BASELINE SURVEY:

BARGARH DISTRICT-2018-19, Phase 3

(Special Programme 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)

2020

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

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FOREWORD

The seeds for the "Special Programme for Promotion of Millets in Tribal Areas of Odisha" (Odisha Millets Mission, OMM) were sown 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 (currently, Chief Advisor, Government of Odisha). The consultation meeting had representatives from different line departments of the Government of Odisha, members of different civil society groups from across the country and from within the state (which, among others, included the Alliance for Sustainable and Holistic Agriculture (ASHA), the Millets Network of India (MINI), the Revitalizing Rainfed Agriculture (RRA) Network of India), that brought in their experiences, and the academia that included among others the then Chairperson of Karnataka Agricultural Price Commission, Dr T. Prakash. As per the decision taken at the consultation meeting, NCDS submitted a proposal to the Government of Odisha on the revival of millets. Lo and behold, there was an announcement in the budget speech of 18 March 2016 conveying that the Government of Odisha intends to revive millets. This led to a series of interactions and a memorandum of understanding (MoU) was signed on 27 February 2017 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.

It was in 2017-18 that budget was apportioned for 30 selected blocks, the phase 1 blocks. In principle decision was taken to extend the programme to another 25 blocks in 2018-19, the phase 2 blocks, a further 17 blocks in 2019-20 (that includes 10 under the state plan and seven under District Mineral Fund (DMF), Keonjhar), the phase 3 blocks, and an additional 4 blocks under DMF, Sundargarh in Kharif 2021, the phase 4 blocks. The MoU with NCDS for 7 blocks under DMF Keonjhar was signed on 13 December 2018 and for 35 phase 2 and phase 3 blocks under state plan were signed on 25 February 2019. The current set of 10 baseline reports are based on surveys conducted during October 2019 and January 2020 in 43 blocks where the programme intervention had already started.

In each of the blocks, from the list provided by the facilitating agency through the programme secretariat that had names of participating farmer, village and gram panchayat. We first selected two of the gram panchayats randomly, and then, from each of the selected gram panchayat we selected two villages randomly. From each selected village, 15 farmer households were selected randomly and from a listing of non-participating farming households, five farmer households were selected. If a village did not have 15 participants then the sample size of non-participating households was increased so that the total number of sample households from each village was 20. As per this design, each block would have a sample of 80 farmer households. All respondent households were asked question regarding the scenario before the intervention of the programme, and hence, they were canvassed the same schedule. The survey was conducted by a third party. A sample of the surveyed households was re-visited by the research secretariat team for scrutiny and validation of data. Besides, during this visit, focus group discussions were also conducted in some villages by the research secretariat team.

The lead authors for the current baseline report on Bargarh are Mr. Nitin Kumar Hotha and Dr. Abhisek Mishra along with other members of the study team. As Principal Investigator of the team, I compliment all the members for their effort.

The Odisha Millets Mission, as per a recent report that I authored, comparing first year outcome with the baseline report of the phase 1 blocks indicate that the yield has more than doubled and the value of produce has more than trelbled in the year one of its intervention. In 2019, mandia procurement in *swabhiman anchal* of Malkangiri district was the first ever procurement of any grain in the region even after 70+ years of independence. In 2020, in spite of the pandemic, ragi ladoos are being piloted as a consumption awareness campaign through Integrated Child Development Scheme in Keonjhar and Sundargarh under respective DMF. These expansions are also brining in opportunities of convergence across line departments, which is an important development for any pro people public policy engagement.

On the research front there have been engagements with a consortium of universities and institutes led by University of Cambridge through TIGR^{2}ESS (Transforming India's Green Revolution by Research and Empowerment for Sustainable food Supplies). Agreements have been signed with Indian Institute of Millets Research (IIMR), Hyderabad, and Central Food Technological Research Institute (CFTRI), Mysuru, Fobenius Institute at Goethe University, Frankfurt and also exploring a research collaboration with them that includes scholars from Groningen University among others.

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 the Academia led by NCDS to complement and supplement each other has been appreciated by policy makers (including National Institution for Transforming India, NITI Aayog), civil society and the Academia. So, the chant of OMM continues to reverberate.

Srijit Mishra
Director, NCDS

ACKNOWLEDGEMENTS

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 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, Chief Secretary and former DC-cum-ACS, Government of Odisha and former Chairman, NCDS; Mr Suresh Chandra Mahapatra, IAS, DC- cum-ACS, Government of Odisha and Chairman, NCDS; Mr. Gagan Ku Dhal, IAS, Former Agriculture Production Commissioner; Mr. Pradipta Ku Mohapatra, IAS, Agriculture Production Commissioner; Mr. Manoj Ahuja, IAS, former Principal Secretary, Department of Agriculture and Farmers' Empowerment (DAFE); Dr. Saurabh Garg, IAS, Principal Secretary, DAFE; Mr. Bhaskar Jyoti Sarma, IAS, Former Special Secretary, DAFE; Mr. Suresh Vashishth, Special 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; Sri Jyoti Ranjan Pradhan, OAS(SAG), Collector & District Magistrate, Bargarh; 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 Pattnayak, 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 Coodinator; Mr. Ramani Ranjan Nayak, former Regional Coordinator; and all District and block Coordinators who have helped in our data collection work and in addressing other queries. With the same degree of gratitude, we share our heartfelt thanks to the district officials specifically Mr. Dinabandhu Gandhi, Deputy Director of Agriculture (DDA), Mr. Baikuntha Sahu, District Agriculture Officer (DAO), Ms. Sanjukta Munda, Scheme Officer; Ms. Nibedita Pradhan, Assistant Agricultural officers (AAO), Ankit Behera, Assistant Agricultural officers (AAO), Ms. Kalpana Pradhan, Assistant Agricultural officers (AAO), Mr. Pranab Kumar Mantri, Assistant Agricultural officers (AAO), of the concerned blocks.

