

BASELINE SURVEY

STATE REPORT 2017-18, PHASE-2

**(Special Program For Promotion Of Millets In Tribal Areas Of Odisha
or Odisha Millets Mission, OMM)**



Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar, Odisha

(an ICSSR Institute in Collaboration with Government of Odisha)

2021

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(* See next page for details of NCDS study team)

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Foreword

The importance of millets cultivation through the "Special Programme for Promotion of Millets in Tribal areas of Odisha" (Odisha Millets Mission, OMM) were focused at a consultation meeting held on 27 January 2016 at Nabakrushna Choudhury Centre for Development Studies (NCDS) under the Chairmanship of the then Development Commissioner-cum-Additional Chief Secretary (DC-cum-ACS), Government of Odisha, and Chairperson, NCDS, Mr. R. Balakrishnan. This led to a series of interactions and a memorandum of understanding (MoU) was signed between the Directorate of Agriculture and Food Production (DAFP) as the state-level nodal agency that would monitor and implement the programme, NCDS as the state secretariat that would also anchor the research secretariat and Watershed Support Services and Activities Network (WASSAN) that would anchor the programme secretariat as part of the state secretariat.

The date of signing of the contract was treated retrospectively as the start date of programme implementation. The programme was approved and initiated to operate in 30 blocks from seven districts in a period span over five years from 2017 to 2022. But in that year 29 blocks were implemented, and remain one block was included in 2018-19 with additional 21 blocks. The first three years of the programme period constitute be programme implementation phase and the subsequent two years comprise consolidation, expansion and institutionalization. As per the Programme Guidelines, the key project objectives include increased productivity, household consumption of millets by around 25 percent, enhancement of household nutrition security and creating demand for millets with a special focus on women and children.

The report on "Area, Yield, Production and Value of Produce under the Special Programme for Promotion of Millets in Tribal areas of Odisha" Odisha Millets Mission, 2018-19-Phase-II is an outcome of the team efforts of NCDS. I compliment all the members for their effort in preparing the report.

There has been interest in Odisha Millets Mission from the central as also other state governments. The unique institutional architecture that brings together the Government, civil society and Academia led by NCDS to complement and supplement each other has been appreciated by policymakers (including National Institution for Transforming India, NITI Aayog), civil society and Academia. So, the sustainability of Nutri-cereals in changing climate situations will show a new path to ensure qualitative food availability.

Director, NCDS

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All forms of intellectual exercise, in some form or other, are tacitly tuned from a remote background by a few master brains from behind the screen. However, confession as such cannot compensate for their incredible contributions in transforming a mere probability of the yester years to a reality this year. On this score, in the first and foremost, we would like to express our sincere gratitude to farmers, farmers' representatives/associations, senior officers from the state Government, particularly to Mr. R. Balakrishnan, Indian Administrative Service (IAS, superannuated), currently Chief Advisor, Government of Odisha and former Development Commissioner-cum-Additional Chief Secretary (DC-cum-ACS) and former Chairman, Nabakrushna Choudhury Centre for Development Studies (NCDS); Mr. Asit Kumar Tripathy, IAS, Chairman of the Western Odisha Development Council (WODC), former Chief Secretary and former DC-cum-ACS, Government of Odisha and former Chairman, NCDS; Mr. Suresh Chandra Mahapatra, IAS, Chief Secretary, former DC- cum-ACS, Government of Odisha and Chairman, NCDS; Mr. Raj Ku Sharma, IAS, APC-CUM-ACS; Mr. Gagan Ku Dhal, IAS, Former Agriculture Production Commissioner; Mr. Pradipta Ku Mohapatra, IAS, former Agriculture Production Commissioner; Mr. Manoj Ahuja, IAS, former Principal Secretary, Department of Agriculture and Farmers' Empowerment (DAFE); Mr. Sanjeev Chopra, IAS, Principal Secretary; Dr. Saurabh Garg, IAS, Principal Secretary, DAFE; Mr. Bhaskar Jyoti Sarma, IAS, Former Special Secretary, DAFE; Mr. Suresh Ku Vashishth, Commissioner-CUM-Secretary, DAFE; Mr. Basant Ku Sar, Former Agriculturist; Mr. Pramod Ku Samal, Agriculturist; Mr. Hari Ballav Mishra, IAS, former Director, Directorate of Agriculture and Food Production (DAFP); Dr. M. Muthukumar, IAS, Director, DAFP; Prof. Srijit Mishra, former Director, NCDS; Mr. Hiranjan Mahant, Joint Director Agriculture (JDA), Millets & Integrated Farming, DAFP; Mr. Kashinath Khuntia, former Joint Director Agriculture (JDA), Millets & Integrated Farming, DAFP; Mr. Pradeep Rath, JDA, Millets & Integrated Farming, DAFP; Dr. Ananda Chandra Sasmal, Agronomist, DAFE; Mr. Ansuman Pattanayak, In-Charge JDA, Millets & Integrated Farming and Assistant Agriculture Officer (AAO), Farm, Millets, DAFP; and Mr. Sanjay Kumar Pani, Former AAO, DAFP; Ms. Kalpana Pradhan, AAO, DAFP.

Special thanks to the members of the Programme Secretariat (Watershed Support Services and Activities Network, WASSAN), particularly to Mr. Dinesh Balam, former State Coordinator, Programme Secretariat; Mrs. Aashima Choudhury, State Coordinator; Late Mr. Subham Sharma, former Regional Coordinator, Program Secretariat; Mr. Ram Chandra Tosh,

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Nitin Kumar Hotha

EXECUTIVE SUMMARY

1. Study Area

1.1 The implementation of the second phase of the “Special Program for Promotion of Millets in Tribal Areas of Odisha (hereafter Odisha Millets Mission, OMM)” was initiated in *Khari*ff 2018 in 21 blocks of six districts namely, Bolangir, Kandhamal, Koraput, Mayurbhanj, Rayagada, and Sundergarh. These six districts are coming under the state plan whereas another four blocks from Keonjhar district are funded by District Mineral Fund (DMF), Keonjhar. This is the accumulated second phase baseline state report consisting of above mentioned six districts.

1.2 From the six phase-II districts, OMM has already intervened in four blocks of Kandhamal, seven blocks of Koraput, and four blocks of Rayagada. Three new blocks each from Kandhamal and Koraput and four blocks from Rayagada are added in phase-II of OMM.

1.3 A total of 1714 HHs were surveyed from the six districts. It was reported that from the total surveyed HHs, 820 HHs had cultivated millets in 2017-18, the period covered under phase-II of the baseline survey.

2. Socio-Economic Profile

2.1 From the surveyed HHs, 73.5% HHs belong to Schedule tribes (STs), 8.3% HHs were Schedule casts (SCs), and the rest 18.3% HHs belong to other casts (OCs).

2.2 By religion, the majority of HHs were Hindus (82.2%), 17.7% were Christians, and only one HH was Muslim.

2.3 From these six districts, as per the 2011 census sex ratio is highest in Rayagada district (1051) and lowest in Sundergarh district (973).

2.4 From the surveyed HHs, the majority portion were living below the poverty line (BPL, 98.1%).

2.5 The primary economic activity of 97.9% of HHs is agriculture.

2.6 From the surveyed data it reflects that more than half of the population resided in *Kutcha* type houses, almost 30% HHs resided in *Semi-pucca* type houses, and the rest 13.7% HHs resided in *Pucca* type houses.

3. Production

3.1 primarily, five different types of millet crops, viz., *Mandia/Ragi* (Finger millet), *Suan/Gurji* (Little millet), *Janha/Jowar* (Sorghum), *Kangu* (Foxtail millet), and Kodo millet were cultivated in 2017-18, the baseline year across the five districts except for Mayurbhanj.

3.2 820 HHs, from the total surveyed HHs, had cultivated millets, of which 96.1% of HHs had cultivated *mandia* spread across 296.3 ha of land, producing 1427.48 qtls with a yield of 4.8 qtls per hectare and 1.8 quintals per HH.

