

Mid Term Evaluation of “Special Programme for Promotion of Millets in Tribal Areas of Odisha” (Odisha Millets Mission, OMM) Phase-I Blocks

Malkangiri District



Submitted to-



**Nabakrushna Choudhury Centre
for Development Studies (NCDS)
(ICSSR Research Institute in Collaboration with Govt. of Odisha)
Bhubaneswar**

Submitted By-



Bhubaneswar

Study Team

Strategic Direction

Dr C R Das, OMM Coordinator, NCDS

Mr. Nitin Kumar Hota, Research Assistant, NCDS

Ms. Subhashree Lenka, Research Assistant, NCDS

Data Analysis & Preparation of Reports

Mr. Manas Ranjan Khuntia, Team Leader

Dr R K Panda, Consultant

Field Enumerators

Mr. Saroj Chandan

Mr. Bibhuti Ranjan Pal

Mr. Satya Mohan Sahu

Mr. Ranjan Kumar Mohapatro

Mr. Janmejay Sathua

Mr. Babaji Kumar Das

Mr. Prasant Kumar Sathua

Mr. Satya Narayan Rana

Data Entry

Mr. Manoj Pradhan

Mr. Debadutta Sahoo

Mr. Sonali Nayak

Ms. Diptimayee Muduli

Contents

Chapter-I: Introduction	5
1.1 Background	5
1.2 Increased Relevance of Millet Production and Consumption	5
1.3 Emphasis towards Millet Production in India	6
1.3.1 Intensive Millet Promotion (INSIMP)	7
1.3.2 National Mission for Sustainable Agriculture (NMSA)	7
1.3.3 Rainfed Area Development Programme (RADP)	7
1.4 Special Programme for Millets in Tribal Areas of Odisha	8
1.5 Programme Outreach in Malkangiri District	9
1.6 Terms of Reference of the Study	10
1.7 Objectives	11
1.8 Methodology	11
1.8.1 Study Approach	11
1.8.2 Sampling Process	12
1.8.3 Statistical Instruments	12
1.8.4 Study Period	12
Chapter-II: Project Area under First Phase Implementation of Odisha Millets Mission in Malkangiri District	13
2.1 Malkangiri District	13
2.2 Millet Production in Malkangiri District	14
2.5.2 Progress of Odisha Millet Mission in Malkangiri district	16
Concluding Remarks	16
Chapter-III: Socio Economic Characteristics of Millet Farmers of Malkangiri District	18
3.1 Sex Category	18
3.2 Social Category, Religion and Mean age of millet farmers	18
3.3 Mean Age	19
3.4 Educational Background	19
3.5 Religion	19
3.6 Farmer Category	20
3.7 House Structure	20
3.8 Household Structure	21
3.9 Year of joining into OMM	21
Concluding Remarks	22
Chapter-IV: Millet Production, Productivity and Package of Practices in the project area	23

4.1 Operational Land holding	23
4.2 Cropping Pattern	23
4.3 Crop Area	24
4.4 Package of Practices for Millet Production	25
4.4.1 Method of Cultivation	25
4.4.2 Agronomic Practices	26
4.5 No. of times weeding	26
4.6 Production Behaviour of Ragi in the district	27
4.7 Varieties of Ragi Cultivated	29
Concluding Remarks	29
Chapter-V: Assessment of Household Millet Consumption Pattern in the Project Area	31
5.1 Seasonality of Household Millet Consumption	31
5.2 Mean Consumption Pattern	31
5.3 Household Dependence on Market for Millets	32
5.4 Source for purchasing millets	33
Concluding Remarks	33
Chapter-VI: Processing and Marketing of millets in the Project Area	34
6.1 Primary Processing of Millets	34
6.2 Marketing of Millets	35
6.2.1 Marketing Channels for ragi	35
6.2.2 Marketing Channels for Suan	35
Concluding Remarks	36
Chapter-VII: SWOT Analysis on the Functioning of Odisha Millet Mission in the District	37
7.1 Strength of OMM	38
7.2 Weakness of OMM	42
7.3 Opportunities of OMM.....	44
7.4 Threat of OMM.....	46
Chapter-VIII: Key Findings and Way Forward	49
8.1 Key Findings	49
8.1.1 OMM outreach	49
8.1.2 Socio Economic Characteristics of Millet Farmers	49
8.1.3 Behaviour of Millet Production	49
8.1.4 Behaviour of Millet Consumption	50
8.1.5 Behaviour of Millet Processing and Marketing	50
8.2 Way Forward	51

ACKNOWLEDGEMENTS

Towards revival of millet production and consumption in the state, Odisha Millets Mission is one of the landmark projects currently being implemented by the Govt. of Odisha. We are very much thankful to NCDS, Bhubaneswar for entrusting the mid-term evaluation study of the first phase implementation of the project in twenty-nine blocks of seven tribal districts in the state. We are grateful to the Shri Manish Agarwal, IAS, Director, NCDS; Shri P K Kujur, OFS-1 (SB), Secretary, NCDS; Dr C R Das, SRO, NCDS; Mr Biswabas Patro, RO, NCDS for providing all types of official support for smoothly completing the study.

We also acknowledge all DAOs, AAOs, WASSAN State and District officers, Block level FAs in the OMM project area for providing us required information and support during the entire midline study process. Despite Covid-19 led health crisis, our investigators have been able to complete the field study sincerely and dedicatedly. We acknowledge their due cooperation for the timely completion of the study. The CBOs and CRPs of different FAs have provided good deal of support to the enumerators during field study. We are very much grateful to them for their support and cooperation. Last but not least, the millet farmers have spared some of their valuable time by participating in the household socio economic survey as undertaken for the mid-term evaluation study. We are highly grateful to the millet farmers.

Green India



Abbreviations

CBOs:	community-based organisations
CRPs:	Cluster Resource Persons
CSOs:	Civil Society Organisations
DAFP:	Directorate of Agriculture and Food Production
FAO:	Food and Agriculture Organisation
FAs:	Facilitating Agencies
FPC	Farmer Producer Company
FPO	Farmer Producer Organisations
GP:	Gram Panchayat
HSC:	High School Certificate
ICDP-CC:	Integrated Cereals Development Programmes in Coarse Cereals based Cropping Systems Areas
IFS:	Integrated Farming System
INSIMP:	Initiative for Nutritional Security through Intensive Millets Promotion
LS:	line sowing
LT:	line transplanting
MFP:	Minor Forest Produce
MGNREGS:	Mahatma Gandhi National Rural Employment Guarantee Scheme
MMA:	Macro Management of Agriculture
MT:	Metric Tonne
NAPCC:	National Action Plan on Climate Change
NCDS:	Nabakrushna Choudhury Centre for Development Studies
NMSA:	National Mission for Sustainable Agriculture
NPM:	Non-pesticide Pest Management
OMM:	Odisha Millets Mission
PCPDC:	Per Capita Per Day Consumption
PDS:	Public Distribution System
RADP:	Rainfed Area Development Programme
RKVY:	Rashtriya Krishi Vikas Yojana
SC:	Scheduled Caste
SMI:	systemic millets intensification
ST:	Scheduled Tribe
WASSAN:	Watershed Support Services and Activities Network

Chapter-I: Introduction

1.1 Background

History of millet is as old as the food history of human civilisation. There is evidence of millet cultivation in the Korean Peninsula dating back to the Middle Jeulmun Pottery Period (around 3,500–2,000BC). In India, millets have been mentioned in some of the oldest Yajurveda texts, identifying foxtail millet (*priyangava*), Barnyard millet (*aanava*) and black finger millet (*shyaamaka*), thus indicating that millet consumption for human food is as old as Indian Bronze Age (4,500BC).¹ It's mentioned in the Bible as one of the grains used to make bread. In ancient China, millet was one of five sacred grains and the Chinese believed that it was brought from the heavens by Houji or "Lord Millet," a culture hero worshiped as the founding ancestor of farming. In Europe, millet formed an important part of the daily diet during the Roman Empire, however lost relevance during Middle Ages in the name of inferior foods and poor men's foods.² Martin Jones, in his research work "Origin and Spread of Millets" notes that millets became common in North China heartland around 7500 years ago and later on these millets travelled from North China to Central Asia and Europe and South through Thailand to India through nomadic shepherds.³

Millet is an imprecise English term applied to a large number of smaller grained, largely tropical cereals that are often distantly related. Millets tend to be small-seeded cereals, i.e., distinct from wheat, barley, oats, rice, and maize. The most important types are pearl, finger, proso, and foxtail millets; other types of local significance include kodo, little, barnyard, and fonio millets, and teff.⁴ In India, different types of millets continued to be a significant part of adivasi / tribal communities' diets in different parts of the subcontinent until the large-scale promotion of wheat and paddy through the green revolution. Millets were the staple grains of large sections of the population that did not have access to assured irrigation for their lands.⁵ Considering the simple cultivation process of millets, most often millet cultivation is ridiculed as 'lazy farmer's crop' because the usual process of cultivation does not require much technical process and inputs for its fruitful harvest. Simply the seeds are broadcasted and harvested after three months. Similarly, there is also social stigma associated with millet consumption as poor man's food.

1.2 Increased Relevance of Millet Production and Consumption

Despite societal discouragement for millet production and consumption, millets are nutritionally superior food which contain rich micronutrients compared to rice and wheat. Millets are rich in minerals like iron, magnesium, phosphorous and potassium. Finger millet is the richest in calcium content, about 10 times that of rice or wheat. In this fashion, nutrient to nutrient, every single millet is extraordinarily superior to rice and wheat and therefore can be considered as the solution for the malnutrition that affects a vast majority of the Indian population.

¹ ICRISAT Official website

² <https://foodprint.org/real-food/millet/>

³ Jones, Martin (2016): " Food Globalisation in prehistory: The agrarian foundations of an interconnected continent", Journal of the British Academy, Vol-4, PP 73-87

⁴ M.I. Gomez, S.C. Gupta, in Encyclopedia of Food Sciences and Nutrition (Second Edition), 2003

⁵ <https://themillet.org/a-brief-history-of-millets/>

As per one report of the FAO, historically India is the largest global producer of millets. However, during last two decades, the importance of millet as food staples, has been declining in India owing to rising income of the people, growing urbanization, and government policies. More than 50.0% of the millet production is currently finding its way into alternative uses as opposed to its consumption only as a staple.⁶ In recent years, in Europe and North America, millets are gaining prominence as staple food owing to their gluten-free and hypoglycemic properties. As per the UN Food and Agriculture Organization's data, agriculture accounts for 70% of total water consumption among these sectors. It is highest for Asia and Africa where agriculture is in primary sector of economy. Among agricultural crops, rice and wheat are staple food in large parts of globe. However, these crops like paddy and wheat are water intensive and are unlikely to be sustainable, as freshwater resources are depleting around the globe. Millet grows easily in dry climate, have smaller harvesting period and require minimal water quantity. Millets could be a sustainable alternative to rice and wheat, as a new staple food. It can also help in providing food security to large population in the coming years. Given the nutritional value associated with millets and its climate resilient capacity there is growing emphasis on millets consumption as well as production. Despite decreased popularity of millets during past decades, continuation of millet cultivation is reemphasized in recent years owing to its historical versatility, resilience in difficult environments, nutritional properties and health benefits, long storage life and economic potential.⁷

1.3 Emphasis towards Millet Production in India

Nearly 60 percent of India's cultivated area is rain-fed, the damage caused by climate change is huge in the agriculture sector. In order to save the farmers from climate stresses, there is imperative need of promotion of climate smart agricultural practices among the farmers. Cultivation of millets is considered to be as one of the climate smart agricultural practices.⁸ In order to increase millet production in the country, Govt. of India has taken several initiatives under different policies formulated from time to time. The important policies in this regard include Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP) and Rainfed Area Development Programme (RADP) which are part of Rashtriya Krishi Vikas Yojana" (RKVY), and Integrated Cereals Development Programmes in Coarse Cereals based Cropping Systems Areas (ICDP-CC) under Macro Management of Agriculture (MMA). Besides, the National Mission for Sustainable Agriculture (NMSA) adopted by Department of Agriculture & Cooperation, Ministry of Agriculture Government of India in 2014, has the objective of enhancing agricultural productivity especially in rainfed areas focusing on integrated farming, water use efficiency, soil health management and synergizing resource conservation. The programme has a mandate of improving millet production in the country. NMSA derives its mandate from Sustainable Agriculture Mission which is one of the eight Missions outlined under National Action Plan on Climate Change (NAPCC). NMSA aims at promoting sustainable agriculture through a series of adaptation measures focusing on ten key dimensions encompassing Indian agriculture namely, 'Improved crop seeds, livestock and fish cultures', 'Water Use Efficiency', 'Pest Management', 'Improved Farm Practices',

⁶ Rao, P. P. and Basavaraj, G. (2015). Status and prospects of millet utilization in India and global scenario, Millets: Promotion for Food, Feed, Fodder, Nutritional and Environment Security, Proceedings of Global Consultation on Millets Promotion for Health & Nutritional Security. Society for Millets Research, ICAR, Indian Institute of Millets Research, Hyderabad, Pp. 197-209.

⁷ Apetrei, Cristina (2012), "Food Security and Millet Cultivation in the Kumaon Region of Uttarakhand", Research Report for Gene Campaign, August 2012.

⁸ Behera, Manoj. (2017). Assessment of the State of Millets Farming in India. MOJ Ecology & Environmental Science. 2.

