, Rayagada, Subarnapur and Sambalpur reported 100 per cent processing rate, highlighting the integral role of millets in their daily lives. Cuttack and Kendrapara also show high processing rates of 87.23 per cent and 78.05 per cent, respectively. In contrast, the districts which are not producing millets, such as; Balasore, Bargarh, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, Nayagarh, and Sundargarh also have no processing.

Table 5.1 Percentage of sample households processing millets across the districts

Districts	Processing		Not Processing	
	N	%	N	%
Balasore	0	0	0	0
Bargarh	0	0	0	0
Bhadrak	5	100	0	0
Cuttack	82	87.23	12	12.8
Deogarh	4	100	0	0
Jagatsinghpur	0	0	0	0
Jajpur	0	0	0	0
Kendrapara	32	78.05	9	21.95
Khordha	0	0	0	0
Mayurbhanj	0	0	0	0
Nabarangpur	6	100	0	0
Nayagarh	0	0	0	0
Puri	11	100	0	0
Rayagada	36	100	0	0
Sambalpur	16	100	0	0
Subarnapur	4	100	0	0
Sundargarh	2	100	0	0

Source: Baseline Survey, 2023

5.3 Method adopted for Processing Millets

Table 5.2 present the distribution of millets cultivating households by the methods of processing they used. It shows that majority (59.1 per cent) of them are processing it by machine and 40.9 percent farmers using traditional method. The district-wise distribution of millets processing sample households reveals that all the farmers of Deogarh, Nabrangpur, Sundargarh and Subarnapur are using traditional method for processing whereas, all farmers of Sambalpur district use machinery. In Rayagada district 86.1 percent farmers are using machinery followed by Cuttack (56.1 %) of households use machinery for millet processing, indicating a significant shift towards mechanization. Further it highlights a predominant trend towards mechanized millet processing, with traditional methods persisting in certain districts, reflecting regional variations in technological adoption and cultural practices.

Table 5.2: Method adopted for Processing Millets across the districts

Districts	Traditional Methods		Use of Machinery	
	N	%	N	%
Balasore	0	0.0	0	0.0
Bargarh	0	0.0	0	0.0
Bhadrak	3	60.0	2	40.0
Cuttack	36	43.9	46	56.1
Deogarh	4	100.0	0	0.0
Jagatsinghpur	0	0.0	0	0.0
Jajpur	0	0.0	0	0.0
Kendrapara	18	56.3	14	43.8
Khordha	0	0.0	0	0.0
Mayurbhanj	0	0.0	0	0.0
Nabarangpur	6	100.0	0	0.0
Nayagarh	0	0.0	0	0.0
Puri	3	27.3	8	72.7
Rayagada	5	13.9	31	86.1
Sambalpur	0	0.0	16	100.0
Subarnapur	4	100.0	0	0.0
Sundargarh	2	100.0	0	0.0
Total	81	50.9	117	59.1

Source: Baseline Field Survey, 2023

5.4 Marketing of Millets and Millet-based Products

Table-5.3 presents the distribution of millets cultivating sample households by marketing of millets. The data shows that majority (50.70 per cent) of millets cultivating households selling their produce. The district-wise variation by marketing of millets suggests, in districts like Cuttack (71.28 per cent), Kendrapara (62.41 per cent), and Nabarangpur (66.67 per cent) have a majority of households selling millets, suggesting a strong market presence and potentially higher production levels. These districts likely have better market access or a cultural inclination towards selling millets.

In contrast, several districts exhibit no households selling millets, such as Balasore, Bargarh, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, Nayagarh, Subarnapur, and Sundargarh. This is dueto no production or lower production levels, resulting limited market access, or a preference for self-consumption. Bhadrak shows a lower engagement in selling millets, with only 20 per cent of households participating in the market, while Deogarh has none. Puri (27.27 per cent) and Rayagada (13.88 per cent) also have relatively low participation rates, indicating that most households prefer not to sell millets. Sambalpur shows a minimal selling rate at 12.50 per cent, reflecting a similar trend of low market engagement. These patterns highlight regional differences in the economic behaviour related to millet production and sales, influenced by factors such as market access, production levels, and cultural practices.