We express our sincere thanks and gratitude to Ms. Sumati Jani (Odisha Finance Service, OFS), Secretary, Mr. Srikanta Rath, former Administrative Officer; Mr. B.Pradhan, Research Assistant; Mr. Niranjan Mohapatra, Librarian; Ms. S. M. Pani, Computer Programmer; Mr. D. B. Sahoo, P.A to Director; Mr. P. K. Mishra, Senior Assistant; Mr.P. K. Mohanty, Junior Accountant; Mr. N. K.Mishra, Jr. Stenographer and Mr. P. K. Mallia, Computer Literate Typist; Mr. S. B. Sahoo, Xerox Operator for their support, help and cooperation.

Last but not the least, credit and special thanks to the GREEN INDIA team for their help in data collection and data entry work. With the same degree of gratitude, we would like to thank the Facilitating Agencies (FAs)- Ahinsa club, Paikmal block, Mahashankti Foundation, Bijepur block; Debadutta Club, Gaisilet block; Parda, Jharbandh block; and Triranga Yubak Sangh, Padampur block for their help during the field visit. Additionally, with the same degree of appreciation we would like to thank Mr. Bidyadhar Pinjura, Mr. Ratu Lohar, Mr. Subash Chandra Bhoi, Mr. Phuleswar Rona, CRPs of Paikmal block; Mr. Mahadeb Sahu, Mr. Pitambar Rona, Mr. Gopala Padhan,Mr. Bikramaditya Sahu, CRPs of Bijepur block; Mr. Nabin Kumbhar, Mr. Thabira Sahu, Mr. Bhajamana Gadtia, Mr. Umakanta Sahu, CRPs of Gaisilat block; Mr. Satyapriya Gual, Mr. Tilakram Naik, Prasant Sahu, Mr. Kalachan Sahu, CRPs of Jharbandh block; Mr. Nirakar Jal, Mr. Rohini Dharua, Mr. Hrudananda Nayak, Kailash Barik, CRPs of Padampur block for their support in data collection. Further, we would thank all farmer households for their cooperation without which the data collection would not be possible. Our sincere thanks to all of them.

Nitin Kumar Hotha

Abhisek Mishra

EXECUTIVE SUMMARY

1. Study Area

1.1 Bargarh is one of the three districts where the "Special Program For promotion of Millets in Tribal Areas of Odisha (hereafter, Odisha Millets Mission, OMM), Phase III" was started in five blocks of the district, namely, Bijepur, Gaisilet, Jharbandh, Padampur, Paikamal.

1.2 Data were collected from 400 HHs (80 HHs from each block). Out of 400 HHs, 22 HHs had cultivated millets in 2018-19, the period cover under Phase III of baseline survey.

2. Socio-Economic Profile

2.1 From the surveyed HHs, 109 HHs (27.2%) belong to Schedule Tribes (STs), 37 HHs (9.3%) belong to Schedule Castes (SCs), and 254 HHs belong to Other Social Groups (OSG).

2.2 All the surveyed HHs belongs to Hindu religion.

2.3 From the surveyed HHs, it was evident that 96.5% were living below poverty line (BPL).

2.4 The primary activity of all the surveyed HHs was cultivation. 63.3% HHs were indulged in allied activity, 9.5% in services and 42.8% in other activities.

2.5 62.8% HHs had lived in *Kutchha* houses, 13.5% had *Pucca* houses and 23.8% had *semi-pucca* house.

3. Production

3.1 Broadly three millet crops, viz., *mandia, suan,* and kodo were cultivated by 22 the surveyed HHs in an area of 4.6 ha with a production of 12.9 qtls; such that, average production per hectare was 2.8 1qtls/ha and the average production per millet cultivating HH was 0.6 qtls/HH.

3.2 *Mandia* was the dominant among three millet crops. It was cultivated by 17 HHs in an area of 2.6 ha with a production of 4.7 qtls; such that the average production per hectare was 1.8 qtls/ha and the average production per *mandia* cultivating HH was 0.3 qtls/HH. From the 17 *mandia* cultivating HH, 13 had adopted broadcasting method and 4 had adopted LT/LS method. No one had adopted SMI method.

3.3 *Suan* was cultivated by only one HH adopting LT/LS method in an area of 0.4 ha with a production of 0.8 qtls.

3.4 Kodo was cultivated by four HHs. Three of them adopting LT/LS method had cultivated in an area of 1.4 ha and produced 7 qtls. Only one HH had adopted broadcasting method

and had produced 0.4 qtls. The average production of kodo per hectare was 4.9 qtls/ha and the average production per kodo cultivating HH was 1.9 qtls/HH. The yield of kodo was the highest among the three millet crops.

4. Consumption

4.1 The consumption of millets across different seasons (not mutually exclusive) indicates that 11.8 % HHs had consumed in summer, 5.5 % HHs had consumed in rainy, 6 % HHs had consumed in winter season.