‘Nutrient Management’, ‘Agricultural insurance’, ‘Credit support’, ‘Markets’, ‘Access to Information’ and ‘Livelihood diversification’.⁹

1.3.1 Intensive Millet Promotion (INSIMP)

The Central government launched the Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP) in 2011-12 to promote millets as “nutri-cereals”. The scheme aimed at increased production of millets in the country. The scheme proposed to bring 0.5 million hectares (ha) under millet cultivation. A key feature of INSIMP is giving input kits, comprising urea and pesticides; costing Rs 2,000-3,000 depending on the type of crop; and seed kits, comprising hybrid seeds to the farmers. These kits are supplied by nodal agencies in a state, and are, in turn, procured from various manufacturers. The other key aspects of the scheme such as the post-harvest handling of millets, involving establishment of processing and value-addition units were also taken into consideration. Composite millet processing centres, that handle de-stoning, de-hulling, flaking and rava- making, were planned to be established across millet producing areas in the country. The scheme has been implemented since Kharif 2011. As per the scheme provisions, Technology demonstrations in compact blocks were organized in selected districts for four categories of millets – Sorghum, Pearl millet, Finger millet and small millets. Technology demonstration kits of critical inputs of nutrients and plant protection measures comprising of micro-nutrients, fungicides and bio-fertilizers, DAP, urea, potash, and pesticides including weedicides at a total cost of Rs. 3,000/- per ha for sorghum, pearl millet and finger millet and Rs. 2,000/- per ha for small millets would be supplied to all the farmers in the units. These kits would be supplied free of cost to the beneficiary farmers subject to maximum area of 2 hectare.

1.3.2 National Mission for Sustainable Agriculture (NMSA)

National Mission for Sustainable Agriculture (NMSA) has been formulated for enhancing agricultural productivity especially in rainfed areas focusing on integrated farming, water use efficiency, soil health management and synergizing resource conservation.

1.3.3 Rainfed Area Development Programme (RADP)

RADP put forward a holistic approach to rainfed area development through the promotion of rainfed farming systems and by focusing on the needs of small and marginal farmers through integrated farming practices, assistance to farmers in improving the productivity of existing cropping patterns and in diversifying production. Support to millets was only one component amongst its programme components. Similarly, millets through MMA under ICDP-CC being a sub-category had limited reach. As a part of the Rashtriya Krishi Vikas Yojana (RKVY), RADP aims at Developing and identifying new areas receiving adequate rainfall for millet farming. Implementation of RADP has been taken up since 2014-15. Rainfed Area Development Programme (RADP) is one of the four components of National Mission for Sustainable Agriculture (NMSA). RADP involves an area-based approach for development and conservation of natural resources along with appropriate integrated farming system. It explores potential utilization of natural assets created / available through Watershed Development and Soil conservation activities under MGNREGS/NWDPR / RVP /RKVY /IWMP etc. It aims at promoting Integrated Farming System (IFS) with emphasis on multi cropping, rotational cropping, inter cropping, mix cropping practices and allied activities of Horticulture, Livestock, Fishery, Forestry, Apiculture,

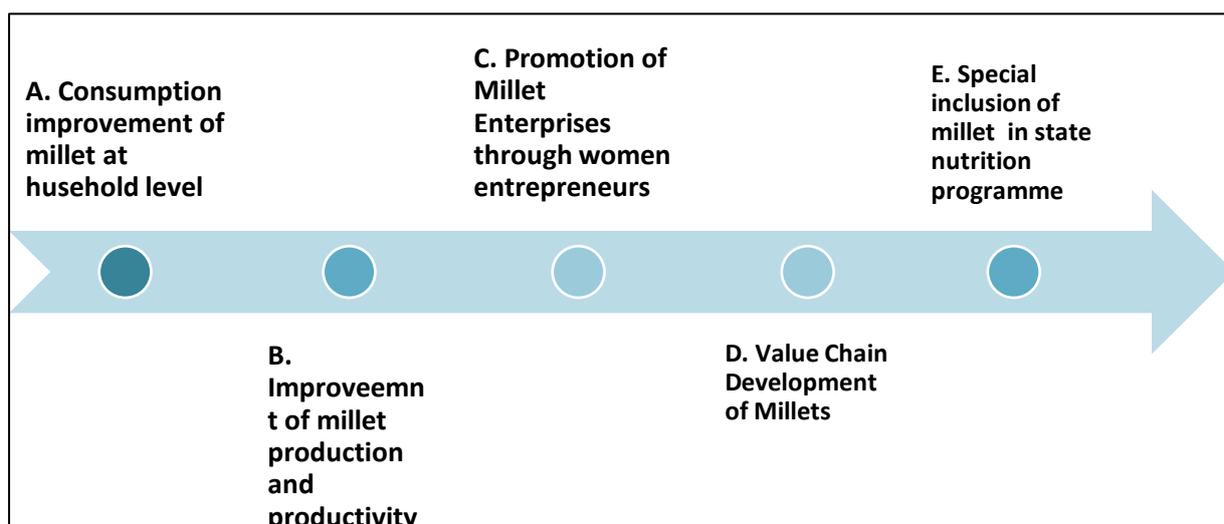
⁹ Department of Agriculture & Cooperation, (2014), “National Mission for Sustainable Agriculture (NMSA): Operational Guidelines”, Ministry of Agriculture, Government of India

Mushroom etc which enable the farmers in not only maximizing farm production for sustainable livelihood, but also to mitigate the impact of drought, flood, and other extreme weather events.

1.4 Special Programme for Millets in Tribal Areas of Odisha

Special Programme for millets in tribal areas otherwise called Odisha Millet Mission (OMM) evolved in 2017, after a state level consultation organized by Planning and Convergence Department, Govt. of Odisha on the subject “Comprehensive Revival of Millets in Tribal areas of Odisha” to secure Nutrition Security and mitigate drought in South Odisha held at Nabakrushna Choudhury Centre for Development Studies on 27th January 2016. 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. The date of signing of the contract was treated retrospectively as the start date of programme implementation. The programme period spans over a five-year time from 2017 to 2022. The first three years of programme period constituted to be programme implementation phase and the subsequent two years comprise of consolidation, expansion, and institutionalisation. As per the Programme Guidelines¹⁰, the key project objectives include increased household consumption of millets by around 25 percent, enhancement of household nutrition security and to create demand for millets with special focus on women and children.

The programme also aims at promoting millet processing enterprises at GP and block level to ensure household access for easy processing and value-added millets and millet products. Improvement of millet productivity, profitability from millet cultivation, development of millet-based enterprises with market led value chain activities, promotion of women entrepreneurs for millet-based activities, inclusion of millet in state nutrition programme including public distribution programme are the added objectives for which the special programme on millets is implemented in the state.



¹⁰ National Food Security Mission Cell, Directorate of Agriculture and Food Production, Govt. of Odisha, Guidelines for Implementation of “Special Programme for Millets in Tribal Areas of Odisha”, Letter No-40856, dated 25.11.2016.

Selected blocks within the districts covered under OMM are assigned to civil society organisations (CSOs), which are called as the facilitating agencies (FAs) of the programme. Mainly the NGOs are involved as the facilitating agencies at Block level. The FAs are very much involved in the last-mile delivery and adoption of OMM. Towards overall implementation of the programme, the government collaborates with CSOs and community-based organisations (CBOs) and seeks advice from external agencies on technical aspects and programme implementation. The programme focusses on training millet farmers to follow improved practices of systemic millets intensification (SMI), line sowing (LS), and line transplanting (LT). Farmers who adopt the improved methods receive a cash transfer directly to their bank accounts, upon successful verification. This is to note that SMI is the application of the principles of systemic rice intensification (SRI) on millets, whereby young seedlings are planted in a specific square pattern. It also involves maintaining a certain level of soil condition over the growing period. Line sowing is a method of sowing seeds directly on the field in the form of a line and maintaining precise spacing. Line transplanting involves transplanting a young sapling raised in a nursery, in the form of lines with specific spacing.¹¹ The programme also supports farmers in adopting improved crop management practices such as weeding, rolling, crop-cutting, and non-pesticide pest management (NPM). This is done via traditional agricultural extension models, using field demonstrations and trainings by the CSOs in collaboration with CBOs such as farmer producer groups, and women’s collectives.

1.5 Programme Outreach in Malkangiri District

During first phase programme intervention of OMM, 4323.08 hectares of land in four blocks covering Chitrakonda, Khairaput, Korukunda and Mathili are taken up for ragi cultivation. Out of the total land area taken up for ragi cultivation, the percentage share of Chitrakonda, Khairaput, Korukunda and Mathili are 26.6, 25.6, 22.0 and 25.9 percent respectively. Out of overall land area taken up in the state, percentage share of Malkangiri district is 19.6 percent.

Table –1.2: Coverage of Ragi under first phase OMM Project Intervention

Sl.	Blocks	Land area taken up for ragi cultivation by Districts, blocks and crop years (in Hectares)				% Share of the block in district total	% Share of the district in state total
		2017-18	2018-19	2019-20	All Years		
1	Chitrakonda	161.87	390	596.16	1148.03	26.6	19.6
2	Khairaput	124.44	280.88	700.48	1105.8	25.6	
3	Korukonda	169.97	354.4	426	950.37	22.0	
4	Mathili	231.28	273.2	614.4	1118.88	25.9	
	Sub total	687.56	1298.48	2337.04	4323.08	100.0	
	Grand Total	3161.03	7625.93	11288.8	22075.8		100.0

Source: Computed from WASSAN Official data

With respect to non ragi millets during first phase intervention of OMM, Malkangiri district accounts only 2 percent of the total land area for non ragi millets cultivation for the entire OMM area of the state.

¹¹ Basu, Subhodeep et. al. (2021), “Addressing the nutrition crisis: Reflections from Odisha Millets Mission”, Ideas for India, <https://www.ideasforindia.in/topics/agriculture/addressing-the-nutrition-crisis-reflections-from-odisha-millet-mission.html>

Within the district, Chitrakonda block only accounts about 98.99 percent. This implies that non ragi millet cultivation is practiced by good chunk of millet farmers of Chitrakonda block only.

Table- 1.3: Coverage of Non ragi Millets under first phase OMM Project Intervention (land Area in Hectares)

Sl.	Blocks	Land area taken up for non-ragi millet cultivation by Districts, blocks and crop years (in Hectares)				% Share of the block in district total	% Share of the district in state total
		2017-18	2018-19	2019-20	All Years		
1	Chitrakonda	0	14	64.31	78.31	98.99	2.0
2	Khairaput	0	0	0.8	0.8	1.01	
3	Korukonda	0	0	0	0	0.00	
4	Mathili	0	0	0	0	0.00	
	Sub total	0	14	65.11	79.11	100.00	
	All districts	114.45	1880.8	1873.71	3868.96		100.0

Source: Computed from WASSAN Official data

Out of the total millet farmers registered in the overall OMM area of the state, percentage share of Malkangiri district is about 15.0 percent. There were 9467 millet farmers registered under first phase OMM in Malkangiri district and percentage share of registered farmers in Chitrakonda, Khairaput, Korukonda and Mathili are found at 30.5, 25.6, 18.5 and 25.4 percent respectively.

Table-1.4: Farmer Outreach under first phase intervention OMM

Sl.	Blocks	Number of farmers covered under first phase OMM by districts, blocks and crop years (No. of farmers)				% Share of the block in district total	% Share of the district in state total
		2017-18	2018-19	2019-20	All Years		
1	Chitrakonda	377	902	1610	2889	30.5	15.0
2	Khairaput	303	640	1479	2422	25.6	
3	Korukonda	375	647	727	1749	18.5	
4	Mathili	506	621	1280	2407	25.4	
	Sub total	1561	2810	5096	9467	100.0	
	All districts	8636	21972	32394	63002		100.0

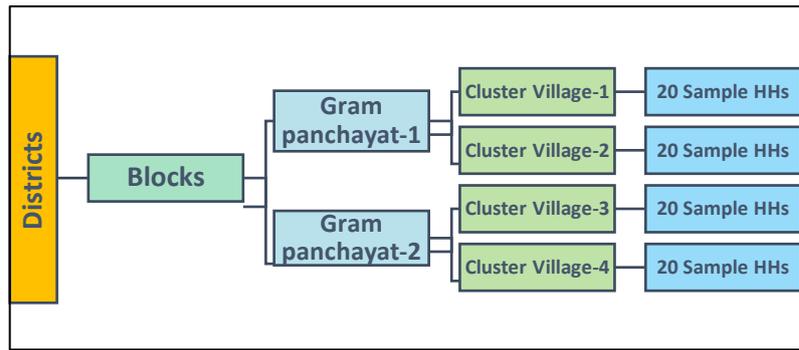
Source: Computed from WASSAN Official data

1.6 Terms of Reference of the Study

Naba krushna Choudhury Centre for Development Studies (NCDS), Bhubaneswar has commissioned the mid-term evaluation study of Odisha Millet Mission covered under first phase implementation in 29 blocks except Chandrapur block in Rayagada district. Resultingly, the study covers all the 29 blocks of seven districts through a sample-based household survey of the millet farmers covered under OMM. In order to strengthen evidence-based decision making in further project implementation, the study is to compare the findings of the mid-term evaluation study with corresponding baseline findings so as to understand the changes taking place at farmers' household level as a result of OMM intervention. In this background, the objectives stipulated in the baseline study remains valid for the mid-term evaluation study.

1.7 Objectives

- To assess the socio-economic condition of Millet HHs in the project area.
- To outline the millet production Productivity and Package of Practices in the project area.
- To assess the consumption pattern of millets among the households in the project area.
- To examine the method of processing and mode of Marketing of millets produced by the farmers.



1.8 Methodology

1.8.1 Study Approach

The midterm evaluation study is carried out with the objective of assessing the performance of OMM implementation on the basis of selected output and outcome and impact indicators as framed in the project log-frame as formulated under the project. The indicators at the district and block level are well aligned to gather consolidated evidence at the state level. The assessment of output and outcome and impact indicators entails the approach of impact pathway of project intervention under different project components. The four major components of OMM intervention comprises increased millet production through enhancing millet area and adaption of improved package of practices by millet farmers, increased millet consumption at household level, improved practices of millet processing and improved millet marketing in the project area. These are collectively levelled as four pillars of OMM's intervention in the project area. This is to mention that the evaluation is carried out to measure the current values of those baseline indicators and to examine the pattern of changes taking place due to OMM intervention in the project area. The horizontal differences in the values of baseline indicators and midline indicators either positive or negative are treated as the outcome and impact of OMM intervention in the project areas.



