BASELINE SURVEY:

BOLANGIR DISTRICT-2017-18, Phase 2

(Special Programme for Promotion of Millets in Tribal Areas of Odisha or Odisha Millets Mission, OMM)

Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar, Odisha
(anICSSR 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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FOREWARD

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 were 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 author for the current baseline report on Bolangir 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 trebled 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; Shri D. N. Thirumala, IAS, Collector & District Magistrate, Bolangir; 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. Ashok Mohanty, Deputy Director of Agriculture (DDA);Mr. Balakrishna Gaudo, District Agriculture Officer (DAO); Mr. Bahantia Rona, Scheme Officer; Mr. Amit Patel, Assistant Agriculture Officer (AAO), Bangamunda; Ms. Smaraki Pradhan, AAO, Bangamunda; Mr.

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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.

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Nitin Kumar Hotha

Abhisek Mishra

EXECUTIVE SUMMARY

1 Study Area

1.1 Bolangir is one of the seven districts where the "Special Programme for Promotion of Millets in Tribal Areas of Odisha Phase II (hereafter, Odisha Millets Mission, OMM)" was started in 2018 in four blocks of the district, namely, Bangamunda, Khaprakhol, Muribahal, Tureikela.

1.2 Data were calculated from 320 HHs (80 HHs from each block). It was reported that from the total surveyed HHs, 136 HHs had cultivated millets in 2017-18, the period covered under Phase II of baseline survey.

2 Socio-Economic Profile

2.1 From the surveyed HHs, 111 HHs (34.7%) belong to Scheduled Tribes (STs) category, 44 HHs (13.8%) belong to Scheduled Castes (SCs) category, 165 HHs (51.6%) belongs to Other Social Groups (OSGs) category.

2.2 All the surveyed HHs belong to Hindu religion.

2.3 From the HHs surveyed it was evident that 96.2% were living below poverty line (BPL).

2.4 The distribution across economic activities (which are not mutually exclusive) of the surveyed HHs are as follows: cultivation (100%), allied activities (82.2%, include agricultural labourer and forest product collection), services (5.9%) and other activities (58.8%).

2.5 From the HHs surveyed 64.6% HHs had *kutcha* houses, 21.6% HHs had *pucca* houses and 13.8% HHs had *semi-pucca* houses.

3 Production

3.1 Primarily, three millet crops, viz., *mandia* or *ragi* (finger millet), *suan/gurji* (little millet) and kodo millet were cultivated in 2017-18, the baseline year. *Mandia* was cultivated by 119 HHs in 39.4 hectares (ha), *gurji* or *suan* was cultivated by 36 HHs in 17.5 ha and *kodo* was cultivated by 3 HHs in 0.9 ha.

3.2 From the total millets production of 214.7 quintals (qtls), *mandia* was 135.9 qtls (63.3%), *suan* was 76.1 qtls (35.4%), and *kodo* was 2.7 qtls (1.3%).

3.3 The yield of all millets was 3.7 quintals per hectare (qtls/ha). It was 3.4 qtls/ha for *mandia*, 4.4 qtls/ha for *suan* and 3 qtls/ha for *kodo*.

3.4 The average per HH millet production was 1.6 qtls/HH. It was 1.1 qtls/HH for *mandia*, 2.1 qtls/HH for *suan*, and 0.9 qtls/HH for *kodo*.

3.5 In Khaprakhol block, 17 HHs had cultivated millets, from which 16 HHs had cultivated *mandia* in 6 ha producing 29.5 qtls with a yield of 4.9 qtl/ha and average production per *mandia* producing HH was 1.8 qtls/HH.

3.6 In Khaprakhol block, two HHs had cultivated *suan* in 0.4 ha producing 3 qtls with a yield of 7.4 qtls/ha and average production per suan producing HH was 1.5 qtls/HH.

3.7 In Khaprakhol block, two HHs had cultivated *kodo* in 0.5 ha producing 1.2 qtls with a yield of 2.4 qtls/ha and average production per kodo producing HH was 0.6 qtls/HH.

3.8 In Tureikela block, 45 HHs had cultivated millets, from which 36 HHs had cultivated *mandia* in 12.3 ha Producing 35.6 qtls with a yield of 2.9 qtls/ha and average production per mandia producing HH was 1 qtl/HH.

3.9 In Tureikela block, 13 HHs cultivated *suan* in 5.4 ha producing 23.3 qtls with a yield of 4.3 qtls/ha and average production per suan producing HH was 1.8 qtls/HH. Only one HH had cultivated *kodo* in 0.4 ha producing 1.5qtls.

3.10 In Muribahal block, 32 HHs had cultivated millets, from which 31 HHs had cultivated *mandia* in 9.1 ha producing 32.3qtls with a yield of 3.6 qtls/ha and average production per mandia producing HH production was 1.0 qtl/HH. Only two HH cultivated *suan* in 0.8 ha producing 8 qtls.

3.11 In Bangamunda block, 42 HHs had cultivated millets, out of which 36 HHs cultivated *mandia* in 12.1 ha producing 38.5 qtls with a yield of 3.2 qtls/ha and average production per *mandia* production HH was 1.1 qtl/HH.

3.12 In Bangamunda block,19 HHs had cultivated *suan* in 10.9 ha producing 41.8 qtls with a yield of 3.8 qtls/ha and average production per suan producing HH was 2.2 qtls/HH.

4 Package of Practices

4.1 From 119 HHs cultivating *mandia*, 10 HHs had adopted broadcasting in 3.3 ha producing 16.2 qtls with a yield of 4.9 qtls/ha, 109 HHs had adopted line sowing/line transplanting in 36.1 ha producing 119.7 qtls with a yield of 3.3 qtls/ha.