Table 5.3: Marketing of Millets across Districts

Districts	Number of Households			
	Millets Sold		Did Not Sell Millets	
	N	%	N	%
Balasore	0	0	0	0
Bargarh	0	0	0	0
Bhadrak	1	20	4	80
Cuttack	67	71.28	27	28.72
Deogarh	0	0	4	100
Jagatsinghpur	0	0	0	0
Jajpur	0	0	0	0
Kendrapara	26	63.41	15	36.59
Khordha	0	0	0	0
Mayurbhanj	0	0	0	0
Nabarangpur	4	66.67	2	33.33
Nayagarh	0	0	0	0
Puri	3	27.27	8	72.73
Rayagada	5	13.88	31	86.11
Sambalpur	2	12.5	14	87.5
Subarnapur	0	0	0	0
Sundargarh	0	0	0	100
Total	**108**	**50.7**	**105**	**49.3**

Source: Baseline Field Survey, 2023

5.5Selling Point of Millets

Table 5.4 is representing the data on the different channels through which households sell their millets production. A total of 108 farmers reported selling millets in the baseline survey conducted in 2023. Interestingly, a dominant majority of these farmers 105 out of 108sold their produce through middlemen or local businessmen, accounting for a striking 97.2% of the total. In sharp contrast, only 3 farmers, or 2.8%, reported selling millets directly in daily markets or haats. This lopsided pattern clearly indicates that the role of intermediaries continues to be the most common and possibly the most accessible mode of market engagement for millet farmers in Odisha.

It is seen that all the selling farmers of Cuttack, Kendrapada, Rayagada, Sambalpur is relying entirely on middlemen, while the only selling farmer of Bhadrak district sell in daily market. Similarly, in Nabrangpur 75 per cent of households using middlemen and 25 per cent selling through daily Markets or Hats, indicating some degree of direct market interaction. Similarly, in Puri 66.67 per cent (2 HHs) of households using middlemen and 33.33 per cent utilising daily markets.

On the other hand, a large number of districts Balasore, Bargarh, Deogarh, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, Nayagarh, Subarnapur, and Sundargarh reported zero farmers selling millets, either through middlemen or in haats. This absence is due tono or low levels of millet cultivation, subsistence-based farming where production is meant for household consumption, or possibly a lack of market infrastructure and awareness.

Table 5.4: Number of Farmers Selling Millets at different Selling Point across the districts

Districts	Total farmers sold	Middleman/ Local Businessman		Daily Market/ Haat	
		No.	%	No.	%
Balasore	0	0	0.0	0	0
Bargarh	0	0	0.0	0	0.0
Bhadrak	1	0	0.0	1	100.0
Cuttack	67	67	100.0	0	0.0
Deogarh	0	0	0.0	0	0.0
Jagatsinghpur	0	0	0.0	0	0.0
Jajpur	0	0	0.0	0	0.0
Kendrapara	26	26	100.0	0	0.0
Khordha	0	0	0.0	0	0.0
Mayurbhanj	0	0	0.0	0	0.0
Nabarangpur	4	3	75.0	1	25.0
Nayagarh	0	0	0.0	0	0.0
Puri	3	2	66.7	1	33.3
Rayagada	5	5	100.0	0	0.0
Sambalpur	2	2	100.0	0	0.0
Subarnapur	0	0	0.0	0	0.0
Sundergarh	0	0	0.0	0	0.0
Total	108	105	97.2	3	2.8

Source: Baseline Field Survey, 2023

5.6 Findings

The analysis of the survey data reveals that households engaged in millet processing, utilising machinery significantly. The millet selling points are mostly middle man and local business men indicating need for strong market linkages. Despite not cultivating millets themselves, some households still consume millets, for which they purchase pre-processed from the market, eliminating the need for further processing at home.

CHAPTER-VI: SUMMARY & CONCLUSION

6.1: Summary

The Shree Anna Abhiyan, a flagship programme of the Department of Agriculture and Farmers Empowerment, was implemented with the aim of reviving millet production and consumption. This initiative holds significant implications for nutrition, the economy, and livelihoods in the state (Department of Agriculture and Farmers Empowerment, 2023). Before the implementation of the programme, a baseline survey was conducted across the selected districts in different phases to understand the characteristics of farmers and the dynamics of millet production, consumption, and marketing challenges. The summary presented in the report provides the major findings from Baseline Survey Phase VII, which was implemented in 17 districts across 34 blocks, comprising 2705 sample households.