1.8.2 Sampling Process

The Mid-Term Survey is conducted in all of 29 blocks of Seven Districts covered under the first phase implementation of OMM. The household samples at each of the block were selected on the basis of three stage sampling process involving GP selection process in the first stage, Village selection process in the second stage and ultimately household selection process in the third stage. For each of the intervention block, by looking at the list of programme GPs, two GPs located in a cluster were identified in the first stage. From each of the selected GP, two programme villages located in a cluster were identified in the second stage. Thus, for each block the study ultimately covered four villages. From each of the selected village in a block, ultimately 20 households were randomly chosen from the list farmers registered under OMM. In this process, about 80 households (millet farmers registered under OMM) were covered for each of the selected block and accordingly the overall household sample size stands at 2325 for all districts. Apart from household coverage, one Facilitating Agency in each Block, Community Resource Persons, CRPs/CBOs/ District Coordinators of WASSAN/ Key Informants were also covered. The Sample design of the study is as per table 1.5.

Table-1.5: Sample Design

Sl.	Districts	Blocks	Gram Panchayats	Villages	No. of households covered in the study
1	Malkangiri	Chittrakonda	Doraguda, Nuaguda	Bhursundiguda & Doraguda Nuagada & Purunapani	80
2		Khairput	Govindapali, Khairput	Govindapali, & Mundaguda Bayaguda & Kudaguda	80
3		Korakunda	Dudamenta, Portel	Balakati & Kayaguda Chhitapari & Shiraguda	80
4		Mathili	Dalapatiguda, Dhungiaput	Daiguda & Dalapatiguda, Durkajodi & Dhungiaput	80
				Sub total	320

1.8.3 Statistical Instruments

- Household Questionnaire for Millet Farmers
- Format for Facilitating Agency
- Format for CRP/ CBO/ District Coordinator (WASSAN)
- KII Check list
- FGD Discussion Points

1.8.4 Study Period

The field work pertaining to the study was undertaken simultaneously in all of the project districts by deploying separate study teams for each of the district during the period 1st June 2021 to 30th June 2021.

Chapter-II: Project Area under First Phase Implementation of Odisha Millets Mission in Malkangiri District

The first phase implementation of Odisha Millet Mission was started in seven southern Odisha districts Gajapati, Kalahandi, Kandhamal, Koraput, Malkangiri, Nuapada and Rayagada. A brief statistical profile by major socio-economic indicators of the district is outlined in this chapter. The pattern of millet production in these districts are also highlighted. With the intension of providing a perspective to the ongoing study, the first phase intervention in terms of coverage of GPs, villages, number of farmers and area put for all types of millet cultivation under all types of agronomic practices are also highlighted in this chapter.

2.1 Malkangiri District

Malkangiri District is named after its headquarters town, Malkangiri. During formation of Odisha Province in 1936, Malkangiri was a 'Taluk' of Nabrangpur subdivision of Koraput District of Odisha. In 1962 it was upgraded to a subdivision of Koraput District. The present Malkangiri got its identity as an independent district due to reorganization of districts of Odisha as per a notification on 1st October, 1992 and with effect from 2nd October 1992. Covering an area of 5,791 sq. kms.

The district lies between 17 degree 45'N to 18 degree 40'N latitudes and 81 degree 10' E to 82 degree E longitude. This District is sparsely populated with not much of a difference between the numbers of males and females. Almost the whole of the district is a vast dense jungle, with a very small percentage of the population residing in the urban areas. The district is divided into two distinct physical divisions. The eastern part is covered with steep ghats, plateaus and valleys, sparsely inhabited by primitive tribes, notable among who are Bondas, Koyas, Porajas and Didayis. The district is moderately literate, with the number of literate males far out numbering the number of literate females. The climate in the district is generally cold during winter and hot in summer with temperature ranging from 13 degree C to 47-degree C. The average annual rainfall is about 1700 mm. Relative humidity is generally high, especially in the monsoon and post-monsoon months. During the rainy season, most areas of the district become impassably swampy and heavy floods isolate it from the outer world. This district lies within the malaria prone belt. It is bounded by the Chhattisgarh State in North, Andhra Pradesh in South, Chhattisgarh in the East and Koraput district in the west. A brief socio-economic outline of the district is presented in table 2.21.

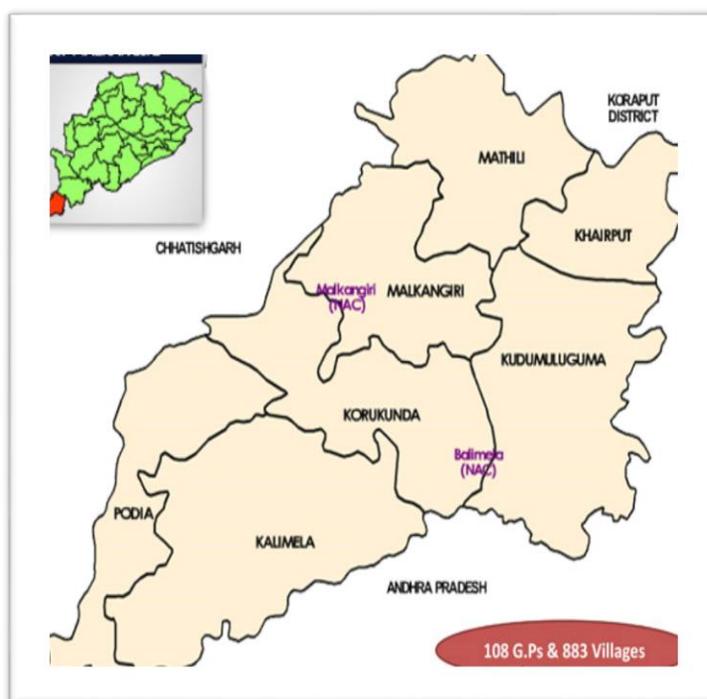


Table 2.1: Brief Statistical Profile of Malkangiri District

Sl.	Particulars	Value	Sl.	Particulars	Value
1	Population (In Lakh)	6.1	18	Land Use Pattern (Area in '000 ha), 2014-15*	
2	Male (In Lakh)	3.0		Forest	155.5
3	Female (In Lakh)	3.1		Land put to Non-agricultural use	24.9
4	Scheduled Caste (In Lakh)	1.4		Barren and Non-Cultivable Land	51.2
5	Scheduled Tribe (In Lakh)	3.5		Permanent Pasture and Other Agricultural Land	22.7
6	Household (HH) (In Lakh)	1.4		Net Area Sown	12.5
7	Average HH Size	4.5		Cultivable Waste Land	5.2
8	Sex Ratio	1020		Old Fallow	15.3
9	Total Worker (in Lakh)	3.1		Current Fallows	23.1
10	Main Worker (in Lakh)	1.8		Miscellaneous Trees and Groves	0.6
11	Marginal Worker (in Lakh)	1.3	19	Agriculture, 2014-15*	
12	Non-Worker (in Lakh)	3.0		Average Fertilizer Consumption (kg/ha)	32.9
13	Work Participation Rate (WPR, %)	50.7		Avg. Size of Operational Holding per HH (In Nos.)	1.3
14	Literacy Rate (%)	48.5		Irrigated Area (In '000 Hectares)	127.2
15	No. of BPL families (In Nos.)	78076	20	No. of villages electrified (In Nos.)	234
16	No. of Job Cards Issued (In Nos.)	100882	21	No. of banks (In Nos.)	07
17	HH provided employment of demand, MGNREGS, cumulative 2014-15	41341	22	No. of AWCs (In Nos.)	1020

Source: District Statistical Handbook, Malkangiri, 2015 and *District at a Glance-2016

2.2 Millet Production in Malkangiri District

Millet area of Malkangiri district as a percentage to state level millet area is separately shown by ragi area and small millet area. The ragi area of the district, was 4.23 percent of the state area in 2000 which has increased to 5.36 percent in 2010s. On the other hand, small millet area as a proportion to the overall small millet area of the state has declined from 3.15 percent in 2000s to 2.10 percent in 2010s. However, there is very negligible fall in the ragi area of the district in 2010s compared to 2000s. As it is revealed from table 2.22, there is 0.63 percent fall in the ragi area of the district compared to a sizable fall at the state level. This implies there is low level of shifting of ragi crop to other crops in the district. However, in the case of small millets, there is sizable fall in the area under small millet cultivation in 2010s compared to 2000s. The area under small millets cultivation in 2010s compared to 2000s, is reduced by 39.76 percent which is only 9.61 percent fall at the state level. This indicates that there is massive crop shifting by farmers from small millets to other crops in Malkangiri district during last two decades.

Table-2.2: Area under ragi and small millets cultivation in Malkangiri district compared to All Odisha

Sl.	Regions	Decadal variation in the land area under annual ragi and Small Millets cultivation in Malkangiri district compared to all Odisha (Land area in 000 hectares)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Malkangiri	7.99	7.94	-0.63	0.83	0.50	-39.76
2	All Odisha	189.07	148.05	-21.70	26.33	23.80	-9.61
	Malkangiri district as % to All Odisha	4.23	5.36		3.15	2.10	

Source: Computed from compiled data base from Odisha Agricultural statistics (2000-01 to 2017-18), Directorate of Agriculture and Food Production, Govt. of Odisha

As per table 2.23, the yield rate of ragi in Malkangiri district tends to marginally decrease by 1.60 percent during 2010s compared to 2000s. During the corresponding period, at state level it has increased by 12.83 percent. The yield index of ragi in Malkangiri district in comparison to state level performance of the same depicts lower status of the district in terms yield rate of ragi during both the decades. On the other hand, in the case of small millets, there is almost similarity in the yield index in both the decades. Similarly, the decadal variation in yield rate for the district as well as state is almost found similar.

Table-2.3: Yield Rate of ragi and small millets in Malkangiri district compared to All Odisha

Sl.	Regions	Decadal Variation in average annual yield Rate of ragi and small millets in Malkangiri district compared to all Odisha (Yield Rate in Kg/ Hectare)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Malkangiri	643.78	633.50	-1.60	401.33	446.13	11.16
2	All Odisha	791.20	892.70	12.83	453.60	505.00	11.33
	Yield index of the district (All Odisha = 100)	81.37	70.96		88.48	88.34	

Source: Computed from compiled data base from Odisha Agricultural statistics (2000-01 to 2017-18), Directorate of Agriculture and Food Production, Govt. of Odisha

The average annual production of ragi and small millets in Malakngiri district compared to all Odisha is separately analyses for 2000s and 2010s in table 2.24. It is revealed that the decadal variation in ragi production in the district as well as the state is negative. However, the percentage fall in 2010s compared to 2000s in the district stands much lower compared to all Odisha level. Percentage share of the district in the total ragi production of the district stood at 3.40 percent in 2000s which has slightly increased to 3.84 percent in 2010s. In the case of production volume of small millets, there is 33.33 percent average annual fall in 2010s compared to 2000s in the district which is much lower at state level during the corresponding period.

Table-2.4: Ragi and small millets production in Malkangiri district compared to All Odisha

Sl.	Regions	Decadal Variation in Volume of Ragi and small millets Production in Malkangiri district compared to All Odisha (Production in 000 MT/ Hectare)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Malkangiri	5.08	5.04	-0.79	0.33	0.22	-33.33
2	All Odisha	149.39	131.19	-12.18	11.71	12.07	3.07
	Malkangiri district as % to All Odisha	3.40	3.84		2.82	1.82	

Source: Computed from compiled data base from Odisha Agricultural statistics (2000-01 to 2017-18), Directorate of Agriculture and Food Production, Govt. of Odisha

2.5.2 Progress of Odisha Millet Mission in Malkangiri district

By the end of Kharif 2019-20, OMM has covered four blocks in Malkangiri district. Cumulatively, in all these blocks, there is outreach of OMM in 61 GPs, 579 villages, 9351 farmers and 5993.27 hectares of land area under millet cultivation. The details of progress of OMM in Malkangiri district is shown in the table 2.25 given ahead.

Table- 2.25: Progress of Odisha Millet Mission in Malkangiri District

Sl.	Time Period	Coverage of OMM in Malkangiri district				
		Blocks	No. of GPs	No. of Villages/ Hamlets	No. of farmers	Land Area (Hectares)
1	Kharif 2017-18	Korkunda			375	168.00
		Khairput		7	187	212.50
		Mathili	4	26	506	570.50
		Chitrakunda	6	45	377	395.50
		Sub Total	10	78	1445	1346.50
2	Kharif 2018-19	Korkunda	6	35	621	273.20
		Khairput	7	45	647	374.40
		Mathili	6	72	902	395.20
		Chitrakunda	4	40	640	280.48
		Sub Total	23	192	2810	1323.28
3	Kharif 2019-20	Korkunda	8	61	727	426.00
		Khairput	5	80	1479	701.28
		Mathili	8	75	1280	1536.00
		Chitrakunda	7	93	1610	660.21
		Sub Total	28	309	5096	3323.49
	Total	61	579	9351	5993.27	

Source: Compiled from the Tracking Sheets of State Odisha Millet Mission

Concluding Remarks

The ragi area of the district, was 4.23 percent of the state area in 2000 which has increased to 5.36 percent in 2010s. On the other hand, small millet area as a proportion to the overall small millet area of the state has declined from 3.15 percent in 2000s to 2.10 percent in 2010s. However, there is very negligible fall in the ragi area of the district in 2010s compared to 2000s. As it is revealed from table

2.22, there is 0.63 percent fall in the ragi area of the district compared to a sizable fall at the state level. This implies there is low level of shifting of ragi crop to other crops in the district. However, in the case of small millets, there is sizable fall in the area under small millet cultivation in 2010s compared to 2000s. The area under small millets cultivation in 2010s compared to 2000s, is reduced by 39.76 percent which is only 9.61 percent fall at the state level. The yield rate of ragi in Malkangiri district tends to marginally decrease by 1.60 percent during 2010s compared to 2000s. During the corresponding period, at state level it has increased by 12.83 percent. The yield index of ragi in Malkangiri district in comparison to state level performance of the same depicts lower status of the district in terms yield rate of ragi during both the decades. On the other hand, in the case of small millets, there is almost similarity in the yield index in both the decades. the decadal variation in ragi production in the district as well as the state is negative. However, the percentage fall in 2010s compared to 2000s in the district stands much lower compared to all Odisha level. By the end of Kharif 2019-20, OMM has covered four blocks in Malkangiri district. Cumulatively, in all these blocks, there is outreach of OMM in 61 GPs, 579 villages, 9351 farmers and 5993.27 hectares of land area under millet cultivation.