4.2 From 36 HHs cultivating *suan*, 28 HHs had adopted broadcasting in 13.7 ha producing 52.3 qtls with a yield of 3.2 qtls/ha, 8 HHs had adopted line sowing/line transplanting in 3.8 ha producing 23.8 qtls with a yield of 6.2 qtls/ha.

4.3 From three HHs cultivating *kodo*, all of them had adopted broadcasting in 0.9 ha producing 2.7 quintals with a yield of 3qtls/ha.

5 Consumption

5.1 The consumption of millets in different seasons (not mutually exclusive) indicates that 46.6 % HHs had consumed in summer, 30.9 % HHs had consumed in winter, 21.3 % HHs had consumed in rainy season.

5.2 Findings regarding different meals of the day (not mutually exclusive) indicates that 44.1 % HHs had consumed as breakfast, 29.7% HHs had consumed in lunch, 3.1 % HHs had consumed as evening snacks, and 0.6 % HHs had consumed in dinner.

5.3 To a query on the form in which millets was consumed (not mutually exclusive), 42.8% HHs indicated the consumption of millets in the form of *jau* (porridge, particularly *ragijau*), 41.3 % HHs indicated *pitha* (pancakes and other forms), 14.1 % HHs indicated *mandia torani*(fermented *ragi*), 1.6 % HHs indicated *tampo* (a semi-liquid recipe), 3.1 % HHs indicated *koda* rice, 3.4 % HHs indicated *roti*, and 1.9 %HHs indicated the consumption of *handia* (*mandia* beer, *handia*can also be prepared from rice).

6 Processing & Marketing

6.1 From the baseline survey it was evident that 47.5% HHs had processed manually, 24.7% had processed using machine and 27.8% had processed both manually as well as using machine.

6.2 A distribution of sale of millets indicates that 48 HHs (60%) had sold to the middle men or the local trader, 30 HHs (37.5%) had sold in market, one HH had sold to money lender towards repayment of debt and one HH had sold to neighbour.

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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 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 giving emphasis to production, consumption, processing, and marketing of millets. In 2017-18, the programme 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. Bolangir district is one of them. This baseline study attempts to provide necessary information on the above-mentioned dimensions of the programme in Bolangir district. Thus, the profile of Bolangir district is provided below.

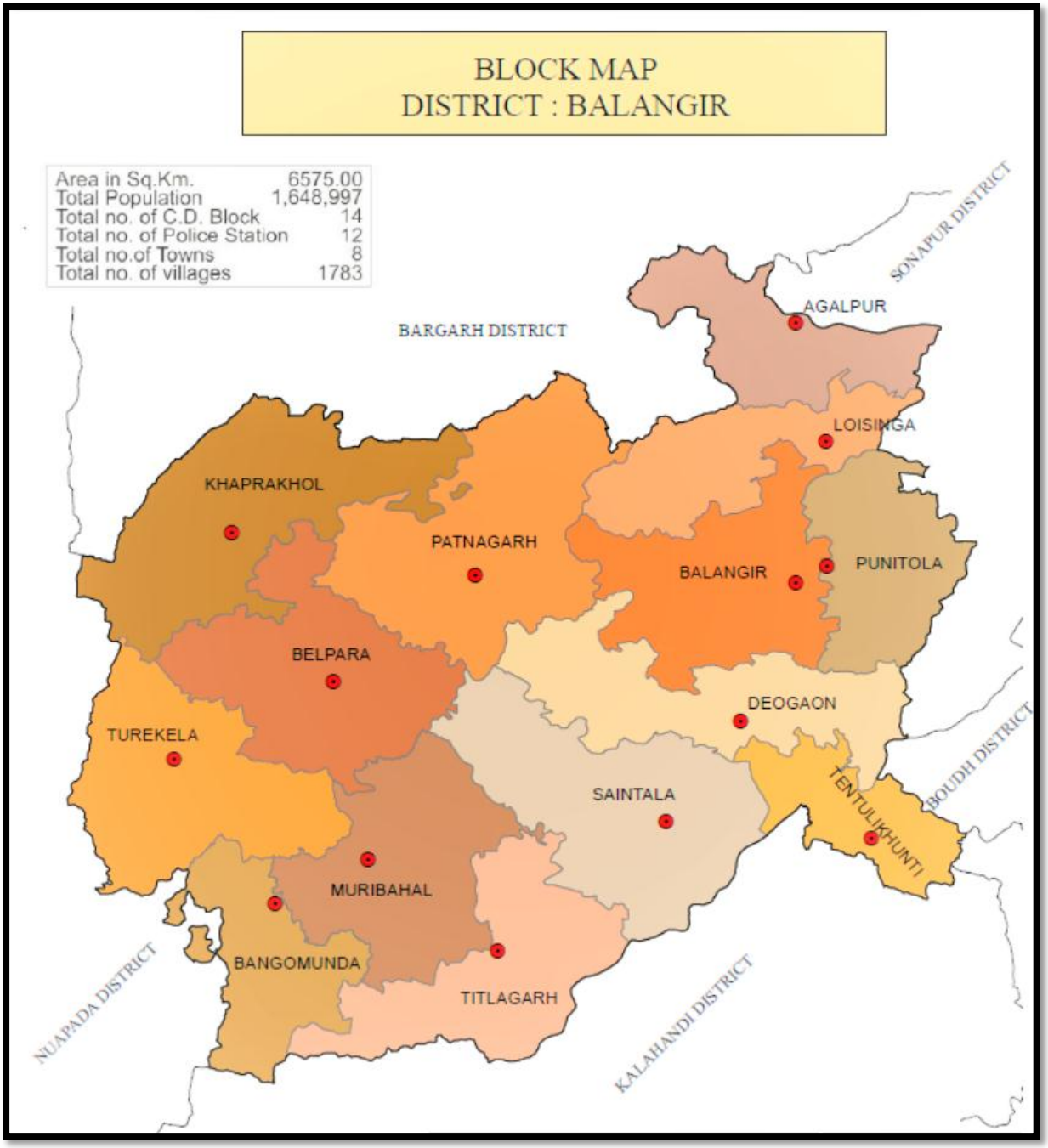
1.2 District Profile

Bolangir district is in the western part of the Odisha. It lies between 20° 11'40" to 21° 05' 08" north latitude and 82°41'15" to 83° 40' 22° longitude. It is surrounded by Subarnapur in the North-East, Boudh in Central-East, Kalahandi in the South-East and Nuapada in the West and Bargarh in the North(Fig.1.1).The district of Bolangir has an area of 6575 sq.km and 16.49 lakh of population as per 2011 census. The district accounts for 4.2% of the state's territory