4.2 All the HHs had consumed millets only during the breakfast in form of *Jau* and *Pitha.*

5. Processing and Marketing

5.1 A total of 48 HHs had processed millets for different purposes. 47 of them had processed millets manually and one HH had processed both manually and using machine.

5.2 A majority of the HHs had produced millets for their own consumption. Only few HHs had sold their access in market.

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ABBREVIATIONS

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 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

Chapter-1

Introduction

1.1 Background

Millets are found to be the most ancient food grains that have been growing in Asian countries since 2700 BC (Gupta, Srivastava, & Pandey, 2012). The rapidly changing climatic condition is forcing the developing countries in general and India in particular to adopt millet cultivation and consumption due to the expansion of dry land (Haung et al., 2016; ICRISAT, 2017) as millets can grow in hardy and drought conditions where major cereals fail to provide a sustainable yield (Hulse et al. 1980; Devi et al. 2014).

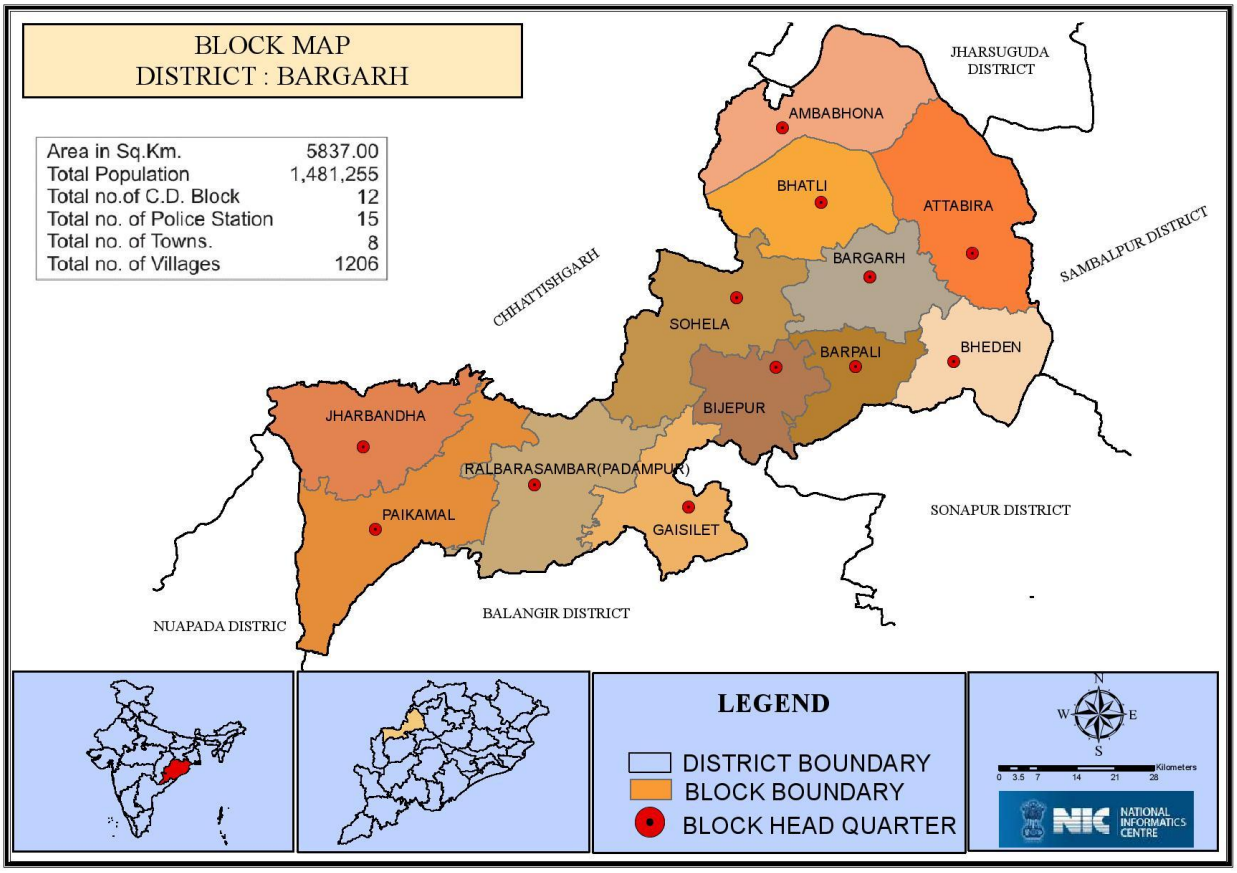
At this outset, keeping the nutrition value and climate susceptible quality of millets in mind, the Special Programme for Promotion of Millets in Tribal Areas of Odisha (hereafter Odisha Millets Mission, OMM) with a novel organisational structure[1] was initiated by the Government of Odisha in 2017-18 emphasising production, consumption, processing, and marketing of millets. In 2017-18, the program was initiated in 30 blocks of seven districts namely Gajapati, Kalahandi, Kandhamal, Koraput, Malkangiri, Nuapada, and Rayagada. At the time of implementation of OMM, some of the millets cultivated in Odisha are *mandia/ragi* (finger millet), *suan/gurji* (little millet), *janha/jowar* (sorghum), *kangu* (foxtail millet), and *kodo* (kodo millet). In 2018-19, the phase-2 implementation of OMM was started in 7 districts (including 3 old districts included in phase 1) and 22 blocks. Further, the phase-3 intervention was started in 2019-20 in 14 blocks of three districts. Bargarh district is one of them. This baseline study attempts to provide necessary information on the above-mentioned dimensions of the programme in Bargarh district. Thus, the profile of Bargarh district is provided below.