Chapter-III: Socio Economic Characteristics of Millet Farmers of Malkangiri District

The farmer households supported under OMM for undertaking millet production in their lands is defined as millet households in the ongoing study. The study covers a sample of 320 millet households spread across four blocks Chitrakonda, Khairaput, Korakunda and Mathili blocks in Malakangiri district. Details of the sample coverage is already discussed in the previous chapter. The socio-economic conditions of the millet farmers' households based on selected socio-economic characteristics is analysed in this chapter.

3.1 Sex Category

Millet farmers classified based on sex category as male and millet farmers reveals that majority of registered millet farmers are male farmers. Overall, about 76.9 percent of millet farmers of Malkangiri district are males and the remaining 23.1 percent are females. Incidence of female millet farmers is comparatively higher at Korakunda and Chitrakonda blocks in relation to Khairaput and Mathili blocks.

Table- 3.1: No. of Farmers by sex category

Sl.	Blocks	Number of farmers by sex category (%)					
		Males	%	Females	%	Total	%
1	Chitrakonda	58	72.5	22	27.5	80	100.0
2	Khairaput	68	85.0	12	15.0	80	100.0
3	Korakunda	56	70.0	24	30.0	80	100.0
4	Mathili	64	80.0	16	20.0	80	100.0
	All Blocks	246	76.9	74	23.1	320	100.0

3.2 Social Category, Religion and Mean age of millet farmers

Classification of millet farmers based on social category reveals that majority of millet farmers, overall, to the extent of 84.7 percent are Scheduled Tribes (STs) followed by other castes (13.1%) and the remaining 2.2 percent are SCs. More than 90 percent of millet farmers of Chitrakonda and Korakunda blocks are from ST background.

Table- 3.2: No. of Farmers by social category

Sl.	Blocks	Number of millet farmers by social category (%)			
		SC	ST	OC	Total
1	Chitrakonda	6	73	1	80
2	Khairaput		63	17	80
3	Korakunda		74	6	80
4	Mathili	1	61	18	80
	All Blocks	7	271	42	320
		% of millet farmers			
1	Chitrakonda	7.5	91.3	1.3	100.0
2	Khairaput	0.0	78.8	21.3	100.0
3	Korakunda	0.0	92.5	7.5	100.0
4	Mathili	1.3	76.3	22.5	100.0
	All Blocks	2.2	84.7	13.1	100.0

3.3 Mean Age

The mean age of millet farmers is overall found at 41.8 years which is found on the higher side among the SC farmers. The mean age of millet farmers of SC, ST and OC category farmers is calculated at 50.6 years, 42.1 years and 38.8 years respectively. Regardless social category, the mean age of millet farmers of Chitrakonda block is comparatively higher at Chitrakonda block.

Table 1.3: Mean age of farmers by social category

Sl.	Blocks	Mean Age of millet farmers			
		SC	ST	OC	Total
1	Chitrakonda	49.8	44.6	38.0	44.9
2	Khairaput		41.6	41.9	41.6
3	Korakunda		40.1	37.0	39.9
4	Mathili	55.0	42.0	36.4	40.9
	All Blocks	50.6	42.1	38.8	41.8
		Standard deviation in the mean age			
1	Chitrakonda	10.8	13.5		13.2
2	Khairaput		11.4	11.3	11.3
3	Korakunda		10.3	8.9	10.2
4	Mathili		12.2	6.4	11.4
	All Blocks	10.0	12.0	9.1	11.7

3.4 Educational Background

The educational background of millet farmers as indicated in table 3.4 reveals that majority of millet farmers of Malkangiri district are illiterates followed primary level of education. In percentage terms, out of the total registered millet farmers, as high as 59.7 percent are illiterates followed by primary level (16.9%), upto HSC standard (12.2%), upper primary (9.1%) and above HSC (2.2%).

Table-3.4: Farmers' educational level

Sl.	Blocks	Number of millet farmers					Total
		Illiterate	Primary	Upper Primary	Upto HSC	Above HSC	
1	Chitrakonda	58	10	7	2	3	80
2	Khairaput	38	20	7	15		80
3	Korakunda	51	14	3	10	2	80
4	Mathili	44	10	12	12	2	80
	All Blocks	191	54	29	39	7	320
		% Of millet farmers					
1	Chitrakonda	72.5	12.5	8.8	2.5	3.8	100.0
2	Khairaput	47.5	25.0	8.8	18.8	0.0	100.0
3	Korakunda	63.8	17.5	3.8	12.5	2.5	100.0
4	Mathili	55.0	12.5	15.0	15.0	2.5	100.0
	All Blocks	59.7	16.9	9.1	12.2	2.2	100.0

3.5 Religion

Household religion of millet farmers as shown in the following table, significant majority of farmers are Hindus by religion and other religions are almost negligible.

Table-3.5: Household religion of millet farmers

Sl.	Blocks	No. of millet farmers by religion							
		Hindu	%	Christianity	%	Muslims	%	Total	%
1	Chittrakonda	79	98.8	1	1.3		0.0	80	100.0
2	Khairaput	80	100.0		0.0		0.0	80	100.0
3	Korakunda	79	98.8	1	1.3		0.0	80	100.0
4	Mathili	79	98.8		0.0	1	1.3	80	100.0
	All Blocks	317	99.1	2	0.6	1	0.3	320	100.0

3.6 Farmer Category

On the basis of amount of land holdings farmers are categorised under marginal farmers (MFs), small farmers (SFs), medium farmers and large farmers. As per table 3.6, it is found that majority of millet farmers of the district are small farmers followed by medium farmers. The proportionate share of small farmers, medium farmers, marginal farmers and large farmers are found at 56.6, 33.8, 6.3 and 3.4 percent respectively. The pattern is similarly noticed in all of the blocks covered under OMM. Compared to Chittrakonda and Khairaput blocks, incidence of medium farmer category is relatively higher at Korakunda and Mathili blocks. The analysis suggests that millet farmers of the district are basically medium and large farmers.

Table-3.6: Farmer Category of millet farmers

Sl.	Blocks	No. of farmers				
		MF	SF	Med. Farmers	Large Farmers	Total
1	Chittrakonda	16	45	17	2	80
2	Khairaput		63	16	1	80
3	Korakunda	1	35	37	7	80
4	Mathili	3	38	38	1	80
	All Blocks	20	181	108	11	320
		% Of farmers				
1	Chittrakonda	20.0	56.3	21.3	2.5	100.0
2	Khairaput	0.0	78.8	20.0	1.3	100.0
3	Korakunda	1.3	43.8	46.3	8.8	100.0
4	Mathili	3.8	47.5	47.5	1.3	100.0
	All Blocks	6.3	56.6	33.8	3.4	100.0

3.7 House Structure

The housing structure of millet farmers as analysed in table 3.5 reveals that overall, marginally higher proportion of millet farmers of the district have Kuchha houses followed by semi pucca houses and pucca houses. The incidence of pucca houses is found with more proportion of millet farmers' households of Khairaput block followed by Korakunda block. Majority of millet households of Chittrakonda block have Kuchha houses.

Table-3.7: House Structure of millet farmers

Sl.	Blocks	No. of farmers by house structure			
		Pucca	Semi Pucca	Kutchra	Total
1	Chitrakonda	3	44	33	80
2	Khairaput	13	27	40	80
3	Korakunda	10	21	49	80
4	Mathili	8	28	44	80
	All Blocks	34	120	166	320
		% Of farmers			
1	Chitrakonda	3.8	55.0	41.3	100.0
2	Khairaput	16.3	33.8	50.0	100.0
3	Korakunda	12.5	26.3	61.3	100.0
4	Mathili	10.0	35.0	55.0	100.0
	All Blocks	10.6	37.5	51.9	100.0

3.8 Household Structure

A household structure comprises of male as well as female members. As it can be seen from table 3.8, overall, there are 2.5 male and 2.5 female members per each millet farmers' household in the district. The average family size is found at 5.0 persons. The average family size at Chitrakonda, Khairaput, Korakunda and Mathili blocks are found at 4.6, 4.9, 5.0, and 5.4 respectively. The overall sex ratio among the millet households of the district is found balanced. Compared to all blocks, the sex ratio at Khairaput block stands very much advantageous in favour of females.

Table-3.8: Household Size by Average male and female numbers

Sl.	Blocks	Average Household Size			Number of females per 1000 males
		Males	Females	Total	
1	Chitrakonda	2.3	2.3	4.6	1000
2	Khairaput	2.4	2.5	4.9	1042
3	Korakunda	2.5	2.5	5.0	1000
4	Mathili	2.7	2.7	5.4	1000
	All Blocks	2.5	2.5	5.0	1000

3.9 Year of joining into OMM

In order to avail the benefits of OMM project intervention, the farmers in the programme area are required to register themselves with OMM. The sampled-out farmers covered in the study have joined into OMM since 2017-18. As it is evident from table 3.9, overall 85.9 percent of the farmers have joined into OMM in 2017-18 year, followed by 10.3 percent in 2018-19 and the remaining 3.8 percent in 2019-20. Except Chitrakonda block more than 80 percent of sampled out millet farmers had joined into OMM in the initial year of first phase OMM implemented in the district. In Chitrakonda block about 65 percent of millet farmers had joined into the OMM programme in the year 2017-18 and another good chunk of them, about 30 percent had joined in the year 2018-19.

Table 3.9: Year of joining into OMM

Sl.	Blocks	No. of farmers by year of joining into OMM			
		2017-18	2018-19	2019-20	All Years
1	Chittrakonda	52	24	4	80
2	Khairaput	73	3	4	80
3	Korakunda	80			80
4	Mathili	70	6	4	80
	All Blocks	275	33	12	320
		% of farmers			
1	Chittrakonda	65.0	30.0	5.0	100.0
2	Khairaput	91.3	3.8	5.0	100.0
3	Korakunda	100.0	0.0	0.0	100.0
4	Mathili	87.5	7.5	5.0	100.0
	All Blocks	85.9	10.3	3.8	100.0

Concluding Remarks

About 85.9 percent of the farmers have joined into OMM in 2017-18 year, followed by 10.3 percent in 2018-19 and the remaining 3.8 percent in 2019-20. Except Chittrakonda block more than 80 percent of sampled out millet farmers had joined into OMM in the initial year of first phase OMM implemented in the district. Overall, about 76.9 percent of millet farmers of Malkangiri district are males and the remaining 23.1 percent are females. Incidence of female millet farmers is comparatively higher at Korakunda and Chittrakonda blocks. Majority of millet farmers, overall, to the extent of 84.7 percent are Scheduled Tribes (STs) followed by other castes (13.1%) and the remaining 2.2 percent are SCs. The mean age of millet farmers is overall found at 41.8 years which is found on the higher side among the SC farmers. The educational background of millet farmers as indicated in table 3.4 reveals that majority of millet farmers of Malkangiri district are illiterates followed primary level of education. significant majority of farmers are Hindus by religion and other religions are almost negligible. The proportionate share of small farmers, medium farmers, marginal farmers, and large farmers are found at 56.6, 33.8, 6.3 and 3.4 percent respectively. Marginally higher proportion of millet farmers of the district have Kuchha houses followed by semi pucca houses and pucca houses. overall, there are 2.5 male and 2.5 female members per each millet farmers' household in the district. The overall sex ratio among the millet households of the district is found balanced.

Chapter-IV: Millet Production, Productivity and Package of Practices in the project area

One of the objectives of the study is to outline the millet production, Productivity and Package of Practices in the project area. Based on empirical data obtained from millet farmers the pattern of millet production, productivity and package of practices adopted by the farmers, the objectives of the study are analysed in the current chapter. While doing so, a comparative analysis of current situation as a member of OMM and past situation when they were not the members are undertaken with the objective of ascertaining the changes taking place at farmers level as a result of OMM project intervention. Despite the focus of the chapter on highlighting the production behaviour of millets, the general scenario of cropping pattern is also discussed in the first section of the chapter.

4.1 Operational Land holding

The farmers' operational land holding as shown in table 4.1 comprises of own land, encroached land and shared in land. The overall operational landholding among the millet farmers of Malkangiri district stands at 9 acres. On an average, encroached land and shared in land per farmers is calculated at 2.9 and 2.3 acres respectively. Out of the total operational landholding per farmer, percentage share of own-land, encroached land, shared in land stand at 42.2, 32.2 and 25.6 percent respectively.

Table-4.1: Millet Framers' Operational Landholding

Sl.	Blocks	Mean land holding (Aces)			
		Land owned (Aces)	Other encroached land, if any (Aces)	Shared in Land (Aces)	Total Operational Land holding (Aces)
1	Chittrakonda	3.1	2.6	1.9	7.6
2	Khairaput	3.2	3.3	2.3	8.8
3	Korakunda	4.5	3.8	2.2	10.5
4	Mathili	4.3	2.3	3.2	9.8
	All Blocks	3.8	2.9	2.3	9
		% Share in operational land holding			
1	Chittrakonda	40.8	34.2	25.0	100.0
2	Khairaput	36.4	37.5	26.1	100.0
3	Korakunda	42.9	36.2	21.0	100.0
4	Mathili	43.9	23.5	32.7	100.0
	All Blocks	42.2	32.2	25.6	100.0

4.2 Cropping Pattern

Cropping of pattern of the millet farmers in the project area is analysed in terms of crop mix, which is combinations different crops grown by them. The millet farmers not only produce millet. In addition to millet, they cultivate paddy, pulses, vegetables, oil seeds, and cash crops. Ragi, suan, Kangu, Janha and kodo are different types of millets cultivated by the farmers. A comparative picture about number farmers cultivating different crops during post project situation compared to pre project situation is presented in the following table 4.1. The number of farmers cultivating different crops during post project situation is found changed relative to pre project situation and the pattern of such change is

different in different project blocks. The pattern of change is examined in term of percentage variation in the number of farmers cultivating a crop during post project situation over pre project situation. Overall, for all project blocks in the district, there is no change in the number of farmers for paddy cultivation during post project situation. The number of farmers cultivating paddy, vegetables and oil seeds has increased by 37.3, 53.8 percent respectively. Cultivation of cash crops is very much negligible and limited to few farmers only in the district. So far as millet farming is concerned, it was found that there has not been any change in the number of farmers cultivating ragi crops. However, there is 50 percent increase in the number of suan farmers.