In the survey, most of the households are OBC, followed by ST communities, Hindu religion, and those who have attained primary and secondary education. More than 80% of households have marginal and small landholdings. Around 40% of households fall in the income range of 40,000-80,000 per annum, indicating poorer economic conditions. However, the availing of loans for agriculture is minimal.

Paddy is found to be the dominant crop across the districts, as it is cultivated by most of the sample households. In addition to paddy cultivation, a significant majority (52.08 percent) are also cultivating vegetables, and another 32.92 percent are engaged in cash crops such as cashew, lemon, maize, sunflower, green gram, and black gram. Moreover, about 39.27 percent of them are cultivating millets (Baseline Survey Report, 2023). As observed, across all 17 districts, the total area under millet cultivation is 139.82 acres, with a production of 223.99 quintals, resulting in an average yield of 1.60 quintals per acre (Survey Data, 2023).

In the study site, only 8% of farm households are engaged in millet cultivation. This indicates that millet cultivation is less in demand and less important as a source of food due to the increasing demand for wheat, rice, etc. This is evident from the study area, where all the farming households are cultivating paddy (Baseline Survey Report, 2023). Among the districts, Rayagada (45%) recorded the highest millet cultivation, followed by Cuttack (39%) and Kendrapara (28%). In Balasore, Bargarh, Jagatsinghpur, Jajpur, Khordha, Mayurbhanj, and Subarnapur, none of the farm households are cultivating millets (Survey Data, 2023). Other districts do not show significant millet cultivation. The Badamba block of Cuttack district has the highest area under millet cultivation across all the 34 blocks, while the highest yield per acre was recorded in Jamankira block in Sambalpur district (Survey Data, 2023). Most households use high or upland for millet cultivation, while a few utilize sloped land. Districts like Bhadrak, Cuttack, Khordha, and Puri notably highlight less economic viability as a primary barrier, which could be due to the lack of demand for millet, while Jagatsinghpur and Jajpur face challenges with HYV seed availability. Subarnapur and Deogarh indicate critical needs for training, and Khordha and Deogarh also report a shortage of land as a major constraint (Department of Agriculture and Farmers Empowerment, 2023).

The majority of farmers cultivating millets were using local seeds and traditional weeding practices. There was minimal use of the SMI method (4%) as an agronomic practice. Among the districts, the lack of irrigation was high in Subarnapur (33.33%) and Deogarh (33.33%), reflecting the need for water resources. It is also found that the shortage of agricultural land is a significant barrier in Khordha (41.10%) and Deogarh (46.67%), which is affecting millet cultivation (Baseline Survey Report, 2023). The Baseline Survey found that

across the districts, due to lack of awareness, no cultivation, and non-availability of millets in their locality, 68.32% of the sample households are not consuming millets, while only 31.68% are consuming them (Survey Data, 2023).

Among the 2706 sample farm households, millet consumption was found to be 164.51 kg per annum. A district-wise variation in consumption was observed, with no millet intake found in Jajpur, Jagatsinghpur, Deogarh, and Balasore. Districts like Nabarangpur (Chandahandi), Puri (Krushnaprasad), Cuttack (Badamba, Nursinghpur, and Tigiria), and Kendrapara (Derabis and Kendrapara) consumed millet within the range of 20 to 50 kg per annum per household (Survey Data, 2023). On the contrary, districts like Sundargarh (Bonaigaon, Subdega, and Sundargarh Sadar), Mayurbhanj (Baholda, Gopabandhunagar, Jamda, and Sukruli), Subarnapur (Biramaharajpur and Ulunda), Bargarh (Ambabhona), and Khordha (Banapur and Tangi) had millet consumption lower than 5 kg per annum. Millet consumption is higher among the older generation (i.e., adults and middle-aged individuals) than among the younger age groups across the districts (Survey Data, 2023). The seasonal pattern of millet consumption shows that consumption is higher in the summer season, mainly during breakfast, and Pitha and Jau/Torani are the most common millet recipes (Survey Data, 2023).

The analysis of the survey data reveals that few households are engaged in millet processing but mainly utilize traditional methods. A majority (86.94%) of the respondent households process millets using machines. A significant portion of these households sell their processed millets, primarily to middlemen or local businessmen. Selling of millets is mainly found in Cuttack and Nabarangpur (Survey Data, 2023).