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

and 3.93% of the state's population. The density of population of the district is 251 people per sq. km as against 270 persons per sq.km for the state. The district has 1794 villages that are spread over 14 blocks. As per 2011 census, the Scheduled Caste (SC) population was 17.89% and Scheduled Tribe (ST) population was 21.04%, Table 1.1. The literacy rate of the district was 64.72% as against 72.9% of the state.

Fig 1.1 Map of Bolangir district with blocks



Source: https://gisodisha.nic.in/Block/BOLANGIR.pdf

Table 1.1: Key Indicators of Bolangir District

Indicators Census 2011	Value
Population (In Lakh)	16.5
Male	8.3
Female	8.2
Scheduled Caste	3.0
Scheduled Tribe	3.5
Others	10.0
Household (In Lakh)	4.1
Average HH Size	4.0
Sex Ratio (Number of females per 1000 males)	987
Total Worker (In Lakh)	7.2
Main Worker	4.0
Marginal Worker	3.2
Non-Worker	9.3
Cultivator as % of Total Worker	23.11
Agricultural Labourers as % of Total Worker	45.30
Workers in Household Industry as % of Total Worker	3.98
Other Workers as % of Total Worker	27.61
Literacy Rate (%)	64.72
Total Geographical Area (sq.km)	6575
Land Use Pattern (Area in '000 ha), 2014-15	
Forest	59189
Land put to Non-agricultural use	52406
Barren and Non-Cultivable Land	17168
Permanent Pasture and Other Agricultural Land	42301
Net Area Sown	268965
Cultivable Waste Land	25936
Old Fallow	23060
Current Fallows	51468
Miscellaneous Trees and Groves	1344
Total Area under Survey	39416
Agriculture, 2013-14	
Average Fertilizer Consumption (kg/ha)	43.10
Irrigation, Kharif (ha)	67885
Irrigation, Rabi (ha)	20523
Other Information	
Proportion of Villages Electrified (as on March 2014)	1764
Credit Deposit Ratio (as on December 2015)	50.04
No.of banks (In Nos.)	146

Source: http://www.desorissa.nic.in/pdf/2015-dshb-bolangir.pdf
http://censusindia.gov.in/2011census/dchb/2124_PART_B_DCHB_BOLANGIR.pdf

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 outlinemillet production, productivity and 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

Millets are grown in arid and semi-arid regions of Asia and Africa (Nithiyanantham et al., 2019). The climatic condition is suitable for millets. That's why Bolangir district was chosen under the Programme. Out of 14 blocks, four blocks, viz, Bangamunda, Muribahal, Khoprakhol, and Tureikela were chosen for the study considering 1093 participant farmer HHs spread across 8 *grampanchayats*. From these, in the first stage sampling two *grampanchayats* were selected randomly 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 320 surveyed households, 135 were participant households and 185 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 Bolangir

Blocks	Programme HHs	Surveyed HHs	Participant HH 2017-18	Non-Participant HH 2017-18
	No	No	No	No
Khaprakhol	197	80	30	50
Tureikela	233	80	23	57
Muribhal	398	80	37	43
Bangamunda	265	80	45	35
Total	1093	320	135	185

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 using pre-tested interview schedule (Annexure 1) focusing on basic demographic profile as well as the four dimensions of the programme viz production, processing, consumption, and marketing of millets. Focus Group Discussion (FGD), (Annexure 2) were also conducted. The secondary data has been collected from different published and unpublished sources specifically used in the preparation of table 1.1.

In addition to the methodology, for better understanding here we provide a brief description on the total millets produced, processed, consumed and marketed during the year 2017-18, table 1.3. It is evident from the table that both participants and non-participants HHs were active in production, processing, consumption, and marketing of millets.

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

Blocks	Production		Consumption		Processing		Marketing	
	Participant HH	Non-Participant HH	Participant HH	Non-Participant HH	Participant HH	Non-Participant HH	Participant HH	Non-Participant HH
Bangamunda	34	8	36	5	35	8	22	5
Khaprakhol	6	11	9	25	9	23	3	7
Muribahal	23	9	24	13	24	13	10	1
Tureikela	20	25	20	30	20	30	15	17
Total	83	53	89	73	88	74	50	30
Difference	52	132	46	112	47	111	85	155

Source: Field Survey

Note: Difference is calculated by taking total no of Participant HH and Non-Participant HH into account.

1.5 Limitations

There are three broad limitations. First, the study relied on a random sample of 320 HH all HHs due to logistic reasons and other difficulties (like non-availability of

respondents) faced by the field investigators during data collection. Second, there is the possibility of recall error, particularly applicable in case of actual quantity of consumption, expenditure, investment, and marketing among others. Last but not the least, there were instances where surveyed households had consumed millets, but had not produced or processed it. 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 annotates on processing and marketing of millets. Chapter 6 summarises the findings.