Table-4.2: Crop mix among the farmers of project area (No. of Farmers cultivating the crops)

Sl.	Districts	Time Period	Overall agricultural practices of sample farmers (No. of farmers)				
			Chitrakonda	Khairaput	Korakunda	Mathili	All Blocks
1	Paddy	Before Project	79	80	80	80	319
		After Project	80	79	80	80	319
		% Variation	1.3	-1.3	0.0	0.0	0.0
2	Pulses	Before Project	12	20	20	7	59
		After Project	25	25	21	10	81
		% Variation	108.3	25.0	5.0	42.9	37.3
3	Vegetables	Before Project	4	12	9	13	38
		After Project	11	16	10	17	54
		% Variation	175.0	33.3	11.1	30.8	42.1
4	Oil seeds	Before Project		4	4	5	13
		After Project		5	9	6	20
		% Variation		25.0	125.0	20.0	53.8
5	Cash Crops	Before Project	3	1			4
		After Project	3	1			4
		% Variation	0	0			0
6	Ragi	Before Project	76	74	73	71	294
		After Project	76	74	73	72	295
		% Variation	0.0	0.0	0.0	1.4	0.3
7	Suan	Before Project	10	1		1	12
		After Project	15	2		1	18
		% Variation	50.0	100.0		0.0	50.0

4.3 Crop Area

Crop wise land area among the sample farmers during pre-project period compared to post project period is separately shown for all the project blocks in the following table 4.2. It is observed that overall paddy area by all farmers in the district, has come down by 0.4 percent, although there is positive increase in the pulses, vegetables, and cash crops. The land area under pulses, vegetables, and oil seeds has increased by 18.4, 42.6 and 46.5 percent respectively. This is to note that area under ragi cultivation has increased by 22.1 percent. However, for suan cultivation, there is about 60.5 percent increase in suan crops.

Table-4.2: Area under crop in post project period compared to pre project period among the sample farmers (Land area in Acres)

Sl.	Districts	Time Period	Area under Crops in OMM Blocks of Malkangiri district (Acres)				
			Chitrakonda	Khairaput	Korakunda	Mathili	All Blocks
1	Paddy	Before Project	167.72	182	260	256.5	866.22
		After Project	170.72	182.5	259	250.5	862.72
		% Variation	1.8	0.3	-0.4	-2.3	-0.4
2	Pulses	Before Project	7.3	12.05	23.95	4.4	47.7
		After Project	13.55	12.45	24.95	5.51	56.46
		% Variation	85.6	3.3	4.2	25.2	18.4
3	Vegetables	Before Project	0.7	2.5	0.8	0.7	4.7
		After Project	1.5	2.5	1.8	0.9	6.7
		% Variation	114.3	0.0	125.0	28.6	42.6
4	Oil seeds	Before Project	0	1	2	1.3	4.3
		After Project	0	1	4	1.3	6.3
		% Variation		0.0	100.0	0.0	46.5
5	Cash Crops	Before Project	1				1
		After Project	1				1
		% Variation	0.0				0.0
6	Ragi	Before Project	59.65	73.1	76.95	84.4	294.1
		After Project	86.35	79.5	106.4	86.9	359.15
		% Variation	44.8	8.8	38.3	3.0	22.1
7	Suan	Before Project	9.25	1		0.5	10.75
		After Project	14.75	2		0.5	17.25
		% Variation	59.5	100.0		0.0	60.5

4.4 Package of Practices for Millet Production

4.4.1 Method of Cultivation

With the objective of increasing the productivity of millets improved agronomic practices among the farmers have been popularized by the OMM project. This includes Introducing System of Crop Intensification based on suitability, Promotion of Line transplanting/Line sowing/Inter cropping of millets, Improved manure/ composting / in-situ practices for better crop nutrition Pest and disease management practices in the lines of NPM and other organic/agro ecological practices as deemed necessary as per local needs. In this direction, method of cultivation of millets assumes significance. As it is indicated in table 4.3, method of millet cultivation comprises of mono cropping, mixed cropping and intercropping. The prevalence of different methods of cultivation of different millets by the millet farmers are comparatively shown during pre and post project period. For ragi crop, it is found that mono cropping practice is the dominant method of cultivation during pre-project as well as post project situations. However, mixed crop practices are also found with sizable proportion of millet farmers.

Table-4.3: Method of cultivation adopted by millet farmers (Mono crop, mixed crop and inter crop)

Sl.	Millet Varieties	Blocks	Pre-Project (% of farmers)				Post-Project (% of farmers)			
			Mono Crop	Mixed Crop	Inter crop	Total	Mono Crop	Mixed Crop	Inter crop	Total
1	Ragi	Chitrakonda	56.6	43.4	0.0	100.0	98.8	0.0	1.3	100.0
		Khairaput	43.2	56.8	0.0	100.0	98.8	1.3	0.0	100.0
		Korakunda	46.6	52.1	1.4	100.0	100.0	0.0	0.0	100.0
		Mathili	85.7	14.3	0.0	100.0	100.0	0.0	0.0	100.0

		All Blocks	57.7	42.0	0.3	100.0	99.4	1.3	1.3	100.0
2	Suan	Chitrakonda	100.0	0.0	0.0	100.0	100.0	0.0	0.0	100.0
		Khairaput					100.0	0.0	0.0	100.0
		Korakunda						0.0	0.0	
		Mathili	100.0	0.0	0.0	100.0	100.0	0.0	0.0	100.0
		All Blocks	100.0	0.0	0.0	100.0	100.0	0.0	0.0	100.0

4.4.2 Agronomic Practices

Comparative analysis of the agronomic practices of millet farmers during post period compared to pre project period suggests that, there is declining importance of broadcasting and increasing importance of other type of agronomic practices like SMI, LT and LS methods. As per the following table 4.4, it is evident that agronomic practices of ragi was mainly based on broadcasting methods during pre-project period, which is shifted much in favour of LT and SMI methods. During post project period, LT method of ragi cultivation is found as the dominant agronomic practice for ragi cultivation. Suan, although practiced by very limited number of farmers, broadcasting based agronomic practice is mainly pursued by the farmers during pre-project as well as post project situations.

Table-4.4: Cultivation Practices

Sl.	Millet Varieties	Blocks	Pre-Project (% of Farmers)					Post-Project (% of farmers)				
			SMI	LT	LS	Broadcasting	Total	SMI	LT	LS	Broadcasting	Total
1	Ragi	Chitrakonda	0.0	0.0	0.0	100.0	100.0	4.0	93.3	0.0	2.7	100.0
		Khairaput	0.0	0.0	0.0	100.0	100.0	7.6	88.6	0.0	3.8	100.0
		Korakunda	0.0	0.0	0.0	100.0	100.0	1.5	97.0	0.0	1.5	100.0
		Mathili	0.0	14.3	0.0	85.7	100.0	29.2	68.1	0.0	2.8	100.0
		All Blocks	0.0	3.4	0.0	96.6	100.0	10.6	86.6	0.0	2.7	100.0
2	Suan	Chitrakonda	0.0	0.0	0.0	100.0	100.0	16.7	0.0	0.0	83.3	100.0
		Khairaput						0.0	0.0	0.0	100.0	100.0
		Korakunda										
		Mathili	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	100.0	100.0
		All Blocks	0.0	0.0	0.0	100.0	100.0	14.3	0.0	0.0	85.7	100.0

4.5 No. of times weeding

Weeding is a traditional process undertaken in crop fields to remove weeds hampering the growth of crop on the crop field. More number of times of weeding implies better expected yield of the crop and consequently productivity. The OMM project intervention has systematically encouraged millet farmers to undertake a greater number of weeding on the millet fields. As a result of this, more than two-time weeding has positively increased for all types of millets. As per table 4.5, it is evident that weeding practices of millet farmers are mostly one time for ragi cultivation during post project period. Previously during pre-project situation, ragi farmers were not undertaking any weeding activity for ragi crop. Due to OMM intervention, ragi farmers have adapted weeding practice. However, for suan cultivation farmers are found to have adapted more than two times weeding during pre-project as well as post project situations.

Table-4.5: Weeding practices followed for cultivating different types of millets in the project area

Sl.	Millet Varieties	Blocks	Pre-Project (% of farmers)				Post-Project (% of farmers)			
			One time	Two times	More than two times	Total	One time	Two times	More than two times	Total
1	Ragi	Chitrakonda					100.0	0.0	0.0	100.0
		Khairaput					100.0	0.0	0.0	100.0
		Korakunda					100.0	0.0	0.0	100.0
		Mathili					100.0	0.0	0.0	100.0
		All Blocks								
2	Suan	Chitrakonda			100.0	100.0	0.0	0.0	100.0	100.0
		Khairaput					0.0	0.0	100.0	100.0
		Korakunda								
		Mathili			100.0	100.0	0.0	0.0	100.0	100.0
		All Blocks			100.0	100.0	0.0	0.0	100.0	100.0

4.6 Production Behaviour of Ragi in the district

Ragi is found to be the major millet reported in the district. For other types of millets, there are only a few farmers involved during pre-project and post project period. So, taking note of the importance of ragi, the economics ragi production in the district compared to all Odisha situation (All OMM districts) is analysed in this section. On an average for the whole district production of ragi per framer and per acre is found at 1.5 and 2.5 quintal respectively.

Table-4.6: Behaviour of millet production in Malkangiri District (Pre-project)

Sl.	Particulars	Ragi	Suan/Gurji	Kangu	Janha	Kodo	All millets
1	No. of farmer involved in millet cultivation	294	12				306
2	Area under millet cultivation (Acres)	294	11				314
3	Production /Farmer (Quintal)	1.5	1.9				1.6
4	Production /Acre (Quintal)	2.5	2.1				1.5
5	Total Sales Proceeds/Framer (Rs.)	1135	1126				1162
6	Total Sales Proceeds/ Acre (Rs.)	1134	1819				1133
7	Total Sales Proceeds/ Quintal of marketable surplus (Rs.)	1400	2030				1263
8	Total cost /Farmer (Rs.)	1316	1014				1128
9	Total Cost/ Acre (Rs.)	1316	1013				1128
10	Total Cost/ Quintal of marketable surplus (Rs.)	1623	627				1417
11	Net Income/ Farmer (Rs.)	-181	112				34
12	Net Income / Acre (Rs.)	-182	806				5
13	Net Income / Quintal of marketable surplus (Rs.)	-223	1403				-154

Table- 4.7 Behaviour of millet production in Malkangiri District (Post-project)

Sl.	Particulars	Ragi	Suan/Gurji	Kangu	Janha	Kodo	All millets
-----	-------------	------	------------	-------	-------	------	-------------

1	No. of farmer involved in millet cultivation	320	18				338
2	Area under millet cultivation (Acres)	386	17				404
3	Production /Farmer (Quintal)	4.7	2.7				4.6
4	Production /Acre (Quintal)	3.9	2.8				3.9
5	Total Sales Proceeds/Framer (Rs.)	14017	2389				13567
6	Total Sales Proceeds/ Acre (Rs.)	11612	5567				11363
7	Total Sales Proceeds/ Quintal of marketable surplus (Rs.)	2960	5809				3474
8	Total cost /Farmer (Rs.)	5139	3957				4404
9	Total Cost/ Acre (Rs.)	4258	3279				3649
10	Total Cost/ Quintal of marketable surplus (Rs.)	1136	1409				1077
11	Net Income/ Farmer (Rs.)	8878	-1568				9163
12	Net Income / Acre (Rs.)	7354	2288				7714
13	Net Income / Quintal of marketable surplus (Rs.)	1824	4400				2397

Table- 4.8 Behaviour of millet production in the first phase OMM intervention area in State (First Phase 29 blocks) during Pre Project period

Sl.	Particulars	Ragi	Suan/Gurji	Kangu	Janha	Kodo	All millets
1	No. of farmer involved in millet cultivation	1896	148	11	18	106	2179
2	Area under millet cultivation	1725	149	6	10	106	1996
3	Production /Farmer (Quintal)	1.7	1.7	0.73	1.28	1.3	1.6
4	Production /Acre (Quintal)	2.6	1.7	1.38	2.32	1.3	1.8
5	Total Sales Proceeds/Framer (Rs.)	1044	1380	6569	2457	2899	1228
6	Total Sales Proceeds/ Acre (Rs.)	1148	2097	2950	2298	2942	1340
7	Total Sales Proceeds/ Quintal of marketable surplus (Rs.)	1560	2076	5595	4157	2937	1490
8	Total cost /Farmer (Rs.)	1904	1790	1575	1622	1752	1729
9	Total Cost/ Acre (Rs.)	2093	1968	1731	1783	1926	1900
10	Total Cost/ Quintal of marketable surplus (Rs.)	3128	1295	3855	1907	1898	2514
11	Net Income/ Farmer (Rs.)	-860	-410	4994	835	1147	-501
12	Net Income / Acre (Rs.)	-945	129	1219	515	1016	-560
13	Net Income / Quintal of marketable surplus (Rs.)	-1568	781	1740	2250	1039	-1024

Table- 4.9: Behaviour of millet production in the first phase OMM intervention area in State (First Phase 29 blocks) during post-Project period

Sl.	Particulars	Ragi	Suan/Gurji	Kangu	Janha	Kodo	All millets
1	No. of farmer involved in millet cultivation	2252	213	29	28	116	2638
2	Area under millet cultivation	2102	178	10	16	115	2422
3	Production /Farmer (Quintal)	5.6	2.1	0.83	1.45	1.2	5.0
4	Production /Acre (Quintal)	6.0	2.5	2.35	2.54	1.2	5.5
5	Total Sales Proceeds/Framer (Rs.)	16515	2256	5290	3671	3601	14700
6	Total Sales Proceeds/ Acre (Rs.)	17692	3886	2178	4296	4955	16012
7	Total Sales Proceeds/ Quintal of marketable surplus (Rs.)	2960	4646	6132	7541	4990	3294
8	Total cost /Farmer (Rs.)	4341	4081	3591	3699	3995	3941
9	Total Cost/ Acre (Rs.)	4650	4371	3847	3962	4279	4222
10	Total Cost/ Quintal of marketable surplus (Rs.)	987	2537	9342	3386	3109	1030
11	Net Income/ Farmer (Rs.)	12174	-1825	1699	-28	-394	10759
12	Net Income / Acre (Rs.)	13042	-485	-1669	334	676	11790
13	Net Income / Quintal of marketable surplus (Rs.)	1973	2109	-3210	4155	1881	2264

4.7 Varieties of Ragi Cultivated

Varieties of ragi cultivated in the OMM project area is highlighted in the following table 4.10. In addition to promoting the outreach of existing millets among a greater number of farmers, the OMM has also successfully promoted new improved varieties of millets in selected project areas. Despite continuance of traditional varieties, ragi farmers in selected areas also undertake ragi cultivation by introducing improved varieties. The improved ragi varieties reported in the district include Arjuna and Bhairavi.