6.2: Conclusions

Promoting millet as a key crop for sustainable agriculture, enhanced food security, and better health outcomes is crucial in Odisha, considering the region's socioeconomic, demographic, and ecological changes (Department of Agriculture and Farmers Empowerment, 2023). Transforming dietary habits and incorporating millet into the food system is essential for improved health outcomes and overall well-being. Without substantial efforts in raising awareness, adequate infrastructure, and specific incentives for millet cultivation, only a limited number of responding farm households are seeing positive outcomes. Based on the major findings of the Baseline Survey, Phase VII under SAA, it is suggested that need-based and timely handholding training on improved agricultural methods and practices, provision of high-quality seeds, and machinery through community-managed Common Facility Centres can be a boon for promoting millets in all districts. This can be more decentralized, sustainable, and people-oriented, leading to a successful programme.

Moreover, a collaborative strategy involving various stakeholders, including the government, is crucial for effectively rolling out programs designed to tackle issues related to production, consumption, and marketing of millet.

Annexure1: Mapping Baseline Survey Data, AllDistrict

Sl.	Indicators	Unit	Value
1	% Of Sample Households Cultivating Millets	%	8
2	Types of Millets Cultivated (2023)		
	a) Mandia	%	
3	Avg. Area under Millets/HHs	Acre	152.33
4	% Of millets area to total cultivated area	%	
5	Average Production of Millets (HHs)	Qtls.	274.3
6	% HHs by Package of Practice		
	a) Broadcasting	%	23.7
	b) LS	%	7.98
	c) LT	%	64.32
	d) SMI	%	4
7	Yield Rate (Qtls./Acre)	Qtls.	1.8
8	% Of HHs Consuming Millets	%	
	a) Breakfast	%	62.6
	b) Lunch	%	46.7
	c) Evening Snacks	%	24.7
	d) Dinner	%	9.32
9	Popular Millets Recipes		
	a) Tampo/Pitha	%	53
	b) Jau/Torani	%	63
	c) Khiri	%	30.4
10	Percentage of HH using Processing Ragi		
	a) Manually	%	50.9
11	% Of Millets Cultivating HHs Selling Millets	%	
	a) Middleman/ Local Businessman	%	97.2
	b) Daily Market / Haat	%	2.8

Annexure 2

ConfidentialandtoBeUsedforResearchPurpose Only

HouseholdsSchedule for

BaselineSurvey2023-24,PhaseVIof SHREE ANNA ABHIYAN (SAA)

Serial No..... Date.....

Part-I.Socio-EconomicStatus

1. ProfileoftheHouseholds

1.1. NameoftheHousehold'Head:.....

1.2. NameoftheRespondent:.....

1.3 Nameofthe(i)Village: (ii)GP

(iii)Blocks: (iv) District

1.4 Category: (i)SC (ii)ST (iii)OBC/SEBC (iv)Others(specify)

1.5. Religion (i)Hindu (ii)Muslim (iii)Christian (iv) Animism (v)Others

1.6. Ration Card Holding: (i)Ration Card (ii) Antyodaya Card (iii)Other (iv)No Card

1.7. Type of Family: (i) Nuclear (ii)Joint (iii)Extended (iv)Others(specify)

1.8.HouseStructure (i) Katcha (ii)Semi-Pucca (iii)Pucca

3. HHs'LandownershipinAcre.....

4. OperationalHoldingsUnderDifferentCrops(inAcre)

Sl.No	Name of the Crops	Yes/No	OwnLand*	Leased-in*	Sl.No	Nameofthe Crops	Yes/No	OwnLand*	Leased-in*
a	Paddy				c	Vegetables			
b	Millets				d	AnyOthersCrops			
TotalOperationalHolding									

5. AnnualExpenditure:

Sl.No	Source	ExpenditureHeads						Total Amount(inRs.)
	Agriculture	Land Preparation	Transplantation/ Sowing	Weeding	Fertilizers/ Pesticides	Harvesting	Others	
1	a)Millet							
	b)Paddy							
	c) Vegetables							
	d)Any Other Crops(Specify)							
3	HouseholdsExpenses							
4	OtherHHExpenses							
	Total							