3.3 *Suan* was cultivated by 16.7% of HHs in an area of 61.5 ha producing 390.25 qtls. The yield of *suan* per hectare was 6.3 qtls/ha and per household was 2.8 qtls/hh.

3.4 Rayagada was the only district where *jonha* cultivation was reported whereas Bolangir was the only district where cultivation of kodo was recorded.

3.5 *Kangu* was seen cultivated in Kandhamal and Rayagada districts only.

3.6 482 HHs from the 820 millet cultivating HHs perceived that the seed, they used for millet cultivation, was good in quality. 337 HHs said that the quality of the seed was average and only one HH mentioned that the quality was bad.

3.7 From 788 *mandia* cultivating HHs, only 5 HHs had adopted the method of systematic millet intensification (SMI). Around 75% of HHs had adopted either LT or LS for millet cultivation which seems to be the most popular method among all.

3.8 Apart from *mandia*, for all other types of millet broadcasting was the more generic method of cultivation which had been adopted by almost all HHs for cultivation.

4. Consumption

4.1 More than 90% of HHs had reported consumption of millets. Again, most of them had consumed it in summer. *Mandia jau* was the popular recipe across all districts. In addition to *jau*, they also consumed in the form of rice/upama, *mandia torani*, *pitha*, *tampo*, *roti*, and *handia*.

5. Processing and marketing

5.1 From the survey, it is evident that 54% of HHs had processed millet manually, 23.7% used machines, and the rest 22.3% processed millet both manually and by machine.

5.2 From those who use machines for processing, almost all of them (99.8%) had used others pulverizes.

5.3 Almost 50% of HHs, who had cultivated millet, had marketed it in four different modes as middlemen/local traders, market, money lenders, and neighbor sales.

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ABBREVIATION

AAO	Assistant Agriculture Officer
ACS	Additional Chief Secretary
APL	Above Poverty Line
ASHA	Alliance for Sustainable and Holistic Agriculture
ATMA	Agricultural Technology Management Agency
BPL	Below Poverty Line
DAFE	Department of Agriculture and Farmers' Empowerment
DAFP	Directorate of Agriculture and Food Production
DC	Development Commissioner
DDA	Deputy Director Agriculture
FGD	Focused Group Discussion
HH	Household
ha	Hectare
IAS	Indian Administrative Service
JDA	Joint Director of Agriculture
km	Kilometre
MoU	Memorandum of Understanding
MINI	Millets Network of India
NCDS	Nabakrushna Choudhury Centre for Development Studies
OFS	Odisha Finance Service
OMM	Odisha Millets Mission
OSG	Other Social Groups
PD	Project Director
qtls	Quintals
RRA	Revitalizing Rainfed Agriculture
SC	Scheduled Caste
SHG	Self-help Group
ST	Scheduled Tribe
SVA	Sahabhagi Vikash Abhiyan
WASSAN	Watershed Support Service and Activities Network

Introduction

1.1 Background

Millet is one of the oldest foods known to humans. The ancient food crop has been growing in Asian countries since 2700 BC (Gupta, Srivastav, & Pandey, 2012). In India, post-green revolution millet was gradually extinct from the plates of people as the emphasis was given more on paddy and wheat in Government's food security scheme. However, the rapidly changing climatic condition is forcing developing countries in general and India, in particular, to adopt millet cultivation and consumption since millet is a climate-compliant crop as compared to other crops such as paddy and wheat. Millets can be grown in arid and semi-arid areas. So, instead of cultivating rice and wheat, growing millets can substantially reduce water demand and improve the production of nutrients like iron, zinc, and potassium(Davis, et al.,2018).

Primitively, taking the nutritional value and climate-resilient nature of millets into account, the Special Programme for Promotion of Millets in Tribal Areas of Odisha (hereafter Odisha Millets Mission, OMM) with a novel organizational structure¹ was initiated by the Government of Odisha in 2017-18 putting the accent on four verticals i.e. production, consumption, processing, and marketing of millets. In 2017-18, the phase-1 of the Programme was initiated in 30 blocks of seven districts, and thereafter in 2018-19, phase-2 of the Programme was extended to 21 blocks of six districts (including three phase-1 districts) namely Bolangir, Kandhamal, Koraput, Mayurbhanj, Rayagada, and Sundergarh. The baseline survey aims to provide necessary information on the above-mentioned aspects before the implementation of the Programme. Thus, the profile of the six districts is provided below.

1.2 District profile

The phase-II of the program commenced in 21 blocks of six districts in 2018-19. The key indicators of the districts are shown in Table 1.1. The total population of second-phase districts of OMM constitutes 22% of the state's population. The sex ratio (number of females per 1000 males) of these districts, except Sundergarh, is higher than State's sex ratio (979 females per 1000 males, census 2011). The population of ST is highest in all OMM districts.

¹ This programme is implemented with combined efforts of Government, academia, and civil society.

Table 1.1: Key Indicators of Districts

Table 1.1: Key indicators of OMM phase-II districts						
Indicators	Bolangir	Kandhamal	Koraput	Mayurbhanj	Rayagada	Sundergarh
Census 2011						
Population (In Lakh)	16.5	7.3	13.8	25.2	9.7	20.9
Male	8.3	3.6	6.8	12.6	4.7	10.6
Female	8.2	3.7	7.0	12.6	5.0	10.3
Scheduled Caste	3.0	1.2	2.0	1.8	1.3	1.9
Scheduled Tribe	3.5	3.9	7.0	14.8	5.4	10.6
Others	10.0	2.2	4.8	8.6	3.0	8.4
Household (In Lakh)	4.1	1.7	3.4	4.7	2.0	47.9
Average HH Size	4	4.3	4.1	45.31	4.8	43.68
Sex Ratio (Number of females per 1000 males)	987	1037	1032	1006	1051	973
Total Worker (In Lakh)	7.2	3.6	6.9	12.23	4.7	8.73
Main Worker	4	1.7	4	5.48	2.3	5.35
Marginal Worker	3.2	1.9	3	6.75	2.4	3.38
Non-Worker	9.3	3.7	6.9	12.96	5.1	12.2
Cultivator as % of Total Worker	23.11	22.3	29.8	19.51	21.25	21.1
Agricultural Labourers as % of Total Worker	45.3	45.9	41.9	46.48	53.12	29.01
Literacy Rate (%)	64.72	64.1	49.2	63.17	49.8	73.34
Total Geographical Area (sq. km)	6575	8021	8807	10418	7073	9712
Land Use Pattern (Area in '000 ha), 2014-15						
Forest	59.18	170	81	72.33	1010	168
Land put to Non-agricultural use	52.40	21	47	71.46	300	69
Barren and Non-Cultivable Land	17.16	103	144	18.12	2040	74
Permanent Pasture and Other Agricultural Land	42.30	13	20	34.41	100	33
Net Area Sown	268.96	57	192	31.81	1440	207
Cultivable Waste Land	25.93	19	16	50.35	90	45
Old Fallow	23.06	28	24	50.23	230	47
Current Fallows	51.46	28	50	57.56	420	70
Miscellaneous Trees and Groves	1.34	1	33	25.99	90	1941
Agriculture, 2013-14						
Average Fertilizer Consumption (kg/ha)	43.1	8.3	43.6	41.39	54.8	31.93
Irrigation, Kharif (ha)	67885	30758	110.2	24.07	71.6	89823
Irrigation, Rabi (ha)	20523	11526	43.5	14.44	28.1	44760
Other Information						
The proportion of Villages Electrified (as on March 2018)	1751	2017	1383	3644	2220	1713
Credit Deposit Ratio (as on December 2018)	50.41	41.22	51.62	37.71	48.16	48.24
Bank's branch network (In Nos.) (as on December 2018)	160	72	127	263	97	263

Source: [dshb-kandhamal-2018.pdf \(desorissa.nic.in\)](#) [dshb-sundargarh-2018-final.pdf \(desorissa.nic.in\)](#) [dshb-koraput-2018-final.pdf \(desorissa.nic.in\)](#) [dshb-bolangir-2018-final.pdf \(desorissa.nic.in\)](#) [dshb-mayurbhanj-2018-final.pdf \(desorissa.nic.in\)](#) [dshb-rayagada-2018\(final\).pdf \(desorissa.nic.in\)](#)

the proportion of agricultural laborer is more in OMM districts. The land use pattern shows that forest land is more in OMM districts. Electrification has been provided to more than 90% of villages of OMM districts.