Table-4.10: Reported varieties of ragi seeds used in the OMM area

Sl.	Districts	Blocks	Varieties of seeds used by ragi farmers	
			Traditional Varieties	Improved varieties
1	Malkangiri	Khairaput	Sana Mandia, Bada Mandia, Dhala Mandia	Arjuna, Bhairavi
2		Mathili	Rishka, Sana Mandia, Bada Mandia, Dhala Mandia	Bhairavi
3		Chitrakonda	Mami Mandia, Bada Mandia, Dhala Mandia	
4		Korkunda	Sana Mandia, Bada Mandia, Dhala Mandia	Bhairabi

Concluding Remarks

The overall operational landholding among the millet farmers of Malkangiri district stands at 9 acres. On an average, encroached land and shared in land per farmers is calculated at 2.9 and 2.3 acres respectively. Out of the total operational landholding per farmer, percentage share of own-land, encroached land, shared in land stand at 42.2, 32.2 and 25.6 percent respectively. Overall, for all project

blocks in the district, there is no change in the number of farmers for paddy cultivation during post project situation. The number of farmers cultivating paddy, vegetables and oil seeds has increased by 37.3, 53.8 percent respectively. Cultivation of cash crops is very much negligible and limited to few farmers only in the district. So far as millet farming is concerned, it was found that there has not been any change in the number of farmers cultivating ragi crops. However, there is 50 percent increase in the number of suan farmers. Method of millet cultivation comprises of mono cropping, mixed cropping and intercropping. The prevalence of different methods of cultivation of different millets by the millet farmers are comparatively shown during pre and post project period. For ragi crop, it is found that mono cropping practice is the dominant method of cultivation during pre-project as well as post project situations. However, mixed crop practices are also found with sizable proportion of millet farmers. Agronomic practices of ragi was mainly based on broadcasting methods during pre-project period, which is shifted much in favour of LT and SMI methods. During post project period, LT method of ragi cultivation is found as the dominant agronomic practice for ragi cultivation. Suan, although practiced by very limited number of farmers, broadcasting based agronomic practice is mainly pursued by the farmers during pre-project as well as post project situations. weeding practices of millet farmers are mostly one time for ragi cultivation during post project period. Previously during pre-project situation, ragi farmers were not undertaking any weeding activity for ragi crop. Due to OMM intervention, ragi farmers have adapted weeding practice. However, for suan cultivation farmers are found to have adapted more than two times weeding during pre-project as well as post project situations. Production of ragi per framer and per acre in Malkangiri district is found at 1.5 and 2.5 quintal in respectively.



Chapter-V: Assessment of Household Millet Consumption Pattern in the Project Area

One of the key objectives of OMM is to promote household millet consumption at least by 25 percent so as to enhance household level nutritional security and to create a demand for millets by the households.¹² In this chapter, an attempt has been made to analyse household consumption pattern of millets on the basis of household survey data obtained from 320 millets households in all of programme blocks of Malkangiri district. The consumption pattern examines seasonality of mean household consumption pattern, preferred timing of the day for the consumption of millets, extent of dependence of millet households on market for purchasing millets, average quantity of millet purchased per millet household and source of purchase of millets.

5.1 Seasonality of Household Millet Consumption

The seasonality of household millet consumption pattern is analysed based on proportion of households in the project area consume millets during different seasons in a year. The different seasons are categorized as Winter seasons, Rainy seasons, and summer seasons. As per table 5.1, it is found that almost all households are consuming millets during summer season followed by winter and rainy seasons. Compared to pre project situation, number of households consuming millets has slightly declined in summer seasons. However, more than 95 percent of households are consuming millets. But there is marginal increase in the number of households consuming millets during both time periods.

Table 5.1: No. of households consuming millets during pre-project period

Sl.	Blocks	No. of households consuming Millets					
		Pre- project period			Post-project period		
		Winter season	Rainy season	Summer season	Winter season	Rainy season	Summer season
1	Chitrakonda	42	42	80	46	43	78
2	Khairaput	44	45	80	45	45	80
3	Korakunda	41	42	79	41	42	78
4	Mathili	41	41	79	44	41	77
	All Blocks	168	170	318	176	171	313
		% of surveyed households					
1	Chitrakonda	52.5	52.5	100.0	57.5	53.8	97.5
2	Khairaput	55.0	56.3	100.0	56.3	56.3	100.0
3	Korakunda	51.3	52.5	98.8	51.3	52.5	97.5
4	Mathili	51.3	51.3	98.8	55.0	51.3	96.3
	All Blocks	52.5	53.1	99.4	55.0	53.4	97.8

5.2 Mean Consumption Pattern

The mean consumption pattern is analysed taking into account mean household consumption of millets per day among the household members. Further it is disaggregated by winter, rainy and summer seasons. As per the analysis made in table 5.2, it is depicted that the overall per day household consumption of millets during post project situation has slightly decreased during all seasons. During

¹² OMM Guidelines, 25.11.2016.

interaction with farmers, it was elicited by the respondents that over time quantity of staple food consumptions are declining owing to increased food diversification by the households. Added to it, number of days of millet consumption during each season has tended to increase during post project period. On the basis of qualitative information obtained from respondents it is found that the quantity of millet consumption per household during post project period is reduced because they have received more PDS rice during last two three years. In the last two three years Odisha has witnessed few cyclones and heavy rainfalls. Besides, rural households have also received relief materials for covid related crisis in the country. Over and above, due to increased real income at household level in the rural areas there is good deal of diversified food pattern. All these factors have contributed reduced average consumption of millets during the post project period.

Table-5.2: Seasonality in average household consumption of millets

Sl.	Blocks	Millet Consumption per household per day (Kg)					
		Pre- project period			Post-project period		
		Winter season	Rainy season	Summer season	Winter season	Rainy season	Summer season
1	Chittrakonda	0.874	0.332	0.398	0.587	0.137	0.288
2	Khairaput	0.768	0.153	0.367	0.500	0.138	0.276
3	Korakunda	1.059	0.300	0.347	0.561	0.137	0.296
4	Mathili	1.088	0.239	0.392	0.568	0.137	0.375
	All Blocks	0.943	0.254	0.376	0.554	0.137	0.308

5.3 Household Dependence on Market for Millets

Despite own production of millets, most often millet farmer households depend on market to meet the household consumption requirement. This implies their own production is insufficient to meet their domestic requirements or self-consumption. As per table 5.4, it is evident that number of households purchasing millet for domestic consumption was 7.2 percent during pre-project period which has increased to 45.3 percent during post project period. The discussion suggests that notwithstanding more production of millets during post project period, number of households depend on market for purchasing millets has increased during post project situation. The reason being that number of days of millet consumption by a greater number of household members has increased during post project situation.

Table-5.3: No of households purchasing millets from outside despite own production

Districts	No. of households' purchase millet for household use					Average quantity of millet purchased for household use (Quintal)		
	Pre-project period	% of HHs	Post-Project period	% of HHs	Total Households surveyed	Pre-project period	Post-Project period	% Deviation
Malakangiri	23	7.2	145	45.3	320	0.23	2.00	772.1
All Odisha	920	39.6	436	18.8	2325	0.28	1.86	555.6

5.4 Source for purchasing millets

As per table 5.5, It is found that during pre-project period, major source of purchasing millets were local market and barter. However, during post project period owing to mainstreaming of PDS, significantly higher number of households are found purchasing millets from PDS.

Table-5.4: Source for purchasing (procuring) by households

Sl.	Source for purchasing millets (% of households)					
	Pre-Project Period			Post- Project Period		
	Source	Malkangiri	All districts	Source	Malkangiri	All districts
1	Local Market	42.3	4.6	Local Market	3.8	9.8
2	Wage good	0	1.5	PDS	95.5	86.2
3	Barter	34.6	3	Barter	0.7	0.6
4	Received as gift from fellow relatives	11.5	0.4	Local market & PDS	0	0.8
5	Local market & PDS	3.8	4.7	Local Market & Wage good	0	1.8
6	Local Market & Wage good	0	83.3	PDS & Barter	0	0.7
7	Local Market and Barter	3.8	2			
8	PDS and wage good	3.8	0.2			
9	Wage good and barter	0	0.1			
	Total		100			

Concluding Remarks

Compared to pre project situation, number of households consuming millets has slightly declined in summer seasons. However, more than 95 percent of households are consuming millets. But there is marginal increase in the number of households consuming millets during both time periods. The overall per day household consumption of millets during post project situation has slightly decreased during all seasons. During interaction with farmers, it was elicited by the respondents that over time quantity of staple food consumptions are declining owing to increased food diversification by the households. Added to it, number of days of millet consumption during each season has tended to increase during post project period. Notwithstanding more production of millets during post project period, number of households depend on market for purchasing millets has increased during post project situation. The reason being that number of days of millet consumption by a greater number of household members has increased during post project situation. During pre-project period, major source of purchasing millets were local market and barter. However, during post project period owing to mainstreaming of PDS, significantly higher number of households are found purchasing millets from PDS.

Chapter-VI: Processing and Marketing of millets in the Project Area

With the objective of assessing millet farmers' behaviour with regard to processing and marketing of millets, present chapter is attempted. Processing and marketing relate to the post-harvest management practices of millet farmers. The first section of this chapter deals with millet processing and the subsequent section deals with marketing behaviour of millet farmers. While analysing processing behaviour only post project situation is considered as the data pertaining to this area are obtained through FGD. However, for analysing marketing situation, a comparative analysis of pre and post project situation is undertaken for assessing the type of change in millet marketing system. Processing and marketing behaviour is separately analysed for the varieties of millets reported in the study.

6.1 Primary Processing of Millets

The type of first-hand processing of the produced millets by the farmers' themselves is conceptually known as primary processing. From the previous analysis it is well known that millet farmers ultimately use their produced millet for the purpose of self-consumption and sales of marketable surplus. Thus, broadly there are two types of processing activities separately carried out by the millet farmers. This implies for self-consumption; they do undertake one type of processing and for marketing purposes they do undertake different types of processing. Table 6.1 analyses the processing activities undertaken by the households for self-consumption of millets. The different food items prepared for millets are also discussed separately for all the districts. The processing activities mainly comprise of converting ragi to flour and de-husking in the case of other millets. With respect to ragi flour making, majority of households depend on machine for which they cover a minimum distance of 2 Kms. and maximum distance of 10 Kms. On the other hand, for other types of millets, de-husking of millet is required which is done through traditional means by all households. However, the household's dependent on traditional processing uses locally available traditional instruments like "dhinki", made up of wooden logs, and "chakki", made up of two round stone plates. Dhinki is used for dehusking and chakki is used for grinding. Both these instruments are operated manually.

Table-6.1: Processing of millets for Self-Consumption in Malkangiri district

Sl.	Type of millets reported	Type of food items prepared by millet households	Reported Primary Processing activities	Access to Primary Processing Methods	Average distance covered for machine processing
1	Ragi	Soup, Porridge, pan cake, Vada, Pakoda, Ladu, deep fried cake, Idli (steam cake), landa	Ragi to ragi flour	About 30 percent of HHs doing ragi flour manually at home	Those 70 percent cover a distance of 2 -10 kms to access mills
2	Suan	Khair, Upma, khicdi, pan cake	De-husking for suan rice	All HHs do dehusking manually through traditional means like dhenki .	Nil distance

So far as processing of marketable surplus is concerned, traditionally millets farmers were categorising millets particularly ragi under two categories as with and without husk. Accordingly, there was price

differentiation and obviously they were selling with husked millets at lower price and without husked millets at a higher price. Soon after the introduction of Mandies under OMM, millet farmers are processing their millets as per Mandi standards. They are sun-drying dehusked millets for maintaining required moisture. Very commonly, they sell millets with husk at a lower price. The middlemen undertake value addition activities by making millets husk free. Further middlemen also do sort and grading of millets according to quality. Now as a result of OMM intervention and training to millet farmers, slowly they have started value addition activities for the marketable surplus of millets.

6.2 Marketing of Millets

The marketable surplus of millets is sold through different channels. As per millet farmers' survey data, it is found that local middlemen, local haat, local money lender, input supplier and barter are different market channels through which surplus millet is sold by the farmers. Barter is a type of market channel, when surplus millet is exchanged for other commodities needed by the millet farmers.

6.2.1 Marketing Channels for ragi

As it can be seen from the following table 6.2, during pre-project period local middlemen was the predominant channel which has been shifted in favour of Mandi during post project period. During pre-project situation, around 98.2 percent of surplus ragi of the district were sold through middlemen and now, during post project period, about 73.1 percent of surplus ragi are sold through Mandis. This is a remarkable achievement of OMM. Despite mainstreaming of mandi during post project period, the importance of middleman for selling out surplus ragi still continues in the district.

Table-6.2: Marketing of Ragi by different Marketing Channels

Sl.	Districts	Marketing of Ragi by farmers in different market channels (% of overall quantity) during pre-project period					
		Govt. procurement	Middlemen	Local Haat	local Money Lender	Input supplier	Barter
1	Malkangiri	-	98.2	1.8	0.0	0.0	0.0
2	All districts	-	79.8	18.3	0.7	0.0	1.1
		Marketing of Ragi by farmers in different market channels (% of overall quantity) during post-project period					
1	Malkangiri	73.1	26.9	0.0	0.0	0.0	0.0
2	All districts	81.0	15.9	1.3	0.7	1.2	0.0

6.2.2 Marketing Channels for Suan

As it can be seen from the following table 6.3, during pre-project period local middlemen was the predominant channel which is still evident during post project period. During pre-project situation all of the surplus suan were sold to middlemen and now, during post project period also, the same is practiced by the suan farmers of the district. As other channels for selling marketable surplus of suan are found to have some influence at all Odisha level, but the same at Malkangiri district is not found having any relevance.