1.2. District Profile

Bargarh district is located in the western part of Odisha and lies between 20 degree 45’ N to 21 degree 45’ N latitude and 82 degree 50’ E to 83 degree 50’ E longitude. It is bounded by Jharsuguda district in the North, Subarnapur and Bolangir on the South, Sambalpur on the East, Nuapada and Chhattisgarh and Nuapada on the West. It has an area of 5837 sq. Kms.

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

Fig. 1.1 Map of Bargarh District with Blocks



(Source: https://gisodisha.nic.in/Block/BARGARH.pdf)

1.3. Objectives

The objectives of the baseline survey were to obtain information of millets before the intervention of Odisha Millet Mission (OMM). Along with this, the study tried to collect some background information of the surveyed HHs before the intervention of the programme. The objectives of the study are as follows.

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

Table 1.1: Key Indicators of Bargarh District

Indicators	Value
Census 2011	
Population (In Lakh)	14.81
Male(In Lakh)	7.49
Female(In Lakh)	7.32
Scheduled Caste(In Lakh)	2.98
Scheduled Tribe(In Lakh)	2.81
No.of HHs (In Lakh)	3.7
Average HH Size	4.0
Sex Ratio	977
Total Worker (In Lakh)	7.62
Main Worker(In Lakh)	4.74
Marginal Worker(In Lakh)	2.87
Non-Worker(In Lakh)	7.19
Work Participation Rate (WPR)	62.2
Literacy rate (%)	66.42
Land Use Pattern (Area in '000 ha), 2014-15 *	
Forest	122
Land put to Non-agricultural use	47
Barren & Non-Cultivable Land	20
Permanent Pasture	20
Net Area Sown	298
Cultivable waste Land	15
Other Fallow	6
Misc. Trees and Groves	4570
District at a Glance 2016*	
Average Fertilizer Consumption (Kg/ha)	54
Irrigation, Kharif ('000 ha)	153.92
Irrigation, Rabi ('000 ha)	95.64
No. of Villages electrified (in No., as on 31/8/2013)	534
No. of AWCs (in No.)	1474

Source: District Statistical Handbook- Kandhamal, 2011

*District at a Glance-2016

Note: MANGERS is Mahatma Gandhi National Rural Employment Guarantee Scheme

1.4. Methodology

1.4.1. Sample Design

Millets are grown in arid and semi-arid regions of Asia and Africa (Nithiyanantham et al., 2019). The average rain fall of 456.4 mm (Dash & Dwibedi, 2018) signifies Bargarh as an arid region. That means, the climatic condition is suitable for millets. That's why Bargarh district was chosen under the Programme. Out of 12 blocks, five blocks, viz, Bijepur, Gaisilet, Jharbandh, Padamur, and Paikmal were chosen for the study considering 1243 participant farmer HHs spread across 10 *grampanchayats*. From these, in the first stage sampling, two *grampanchayats* were selected at random from each block. In the second stage sampling, two villages from each of the selected gram*panchayat* were selected. The third stage sampling had two parts, one was to select 15 households randomly from each selected village from the list of participating farmer households, 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 is less than 15 then increase the number of non-participating households in the sample so that the total sample in the village is 20. With the above sample design, 80 households have been surveyed from each block. From the 400 surveyed households, 247 were participant households and 153 were non-participant households. However, as the information pertained to 2017-18 when the programme was not implemented a common schedule was canvassed to all the surveyed households and the following analysis does not distinguish between the two categories of households.

Table 1.2: Households Surveyed in Bargarh

Blocks	Programme HHs	Surveyed HHs	Participant HHs in 2017-18	Non-Participant HHs in 2017-18
	No	No	No	No
Bijepur	282	80	31	49
Gaisilet	237	80	57	23
Jharbandh	299	80	60	20
Padampur	127	80	43	37
Paikmal	298	80	56	24
Total	1243	400	247	153

Source: Programme Secretariat & Field Survey
Note: HHs denotes households

1.4.2 Data collection

This baseline survey report is based on both secondary and primary data. The primary data were collected from the respondents in the concerned districts by using 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 (Annexure 2) were also conducted. The secondary data has been collected from different published and unpublished sources (that may be any statistical data or tables) and used specifically in the preparation of table 1.1.

In addition to the above for better understanding here we provide a brief description on the total millets produced, processed, consumed and marketed during the year 2018-19. It was found that participant HHs had produced, processed, consumed and marketed millets in the year 2018-19, but non-participant HHs had only processed and consumed millets, table 1.3.

Table 1.3: Distribution of HHs by Production and Utilisation of Millets

Blocks	Production		Consumption		Processing		Marketing	
	Participant HHs	Non-Participant HHs	Participant HHs	Non-Participant HHs	Participant HHs	Non-Participant HHs	Participant HHs	Non-Participant HHs
Bijepur	1	0	6	6	6	6	0	0
Gaisilet	7	0	7	0	7	0	1	0
Jharbandh	3	0	9	0	9	0	2	0
Padampur	5	0	5	1	6	1	1	0
Paikmal	6	0	12	1	12	1	4	0
Total	22	0	39	8	40	8	8	0
Difference	225	153	208	145	207	145	239	153

Source: Field Survey

Note: The difference is calculated taking the total participant and non-participant HHs into account.