1.3 Objectives

The objectives of the baseline survey were to obtain information on proposed interventions under OMM around production, consumption, processing and marketing. Along with this, the study tries to collect basic socio-economic information of respondents in the base year. The objectives of the study are as follows.

- To assess the socio-economic condition of the HHs
- To outline millet production, productivity, and the package of practices
- To examine the consumption pattern of millets
- To elucidate the method of processing and mode of marketing

1.4 Methodology

1.4.1 Sample Design

Six districts are proposed as Programme districts for the promotion of millets because the climatic condition is convenient for millets cultivation. From the six districts, all 21 Programme-intervened blocks have been taken for survey. From these, first stage sampling selected two-gram panchayats randomly from each block, and second stage sampling was to select two villages from each of the selected gram panchayats. The third stage of sampling had two parts, one was to select 15 households randomly from each selected village from the list of participating farmer households, and the other part was to prepare a village listing of non-participating farmer households and then select five households randomly and if the participating households in the village are less than 15 then increase the number of non-participating households in the sample so that the total sample in the village is 20. By design, 80 households have been surveyed from each block.

Table 1.2: Households surveyed in selected districts

Districts	Programme HHs	Surveyed HHs	Participant HH 2017-18	Non-Participant HH 2017-18
Bolangir	1093	320	135	185
Kandhamal	896	240	67	173
Koraput	958	200	64	136
Mayurbhanj	550	240	59	181
Rayagada	2090	398	128	270
Sundergarh	1403	316	138	178
Total	6990	1714	591	1123

Source: Programme Secretariat & Field Survey

1.4.2 Research tool

The survey is primarily based on primary data. The primary data were collected from the respondents in the concerned districts using the pre-tested interview schedule (Annexure 1) focusing on the basic demographic profile as well as the four dimensions of the Programme viz. production, processing, consumption, and marketing of millets. Focus Group Discussions (FGD), (Annexure 2) were also conducted in Programme-intervened blocks of all phase-2 districts to get qualitative information related to the locality. Additionally, secondary data was also used to get the geographical information, population detail, and agricultural and food practices through a comprehensive desk review of the literature.

1.5 Limitations of the survey

The Survey is limited to 21 Blocks of six districts and may not be generalized to understand the socio-economic status of the people, the geo-climatic condition of the region, and the agronomic practices of the district as it may vary from region to region. Also, some of the data are purely based on respondents' perceptions, and researchers had no scope to validate the information. All the HHs could not be surveyed due to logistics and the non-availability of respondents. So, a sample of HHs had been taken for the study.

SOCIO-ECONOMIC PROFILE OF HOUSEHOLDS SURVEYED

2.1 Introduction

This chapter outlines the socio-economic and demographic characteristics of the surveyed households from six phase-2 districts of Odisha Millets Mission. Basic socio-economic parameters like social category, religion, poverty status, economic activities, dwelling house type, and demographic profiles like sex, and occupation were captured.

2.2 Social and Demographic profile

Table 2.1 shows the distribution of households by social groups across six Phase-2 districts. Schedule tribe is the dominant community with 73.5%, followed by Other Casts (18.2%), and Schedule Cast (8.3%). The highest number of Schedule Tribes (94.5%) resides in the Rayagada district, whereas the Bolangir district has the lowest number of scheduled tribes (34.7%). Similarly, proportion of scheduled caste is highest in the Mayurbhanj district (14.2%) and that of the other caste is highest in the Bolangir district (51.6%).

Table 2.1: Distribution of Households by Social Groups across Districts

Districts	SC		ST		OC		Total	
	HHs	%	HHs	%	HHs	%	HHs	%
Bolangir	44	13.8	111	34.7	165	51.6	320	100
Kandhamal	16	6.7	205	85.4	19	7.9	240	100
Koraput	26	13.0	111	55.5	63	31.5	200	100
Mayurbhanj	34	14.2	181	75.4	25	10.4	240	100
Rayagada	18	4.5	376	94.5	4	1.0	398	100
Sundergarh	5	1.6	276	87.3	35	11.1	316	100
Total	143	8.3	1260	73.5	311	18.2	1714	100

Source: Field survey

Table 2.2 indicates the respondent HHs mainly belongs to Hindu, Christian, and Muslim religious communities. Of the total surveyed HHs, the Hindu religious community is the predominant community with 82.2%, Christians are 17.7%, and only one is Muslim. All the HHs from the Bolangir and Koraput are Hindus. In the Sundergarh district, more than half of the HHs (62%) are Christians, which is the highest among the six districts. The only Muslim HH also belongs to Sundergarh.

Table 2.2: Distribution of Households by Religion across Districts

Districts	Hindu		Christian		Muslim		Total	
	No	%	No	%	No	%	No	%
Bolangir	320	100.0	0	0.0	0	0.0	320	100
Kandhamal	147	61.3	93	38.8	0	0.0	240	100
Koraput	200	100.0	0	0.0	0	0.0	200	100
Mayurbhanj	239	99.6	1	0.4	0	0.0	240	100
Rayagada	384	96.5	14	3.5	0	0.0	398	100
Sundergarh	119	37.7	196	62.0	1	0.3	316	100
Total	1409	82.2	304	17.7	1	0.1	1714	100

Source: Field survey

Table 2.3 indicates the distribution of households by gender across districts. In aggregate, the share of the male population is higher than the female population except for Rayagda and in Kandhamal proportion of males to females is equal.

Table 2.3: Distribution of Households by Gender across Districts

District	Male		Female		Total	
	No	%	No	%	No	%
Bolangir	830	53.0	735	47.0	1565	100
Kandhamal	565	50.0	566	50.0	1131	100
Koraput	446	51.0	428	49.0	874	100
Mayurbhanj	535	51.4	505	48.6	1040	100
Rayagada	890	49.0	927	51.0	1817	100
Sundergarh	791	52.6	712	47.4	1503	100
Total	4057	51.2	3873	48.8	7930	100

Source: Field survey

2.3 Poverty Status

The poverty status of the surveyed HHs has been categorized as below the poverty line (BPL) and above the poverty line (APL). HHs having *Antodaya* or priority cards are referred to as BPL and those without these are referred to as APL. From the surveyed HHs, 98.1% HHs were coming under the BPL category, while the rest (1.9%) were APL. It is conspicuous from Table 2.4 that the percentage of BPL category from all the districts is more than 95% that too 100% in Kandhamal district.

Table 2.4: Distribution of Households by Poverty status across Districts

District	BPL		APL		Total	
	No	%	No	%	No	%
Bolangir	308	96.3	12	3.8	320	100
Kandhamal	240	100.0	0	0.0	240	100
Koraput	198	99.0	2	1.0	200	100
Mayurbhanj	232	96.7	8	3.3	240	100
Rayagada	396	99.5	2	0.5	398	100
Sundergarh	307	97.2	9	2.8	316	100
Total	1681	98.1	33	1.9	1714	100

Source: Field survey

2.4 Economic Activities

Economic activities of surveyed HHs show that majority of HHs (97.9%) were engaged in cultivation which indicates agriculture as the primary economic activity among the respondents. Even all the HHs from Bolangir and Kandhamal districts indulged in cultivation, Table 2.5. Apart from these two districts, in all others districts as well more than 95% of HHs were involved in cultivation. Other than cultivation, about 52.9% HHs were engaged in Allied services (these include agriculture laborer and forest product collection), 9% were engaged in services, and 30.3% HHs were engaged in other activities. It is reasonable to say that cultivation was the major occupation of surveyed HHs in all districts during the survey period, 2017-18.