Table-6.3: Marketing of Suan by different Marketing Channels

Sl.	Districts	Marketing of Suan by farmers in different market channels (% of overall quantity) during pre-project period					
		Govt. procurement	Middlemen	Local Haat	local Money Lender	Input supplier	Barter
1	Malkangiri	-	100	0.0	0.0	0.0	0.0
2	All districts	-	83.6	15.4	0.9	0.0	0.0
		Marketing of Suan by farmers in different market channels (% of overall quantity) during post-project period					
3	Malkangiri	-	100	0.0	0.0	0.0	0.0
4	All districts	-	83.7	15.7	0.7	0.0	0.0

Concluding Remarks

With respect to ragi flour making, majority of households depend on machine for which they cover a minimum distance of 2 Kms. and maximum distance of 10 Kms. On the other hand, for other types of millets, de-husking of millet is required which is done through traditional means by all households. However, the household's dependent on traditional processing uses locally available traditional instruments like "dhinki", made up of wooden logs, and "chakki", made up of two round stone plates. Dhinki is used for dehusking and chakki is used for grinding. Both these instruments are operated manually. Soon after the introduction of Mandies under OMM, millet farmers are processing their millets as per Mandi standards. They are sun-drying dehusked millets for maintaining required moisture. Very commonly, they sell millets with husk at a lower price. The middlemen undertake value addition activities by making millets husk free. Further middlemen also do sort and grading of millets according to quality. Now as a result of OMM intervention and training to millet farmers, slowly they have started value addition activities for the marketable surplus of millets. During pre-project period local middlemen was the predominant channel which has been shifted in favour of Mandi during post project period. During pre-project situation, around 98.2 percent of surplus ragi of the district were sold through middlemen and now, during post project period, about 73.1 percent of surplus ragi are sold through Mandis. During pre-project period local middlemen was the predominant channel which is still evident during post project period. During pre-project situation all of the surplus suan were sold to middlemen and now, during post project period also, the same is practiced by the suan farmers of the district.

Chapter-VII: SWOT Analysis on the Functioning of Odisha Millet Mission in the District

With the objective of assessing the overall impact of OMM on production, consumption, processing and marketing of millets in the district, the study gathers additional information from the district level Agricultural Officers, Block level Agricultural Officers, District Coordinator (WASSAN), Facilitating Agency (FA), Cluster Resource Persons (CRPs), Community Based Organisations (CBOs). The CBOs and CRPs are appointed by the concerned FA of the block. CBOs and CRPs are appointed at the local level to carry forward the task of farmers mobilisation and motivation for millet cultivation. Besides, the functioning of OMM is also mandated to promote consumption, processing and marketing of millets, so, the Strength, Weakness, Opportunities and Threats associated with each facet of OMM implementation in the programme area is highlighted in this chapter. For this purpose, stakeholders' opinions gathered during the time of field survey are analysed.



On the way to Gojiaguda Village of Malkangiri District for Households Survey

		7.1 Strength of OMM			
Sl.	Stakeholders	Stakeholder' Opinions on the Strength of OMM in the district			
		Production	Consumption	Processing	Marketing
1	District level Agricultural Officers	<ul style="list-style-type: none"> → OMM has been instrumental in bringing more areas under millet cultivation. → More numbers farmers are also mobilised for millet cultivation. → Framers are provided with due training and hand holding support for better and scientific cultivation of millets. → Framers' training on Best possible agronomic practices is promoted under OMM. → Organic cultivation of millet is promoted. 	<ul style="list-style-type: none"> → Previously, in the tribal areas, there was also millet consumption habits among majority of households. But owing to insufficient production at their household level they were market dependent. → Due to self-sufficiency of millet production at household level, more number of household members are consuming millets more number of days in a year. 	<ul style="list-style-type: none"> → Millet de-huskers, flour mills provided at local level have reduced the drudgery of women for processing of millets. 	<ul style="list-style-type: none"> → Due to MSP for millets, farmers are quite encouraged for millet cultivation.
2	Block level Agricultural Officers	<ul style="list-style-type: none"> → Millet is a low investment crop for which tribal farmers with low investment capacity can better adapt to millet cultivation. → Tribals are mostly inhabited in dryland areas, so, millets are most suitable crops in these areas because of their drought 	<ul style="list-style-type: none"> → Considering the life style diseases, now a days there is better awareness among people that millet is a healthy and nutritious food. This has led to more millet consumption. 	<ul style="list-style-type: none"> → Now, people are used to modern methods of processing, previously it was labour intensive and cumbersome. So, OMM has also positively 	<ul style="list-style-type: none"> → Previously, farmers were mainly selling millets to local middlemen, whereby they were exploited by price front. Now due to Govt.

		<p>resistant capacity and lower water intake.</p> <p>→ Tribals are historically linked with millet cultivation. So, they are naturally advantageous to undertake millet cultivation.</p>	<p>→ Due to diversification of food, people have increased preference for millets.</p> <p>→ Govt has systematically emphasized the relevance and utility of millet consumption, for which more people are attracted for millet consumption.</p>	<p>contributed to millet processing.</p>	<p>procurement of millets through mandi, there is better scope for farmers to get authentic value for their produced millets.</p>
3	District level WASSAN Officials	<p>→ Due to OMM intervention, farmers have accepted millets as one of the best crops to be cultivated by them in their own lands.</p> <p>→ Most suitable crop in the rainfed areas.</p> <p>→ It is very much cost effective compared to paddy.</p>	<p>→ Millet is a cheap source of nutrition at household level. OMM promoted awareness programmes have influenced millet consumption in the project area.</p> <p>→ Now, millets are distributed through PDS network for which millet consumption has increased.</p> <p>→ Similarly, ICDS has also incorporated millet meals for pre school children at AWCs, which is expected to increase millet consumption of children at household level.</p>	<p>→ Locally availability of quality processing, there is time saving by covering reduced distance for millet processing.</p>	<p>→ OMM is in the process of creating Farmers Producers Companies and other Producers Groups. This is expected to contribute to better aggregation of millets produced by the small and marginal farmers.</p>
4	Facilitating Agencies	<p>→ Adequate training and handholding support are instrumental in bringing about proactive attitude of millet farmers towards continuance of millet cultivation.</p>	<p>→ Millet consumption is very much important for adolescent girls, pregnant women and youth. Due to Covid pandemic, majority of people do also believe that</p>	<p>→ Easy processing has contributed to value addition of millets.</p>	<p>→ Gradation of millets as introduced by the FAs in the OMM project areas have enabled</p>

		<ul style="list-style-type: none"> → Modern method of cultivation as provided under OMM is expected for further increase in millet productivity in the project area. → Govt incentive scheme has encouraged more number of farmers with increased area of millet cultivation in the project area. 	<ul style="list-style-type: none"> millet consumption helps to boost immunity. → The food festivals and exhibitions have showcased millet based food and recipes at different district, block and state level . This has contributed to increased millet consumption. 		<p>farmers to get differential prices for different qualities of millets produced by them.</p>
5	CBOs	<ul style="list-style-type: none"> → Millet framers under OMM are adequately trained for producing organic fertilizers in their own capacities. This is cheap and highly efficient compared to organic fertilizers. Farmers have been able to minimise costs for which they will be interested to go for organic cultivation of millets. → The Custom Hiring Centres run by the CBOs have become very much helpful to arrange modern agricultural instruments to the farmers for which they have been able to cultivate millets efficiently. This is expected to contribute more to millet production in time to come. 	<ul style="list-style-type: none"> → Previously, there were few traditional millet recipes widely used by the consumers. Now due to diversified millet recipes, there is good scope of millet consumption. → Some of the affluent class and urbanised people have started thinking about the increased merits of organic branded foods. As millets are mostly organic in nature, thus there is good acceptability of millet as staple foods even among the urban high-end consumers 	<ul style="list-style-type: none"> → De-husking and flour mills run and managed by the CBOs has not only reduced the drudgery of local people but also contributed to value added millets available for local consumption. 	<ul style="list-style-type: none"> → Due to Govt. procurement, farmers have been able to get a justifiable share of consumers' price which was previously not possible as a sizable proportion of consumer price of the product was misappropriated by the middlemen.

		<p>→ The management skills and other skill development programmes as provided to millet farmers have strengthened millet farmer's confidence for millet production.</p>			
6	CRPs	<p>→ The modern methods and equipments for agronomic practices, cultivation practices and weeding practices as provided under the OMM, have contributed to better millet production and productivity.</p> <p>→ The handholding and regular monitoring of the Agricultural department officials to millets farmers have increased the confidence level of millet farmers and they are quite optimistic to increase miller production in future also.</p>	<p>→ CRPs are also engaged in promoting diversified millet recipes at household level which is augmenting household millet consumption in the project area.</p>	<p>→ There are local level evidences that millets powders are found as essential ingredients of "Chhatua Powder".</p>	<p>→ Due to the upsurge of millet consumption even among the non-millet producing households has significantly contributed to the upward market demand for millets.</p>

7.2 Weakness of OMM

Sl.	Stakeholders	Stakeholder' Opinions on the Weakness of OMM in the district			
		Production	Consumption	Processing	Marketing
1	District level Agricultural Officers	<p>→ Change in the mindset of farmers is a time-consuming process. They are taking their own time from diverting to millets from other crops.</p> <p>→ Further continuance of the OMM supported awareness programme would leverage the adoption of millets as an important dry land crop in the project area.</p>	<p>→ There is still lack of awareness among the masses regarding the health benefits of millet consumption.</p> <p>→ Millet should be included in the Food Security Act, of the Govt. of India, so that millet consumption would be further increased.</p>	<p>→ Millet processing machineries are not available in all village, so for the purpose of processing, households spend a sizable chunk of their time by undertaking travel to the nearby processing centres.</p>	<p>→ Govt. procurement of millets is yet to be full-fledged. Once it gets done, there are good chances of improvement of millet production and consumption.</p>
2	Block level Agricultural Officers	<p>→ Millet farming is a traditional farming practice. Adoption of modern methods of cultivation is yet to be full-fledged.</p>	<p>→ By nature, millets are light foods, so, most often people engaged in hard manual works, accord priority to heavy foods rather than millets.</p>	<p>→ Most of the people are yet to be trained on the required specialised processing of millets.</p>	<p>→ Govt. procurement of ragi is still limited and yet to be strengthened.</p>
3	District level WASSAN Officials	<p>→ Procurements targets currently available is very much limited to ragi only and other non ragi millets are completely excluded from the procurements. Had there been coverage of non ragi millets in the procurement process, perhaps more number</p>	<p>→ Lack of sufficient training on tasty millet recipes compels people to use traditional millet recipes, so, the users get bored most often by repeatedly consuming the same traditional millet-based recipes.</p>	<p>→ Govt. through OMM project intervention is yet to promote access and usage of millet processing units at every village.</p>	<p>→ Besides, non ragi millets are yet to be included in the ambit of Govt. procurement through the fixation of MSP.</p>

		<p>of millet farmers might have adopted non ragi millets.</p> <p>→ The district level project Management Unit (DPMU) might have contributed to more millet production. As the DPMU of OMM is yet to be functional at the district level, perhaps the millet production is limited.</p>	<p>→ Millet recipes although introduced under ICDS and PDS, still it is optional, so consumption improvement is not getting broad-based.</p>		
4	Facilitating Agencies	<p>→ The delay in the receipt of incentives and inputs as provided to millet farmers, very often limits the full-scale acceptability of the OMM farmers.</p>	<p>→ Since decades, there is social discouragement that millet recipes are poor man's food, which stands on the way of increasing millet consumption.</p>	<p>→ Age old food habits may take time to get changed in favour of millet consumption drastically.</p>	<p>→ There is imperative need to promote export of millets from India.</p>
5	CBOs	<p>→ Presently, there is limited implementation of the procurement policy for millet crops. If the procurement policy is expanded, there may be further scope for promoting millets in the project area.</p> <p>→ There is limited progress of Custom Hiring Centres as supported under OMM. The full-scale non-functionality limits to the desirable level of millet production in the project area.</p>	<p>→ There should be training on the preparation of dry foods from different types of millets. Rural women are acquainted only with the preparation of traditional recipes.</p>	<p>→ Electricity facility is not found in all of the villages. Sometimes, despite availability of electricity facility, people find it difficult to pay electricity bills every month.</p> <p>→ Resultingly, even if millet processing units are found, it becomes very difficult to make regular functioning of millet processing machineries.</p>	<p>→ Farmers complain that there is payment delay by the Govt, when they sell their millets through mandis.</p>

6	CRPs	→ Use of certified seeds is practiced by limited number of millets. This is attributed to non-availability of required certified seeds in timely manner. Perhaps use of certified seeds by the millets farmers can enhance millet production in the project area.	→ Most of the rural people consume ragi millet as porridge (Jau) only, which is not tasty. Sufficient training and awareness on the preparation of alternative recipes would further increase millet consumption.	→ Trained manpower to operate millet processing machines is also limiting factor for machine-based processing of millets in the project villages.	→ Owing to higher cost of cultivation, the MSP of millets are still considered lower by the millet farmers. → Besides, there are delays in the procurement of millets under Mandi system. Farmers say that soon after harvest, Mandi system should become effective, so that, there will quick cash inflow to the farmers bank A/Cs.
---	------	---	---	---	---

7.3 Opportunities of OMM

Sl.	Stakeholders	Stakeholder' Opinions on the Opportunities of OMM in the district			
		Production	Consumption	Processing	Marketing
1	District level Agricultural Officers	→ The net income from millet cultivation per acre of land is higher relative to other crops. So, there is good prospect of undertaking millet cultivation and substituting other crops by millets.	→ Millet is very much nutritious and hygienic food.	→ Ragi threshers and peelers supplied to SHGs will strengthen millet processing. → Pulverisers are likely to be provided through OMM will strengthen processing activities.	→ There is increased scope of marketing of millets domestically as well as internationally.