1.5. Limitation

Notwithstanding the outcomes, the present study has limitations. First, the study relied on a random sample of 400 HHs due to logistic reasons and other difficulties (like non-availability of respondents) faced by the filed investigators during data collection. Second, there is the possibility of recall error particularly applicable in case of actual quantity of consumption, and marketing among others. Last but not the least, there were instances where surveyed HHs (particularly non-participant farmer HH) had consumed millets but had not produced. This was possible because of past stock and acquiring of millets through exchange and barter. The details of this have not been captured.

1.6. Chapterisation:

The baseline survey has been divided into six chapters including the current introductory chapter, which provides district profile, objectives, methodology and limitations. Chapter 2 provides socio-economic profile of surveyed HHs. Chapter 3 provides details on production and productivity of millets. Chapter 4 discusses consumption pattern of millets. Chapter 5 elucidates on processing and marketing of millets. Chapter 6 summarizes the findings**.**

Chapter 2

SOCIO-ECONOMIC PROFILE OF HOUSEHOLD SURVEYED

2.1. Introduction:

This chapter looks into social and demographic profile of HHs surveyed, that is their distribution by social group, religion and gender. In addition, for the HHs surveyed, it provides the distribution by poverty status (proportion below poverty line and proportion above), distribution by economic activities (not mutually exclusive, as a HH can have multiple economic activities), and distribution by house structure.

2.2. Social and Demographic Profile:

The distribution of surveyed HHs by social groups indicates that from the total surveyed HHs, 37 HHs (9.3%) belong to Schedule caste (SC) category, 109 HHs (27.2%) belong to Schedule Tribe (ST) category, and 254 HHs (63.5%) belong Other Social Group (OSG), table 2.1 and Fig 2.1. OSG category includes all groups other than SC and ST. Further, the distributions of HHs by religion reveals that all the surveyed HHs belong to Hindu religion.

Fig. 2.1: Distribution of Households by Social Group across Blocks

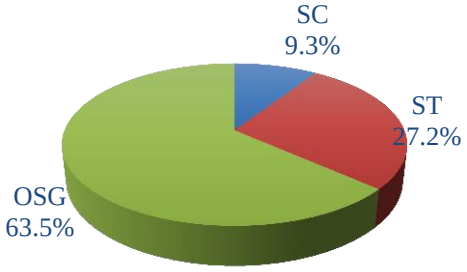


Table 2.1:Distribution of Households by Social Groups across Blocks

Social Groups	BIJEPUR		GAISILET		JHARBANDH		PADAMPUR		PAIKMAL		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
OSG	66	82.5	57	71.3	55	68.8	49	61.3	27	33.8	254	63.5
SC	8	10.0	7	8.8	12	15.0	8	10.0	2	2.5	37	9.3
ST	6	7.5	16	20.0	13	16.3	23	28.8	51	63.8	109	27.2
Total	80	100	80	100	80	100	80	100	80	100	400	100

Source: Field Survey

The distribution of population by gender reveals that the proportion of male (54.2%) was more than female (45.8%) among the surveyed HHs in the district, table 2.3. Further, across the blocks also the proportion of male was found to be more than female.

Table 2.2:Distribution of Population by Gender across Blocks

Gender	BIJEPUR		GAISILET		JHARBANDH		PADAMPUR		PAIKMAL		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Male	160	52.3	161	56.3	167	52.7	176	57.5	163	52.4	827	54.2
Female	146	47.7	125	43.7	150	47.3	130	42.5	148	47.6	699	45.8
Total	306	100.0	286	100.0	317	100.0	306	100.0	311	100.0	1526	100.0

Source: Field Survey

2.3. Poverty status

The poverty status of the surveyed HHs has been examined through the concept of below poverty line (BPL) and above poverty line (APL). HHs having antodaya or priority cards are referred as BPL and those without these are referred as APL. From the surveyed HHs, 96.5 % (386 HHs) were under BPL category and rest 3.5 % (14 HHs) were under APL category, table 2.4. In blocks, Gaisilet blocks reports the highest number of BPL families.

Table 2.3: Distribution of Households by Poverty Status across Blocks

Economic Category	BIJEPUR		GAISILET		JHARBANDH		PADAMPUR		PAIKMAL		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
APL	6	7.5	1	1.3	5	6.3	0	0.0	2	2.5	14	3.5
BPL	74	92.5	79	98.8	75	93.8	80	100.0	78	97.5	386	96.5
Total	80	100.0	80	100.0	80	100.0	80	100.0	80	100.0	400	100.0

Source: Field Survey

2.4. Economic Activities

The distribution of the surveyed HHs by economic activities is as follows: cultivation (100%), allied (85%), services (11.3%) and others (37.5%), table 2.5. allied activities include agricultural labourer, livestock, horticulture, and minor forest produce.

Table 2.4:Distribution of Households by Economic Activities across Blocks

Economic	BIJEPUR		GAISILET		JHARBANDH		PADAMPUR		PAIKMAL		Total	
Activity	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Agriculture	80	100.0	80	100.0	80	100.0	80	100.0	80	100.0	400	100.0
Allied	44	55.0	58	72.5	38	47.5	45	56.3	68	85.0	253	63.3
Services	4	5.0	10	12.5	9	11.3	6	7.5	9	11.3	38	9.5
Others	46	57.5	30	37.5	29	36.3	36	45.0	30	37.5	171	42.8
Total	80	100	80	100	80	100	80	100	80	100	400	100

Source: Field Survey

Note: Activities total are not additive, as one household can be engaged in more than one activity.