Table 2.5: Distribution of Households by economic activities across Districts

District	Cultivation		Allied		Service		Other		Total	
	No	%	No	%	No	%	No	%	No	%
Bolangir	320	100.0	263	82.2	19	5.9	188	58.8	320	100
Kandhamal	240	100.0	230	95.8	16	6.7	76	31.7	240	100
Koraput	191	95.5	1	0.5	2	1.0	6	3.0	200	100
Mayurbhanj	239	99.6	130	54.2	76	31.7	139	57.9	240	100
Rayagada	375	94.2	2	0.5	3	0.8	17	4.3	398	100
Sundergarh	313	99.4	280	88.9	39	12.4	93	29.5	315	100
Total	1678	97.9	906	52.9	155	9.0	519	30.3	1714	100

Source: Field Survey

Note: Activities totals are not additive across economic activities as one household can be engaged in more than one economic activity.

2.5 House Structure

Dwelling characteristics are another important phenomenon to assess the economic condition of HHs. It was categorized into *Kutcha*, *Pucca*, and *Semi-Pucca*. Out of the total surveyed HHs, 56.4% had *Kutcha* houses, 13.7% had *Pucca* houses and 29.9% had *Semi-Pucca* houses, Fig:2.1. Among the Phase-2 districts, the highest percentage of *Kutcha* houses was recorded in

Sundergarh district (75.6%) whereas Koraput had the highest percentage of *Pucca* houses with 22.5%. Similarly, the percentage of Semi-pucca houses was highest in the Rayagada district (50.3%), Table 2.6.

FIG:2.1 DISTRIBUTION OF HOUSEHOLDS BY HOUSE STRUCTURE

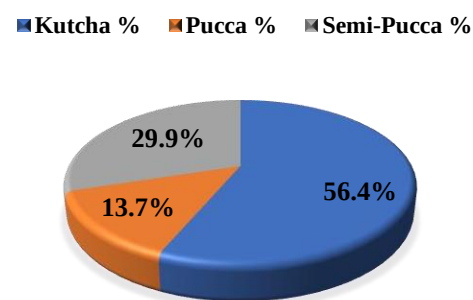


Table 2.6: Distribution of Households by House Structure across Districts

District	Kutcha		Pucca		Semi-Pucca		Total	
	No	%	No	%	No	%	No	%
Bolangir	207	64.7	69	21.6	44	13.8	320	100
Kandhamal	126	52.5	29	12.1	85	35.4	240	100
Koraput	82	41.0	45	22.5	73	36.5	200	100
Mayurbhanj	151	62.9	15	6.3	74	30.8	240	100
Rayagada	162	40.7	36	9.0	200	50.3	398	100
Sundergarh	239	75.6	41	13.0	36	11.4	316	100
Total	967	56.4	235	13.7	512	29.9	1714	100

Source: Field Survey

2.6 Conclusion

Agriculture is the prominent economic activity among the surveyed HHs. Around 98% of HHs had adopted agriculture as the primary source of income. The socio-economic profile of surveyed HHs also indicates that STs (73.5%) are the dominant social group.

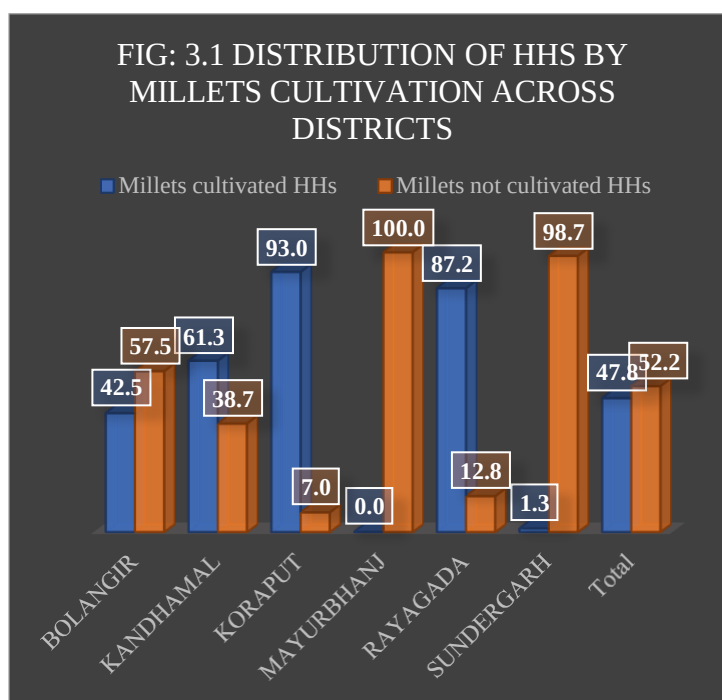
PRODUCTION

3.1 Introduction

This chapter enlightens the area, production, and yield of millets, the package of practices, and the usage of seeds adopted by the surveyed HHs. These are based on 2017-18 baseline data from HHs surveyed in phase-2 districts (Bolangir, Kandhamal, Koraput, Mayurbhanj, Rayagada, Sundergarh) of OMM.

3.2 Area, production, and yield

The millet crops identified during the baseline year 2017-18 were *Mandia/Ragi* (Finger millet), *Suan/Gurji* (Little millet), *Janha/Jowar* (Sorghum), *Kangu* (Foxtail millet), and Kodo millet. From the total surveyed HHs (1714 HHs), 47.8% HHs (820 HHs) cultivated millets and the rest, 52.2% HHs (894 HHs) did not cultivate millets, Fig 3.1. A sample of 200 HHs had been taken for the survey from the Koraput district, of



which 93% HHs had cultivated millets which is the highest among phase-2 districts of OMM, whereas not a single HH had cultivated millets in the Mayurbhanj district. Rayagada district was the second major millet-cultivated district after Koraput where from a sample of 398 HHs, 87.2% HHs had been involved in millet cultivation. Similarly, 320 HHs from Bolangir and 240 HHs from Kandhamal had been surveyed, of which percentage of millets cultivated HHs were 42.5% and 61.3% respectively. From 316 surveyed HHs in Sundergarh district, only 1.3% HHs had cultivated millets which is the second lowest after Mayurbhanj.

The 47.8% millets cultivated HHs had grown millets in an area of 368.4 ha, producing 1865.58 quintals of millets. In terms of area, Rayagada district topped the list with 151.6 ha but production-wise, Koraput district produced the highest quantity of millets (783

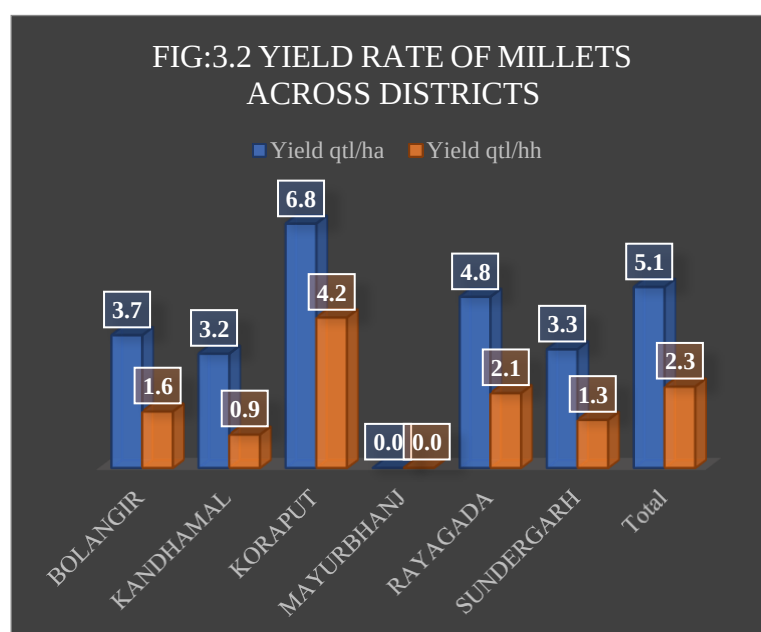
quintals) in comparison to other districts, Table 3.1. In Bolangir and Kandhamal districts, millets were produced 214.6 quintals in an area of 57.8 hectares and 137 quintals in an area of 42.9 hectares respectively. The number HHs cultivated millets from Kandhamal district is more than in Bolangir. However, in the Bolangir district, it was found that the area and production of millets were more as compared to Kandhamal.