2
SOCIO-ECONOMIC PROFILE OF HOUSEHOLDS 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

Out of 14 blocks in Bolangir District, in Phase-2 of Odisha Millets Mission, four blocks are functional, viz, Khaprakhol, Tureikela, Muribahal, and Bangamunda. In these, 320 HHs have been surveyed. The distributions across social groups indicate that 44 HHs (13.8%) belong to schedule caste (SCs), 111 HHs (34.7%) belong to Schedule Tribe (STs), and 165 HHs (51.6%) belong to other social groups (OSG), Table 2.1and Fig 2.1. Further it was found that All the respondents of the surveyed households belong to Hindu by religion.

FIG 2.1 DISTRIBUTION OF HOUSEHOLDS BY SOCIAL GROUPS

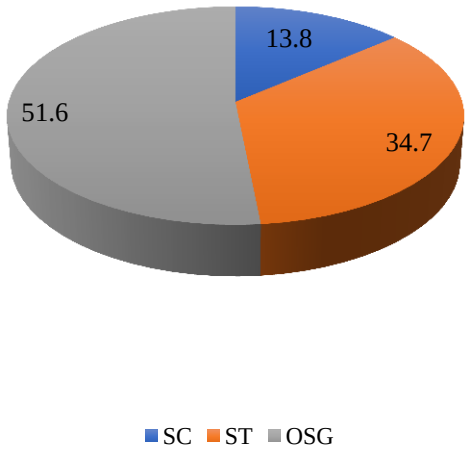


Table 2.1: Distribution of Households by Social Groups across Blocks

Social Groups	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
SC	13	16.3	14	17.5	15	18.8	2	2.5	44	13.8
ST	31	38.8	30	37.5	35	43.8	15	18.8	111	34.7
OSG	36	45.0	36	45.0	30	37.5	63	78.8	165	51.6
Total	80	100.0	80	100.0	80	100.0	80	100.0	320	100.0

Source: Field Survey

Note: Percentages are rounded up to the first decimal, and hence, may not add up to total values summed over blocks.

The total population from the surveyed HHs was 1565, Table 2.2. The share of male population was higher than the female population. From the total population, 53% were male and 47% were female. From the total population of surveyed HHs, 25.3% were from Khaprakhol block, 24.9% were from Tureikela block, 25.3% were from Muribahal block and 24.3% were from Bangamunda block.

Table 2.2: Distribution of Population by Gender across Blocks

Gender	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	No	%	No	%	No	%	No	%	No	%
Male	205	51.8	207	53.1	206	51.8	212	55.6	830	53.0
Female	191	48.2	183	46.9	192	48.2	169	44.4	735	47.0
Total	396	25.3	390	24.9	398	25.4	381	24.3	1565	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, 95% HHs were living BPL and the rest (5%) were APL, table 2.3. The incidence of poverty was more than 90 % in all blocks.

Table 2.3: Distribution of Households by Poverty Status across Blocks

Economic	**Khaprakhol**		**Tureikela**		**Muribahal**		**Bangamunda**		**Total**	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
BPL	78	97.5	72	90	76	95.0	80	100	306	96.2
APL	2	2.5	8	10	4	5.0	0	0	14	3.8
Total	80	100	80	100	80	100	80	100	320	100

Source: Field Survey

Note: BPL is below poverty line and APL is above poverty line

2.4 Economic Activities

Economic activities of surveyed HHs shows that all the surveyed HHs were engaged in cultivation, 82.2% HHs were engaged in allied activities (these include agricultural labourer and forest product collection), 5.9% HHs were in services, and 58.8 % HHs were engaged in other activities. From Table 2.4, it can be concluded that the major occupation of surveyed HHs in all blocks was cultivation in 2017-18.

Table 2.4: Distribution of Households by Economic Activities across Blocks

Economic Activity	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Cultivation	80	100	80	100	80	100	80	100	320	100
Allied	74	92.5	57	71.3	71	88.8	61	76.3	263	82.2
Services	5	6.3	5	6.3	2	2.5	7	8.8	19	5.9
Others	46	57.5	49	61.3	44	55.0	49	61.3	188	58.8
Total	80	100	80	100	80	100	80	100	320	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 Structure of House

House structure is another important indicator to assess the economic condition of HHs. Out of the total HHs surveyed, 64.7% had *kutcha* houses, 13.7 % had *semi-pucca* houses and 21.6 % had *pucca* houses in 2017-18, Table 2.5 and Fig 2.2. The percentage of *kutcha* houses was the highest in Khaprakhol (73.7%) whereas the percentage of *pucca* houses was the highest in Tureikela (37.4%).

FIG 2.2 DISTRIBUTION OF HOUSEHOLDS BY HOUSE STRUCTURE

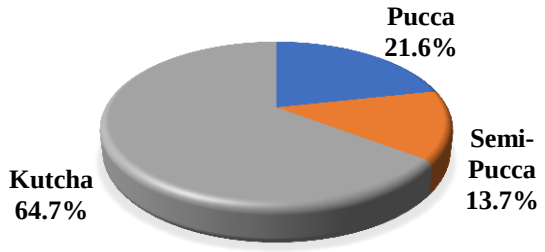


Table 2.5: Distribution of Households by House Structure across Blocks

House Structure	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Pucca	8	10.0	30	37.4	13	16.3	18	22.4	69	21.6
Semi-Pucca	13	16.3	7	8.8	13	16.3	11	13.8	44	13.7
Kutcha	59	73.7	43	53.8	54	67.4	51	63.8	207	64.7
Total	80	100	80	100	80	100	80	100	320	100

Source: Field Survey

2.6 Conclusion

The socio-economic profile of the HHs surveyed indicates that the majority of the respondents belong to other social group (51.6%) in social group, Hindu (100%) by religion, poor (96.2%) by economic condition, cultivators by economic activity. In all the blocks, it was found that the percentage of male was higher than female. Further, it was reported that a larger population (64.7%) reside in *Kutcha* houses. The next chapter, Chapter 3, looks into aspects related to millets productions.