2	Block level Agricultural Officers	→ It requires less water and drought resistant. Even in the very unfavourable marginal lands, millet crops can be grown.	→ It can be easily accessed in any type of marketing places starting village Haats upto supermarkets.	→ Millet farmers to some extent have adopted modern methods of millet cultivation and processing. This is due to the sincere efforts of OMM.	→ Millet procurement with MSP support is gradually mainstreamed and there is also systematic attempts to cover all millets under MSP.
3	District level WASSAN Officials	→ It is climate resilient and having solid promise in rainfed agricultural scenarios.	→ Multiple millet-based recipes are possible and households have slowly learned the preparation of multiple millet-based recipes owing to systematic intervention of OMM in providing demonstrations of different millet-based recipes.	→ Millet farmers are gradually acquiring good deal of knowledge on millet processing and further value addition.	→ Few of the Food retailers have already started branding of millets, so as to cater to the needs of brand conscious urban middle class buyers and high-end buyers.
4	Facilitating Agencies	→ Millet can be grown organically, and the concept of organic foods is trending in recent years particularly among the urban middle class people.	<ul style="list-style-type: none"> → Millet can be consumed along with many other foods. → It can be a wholesome meal even without combining with other foods. → Its consumption can be any meal of the day or all the meals of the day. → Millet is very much a flexible food. 	→ Millet processing units although not established in all of the villages, but, there is good access to the processing units at least at the GP level.	→ Govt. has started millet-based tiffin centres with the support of SHGs, and there is good demand for the items supplied through this millet cafes.

5	CBOs	→ Millet crops can be grown even in the sloppy terrains and hilly areas.	→ Millet is proven immunity booster food and during the time of ongoing Covid-19 pandemic, millet consumption has increased relevance.	→ Millet processing and value addition can enhance the value chain activity of millets and even the supply chain can be increased to the export market.	→ There is good chance of promoting skills for millet-based value addition activities as well as strengthening the supply chain management of millet activities.
6	CRPs	→ All categories of farmers can easily adopt millet cultivation, because of the simplicity of its cultivation process without entailing much of the sophisticated knowledge.	→ The outreach of millet consumption could be further reinforced by further promoting millets in the MDMs and AWCS.	→ There is plan to undertake systematic intervention for the promotion of millet processing in all of the OMM intervention villages.	→ Considering that more number of households and household members are adopting millets as staple foods, there is good chance of marketing of millets in the immediate future.

7.4 Threat of OMM

Sl.	Stakeholders	Stakeholder' Opinions on the Threats of OMM in the district			
		Production	Consumption	Processing	Marketing
1	District level Agricultural Officers	→ Farmers will adopt to millet cultivation only in high land areas where paddy and cultivation of other crops are risky. In that way, there can't be any major diversion of	→ Millet can't be exclusively consumed by itself. Under current socio-economic situations, millet can't be exclusively considered as the staple food.	→ Market needs finest quality flours without presence of any husk in the flour. But in the case of ragi flour, there is every possibility of fibres and starches in the	→ Millet farmers in the absence of MSP are likely to sell to middlemen which is very much exploitative in nature and farmers become bound to undergo distress sales of millets.

		paddy lands for millet cultivation in Odisha.		flour. From marketing point of view, it is to some extent difficult.	
2	Block level Agricultural Officers	→ It is traditionally believed by the farmers that millet cultivation is a subsistence-oriented farming practice and it is very hard for the farmers to believe about the commercial viability of millet farming.	→ As millet are light foods and quickly digests, the hard-working rural people may find it costlier and inconvenient to substitute rice like heavy food for millet.	→ There is large scale wastage in the processing of millets.	→ Although, there is govt. procurement for ragi, for non ragi millets, such mechanism is yet to be established which is a limitation for millet farmers for proper marketing of their produce.
3	District level WASSAN Officials	→ Millet cultivation can't be possible in all land categories, which is very much a limiting factor for aggressive outreach of millet cultivation.	→ Although quality wise millets are very good, but, most often people are detached from millet as taste wise, millets are not very good.	→ There is absence of processing facilities at village level.	→ Marketing of millets is viewed to be a constraint owing to limited processing facilities of millets.
4	Facilitating Agencies	→ Farmers feel it difficult to consider millet cultivation as principal cultivation of any cropping season. Rather it is supplementary cultivation as perceived by the farmers.	→ Despite promotion of so many varieties of millet base recipes, but majority of people consider ragi porridge as the main recipe, which can't be substituted by any other recipe.	→ Considering limited demand, private investment in millet processing sector is found limited.	→ In the case of non ragi millets, there is very much limited marketable surplus, for which it is becoming difficult to strengthen proper marketing channels for millets. Resultingly, middlemen purchase is found to be the very much established channels for non ragi millets.

5	CBOs	→ Paddy cultivation, over time has influenced the socio, religious and cultural practices of farmers' households, which might hinder the sustained adoption of millet farming.	→ Even if there is large scale adoption of millets as staple food, the supply of millet is limited.	→ Limited mechanised processing facilities at village level discourage millet processors to go for necessary value addition particularly for millets requiring dehusking. It is the case of suan, kangu and kodo millets.	
6	CRPs	→ Most often the millet farming is considered inferior compared to the prestige value attached to other crops cultivation particularly paddy cultivation.	→ Large scale adoption of millet as staple food may lead to scarcity of millets and consequently higher price which may confuse households to consume millets.		

Chapter-VIII: Key Findings and Way Forward

8.1 Key Findings

8.1.1 OMM outreach

The ragi area of the district, was 4.23 percent of the state area in 2000 which has increased to 5.36 percent in 2010s. On the other hand, small millet area as a proportion to the overall small millet area of the state has declined from 3.15 percent in 2000s to 2.10 percent in 2010s. However, there is very negligible fall in the ragi area of the district in 2010s compared to 2000s. As it is revealed from table 2.22, there is 0.63 percent fall in the ragi area of the district compared to a sizable fall at the state level. This implies there is low level of shifting of ragi crop to other crops in the district. However, in the case of small millets, there is sizable fall in the area under small millet cultivation in 2010s compared to 2000s. The area under small millets cultivation in 2010s compared to 2000s, is reduced by 39.76 percent which is only 9.61 percent fall at the state level. The yield rate of ragi in Malkangiri district tends to marginally decrease by 1.60 percent during 2010s compared to 2000s. During the corresponding period, at state level it has increased by 12.83 percent. The yield index of ragi in Malkangiri district in comparison to state level performance of the same depicts lower status of the district in terms yield rate of ragi during both the decades. On the other hand, in the case of small millets, there is almost similarity in the yield index in both the decades. the decadal variation in ragi production in the district as well as the state is negative. However, the percentage fall in 2010s compared to 2000s in the district stands much lower compared to all Odisha level. By the end of Kharif 2019-20, OMM has covered four blocks in Malkangiri district. Cumulatively, in all these blocks, there is outreach of OMM in 61 GPs, 579 villages, 9351 farmers and 5993.27 hectares of land area under millet cultivation.

8.1.2 Socio Economic Characteristics of Millet Farmers

About 85.9 percent of the farmers have joined into OMM in 2017-18 year, followed by 10.3 percent in 2018-19 and the remaining 3.8 percent in 2019-20. Except Chitrakonda block more than 80 percent of sampled out millet farmers had joined into OMM in the initial year of first phase OMM implemented in the district. Overall, about 76.9 percent of millet farmers of Malkangiri district are males and the remaining 23.1 percent are females. Incidence of female millet farmers is comparatively higher at Korakunda and Chitrakonda blocks. Majority of millet farmers, overall, to the extent of 84.7 percent are Scheduled Tribes (STs) followed by other castes (13.1%) and the remaining 2.2 percent are SCs. The mean age of millet farmers is overall found at 41.8 years which is found on the higher side among the SC farmers. The educational background of millet farmers as indicated in table 3.4 reveals that majority of millet farmers of Malkangiri district are illiterates followed primary level of education. significant majority of farmers are Hindus by religion and other religions are almost negligible. The proportionate share of small farmers, medium farmers, marginal farmers, and large farmers are found at 56.6, 33.8, 6.3 and 3.4 percent respectively. Marginally higher proportion of millet farmers of the district have Kuchha houses followed by semi pucca houses and pucca houses. overall, there are 2.5 male and 2.5 female members per each millet farmers' household in the district. The overall sex ratio among the millet households of the district is found balanced.

8.1.3 Behaviour of Millet Production

The overall operational landholding among the millet farmers of Malkangiri district stands at 9 acres. On an average, encroached land and shared in land per farmers is calculated at 2.9 and 2.3 acres respectively. Out of the total operational landholding per farmer, percentage share of own-land,

encroached land, shared in land stand at 42.2, 32.2 and 25.6 percent respectively. Overall, for all project blocks in the district, there is no change in the number of farmers for paddy cultivation during post project situation. The number of farmers cultivating paddy, vegetables and oil seeds has increased by 37.3, 53.8 percent respectively. Cultivation of cash crops is very much negligible and limited to few farmers only in the district. So far as millet farming is concerned, it was found that there has not been any change in the number of farmers cultivating ragi crops. However, there is 50 percent increase in the number of suan farmers. Method of millet cultivation comprises of mono cropping, mixed cropping and intercropping. The prevalence of different methods of cultivation of different millets by the millet farmers are comparatively shown during pre and post project period. For ragi crop, it is found that mono cropping practice is the dominant method of cultivation during pre-project as well as post project situations. However, mixed crop practices are also found with sizable proportion of millet farmers. Agronomic practices of ragi was mainly based on broadcasting methods during pre-project period, which is shifted much in favour of LT and SMI methods. During post project period, LT method of ragi cultivation is found as the dominant agronomic practice for ragi cultivation. Suan, although practiced by very limited number of farmers, broadcasting based agronomic practice is mainly pursued by the farmers during pre-project as well as post project situations. weeding practices of millet farmers are mostly one time for ragi cultivation during post project period. Previously during pre-project situation, ragi farmers were not undertaking any weeding activity for ragi crop. Due to OMM intervention, ragi farmers have adapted weeding practice. However, for suan cultivation farmers are found to have adapted more than two times weeding during pre-project as well as post project situations. Production of ragi per farmer and per acre in Malkangiri district is found at 1.5 and 2.5 quintal in respectively.

8.1.4 Behaviour of Millet Consumption

Compared to pre project situation, number of households consuming millets has slightly declined in summer seasons. However, more than 95 percent of households are consuming millets. But there is marginal increase in the number of households consuming millets during both time periods. The overall per day household consumption of millets during post project situation has slightly decreased during all seasons. During interaction with farmers, it was elicited by the respondents that over time quantity of staple food consumptions are declining owing to increased food diversification by the households. Added to it, number of days of millet consumption during each season has tended to increase during post project period. Notwithstanding more production of millets during post project period, number of households depend on market for purchasing millets has increased during post project situation. The reason being that number of days of millet consumption by a greater number of household members has increased during post project situation. During pre-project period, major source of purchasing millets were local market and bartar. However, during post project period owing to mainstreaming of PDS, significantly higher number of households are found purchasing millets from PDS.

8.1.5 Behaviour of Millet Processing and Marketing

With respect to ragi flour making, majority of households depend on machine for which they cover a minimum distance of 2 Kms. and maximum distance of 10 Kms. On the other hand, for other types of millets, de-husking of millet is required which is done through traditional means by all households. However, the household's dependent on traditional processing uses locally available traditional instruments like "dhinki", made up of wooden logs, and "chakki", made up of two round stone plates. Dhinki is used for dehusking and chakki is used for grinding. Both these instruments are operated manually. Soon after the introduction of Mandies under OMM, millet farmers are processing their

millet as per Mandi standards. They are sun-drying dehusked millets for maintaining required moisture. Very commonly, they sell millets with husk at a lower price. The middlemen undertake value addition activities by making millets husk free. Further middlemen also do sort and grading of millets according to quality. Now as a result of OMM intervention and training to millet farmers, slowly they have started value addition activities for the marketable surplus of millets. During pre-project period local middlemen was the predominant channel which has been shifted in favour of Mandi during post project period. During pre-project situation, around 98.2 percent of surplus ragi of the district were sold through middlemen and now, during post project period, about 73.1 percent of surplus ragi are sold through Mandis. During pre-project period local middlemen was the predominant channel which is still evident during post project period. During pre-project situation all of the surplus suan were sold to middlemen and now, during post project period also, the same is practiced by the suan farmers of the district.

8.2 Way Forward

- Due to prevalence of MSP and procurement of kharif ragi through Mandi system, the millet farmers have well accepted ragi as a major millet crop in the OMM project areas. Farmers have also expressed their interest to cultivate ragi during Rabi season. It is suggested by the farmers as well as grassroot level OMM officials that procurement of ragi during Rabi season should be introduced so that ragi farmers will be interested to under rabi cultivation of ragi.
- Besides, there are farmer level suggestion for introducing MSP for other millets like Suan, kangu, janha and kodo millets. Due to non-prevalence of MSP for these millets, farmers are not giving sufficient attention for undertaking cultivation of non ragi millets.
- Govt. of India has recently focussed on promotion of Farmer Producers Companies (FPC) for increasing farmers income through FPC channels. There seems to be sufficient space for organising small holder millet farmers into FPCs. Besides, promoting millet producers' collectives at block and district level is expected to contribute to strengthening the economics of millet farmers. In some of the OMM areas, early efforts for promoting millet based FPOs have already been attempted and the benefits of such producers' collectives are expected very shortly. It is suggested that millet based FPOs should be organized in all of the OMM districts. Mainstreaming of FPO activity in the project area will provide sustainability of the programme, even after completion of the project.
- Despite emphasis of OMM for millet processing at GP level, it is not yet fully strengthened for which except ragi, for non ragi millets people undertake manual processing. Even in case of ragi also, a sizable chunk of households is undertaking manual processing of millets. Efforts should be made to strengthen millet processing units at GP level.
- Due to OMM intervention, there has been improved millet production and consumption in the OMM project area. Based on findings of the study, there is good scope for further improving PCPDC of millets OMM project areas. Further, there should be consumption improvement in non-OMM areas also. It is viewed that there should be continuous research for improving millet production and consumption in the state.