Table 3.1: Area and Production of Millets across districts

District	HHS		Area		Production	
	No	%	Ha	%	Qtl	%
Bolangir	136	16.6	57.8	15.7	214.6	11.5
Kandhamal	147	17.9	42.9	11.6	137	7.3
Koraput	186	22.7	114.5	31.1	783	42.0
Mayurbhanj	0	0.0	0.0	0.0	0.0	0.0
Rayagada	347	42.3	151.6	41.1	725.61	38.9
Sundergarh	4	0.5	1.6	0.4	5.37	0.3
Total	820	100.0	368.4	100.0	1865.58	100.0

Source: Field survey

The district-wise yield rate of millets in terms of average production of millets per hectare and average production of millets per millet cultivating HH is shown in Fig 3.2. The yield was 5.1 qtls/ha; it was 3.7 qtls/ha in Bolangir, 6.8 qtls/ha in Koraput, 3.2 qtls/ha in Kandhamal, 4.8 qtls/ha in Rayagada, and 3.3 qtls/ha in Sundergarh district. The average



production per millet cultivating HH for all districts was 2.3 qtl/HH; it was 1.6 qtls/hh in Bolangir, 0.9 qtls/hh in Kandhamal, 4.2 qtls/hh in Koraput, 2.1 qtls/hh in Rayagada, and 1.3 qtls/hh in Sundergarh district.

Table 3.2 shows the area, production, and yield of different millet crops across districts in 2017-18. *Mandia*, which is the more popular millet crop than other crops, was cultivated in five districts except for the Mayurbhanj district. Out of 820 millet-cultivating HHs, 96.1% of HHs had cultivated *mandia*. The *mandia* cultivating HHs had cultivated *mandia* in an area of 296.3 ha, producing 1427.48 quintals. Among the five millet types, *mandia* alone covers 80.4% of the area.

. The yield was 4.8 qtls/ha and the average production per *suan* cultivating hh was 1.8qtls/hh.

Suan was the second most popular millet crop after *mandia*. It was cultivated by 137 HHs from four districts, viz. Bolangir, Kandhamal, Koraput, and Rayagada, represent 16.7% of the total millet production. It was cultivated in a 61.5 ha area, producing 390.25 quintals. The yield was 6.3 qtls/ha and the average production per *suan* cultivating hh was 2.8qtls/hh.

Table 3.2: Area, Production, and Yield of different millet crops across districts

Millets	Districts	HHS		Area		Production		Yield	
		No	%	Ha	%	Qtl	%	qtls/ha	qtls/hh
<i>Mandia</i>	Bolangir	119	14.5	39.4	10.7	135.9	7.3	3.4	1.1
	Kandhamal	146	17.8	40.5	11.0	129.3	6.9	3.2	0.9
	Koraput	178	21.7	84.6	23.0	538.5	28.9	6.4	3.0
	Rayagada	341	41.6	130.1	35.3	618.41	33.1	4.8	1.8
	Sundergarh	4	0.5	1.6	0.4	5.37	0.3	3.3	1.3
	All	788	96.1	296.3	80.4	1427.48	76.5	4.8	1.8
<i>Suan</i>	Bolangir	36	4.4	17.5	4.8	76.1	4.1	4.3	2.1
	Kandhamal	9	1.1	1.8	0.5	6.4	0.3	3.6	0.7
	Koraput	53	6.5	29.9	8.1	244.5	13.1	8.2	4.6
	Rayagada	39	4.8	12.3	3.3	63.25	3.4	5.1	1.6
	All	137	16.7	61.5	16.7	390.25	20.9	6.3	2.8
<i>Jonha</i>	Rayagada	14	1.7	4.7	1.3	26.1	1.4	5.6	1.9
	All	14	1.7	4.7	1.3	26.1	1.4	5.6	1.9
<i>Kangu</i>	Kandhamal	2	0.2	0.5	0.1	1.3	0.1	2.6	0.7
	Rayagada	22	2.7	4.5	1.2	17.85	1.0	4.0	0.8
	All	24	2.9	5	1.4	19.15	1.0	3.8	0.8
<i>Kodo</i>	Bolangir	3	0.4	0.9	0.2	2.6	0.1	2.9	0.9
All total		820	100	368.4	100.0	1865.6	100.0	5.1	2.3

Source: Field survey

Jonha was cultivated in Rayagada only. It was cultivated by 14 HHs in an area of 4.7 ha, producing 26.1 quintals. The yield was 5.6 qtls/ha and the average production per *suan* cultivating hh was 1.9 qtls/hh. Similarly, *Kodo* was cultivated in Bolangir only. 3 HHs had cultivated it in an area of 0.9 ha, producing 2.6 quintals. The yield was 2.9 qtls/ha and the average production per *suan* cultivating hh was 0.9 qtls/hh.

Kangu was cultivated in Kandhamal and Rayagada districts. A total of 24 HHs from these two districts had cultivated *kangu* in an area of 5 ha, producing 19.15 quintals. The yield was 3.8 qtls/ha and the average production per *suan* cultivating hh was 0.8 qtls/hh.

3.3 Package of Practices

This section depicts different agronomic practices adopted by the sample HHs for the cultivation of different types of millets, System of Millet Intensified (SMI), Line Transplanting (LT)/ Line Sowing (LS), broadcasting, and 1+methods. Some of the sample HHs used two or more types of methods in different plots of land for millet cultivation, we refer to them as 1+methods.

Table 3.3 shows the different packages of practices adapted by the sample HHs for *mandia* cultivation. Out of 788 *mandia* cultivating HHs, 5 of them had adapted the SMI method: 3 HHs from Koraput and one each from Kandhamal and Rayagada districts. LT/LS was the popular method used for *mandia* cultivation. 587 HHs across the five districts had used this method in an area of 219.4 ha producing 981.5 quintals. 191 HHs had adapted the broadcasting method in an area of 71.1 ha producing 430.02 quintals. Multiple methods of cultivation were adopted by 5 HHs; 3 from Rayagada and one each from Koraput and Kandhamal districts. Multiple methods like, LT/LS and broadcasting methods were used as 1+methods by the sample HHs. The 5 HHs, who used 1+methods, from three districts collectively cultivated *mandia* in an area of 4.5 ha producing 31 quintals.

Table 3.3: Package of Practices for *Mandia* Cultivation

Districts	SMI			LT/LS			Broadcasting			1+Methods		
	HHs	Area	Production	HHs	Area	Production	HHs	Area	Production	HHs	Area	Production
Bolangir	0	0	0	109	36.1	119.7	10	3.3	16.2	0	0	0
Kandhamal	1	0.4	1.5	84	22.7	78.05	60	16.7	48.25	1	0.8	1.5
Koraput	3	0.6	6.5	129	58.4	332.1	45	24.8	196.4	1	0.8	3.5
Rayagada	1	0.4	4	262	100.8	446.6	75	26.1	141.85	3	2.8	26
Sundergarh	0	0	0	3	1.4	5.05	1	0.2	0.32	0	0	0
Total	5	1.4	12	587	219.4	981.5	191	71.1	403.02	5	4.5	31

Source: Field survey

Table 3.4: Package of Practices for *Suan* Cultivation

Districts	LT/LS			Broadcasting			Total		
	HHs	Area	Production	HHs	Area	Production	HHs	Area	Production
Bolangir	8	3.8	23.75	28	13.6	52.35	36	17.5	76.1
Kandhamal	1	0.1	0.5	8	1.7	5.9	9	1.8	6.4
Koraput	2	0.8	3	51	29.1	241.5	53	29.9	244.5
Rayagada	0	0	0	39	12.3	63.25	39	12.3	63.25
Total	11	4.8	27.25	126	56.7	363	137	61.5	390.25

Source: Field survey

Suan was cultivated in four districts by 137 HHs covering an area of 61.5 ha producing 390.25 quintals, Table 3.4. Primarily, LT/LS and broadcasting were the two methods followed by the sample HHs for the cultivation of *suan*. A total of 11 HHs followed LT/LS methods, covering an area of 4.8 ha producing 27.25 quintals. 39 HHs, in an area of 12.3 ha producing 63.25 quintals had cultivated *suan* from the Rayagada district and all used the broadcasting method. Similarly, 28 HHs from Bolangir, 8 HHs from Kandhamal, and 51 HHs from Koraput had adapted broadcasting method covering an area of 13.6 ha producing 52.35 quintals, 1.7 ha producing 5.9 quintals, and 29.1 ha producing 241.5 quintals respectively for *suan* cultivation.