3
PRODUCTION

3.1 Introduction

In this chapter an attempt has been made to throw some light on the status of production and productivity of millets, usage of seeds, and package of practices in Bolangir district. These are based on baseline data for 2017-18 from HHs surveyed in Khaprakhol, Tureikela, Muribahal and Bangamunda blocks where OMM has been operational since *Kharif* 2018.

3.2 Area, Production and Yield

Broadly three types of millets, viz., *mandia*, *suan* and *kodo* were cultivated in 2017-18 by the HHs surveyed in Bolangir district, Table 3.1. The total production of different types of millets by 136 HHs surveyed comes to 214.7 qtls. *Mandia* was cultivated by 119 HHs in an area of 39.4 ha with a production of 135.9 qtls (63.3% of the total millet production). Similarly, *Suan* was cultivated by 36 HHs in an area of 17.5 ha with a production of 76.1 qtls (35.4% of the total millet production). Likewise, Kodo was cultivated by only 3 HHs in an area of 0.9 ha with a production of 2.7 qtls, which represents 1.3% of the total millet production.

Fig 3.1 Yield of Millets in Bolangir

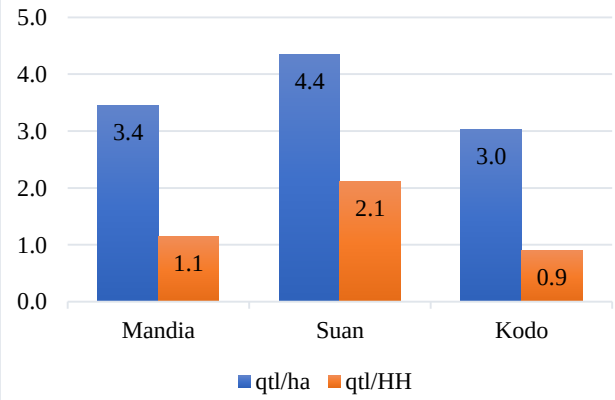


Table 3.1: Area, Production and yield of Millets in Bolangir District

Millets	HHs		Area		Production		Yield	
	No	%	Ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	119	87.5	39.4	68.3	135.9	63.3	3.4	1.1
Suan	36	26.5	17.5	30.2	76.1	35.4	4.4	2.1
Kodo	3	2.2	0.9	1.5	2.7	1.3	3.0	0.9
Total	136	100	57.8	100	214.6	100	3.7	1.6

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.

The yield of all millets was 3.7 qtls/ha, *Mandia* was 3.4 qtls/ha, *suan* was 4.4 qtls/ha, and *kodo* was 3 qtls/ha, Table 3.1 and Fig 3.1. The average production per millet cultivating HH for all millets was 1.6 qtls/HH; it was 1.1 qtls/HH for *mandia*, 2.1 qtls/HH for *suan*, and 0.9 qtls/HH for *kodo*.

Area, production, and yield of millets in Bangamunda block are shown in Table 3.2. From the total 42 millets cultivating HHs, 36 HHs had cultivated *mandia*, 19 had cultivated *suan* and no one had cultivated *kodo*. The total area cultivated under millet was 22.9 ha, of which *mandia* was cultivated in 12.1 ha and *suan* was cultivated in 10.9 ha. From the total production of 80.3 qtls of millets, the production of *mandia* was 38.5 qtls and *suan* was 41.8 qtls. The yield was 3.5 qtls/ha for all millets; it was 3.2 qtls/ha for *mandia* and 3.8 qtls/ha for *suan.* The average millet production per millet cultivating HH was 1.1 qtls/HH for *mandia* and 2.2 qtls/HH for *suan*.

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

Millets	HHs		Area		Production		Yield	
	No	%	Ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	36	85.7	12.1	52.6	38.5	47.9	3.2	1.1
Suan	19	45.3	10.9	47.4	41.8	52.1	3.8	2.2
Total	42	100	22.9	100	80.3	100	3.5	1.9

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.

Area, production, and yield of millets in Khaprakhol block are shown in Table 3.3. Out of Total 17 millet cultivating HHs in the block, 16 HHs had cultivated *mandia. Suan* and *Kodo* were cultivated by two HHs each. The total area cultivated under millets in Khaprakhol block was 6.9 ha of which *mandia* was cultivated in 6 ha, *suan* and *kodo* were cultivated in 0.4 ha and 0.5 ha respectively. The total millet production was fond to be 33.7 qtls; of which *mandia* was 29.5 qtls, *suan* was 3 qtls, and *kodo* was 1.2 qtls. The yield was 4.69 qtls/ha for all millets; it was 4.9 qtls/ha for *mandia,*7.4 qtls/ha for *suan* and 2.4 qtls/ha for *kodo.* The average millet production per millet cultivating HH was 1.8 qtls/HH for *mandia*, 1.5 qtls/HH for *suan*, and 0.6 qtls/HH for *kodo*.

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

Millets	HHs		Area		Production		Yield	
	No	%	ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	16	94.1	6.0	87.1	29.5	87.7	4.9	1.8
Suan	2	11.8	0.4	5.8	3.0	8.9	7.4	1.5
Kodo	2	11.8	0.5	7.1	1.2	3.4	2.4	0.6
Total	17	100	6.9	100	33.7	100	4.9	2.0

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.