2.5. Structure of house

The distribution of surveyed HHs by housing structure reveals that 251 HHs (62.8%) had *kutcha* houses, 54 HHs (13.5%) had *pucca* houses, and 95 HHs (23.8%) had access to semi-pucca houses. In blocks, the percentage of pucca houses was found to be the highest in Bijepur block; whereas, the highest percentage of kutcha houses was found in Paikmal block.

Fig. 2.2: Distribution of Households by House Structure across Blocks

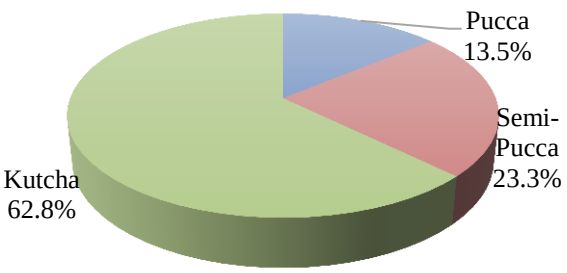


Table 2.5: Distribution of Households by House Structure across Blocks

House	BIJEPUR		GAISILET		JHARBANDH		PADAMPUR		PAIKMAL		Total	
Structure	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Kutcha	45	56.3	51	63.8	40	50.0	49	61.3	66	82.5	251	62.8
Pucca	14	17.5	13	16.3	12	15.0	9	11.3	6	7.5	54	13.5
Semi-pucca	21	26.3	16	20.0	28	35.0	22	27.5	8	10.0	95	23.8
Total	80	100	80	100	80	100	80	100	80	100	400	100

Source: Field Survey

2.6. Conclusion

The socio-economic profile indicates that the majority of the respondents were OSG (6.3.5%) in social group, Hindu (100%) by religion, poor (96.5%) by economic status, and cultivators (100%) by economic activity. In all the blocks it was found that the percentage of male was higher than the female. Further, it was reported that a larger population reside in *kutacha* houses (6.2.8%). Next chapter looks into the aspects related to millets production across different surveyed blocks.

Chapter 3
Production

3.1 Introduction

In this chapter an attempt has been made to understand the status of the area, production, and productivity of millets, usage of seeds and package of practices among the surveyed HHs for the period covered under the baseline survey, 2018-19.

3.2. Area, Production, and Yield

In 2018-19, three types of millet crops viz., *mandia or ragi* (finger millet), *suan or gurji*(little millet) and Kodo millet were cultivated by the survey HHs. From the total surveyed HHs, 22 HHs had cultivated millets in an area of 4.5 ha with a production of 12.9 qtls such that the average production per hectare was 2.8 qtls/ha and the average production per millet cultivating HH was 0.6 qtls/HH, table 3.1. From the surveyed HHs, *Mandia* constitutes 58% of the total millet cultivated area and 36% of the total millets production.

Table 3.1:Area, Production and yield of Millets in Bargarh District

Millets	HHs		Area		Production		Yield	
	No	%	Ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	17	77.3	2.6	57.8	4.7	36.2	1.8	0.3
Suan	1	4.5	0.4	8.9	0.8	6.2	2	0.8
Kodo	4	18.2	1.5	33.3	7.4	57.6	4.9	1.9
Total	22	100	4.6	100	12.9	100	2.8	0.6

Source: Field Survey

Note: Total no of HHs are not additive across Millets, as one HH may cultivate more than one type of millets. The area figures are rounded up to the first decimal, and hence, may not add up to total values summed over blocks and crops.

In Bijepur block, only *mandia* was cultivated in 2018-19, the period of baseline survey. Total *mandia* was cultivated in an area of 0.2 ha with a production of 0.2 qtls, such that the average production per hectare was 1 qtls/ha and the average production per *mandia* cultivating HH was 0.2 qtls/HH.

In Gaisilet block, two types of millet crops viz., *mandia* and Kodo were cultivated by the surveyed HHs during the period of baseline study. From the 7-millet cultivating HHs, 6 HHs had cultivated *mandia* in an area of 0.7 ha with a production of 1.8 qtls; such that the average production per hectare was 2.5 qtls/ha and the average production per *mandia* cultivating HH was 0.3 qtls/HH. Likewise, one HH had cultivated Kodo in an area of 0.1 ha

with a production of 0.4 qtls. The average production of kodo per ha was 4 qtls/ha and the average production per Kodo cultivating HH was 0.4 qtls/HH.

Table 3.2:Area,Production and yield of Millets in Gaisilet Block

Millets	HHs		Area		Production		Yield	
	No	%	ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	6	85.7	0.7	87.8	1.8	81.8	2.5	0.3
Kodo	1	14.3	0.1	12.2	0.4	18.2	0.5	0.1
Total	7	100.0	0.8	100.0	2.2	100.0	3.0	0.4

Source: Field Survey

Note: Total no of HHs are not additive across Millets, as one HH may cultivate more than one type of millets. The area figures are rounded up to the first decimal, and hence, may not add up to total values summed over blocks and crops.

In Jharbandh block, only one millet crop viz., *mandia* was grown by the surveyed HHs during the period of baseline survey. Three HHs had cultivated *mandia* in an area of 0.4 ha with a production of 1.2 qtls. The average production per hectare was 0.4 qtls/ha and the average production per *mandia* cultivating HH was 0.4 qtls/HH.