6. AnnualIncomeoftheHH(lastyear.....)

7. Have you taken any agricultural loan? 1-Yes 2-No

8. Ifyes, please provide details.....

2. Household Particulars

Sl. No.	Name of the HH Members	Relationship with HoH (Use Code)	Age	Sex	Marital Status (Use Code)	Educational Qualification (Use Code)	Main		Subsidiary		Consume Water (Yes/No)
							Occupation (Use Code)	Annual Income	Occupation (Use Code)	Annual Income	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Codes: Marital Status: 1-Married, 2-Unmarried, 3-Widow, 4-Widower, 5-Divorced, 6-Separated, 7-Any Other (specify)
Relationship: 1-Self, 2-Spouse, 3-Son, 4-Daughter, 5-Daughter-in-Law, 6-Son-in-Law, 7-Father, 8-Mother, 9-Brother, 10-Sister, 11-Grandson, 12-Granddaughter, 13-Father-in-Law, 14-Mother-in-Law, 15-Any Other (Specify)
Education: 1-Illiterate, 2-Up to Class 5, 3-Class 6-10, 4-Higher Secondary, 5-Graduate, 6-Post-Graduate, 7-Technical (Diploma/Degree), 8-Professional/Management, 9-Any Other (Specify)
Occupation: 1-Agriculture, 2-Daily Wage Labour, 3-Business/Entrepreneurship, 4-Govt. Service, 5-Private Sector, 6-Pension/Remittances, 7-Student, 8-Housewife, 9-Unemployed, 10-Others (specify)

[illegible]

9. Do you cultivate millets? 1-Yes 2-No

If yes, give millet-wise production details

Sl. No.	Millet Crops	Season	Area (in Acres)	Land Type Used	Sources of Irrigation	Type of Seed Used	Sources of Seed	Quality of Seeds	Method of Cultivation	Use of Fertilizer	Use of Pesticides	Production (Qtl.)	Kept for Seed (Qtl.)	Kept for Consumption (Qtl.)	Sold/Marketing (Qtl.)
a	[illegible]	Kharif													
		Rabi													
		Summer													
b	[illegible]	Kharif													
		Rabi													
		Summer													
c	[illegible]	Kharif													
		Rabi													
		Summer													
d	Any other (specify)	Kharif													
		Rabi													
		Summer													

[illegible]

[illegible]

Type of Seed Used: 1-Local, 2-Certified, 3-HYV [illegible] Sources of Seeds: 1-Own Seed, 2-Relatives, 3-Market, 4-NGO, 5-Govt./Community Seed Centre, 6-Others (please specify)

Quality of Seeds: 1. Good, 2. Average, 3. Bad

[illegible]

Use of Fertilizer: 1. Organic [illegible], 2. Chemical fertilizers, 3. Both, 4. [illegible] [illegible]

10. Whetheryoufollowmixedfarmingormonofarmingsystem? 1.Mixed 2. Mono
If mixed, with which all the crops(s)?

11. Howdoyoustoreyourseedandgrain?

(i)JuteBag(ii)EarthenPot(iii)BambooBasket (iv)Pura (paddy rope)

(v)OpenHanging(vi)Other(Specify)

12. Hadyourseedorgraingotdamaged duringlastyear? 1.Yes 2. No

13. Haveyoudoneweedingforthemilletscultivation? 1.Yes 2. No

14. IfYes,Numberoftimesyoudoweedinginyourmilletfields,byeachmethod?

1) Manually_____2) By Weeder_____3) Both_____

15. IfByWeeder,Sourceofweeder?

i)Own ii)Rental iii)Borrowed from Neighbours iv) Govt.Provided v) Other

16. IfHHisnotcultivatinganyofthemillets,whatisthereason?

(i)Not profitable (ii)Shortage of land (iii)Non-availability of Seeds

(iv)Lackof irrigation (v)Others(pl.specify)_____

17. Howmanyyearshaveyounotcultivated Millets_____?

18. Do you like to cultivate Millets under this programme? 1.Yes 2.No

Part-III ConsumptionofMillets

19. Doesyourhouseholdconsumemillets? 1.Yes2. No

IfYes,TypesofmilletsyourHHconsumedindifferentseasons(PutTickMark)

Sl. No.	Nameof the Millets	Winter				Summer				Rainy			
	Times	Breakfast	Lunch	Evening Snacks	Dinner	Breakfast	Lunch	Evening Snacks	Dinner	Breakfast	Lunch	Evening Snacks	Dinner
a	Mandia												
b	Suan/ Kosla/ Ourji												
c	Koda												
d	AnyOther Millets (Specify)												