Area, production, and yield of millets in Muribahal block are shown in Table 3.4. Total 32 HHs had cultivated millets, of which 31 of them had cultivated *mandia. Suan* was cultivated by 2 HHs and no one had cultivated *kodo*. The total area cultivated under millet was 9.9 ha of which *mandia* was cultivated in 9.1 ha and *suan* was cultivated in 0.8 ha. From the total production of 40.3 qtls of millets, the production of *mandia* was 32.3 qtls and *suan* was 8 qtls. The yield was 4.1 qtls/ha for all millets; it was 3.6 qtls/ha for *mandia*, 9.9 qtls/ha for *suan.* The average millet production per cultivating HH was 1 qtl/HH for *mandia* and 4 qtls/HH for *suan*.

Table 3.4: Area, Production and yield of Millets in Muribahal Block

Millets	HHs		Area		Production		Yield	
	No	%	ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	31	96.9	9.1	91.8	32.3	80.1	3.6	1.0
Suan	2	6.3	0.8	8.2	8.0	19.9	9.9	4.0
Total	32	100	9.9	100	40.3	100	4.1	1.3

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.

Area, production, and yield of millets in Tureikela block are shown in Table 3.5. There were 45 HHs who had cultivated millets, out of which 36 of them had cultivated *mandia. Suan* and *Kodo* were cultivated by 13 HHs and one HH respectively. The total area cultivated under millet was 18 ha, of which, *mandia* was cultivated in 12.3 ha, *suan* and *kodo* were cultivated in 5.4 ha and 0.4 ha respectively. From the total production of 60.4 qtls of millets, the production of *mandia* was 35.6 qtls, *suan* was 23.3 qtls, and *kodo* was 1.5 qtls. The yield was 3.3 qtls/ha for all millets; it was 2.9 qtls/ha for *mandia,* 4.3 qtls/ha for *suan* and

3.7 qtls/ha for *kodo*. The average millets production per cultivating HH was 1 qtl/HH for *mandia*, 1.8 qtls/HH for *suan*, and 1.5 qtls/HH for *kodo*.

Table 3.5: Area, Production and yield of Millets in Tureikela Block

Millets	HHs		Area		Production		Yield	
	No	%	ha	%	qtls	%	qtls/ha	qtls/HH
Mandia	36	80.0	12.3	67.9	35.6	59.0	2.9	1.0
Suan	13	28.9	5.4	29.8	23.3	38.5	4.3	1.8
Kodo	1	2.2	0.4	2.2	1.5	2.5	3.7	1.5
Total	45	100	18.0	100	60.4	100	3.3	1.3

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 on Quality of Seeds Used

Seed is an important input that determines the production, yield, and quality of millets. The HHs surveyed in Bolangir used local varieties of seeds. All the HHs who had cultivated millets in 2017-18 have reported about their perception on quality of seed used in their fields for cultivation, Table 3.6 and Fig 3.2. A three-point scaling technique, viz., good, average, and bad was used to measure the perception of HHs towards the quality of seeds used. It shows that 54.4% opines that the seed quality used by them was good, 45.6 % opines for average quality seed and no HHs had opined for bad quality of seed.

Fig 3.2: Perception on Quality of Seeds

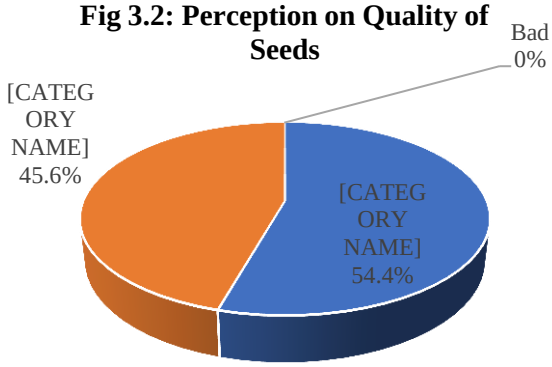


Table 3.6: Perception of Respondents regarding quality of Seed

Quality	Bangamunda		Khaprakhol		Muribahal		Tureikela		Total	
	No	%	No	%	No	%	No	%	No	%
Good	19	45.2	7	41.2	19	59.4	29	64.4	74	54.4
Average	23	54.8	10	58.8	13	40.6	16	35.6	62	45.6
Total	42	100	17	100	32	100	45	100	136	100

Source: Field Survey

Block-wise data on perception of seed quality reveals that the perception of the quality of seed being good was the highest in Tureikela (64.4%). Similarly, the perception of the quality of the seed being average was the highest in Khaprakhol (58.8%).

3.4 Package of Practices

The different agronomic practices (broadcasting, line sowing/line transplanting system of millet intensified) used for the cultivation of different millets by the surveyed HH are presented in this section.

Out of the 119 *mandia* cultivating HHs, 10 HHs had adopted broadcasting method covering an area of 3.3 ha producing 16.2 qtls with a yield of 4.9 qtls/ha, 109 HHs had used line showing or line transplanting method in 36.1 ha producing 135.9 qtls with a yield of 3.3 qtls/ha. No HH had used SMI method of cultivation, Table 3.7.

Table 3.7: Package of Practices for *Mandia* Cultivation in selected Blocks

Package of practices	HHs		Area		Production		Yield
	No	%	ha	%	qtls	%	qtls/ha
Broadcasting	10	8.4	3.3	8.4	16.2	11.9	4.9
Line Showing/transplant	109	91.6	36.1	91.6	119.7	88.1	3.3
Total	119	100	39.4	100	135.9	100	8.2

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

Out of the 36 *suan* cultivating HHs, 28 HHs had adopted broadcasting method covering an area of 13.7 ha producing 52.3 qtls with a yield of 3.8 qtls/ha. 8 HHs had used line showing or line transplanting method in 3.8 ha producing 23.8 qtls with a yield of 6.2 qtls/ha, Table 3.8. The three Kodo cultivated HHs had produced 2.7 qtls from 0.9 ha adopting broadcasting method with a yield of 3 qtls/ha.