Alike Jharbandh, in Pandampur block also only *mandia* was cultivated by the surveyed HHs in 2018-19, the period covered under the baseline study. Five HHs had cultivated *mandia* in an area of 1.1 ha with a production of 1.2 qtls. The average production per hectare was 1.1 qtls/ha and the average production per *mandia* cultivating HH was 0.2 qtls/HH.

In Paikmal, three types of millet crops, viz., *mandia, suan* and kodo were cultivated in 2018-19, the baseline year. Among all millets, Kodo constitutes 70% of the millet cultivated area and 86.4% of total millet production. In the block, Kodo was cultivated by 3 HHs in an area of 1.4 ha with a production of 7 qtls. The yiled of kodo was 4.9 qtls/ha and 2.3 qtls/HH. Likewise, *mandia* was cultivated in an area of 0.2 ha with a production of 0.3 qtls. The yield of *mandia* was 1.5 qtls/ha and 0.2 qtls/HH. *Suan* was cultivated by only one HH in an area of 0.4 ha with a production of 0.8 qtls. The yield of *suan* was 2 qtl/ha and 0.8 qtls/HH, table 3.3.

Table 3.3:Area,Production and yield of Millets in Paikamal Block

Millets	HHs		Area		Production		Yield	
	No	%	ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	2	33.3	0.2	10.0	0.3	3.7	1.5	0.2
Suan	1	16.7	0.4	20.0	0.8	9.9	2.0	0.8
Kodo	3	50.0	1.4	70.0	7.0	86.4	5.0	2.3
Total	6	100.0	2.0	100.0	8.1	100.0	4.0	1.4

Source: Field Survey

Note: Total no of HHs are not additive across Millets, as one HH may cultivate more than one type of millets. The area figures are rounded up to the first decimal, and hence, may not add up to total values summed over blocks and crops.

3.3. Perception of seed quality

Seed is one of the determinants of production, yield and quality of millets. Therefore, in the baseline study questions were envisaged to collect information on the perception of farmers towards seed quality used. A three-point scale was used to measure the perception of the seed quality, viz, good, average, and bad. From the surveyed HHs, 95.5 % opined for good quality of seed used and 4.5 % opined for average quality. No HH opined for bad quality seed used by them in 2018-19.

3.4. Package of Practices

This provides an information on different agronomic practices (broadcasting, line sowing/line transplantation, SMI, and multiple method) adopted by the surveyed HHs for cultivation of millets in 2018-19.

Table 3.4 elucidates the package of practices adopted by the *ragi* cultivated HHs. From the surveyed HHs, 13 HHs (76.5%) had adopted broadcasting method and had a yield of 2.4 qtls/ha. Similarly, 4 HHs (23.5%) adopting line sowing/line transplantation method had a yield of 0.9 qtls/ha.

Table 3.4:Package of Practices for *Mandia* Cultivation in selected Blocks

Package of practice	HHs		Area		Production		Yield
	No	%	Ha	%	qtls	%	qtls/ha
Broadcasting	13	76.5	1.6	60.0	3.8	80.6	2.4
Line Showing/transplant	4	23.5	1.1	40.0	0.9	19.4	0.9
Total	17	100	2.6	100	4.7	100	1.8

Source: Field Survey

Note: The area and production figures are rounded up to the first decimal, and hence, may not add up to total agronomic practices

Suan cultivation across different agronomic practices indicates that only one HH had cultivated *suan* adopting line sowing/ line transplantation method with a yield of 2 qtls/ha.

Kodo cultivation across different agronomic practices indicates that one HH had adopted broadcasting in an area of 0.1 ha and had a yield of 4 qtls/ha. Additionally, 3 HHs had adopted line sowing/line transplantation method in an area of 1.4 ha and had a yield of 5 qtls/ha, table 3.5.

Table 3.5:Package of Practices for Kodo Cultivation in selected Blocks

Package of practice	HHs		Area		Production		Yield
	No	%	ha	%	qtls	%	qtls/ha
Broadcasting	1	25.0	0.1	6.7	0.4	5.4	4.0
Line Showing/transplant	3	75.0	1.4	93.3	7	94.6	4.9
Total	4	100	1.5	100	7.4	100	4.9

(Source: Field Survey)

3.5. Conclusion

Three types of millet crops viz., *mandia or ragi* (finger millet), *suan or gurji*(little millet) and *Kodo* millet were cultivated by the survey HHs in 2018-19. The predominant crops in terms of area and production were *mandia* and *kodo* respectively. In general, broadcasting, line sowing, transplantation were the agronomic practices used by the surveyed HHs. further, across methods, the yield was higher for the broadcasting for *Kodo*.

Chapter 4

Consumption

4.1. Introduction

This chapter looks into consumption of millets across seasons, consumption of millets during different meals of the day and different types of millet recipes consumed by the HHs surveyed. The analysis is for the period under survey, 2018-19.

4.2. Season-wise consumption

From the surveyed HHs total 47 HHs (11.8%) had consumed millets in 2018-19, table 1.3 & table 4.1. From the millet consuming HHs, a majority (47 HHs) had consumed during summer followed by rainy (26 HHs) and winter (24 HHs). From the FGD it was found that the consumption of millets in summer was higher as it reduces thirst and hunger. Moreover, consumption of millets by HHs during different meals of the day points out that all the HHs had consumed millet in their breakfast only.