Janha was seen cultivating only in Rayagada where all 14 HHs had adapted broadcasting methods covering an area of 4.7 ha producing 26.1 quintals. Likewise, Kodo was cultivated only in Bolangir by 3 HHs. All the HHs followed the broadcasting method for kodo cultivation. They cultivated in an area of 0.9 ha producing 2.7 quintals.

Kangu was another type of millet grown by 24 HHs belonging to the Kandhamal and Rayagada district, covering an area of 5 ha producing 19.15 quintals. Out of 24 HHs, 22 HHs were from Rayagada had cultivated *kangu* and 2 HHs were from Kandhamal. From the 22 HHs of Rayagada, 9 HHs had followed the LT/LS method of cultivation while the rest 13 HHs had cultivated using the broadcast method. Similarly, 2 HHs from Kandhamal had cultivated using the broadcasting method.

3.4 Perception on quality of seeds

Table 3.5 shows the result of an assessment of surveyed HHs' questions about the quality of seeds used for sowing millets. A three-point scaling technique, viz., good, average, and bad was used to measure the perception of HHs on the quality of seeds. It delineates that 58.8% of

HHs used good quality seed, 41.1% used average quality seed, and only one HH believed to be using bad quality seed, Fig

3.3. District-wise data on seed quality reveals that the perception of the quality of seeds being good was highest in Rayagada (59.9%). Similarly, the perception of the quality of seed being average was highest in Koraput (48.9%).

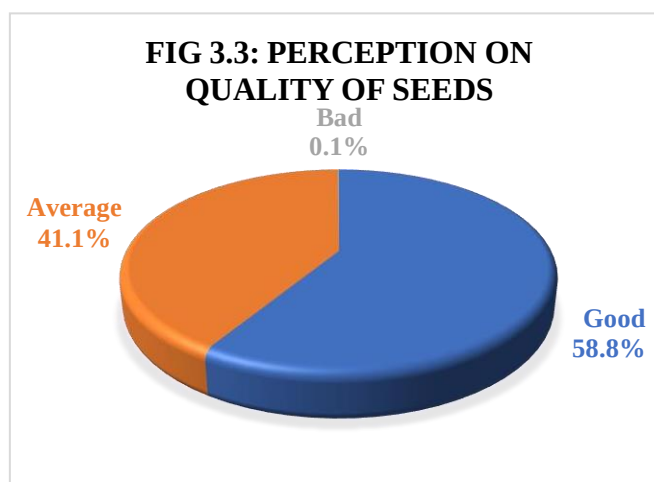


Table 3.5: Perception of Respondents regarding the quality of Seed

Quality	Bolangir		Kandhamal		Koraput		Rayagada		Sundergarh		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Good	74	54.4	10	70.1	94	50.5	208	59.9	3	75	48	58.8
Average	62	45.6	44	29.9	91	48.9	139	40.1	1	25	33	41.1
Bad	0	0	0	0	1	0.6	0	0	0	0	1	0.1
Total	136	100	147	100	186	100	347	100	40	100	820	100

Source: Field survey

3.5 Conclusion

Millet was cultivated in all districts except Mayurbhanj during the period covered under the baseline survey, 2017-18. Five types of millets, Viz., *mandia*, *suan*, *janha*, *kangu*, and *kodo* were grown in the above-mentioned districts. However, *mandia* was the prevailing crop (80.4% of the area, 76.5% of production). In Rayagada, four types of millets were cultivated.

CONSUMPTION

4.1 Introduction

Demand for any product arises due to its consumption. Hence, the consumption of millets plays a vital role in the production and marketing of millets. In this chapter, efforts are made to assess the consumption of millets across seasons, during different meals of the day, and on different types of millet recipes consumed by the surveyed HHs.

4.2 Season-wise consumption

From the total surveyed HHs across six districts, 1000 HHs had consumed millet in all seasons. Out of the total millet-consuming HHs, 98.9% had consumed in summer, 81.4% had consumed in winter, and 75.3% had consumed in the rainy season, Table 4.1. From FGDs, it was found that more HHs consumed millets, particularly *mandia*, during summer due to their perception that consumption of millet reduces the chances of getting thirsty and hungry. For that reason, except for Koraput and Rayagada districts, all other districts have seen a significant drop in consumption of millets during winter and rainy seasons compared to the summer season.

Seven HHs from the Bolangir district were unable to recall their season-wise consumption, so their season-wise consumption could not be recorded.

Table 4.1: Season-wise Consumption of Millets

Districts	Summer		Winter		Rainy		All	
	No	%	No	%	No	%	No	%
Bolangir	149	96.1	99	63.9	68	43.9	155	100.0
Kandhamal	191	100.0	129	67.5	124	64.9	191	100.0
Koraput	190	100.0	189	99.5	187	98.4	190	100.0
Mayurbhanj	38	100.0	13	34.2	16	42.1	38	100.0
Rayagada	356	100.0	344	96.6	331	93.0	356	100.0
Sundergarh	62	98.4	38	60.3	25	39.7	63	100.0
Total	986	99.3	812	81.8	751	75.6	993	100.0
Missing values in Bolangir survey data	3	42.9	2	28.6	2	28.6	7	100.0
Total Millet Consuming HHs	989	98.9	814	81.4	753	75.3	1000	100.0

Source: Field survey

Note: Column total is not addition across the season, as a HH can consume in multiple seasons

4.3 Consumption during different meals of the day

From the total millet-consuming HHs, 96.8% had consumed it their breakfast, 77.5% had consumed it during their lunch, 21.9% had consumed it for evening snacks, and only 7.6% had consumed it during dinner, Table 4.2. Further, it was evident that most of the HHs from all six districts had consumed it during breakfast and lunch.

Table 4.2: Millets Consumption during Different Meals of the Day

District	Breakfast		Lunch		Evening snacks		Dinner		All	
	No	%	No	%	No	%	No	%	No	%
Bolangir	137	84.6	93	57.4	5	3.1	1	0.6	162	100.0
Kandhamal	186	97.4	148	77.5	3	1.6	6	3.1	191	100.0
Koraput	189	99.5	179	94.2	38	20.0	52	27.4	190	100.0
Mayurbhanj	37	97.4	0	0.0	13	34.2	2	5.3	38	100.0
Rayagada	356	100.0	354	99.4	147	41.3	15	4.2	356	100.0
Sundergarh	63	100.0	1	1.6	13	20.6	0	0.0	63	100.0
Total	968	96.8	775	77.5	219	21.9	76	7.6	1000	100.0

Source: Field survey

Note: Total column is not an addition across different meals of the day, as a HH can consume millets in more than one meal during a day.

4.4 Millet recipes consumed

Consumption of millets in six different forms, mainly *Jau*, *Rice/Upama*, *Mandia Torani*, *Pitha*, *Tampo*, *Roti*, and *Handia*, were recorded in the six districts. Table 4.3 shows that 95.3% HHs had consumed millets in form of *jau* (finger millet porridge). It is a popular recipe among others.