20. **MilletsRequirementsofthe HH:**

Sl. No.	Seasons	Millets Consumed (in Kg.)	Total Requirement of Millets (Kg.)	SourcesofMilletConsumedbyHH(inKg)				Total
				Produced	Purchased	Borrowed/ Exchanged	Other Sources	
a	Winter							
b	Summer							
c	Rainy							
d	Total							

21. **ConsumptionofMilletsindifferentRecipes**(PutTickMark)

Sl No.	NameofThe Millets	Pitha/ Tampo	Chhatua	Jau/ Torani	Khiri	Idli/ Upama	Sweets Items	Others (Specify)	Remarks
a	Mandia								
b	Suan/Kosla Guruj								
c	Kodo								
d	AnyOtherMillets (Specify)								

22. Istherearyspecialoccasionwhenyoupreparemillets-based items? 1.Yes 2. No

If yes,whatis/aretheoccasion(s)(specify)? _____

23. Forthiswhattypeofmilletisrequired (specify)?_____

24. DoyoupurchaseMilletBasedProductsfrommarketforconsumption? 1.Yes 2.No

25. If Yes,whataretheMillets-basedItemsyouusuallypurchasefromthemarket?

1. Biscuit/Mixture 2. Idli/Upama 3.Chhatua 4.Pakoda 5.Others (Specify)

26. Howdoyoulikethetasteofmillet-based productsyoupurchasedfrommarket?

1.Likeit 2.So-so 3.Do notlikeit

Part-IV:ProcessingofMillets

27. Doyouprocessthemilletproductsinyourhouse? 1.Yes 2.No

28. If yes,whoamongyourfamilymembers involvedintheprocessingofmillets?

i).Nos.ofMale members_____ ii).Nos.ofFemale members_____

29. Howdoyouprocessthemillets? a)Traditionally b)Machinery c) Both d)Others(Specify)

30. If traditionally,pleaseelaboratethemethodsofprocessing.

31. If Machinary,howfaristhelocationoftheprocessingunitfromyourvillage? _____km

Part-V: Marketing of Millets

Sl.No.	Millet Crops	Yes/No	Sources of Millets You Sale	Quantity	Price /Kg.	Govt. Price (MSP)	Where did you sell your millets	Distance in km	Mode of Transportation Used for Millets Sale	Reason for Sale
a	Mandia									
b	Suan/Kodia/Guri									
c	Koda									
d	Any other (specify)									

Sources of Millets You Sell: 1.Own Produced,2.Purchase from Farmers,3.Others(Specify)
Where Sold Your Millets: 1.Govt./Mandi,2.Middleman/Local Businessman,3.Moneylender/Sahukar,4.Daily market/Haat,5.Others(pl.specify)
Mode of Transportation: 1.Headload,2.Cycle,3.Cart,4.Own Vehicle,5.Hired Vehicle,6.Public Transport,7.Others (Specify)
Reason for Sale: 1. Better Price, 2. Immediate Need of Cash, 3.Loan Repayment, 4.Non-Availability of Market, 5. Any Others (specify)

32. Do you sell millets? 1.Yes 2. No
33. Types of Millets, you Sell and Quantity
34. Any instance of distress sale (less than the market price) of Millets? 1.Yes 2.No
35. If yes, what is the sale price.....and what is the market price.....
36. What are the marketing processes followed by you? a)Barter b)Money c)Others(specify)
37. Do you sell any millet based value-added products? 1.Yes 2.No
38. If yes, provide the details about the Millet Based Value Added Products you sale.

39. Remarks

Contact no of Respondent.....

Signature of the Researcher/Field Investigator

Study Team Member

Dr. Sanghamitra Panda
Dr.Rajadarshini Patra

Ms. Mimansa Sahoo
Mr. Ankit Moharana
Mr. Ramakanta Naik
Ms. Subhashree Pattal
Ms. Sunitra Rani Pradhan
Ms. M. Sandhyarani Dora
Ms. Subhashree Lenka
Md. Sahidul Islam
Ms. Kajal Pradhan
Mr.Utkal Lakra

Mr. Prasanta Kumar Sahu
Ms. Swayamprabha Pattanaik
Ms. Pusapanjali Lenka
Mr. Hemanta Maharanda
Mr. Sukant Kumar Pradhan
Ms. Madhusmita Choudhury
Ms. Sayatri Nayak

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