Table 4.1:Season-wise Consumption of Millets

Food Pattern	Bijepur		Gaisilet		Jharbandh		Padampur		Paikamal		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Summer	12	15.0	7	8.8	9	11.3	6	7.5	13	16.3	47	11.8
Rainy	5	6.3	7	8.8	2	2.5	4	5.0	8	10.0	26	6.5
Winter	5	6.3	7	8.8	0	0.0	4	5.0	8	10.0	24	6.0
Total Millets consuming HHs	12	15.0	7	8.8	9	11.3	6	7.5	13	16.3	47	11.8
Total Millets not consuming HHs	68	85.0	73	91.3	71	88.8	74	92.5	67	83.8	353	88.3

Source: Field Survey

Note: Total column is not an addition across seasons, as a HH can consume millets in multiple seasons.

4.3. Millet Recipes consumed

From the millets consuming HHs, 12 HHs had consumed millets in the form of *jau* (porridge, particularly *mandia jau*) and one HH had consumed in the form of *pitha* (pancake), table 4.2. The FGD also substantiate this and elucidates that millets especially *ragi* as the staple food of the surveyed HHs.

Table 4.2:Distribution of HHs Consumed different Millet Recipes across blocks

Food Pattern	Bijepur		Gaisilet		Jharbandh		Padampur		Paikamal		Total	
	No	%	No	%	No	%	No	%	No	%	No	
Jau	12	15.0	7	8.8	9	11.3	6	7.5	13	16.3	47	11.8
Pitha	0	0.0	1	1.3	0	0.0	0	0.0	0	0.0	1	0.3
Total millets consuming HHs	12	15.0	7	8.8	9	11.3	6	7.5	13	16.3	47	11.8
Total millets not consuming HHs	68	85.0	73	91.3	71	88.8	74	92.5	67	83.8	353	88.3

Source: Field Survey

Note: Total column is not an addition across recipes, as a HH can prepare and consume more than one recipe of millets.

4.4. Conclusion

Millets are consumed across all seasons, but relatively more in summer. All HHs had consumed millets in breakfast. Two types of millet recipes were consumed by HHs, viz., *jau* and *pitha*.

Chapter 5

Processing and Marketing

5.1. Introduction

This chapter looks into different methods of processing of millets as per the convenience of the farmers, availability and accessibility of processing units and the mode by which millets were sold.

5.2. Processing units

Processing of millet grains is necessary for storage and for preparation of different recipes. The processing of grains may be in the form of decorticating/dehusking, grinding, malting, fermentation, roasting, and flaking to improve their edible, nutritional, and sensory properties. From the surveyed HHs, 47 HHs had processed millets traditionally and only 1 HH had processed in both traditional ways and using others machine.

5.3. Marketing

Marketing of millets is considered as an important dimension for millet producing HHs to earn income by selling their surplus produce. Better marketing opportunities generate hope and interest to cultivate millets among these HHs. It creates employability as well. Out of the total 22 HHs surveyed who reported producing of millets during 2018-19 as mentioned in Chapter-3, 8(36.4%) HHs marketed their surplus. Out of 8 HHs who reported marketing of millets, 2 of them sold it within a radius of 5 Kilometres, 4 HHs sold it within 6-10 Kilometres distance and rest 2 HHs sold it within 11-15 Kilometres distance. Moreover, all the HHs had sold in the market. The FGD result also substantiate the above findings.

5.4 Conclusion

During baseline survey, before implementation of Odisha Millets Mission, almost all i.e. 97.9% of the HHs processed their millets (particularly for dehusking and grinding) manually. Only one HH processed part of his millets through machine and the rest manually. He used others pulverized. None of the HHs from Bijepur block sold millets. From FGD, it was also coming to light that people from Bargarh particularly produced millets for their own consumption. So, scope of marketing is very less in Bargarh district.

6

MAJOR FINDINGS

6.1 The socio-economic profile indicates that the majority of the respondents were OSG (6.3.5%) in social group, Hindu(100%) by religion, poor (96.5%) by economic status, and cultivators (100%) by economic activity.

6.2 Three types of millet crops viz., *mandia or ragi* (finger millet), *suan or gurji*(little millet) and Kodo millet were cultivated by the survey HHs in 2018-19. The predominant crops in terms of area and production were *mandia* and kodo respectively.

6.3 A total of 22 HHs had cultivated millets in an area of 4.6 ha with a production of 12.9 qtls with an average yield of 2.8 qtls/ha and the average yield per millet cultivating HH of 0.6 qtls/HH.

6.4. In general, broadcasting, line sowing, transplantation were the agronomic practices used by the surveyed HHs. Further, across methods, the yield was higher for the broadcasting for Kodo.

6.5 Millets were consumed across all seasons, but relatively more in summer. All HHs had consumed millets in breakfast. Two types of millet recipes were consumed by HHs, viz., *jau*and *pitha*.

6.6 Eight HHs had marketed the produce. Out of them, 2 HHs had sold within a radius of 5 KMs, 4 HHs had sold within a radius of 6-10 Km, and the rest 2 had sold within 11-15 Km radius.

ANNEXTURE 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/Kutcha/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) Encrosed_____

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 Pestisides: 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-wiseAverage Requirment/Consumption (in kg)

Season	Summer	Winter	Rainy
Requirment			
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

Sl. No.	Name start with Respondent of the HH	Relationship with HH (Use Code)	Marital Status	Sex M-1 F-2	Age	Education (Use Code)	Occupation/Income (Use Code)			Millet Based Activities (Use Code)
							Main	Subsidiary	Avg. annual income	

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 labour/ Wage labour, 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)	
Kharif		A	P	A	P	A	P	A	P	A	P
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

ANNEXTURE 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.