Table 3.8: Package of Practices for *Suan* Cultivation in selected Blocks

Package of practices	HHs		Area		Production		Yield
	No	%	Ha	%	qtls	%	qtls/ha
Broadcasting	28	77.8	13.7	78	52.3	68.8	3.8
Line Showing/transplant	8	22.2	3.8	22	23.8	31.2	6.2
Total	36	100	17.5	100	76.1	100	10.0

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

3.5 Conclusion

Three types of millets, viz., *mandia*, *suan* and *kodo* were cultivated in Bolangir during the period covered under baseline survey, 2017-18. The predominant crop grown was *mandia* (68.3% of area and 63.3% of produce). *Suan* was grown by some HHs from all four blocks and *kodo* was grown by HHs from Khaprakhol and Tureikela only. More than half (54.4%) perceived the seed quality they used to be good, another nearly half (45.6%) considered it to be average, and no one perceived it to be bad. Most of the surveyed HHs had cultivated millets through broadcasting and some by line sowing or line transplanting. None of the HHs had adopted SMI method or 1+method (using multiple method) in Bolangir for the period covered under baseline survey. In the next chapter we discuss consumption of millets.

4
CONSUMPTION

4.1 Introduction

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

4.2 Season-wise Consumption

From the HHs surveyed, 46.6 % had consumed millets during summer, 30.9 % had consumed millets during winter and 21.3 % had consumed millets during rainy, Table 4.1. Greater consumption during summer was due to their perception that consumption of millet reduces the chances of feeling thirsty and hungry. Nearly half of the surveyed HHs (49.4%) had not consumed millets in any of the seasons.

Table 4.1: Season-wise Consumption of Millets

Food Pattern	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	No	%	No	%	No	%	No	%	No	%
Summer	29	36.3	44	55.0	37	46.3	39	48.8	149	46.6
Rainy	9	11.3	24	30.0	19	23.8	16	20.0	68	21.3
Winter	16	20.0	33	41.3	27	33.8	23	28.8	99	30.9
Total Millets consuming HHs	31	38.7	48	60.0	37	46.3	39	48.8	155	48.4
Missing values in surveyed data	3	3.8	2	2.5	0	0	2	2.4	07	2.2
Total Millets not consuming HHs	46	57.5	30	37.5	43	53.7	39	48.8	158	49.4

Source: Field Survey

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

4.3 Consumption during Different Meals of the Day

Consumption of millets by HHs during different meals of the day reveals that 44.1% HHs had consumed it in their breakfast, 29.7 % HHs had consumed it in their lunch, 3.1 % HHs had consumed in evening snacks and less than one per cent HHs (0.6%) had consumed in dinner, table 4.2. Further it was evident that nearly half of the surveyed HHs had not consumed millets during any of the meals of a day.

Table 4.2: Millets Consumption during different Meals of the Day

Food Pattern	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	No	%	No	%	No	%	No	%	No	%
Breakfast	31	38.8	42	52.5	31	38.8	37	46.3	141	44.1
Lunch	10	12.5	32	40.0	20	25.0	33	41.3	95	29.7
Evening Snacks	3	3.8	3	3.8	3	3.8	1	1.3	10	3.1
Dinner	0	0.0	0	0.0	0	0.0	2	2.5	2	0.6
Total Millets consuming HHs	34	42.5	50	62.5	37	46.2	41	51.3	162	50.6
Total Millets not consuming HHs	46	57.5	30	37.5	43	53.8	39	48.7	158	49.4

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, especially *mandia*, was found to be a staple food in Bolangir from time immemorial. People were consuming millets in several ways in the form of porridge, bread, cake, steamed and beverage among others. The details on consumption of millets recipes during the year 2017-18 are mentioned in Table 4.3.

Table 4.3: Distribution of HHs Consumed different Millet Recipes across blocks

Food Pattern	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	No	%	No	%	No	%	No	%	No	%
Jau	34	42.5	39	48.8	33	41.3	31	38.8	137	42.8
Pitha	27	33.8	42	52.5	32	40.0	31	38.8	132	41.3
Tampo	1	1.3	3	3.8	0	0.0	1	1.3	5	1.6
Mandia Torani	5	6.3	17	21.3	7	8.8	16	20.0	45	14.1
Handia	2	2.5	3	3.8	1	1.3	0	0.0	6	1.9
Kodo rice	0	0.0	6	7.5	1	1.3	3	3.8	10	3.1
Roti	0	0.0	1	1.3	3	3.8	7	8.8	11	3.4
Total Millets consuming HHs	34	42.5	50	62.5	37	46.2	41	51.3	162	50.6
Total Millets not consuming HHs	46	57.5	30	37.5	43	53.8	39	48.7	158	49.4

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.

Table 4.3 shows that 42.8 % HHs had consumed millets as porridge, locally called as *jau* which is popularly known in Odisha as *mandia jau* (finger millet porridge). Nearly two-fifths of the people (41.3%) had consumed millet in the form of *pitha* (pancake), which is another popular millet food recipe. *Tampo* is a semi liquid recipe prepared by adding sugar/jiggery, and grated coconut. Almost one percent (1.6%) had consumed millet in the form of *tampo* (a gruel recipe). *Mandia torani* (fermented *ragi*) is another type of millet food recipe. This recipe is prepared by adding water with the cooked finger millet that is kept

overnight or longer for fermentation. It has been a common food for nearly one-tenth (14.1%) of HHs. Only 1.9% of HHs had consumed millets in the form of *handia* (a form of beer). It is prepared by adding different types of herbs to the cooked *mandia* and kept for few days for fermentation. This recipe gives them physical and mental relaxation and people who do more physical work normally take this recipe. Another 3.1 % of HHs had consumed millets in the form of *Koda rice* and similar percentage of HHs (3.4%) consumed millets in the form of *roti* (ragi bread).