Table 4.3: Consumption of Millets Recipes

Districts	Jau		Rice/Upama		Torani		Pitha		Tampo		Roti		Handia		All	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Bolangir	138	85.2	8	4.9	42	25.9	132	81.5	3	1.9	11	6.8	6	3.7	162	100.0
Kandhamal	185	96.9	0	0.0	18	9.4	156	81.7	12	6.3	11	5.8	0	0.0	191	100.0
Koraput	190	100.0	3	1.6	70	36.8	142	74.7	35	18.4	83	43.7	24	12.6	190	100.0
Mayurbhanj	36	94.7	0	0.0	1	2.6	36	94.7	0	0.0	0	0.0	0	0.0	38	100.0
Rayagada	356	100.0	0	0.0	145	40.7	321	90.2	100	28.1	75	21.1	0	0.0	356	100.0
Sundergarh	48	76.2	0	0.0	0	0.0	39	61.9	0	0.0	0	0.0	0	0.0	63	100.0
Total	953	95.3	11	1.1	276	27.6	826	82.6	150	15.0	180	18.0	30	3.0	1000	100.0

Source: Field survey

Note: Column total is not addition across districts, as a HH can consume more than one recipe of millet

Instances of consumption of millets in form of Rice/Upama were only seen in Bolangir and Koraput districts. Rice was prepared from Kodo millet and 8 HHs from Bolangir, and 3 HHs from Koraput consumed Kodo rice. Similarly, 27.6% HHs consumed millet in form of Mandia torani (fermented ragi), 82.6% HHs in form of pitha (pancake), 15% HHs in form of tampo, 18% in form of roti, and 3% HHs in form of handia.

4.5 Conclusion

Millets were consumed across all seasons but relatively more in summer. Jau and pitha were the two popular recipes, on average consumed by more than 80% of HHs during breakfast and lunch across all districts. The next chapter looks into the processing and marketing of millets.

PROCESSING AND MARKETING

5.1 Introduction

This chapter unveils different methods of processing millets, the availability, and accessibility of processing units, different modes of selling millets, and the distance to selling points. Overall it is an attempt to assess the status of processing and marketing of millets in the surveyed area.

5.2 Processing

Millet grains are very small and removing the thin husk and small stone particles is a tedious job. Manually processing millets is a very time-consuming job. From focused group discussions (FGD) it was found out that for the preparation of flour they used a stone grinder and the processing of millet had been done by the women. Table 5.1 shows that 54% of surveyed HHs had processed millets manually while 23.7% of HHs had used machines. 22.3% of HHs reported that they processed millets both manually and on machines. In Koraput, 70.5% of HHs had processed millets manually which is the highest among other districts, while in terms of HHs, who used machines for the processing of millets, is highest in Sundergarh district (56.1%)

Further, FGDs indicate that the distance of processing units, unavailability of processing units, inaccessible tribal villages, and less amount required for HH consumption are some of the important contributory factors for the greater proportion of HHs resorting to processing manually.

Table 5.1: Method of Processing Millets

District	Manually		Machine		Both		All	
	No	%	No	%	No	%	No	%
Bolangir	77	47.5	40	24.7	45	27.8	162	100.0
Kandhamal	91	46.9	79	40.7	24	12.4	194	100.0
Koraput	134	70.5	22	11.6	34	17.9	190	100.0
Rayagada	192	54.2	59	16.7	103	29.1	354	100.0
Sundergarh	14	34.1	23	56.1	4	9.8	41	100.0
Total	508	54.0	223	23.7	210	22.3	941	100.0

Source: Field survey

All the HHs, except one HH from Kandhamal, who processed millets by machine (including those who used both manual method and machine) were going to other's pulveriser,

Table 5.2. The HHs were depending on other's pulverizes for the processing of millets.

Table 5.2: Availability and Accessibility of Processing Unit

District	Own Machine		Other's Pulveriser		All	
	No	%	No	%	No	%
Bolangir	0	0.0	85	100.0	85	100.0
Kandhamal	1	1.0	102	99.0	103	100.0
Koraput	0	0.0	56	100.0	56	100.0
Rayagada	0	0.0	162	100.0	162	100.0
Sundergarh	0	0.0	27	100.0	27	100.0
Total	1	0.2	432	99.8	433	100.0

Source: Field survey

5.3 Marketing

Marketing is a mode of promoting and selling products. It creates livelihood and provides income opportunities. However, in the case of marketing of millets, most of the HHs in the surveyed area produced millets only for their consumption and they marketed only the surplus. Even with the presence of an unorganized marketing system, they were forced to sell their surplus to middlemen/local traders and money lenders. Some were selling in the market and very few sold to their neighbors.

Table 5.3: Distribution of Households by Mode of Selling Millets

District	Middleman/Local trader		Market		Money lender		Neighbor Sale		All	
	No	%	No	%	No	%	No	%	No	%
Bolangir	48	60.0	30	37.5	1	1.3	1	1.3	80	100.0
Kandhamal	7	30.4	16	69.6	0	0.0	0	0.0	23	100.0
Koraput	44	38.6	54	47.4	14	12.3	2	1.8	114	100.0
Rayagada	73	39.0	90	48.1	17	9.1	7	3.7	187	100.0
Sundergarh	0	0.0	0	0.0	0	0.0	2	100.0	2	100.0
Total	172	42.4	190	46.8	32	7.9	12	3.0	406	100.0

Source: Field survey

Out of the total millet-producing HHs (details mentioned in Chapter 3), 406 HHs had reported marketing. From the 406 HHs, 42.4% HHs had sold millets to the middleman or local trader, 46.8% HHs had sold in the market, 7.9% HHs had sold to money lenders to repay the

loan and only 3% HHs had sold to the neighbors, Table 5.3. It was concluded from FGDs, as per their requirement they kept some for seed and the rest for their consumption.

From the 406 HHs that reported marketing of millets, 271 of them sold it within a radius of 0-5 kilometers, 33 HHs sold it within a radius of 5.1-10 kilometers, 100 HHs sold it within a radius of 10.1-15 kilometers, and only 2 HHs sold it within a radius of 15.1-20 kilometers, Table 5.4.

Table 5.4: Distance to Selling Point

Distance	Middleman/Local trader		Market		Money lender		Neighbor Sale		All	
	No	%	No	%	No	%	No	%	No	%
0-5	152	56.1	81	29.9	27	10.0	11	4.1	271	100.0
5.1-10	1	3.0	29	87.9	3	9.1	0	0.0	33	100.0
10.1-15	18	18.0	80	80.0	2	2.0	0	0.0	100	100.0
15.1-20	1	50.0	0	0.0	0	0.0	1	50.0	2	100.0
Total	172	42.4	190	46.8	32	7.9	12	3.0	406	100.0

Source: Field survey

5.4 Conclusion

During the baseline survey, 54% of the HHs processed their millets (particularly for dehusking and grinding) manually. From those who processed through machines, all of them used others pulverized except one HH from Kandhamal district. HHs sold their millets in multiple ways: market (46.8%), middleman/local trader (42.4%), sold to neighbour (3%), and moneylender (7.9%). More than three-fifth (66.7%) of farmers sold millets within a radius of 5 Km, around one-sixteenth (8.1%) sold within a distance of 5.1-10 Km, one-fourth (25%) sold within a radius of 10.1-15 Km, and only 2 HHs sold it within a radius of 15.1-20 Km.

Major findings

- The socio-economic profile indicates that the majority of the HHs belong to ST (73.5%), by religion 82.2% are Hindus, and by economic condition 98.2% are poor.
- About 98% of HHs were engaged in cultivation. Hence, it can be concluded that agriculture was the primary source of income for the surveyed HHs during the survey period.
- From the total surveyed HHs across the six districts, 47.8% HHs had cultivated millets. However, not a single HH from the Mayurbhanj district reported millet cultivation during the survey period.
- Primarily five types of millet crops viz., *Mandia/Ragi* (Finger millet), *Suan/Gurji* (Little millet), *Janha/Jowar* (Sorghum), *Kangu* (Foxtail millet), and Kodo millet were cultivated in an area of 368.4 ha, producing 1865.58 qtls such that the average production was 5.1 qtl/ha and the average production per millet cultivating HH was 2.3 qtls/HH.
- District-wise per hectare yield of *ragi* is as follows- Bolangir (3.4 qtl/ha), Kandhamal (3.2 qtl/ha), Koraput (6.4 qtl/ha), Rayagada (4.8 qtl/ha), and Sundergarh (3.3 qtl/ha).
- District-wise per hectare yield of *suan* is as follows- Bolangir (4.3 qtl/ha), Kandhamal (3.6 qtl/ha), Koraput (8.2 qtl/ha), and Rayagada (5.1 qtl/ha).
- The yield of *jonha* in Rayagada is 5.6 qtls/ha. The yield of *kangu* in Kandhamal is 2.6 qtls/ha and in Rayagada is 4 qtls/ha. The yield of Kodo in Bolangir is 2.9 qtls/ha.
- Four types of methods viz., SMI, LT/LS, Broadcasting, and 1+method were reported during the survey. However, 72% of HHs had adopted LT/LS method.
- Millets were consumed more in summer and less in monsoon. Different millet recipes were consumed, more in breakfast.
- In the case of processing of millets more than 50% of HHs had processed millets manually. The HHs, who had processed millets using machines, used others' pulverisers for the processing of millets except for one HH from the Kandhamal district who had his pulveriser.
- Around 50% of HHs, who had cultivated millets during the survey period, had sold their surplus in different modes of marketing channels. Nearly 47% of the HHs who marketed it, sold it in the market and 42.4% sold it to the middlemen/local trader.

ANNEXURE I



Confidential for Research Purpose Only

HOUSEHOLD SCHEDULE ON SPECIAL PROGRAMME FOR PROMOTION OF MILLETS IN TRIBAL AREAS OF ODISHA Nabakrushna Choudhury Centre for Development Studies, Odisha, Bhubaneswar-751013

1. Identification of the HHs

- a. Name of the (i) Village _____
(ii) Gram Panchayat: _____
(iii) Block: _____
(iv) District: _____
- b. Category i) SC ii) ST iii) OBC iv) SEBC v) Others (Specify)
- c. Sub-caste/ Sub-tribe: _____
- d. Religion i) Hindu ii) Muslim iii) Christian iv) Animism v) Others
- e. Category of HH: BPL/APL
- f. House structure: Pucca/Kutchra/Semi-Pucca

2. Are you indebted? Yes/ No. If yes, what is the amount: Rs. _____

3. Land Details (last year, Acre) i) Owned _____, ii) leased in _____
iii) Leased out _____ iv) Encroached _____
v) FRA _____ v) Other _____
vi) Cultivable Land _____

4. Total irrigated land owned (last year, Acre): _____

5. Cropping systems i) Mono ii) Mixed [specify the crop(s)] _____
iii) Inter cropping [specify the crop(s)] _____

6. Seed (last year) i) Quantity of seed used (in kg): _____
ii) Is it the quantity adequate? (Yes/No)
iii) Seed Treatment (Yes/No)
iv) Seed quality: Good/Average/Bad

7. Package of practices for millets (Last Year, put tick mark)

- i) Germination test: Yes/No
- ii) Weeding: Weeder/Manual/Both
- iii) Number of weeding: 1/2/3/4
- iv) Application of Fertiliser: Organic/Chemical/Both
- v) Application of Pesticides: Organic/Chemical/Both

8. Production and Utilization of Millets (2017-18)

Type of Millet	Total Production (qtl.)	Family consumption (qtl)	Kept for Seed (qtl)	Marketed (qtl)	Selling Price (Rs/qtl)
Mandia					
Suan					
Kangu					
Gurji					
Any other (Specify)					

9. Season-wise Average Requirement/Consumption (in kg)

Season	Summer	Winter	Rainy
Requirement			
Consumption			

10. Time of consumption: Breakfast/Lunch/Evening snacks/Dinner
11. Whether Purchased: Yes/No
12. Whether received from friends/relatives: Yes/No
13. Processing millets: Manually/ Machine/ Both
14. If by machine, is it your own machine: Yes/No
15. Food items prepared: i) Jau ii) Tampo iii) Pitha iv) Mandis Torani v) Handia v) Others
16. Sale of millets/Distance: a) Mill _____ b) Middle-man/Local trader _____
 d) Market _____ e) Money lender _____
 f) Any Other (Specify) _____

17: Household Particulars

[illegible]

Note: 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-Grand-son, 12- Grand-daughter, 13-Father-in-law, 14-Mother-in-law, 15-(Specify)

Marital Status: 1- Married, 2- Unmarried, 3- Widow, 4- Widower, 5- Divorced, 6-Separated, 7- (Specify)

Education: 1-Illiterate, 2-Just literate, 3-Upto Class 5, 4-Class 6-10, 5-Higher Secondary, 6-Graduate, 7- Post Graduate, 8- Technical (Diploma), 9- Technical (Degree), 10-Professional/Management, 11-Other (Specify)

Occupation: 1- Agriculture, 2- Daily labor/ Wage labor, 3- Business/ Entrepreneurship, 4- Government Servant, 5- Private service, 6-Migrants, 7- Artisans, 8-Service Provider, 9- MFP collection, 10-Student, 11-Housewife, 12-Other (Specify)

Millet Based Activities: 1=Production, 2=Consumption, 3= Processing, 4= Marketing

18: Crop-wise and Method-wise Details of Production (Last Year i.e. June 2017-May 2018):

(Area in Acre, Production in Quintal)

Sl.No	Name of the Crop	SMI		Line Transplanting		Line Sowing		Broadcasting		Any other (Specify)	
		A	P	A	P	A	P	A	P	A	P
Kharif											
1	Mandia										
2	Suan										
3	Kangu										
4	Koda										
5	Gurji										
6	Jawar										
7	Bajra										
8	Any other										
9	Any other										
Rabi	Mandia										

Note: A stands for Area and P stands for Production(Use additional sheets for Rabi)

19: Expenditure pattern

Sl.No	Sources	Annual Expenditure (In Rs)
1	Food	
2	Clothes	
3	Education	
4	Medicine	
5	Social Function	
6	Marriage & Ceremony	
7	Agriculture	
8	Construction	
9	Durable Assets	
10	Others	

20: Sources of Income

Sl.No	Sources	Annual Income (In Rs.)
1	Agriculture	
2	Millets	
3	Horticulture	
4	Forest	
5	Ag.Labour	
6	Salary	
7	Pension	
8	Remittance	
9	Livestock	
10	Others (Specify)	

Remarks:

Signature of the investigator

ANNEXURE II

Phase II Base line Study

Focused group discussion

Date:

Name of the Village:

Name of the Block:

Name of the District:

Stratification: Ethnicity/caste/genger

Sex:

Number of Individuals:

Number of Children:

Verbal consent obtained: yes/no

Researcher's name and observation:

Participant's name	Age	Sex	Education	Job	Notes
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					

[For the benefit of the enumerator: the focused group discussion aims to capture the millet related activities prior to OMM intervention in the community. Thus, focus of the discussion may attempt to capture the existing production activities, whether millet as a crop is being produced, processed, consumed and marketed in the locality.]

Discussion points

- How many HH are there in the village/hamlet? Economic status, Social and religious composition, education, health status et al.
- Please give a brief description of the basic amenities available in the village. (For example, water sources, drinking water facilities, electricity, AWC, primary school, health care facilities, market place, transport facilities etc.)
- What are the primary livelihood activities practised in the village?
- What are major activities around the farm that you undertake? (sowing, reaping, processing, weeding, storage practices). Who generally does what?
- Give a brief description on types of land, irrigation facilities, major crops produced, preservation of seeds/procurement of seeds, agriculture related government programmes, processing of produced crops, marketing of agricultural goods etc.
- Is millet production a part of agriculture practice in the village? How many HH cultivate millets in the village? Please elaborate on the cultivation process.
- What are the common food consumption practices in the village? (also probe: include episodically consumed food/status food, festivities and feasts, death and mourning, food offering to God)
- Is millet consumed in the locality? Source, how frequently, in what form, reason for consumption)
- Are you aware of the nutri benefits of millets? Elaborate.