4.5 Conclusion

Millets were consumed across all seasons, but relatively more in summer. *Jau, Pitha* and *Mandia torani* were the recipes that are popular and millets were consumed more during breakfast and lunch. Around half of the surveyed HHs (50.6%) had consumed millets. The next chapter looks into processing and marketing of millets.

5
PROCESSING AND MARKETING

5.1 Introduction

This chapter looks into processing of millets by traditional manual methods and by machines, and the mode by which millets are sold. It also attempts to make an analysis of millets produced, consumed, sold and stored.

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. Traditionally, the burden of processing grains and the associated drudgery has largely been borne by women.

The distribution of surveyed HHs by method of processing (for dehusking and grinding) is as follows: 47.5% had processed millets manually, 24.7% had used machines and 27.8% reported the processing of millets by both manually and machines, Table 5.1. The Focus Group Discussion (FGD) indicates that inaccessible tribal villages, distance of processing units, unavailability of processing unit and less amount being required for HH consumption are some of the important contributory factors for greater proportion of HHs resorting to process manually.

Table 5.1: Distribution of HHs by different Method of Processing of Millets

Processing	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	No	%	No	%	No	%	No	%	No	%
Manually	20	62.5	16	32.0	18	48.6	23	53.5	77	47.5
Machine	1	3.1	16	32.0	11	29.7	12	27.9	40	24.7
Both	11	34.4	18	36.0	8	21.6	8	18.6	45	27.8
Total	32	100	50	100	37	100	43	100	162	100

Source: Field Survey

All of the HHs who processed millets by machine owned by others. It is evident that the HHs were depending on other pulverisers for the processing of millets and they were not having their own machines in among the surveyed HHs in the district.

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. Out of the total 136 HHs surveyed

who reported producing of millets during 2017-18 as mentioned in Chapter-3, 80(58.8%) HHs marketed their surplus. It was concluded from FGDs, as per their requirement they kept some for seed and rest consumed from whatever they produced. Out of 80 HHs who reported marketing of millets, 37.4% had sold millets in market, 60% to middle-man or local traders, 1.3 % to money landers, and another 1.3 % had sold to neighbours in the year 2017-18, Table 5.3.

Table 5.2: Distribution of HHs by mode of selling Millets across blocks

Selling point	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	No	%	No	%	No	%	No	%	No	%
Market	3	30.0	2	6.3	8	72.7	17	63.0	30	37.4
Middle-Man/Local Trader	6	60.0	29	90.6	3	27.3	10	37.0	48	60.0
Money lander	1	10.0	0	0.0	0	0.0	0	0.0	1	1.3
Neighbour sale	0	0.0	1	3.1	0	0.0	0	0.0	1	1.3
Total	10	100.0	32	100.0	11	100.0	27	100.0	80	100.0

Source: Field Survey

From the 80 HHs that reported marketing of millets, 53 of them sold it within a radius of 5 Kilometres, 17 HHs sold it within 6-10 Kilometres distance and 10 HHs sold it within 11-15 Kilometres distance.

Table 5.3: Distance to Selling Point

Distance (in Km)	Khaprakhol		Tureikela		Muribahal		Bangamunda		Total	
	No	%	No	%	No	%	No	%	No	%
0-5	6	60.0	21	65.6	8	72.7	18	66.7	53	66.3
6-10	4	40.0	1	3.1	3	27.3	9	33.3	17	21.3
11-15	0	0.0	10	31.3	0	0.0	0	0.0	10	12.5
Total	10	100.0	32	100.0	11	100.0	27	100.0	80	100.0

Source: Field Survey

5.4 Conclusion

During baseline survey, before implementation of Odisha Millets Mission, 47.5 per cent of the HHs processed their millets (particularly for dehusking and grinding) manually. From those who processed through machines, all of them used others pulverized. HHs sold their millets in multiple ways: market (37.5%), middle man/local trader (60%), sold to neighbour (1.3%), and moneylender (1.3%). More than three-fifth (66.3%) of farmers sold millets within a radius of 5 Km, around one-fifth (21.3%) sold within a distance of 6-10 Km and one-eighth (12.5%) sold within a radius of 11-15 Km.

MAJOR FINDINGS

6.1 Based on the socio-economic profile, it was found that the majority of the respondents are OSG (51.6%) in social group, Hindu (100%) by religion, poor (96.2%) by economic condition, and cultivators (100%) by economic activity.

6.2 Three types of millet crops viz, *Mandia or ragi*, *Suan*, and Kodo were cultivated in 2017-18 in an area of 57.8 ha with a production of 214.7 qtls such that the average production was 3.7 qtls/ha and the average production per millet cultivating HH was 1.6 qtls/HH.

6.3. From the total 57.8 ha area of millets, *Mandia*, *Suan*, and *Kodo* were cultivated in 39.4 ha, 17.5 ha, and 0.9 ha with a production of 135.9 qtls, 76.1 qtls, and 2.7 qtls respectively. The yield of *mandia* was 3.4 qtls/ha with an average of 1.1 qtls/HH. Likewise, the average production per hectare and average production per millet cultivating HHs for *Suan* and *Kodo* were 4.4 qtls/ha, 2.1 qtls/HH and 3 qtls/ha, 0.9 qtls/HH respectively.

6.4. It was evident that broadcasting and line sowing/line transplantation practices were adopted by the HHs for the cultivation of millets in 2017-18, the base year.

6.5. Millets were consumed more in summer seasons, less during monsoon. Different millet recipes were consumed more in breakfast and lunch of a day.

6.6 In the case of processing of millets, it was evident from the survey that all the HHs had processed millets using machines, manually and both. The HHs who had processed using machines they had used others pulverisers for the processing of millets. More than half of the millets produced (58.8%) was sold. 48 HHs (60%) had sold millets to the middlemen or local traders.

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.