

Mid Term Evaluation

Special Programme for Promotion of Millets in Tribal Areas of Odisha
(Odisha Millets Mission, OMM) Phase-I Blocks

STATE REPORT



Submitted To



Nabakrushna Choudhury Centre for Development Studies
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

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Green India



Abbreviations

AWC	Anganwadi Centre
BPL:	Below Poverty Line
CBOs:	Community-Based Organisations
CRPs:	Community 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
KII:	Key Informant Interview
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 Ton
NA:	Not Available
NAPCC:	National Action Plan on Climate Change
NCDS:	Nabakrushna Choudhury Centre for Development Studies
NMSA:	National Mission for Sustainable Agriculture
NPM:	Non-pesticidal Management
NWDPR	National Watershed Development Project for Rainfed Areas
OMM:	Odisha Millets Mission
PCPDC:	Per Capita Per Day Consumption
PDS:	Public Distribution System
RADP:	Rainfed Area Development Programme
RKVY:	Rashtriya Krishi Vikas Yojana
RVP:	River Valley Project
SC:	Scheduled Caste
SMI:	System of Millets Intensification
ST:	Scheduled Tribe
WASSAN:	Watershed Support Services and Activities Network

EXECUTIVE SUMMARY

Background

The UN Food and Agriculture Organization remarks Millet grows easily in dry climate, have smaller harvesting period and require minimal water quantity (Quoted by APEDA). 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. 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.

Functioning of Odisha Millet Mission

Special Programme for promotion of in tribal areas of Odisha, popularly 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 period 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 Guidelines, 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 System are the added objectives for which the special programme on millets is implemented in the state.

Project Area

As per the programme guideline, the programme outreach is decided taking into account the intensive tribal areas in contiguous habitations and there is predominance of tribal population with previous history of millet consumption and farming practices. Following this principle, Initially the programme was started in 28 blocks under seven tribal districts, Kalhandi, Nuapada, Kandhamal, Gajapati, Rayagada, Koraput and Malkangiri. These seven districts as located in the Southern part of Odisha, collectively these districts are levelled as Southern Odisha districts. In the subsequent year, the programme was upscaled to 53 blocks due to additional 25 blocks covered under OMM in the second phase in 2018-19, and there was a further addition of another 17 blocks in the third phase in 2019-20. However, the programme outreach during the first phase implementation of the project was limited to thirty blocks under seven districts as mention in table 1.2. Out of the thirty blocks covered under the first phase implementation, except Chandrpur block of Rayagada district, in all other twenty-nine blocks the intervention was started in 2017-18 and in Chandrapur block, programme implementation was started in 2018-19.

Rationale

Naba krushna Choudhury Centre for Development Studies (NCDS), Bhubaneswar has commissioned the mid-term evaluation study of Odisha Millets 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.

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.

Approach and Methodology

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.

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 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.

Socio Economic Characteristics of Millet Farmer Households

Majority of millet farmers covered under OMM are under the age group of 25-50 years followed by more than 50 years age group. Overall coverage of male and female farmers under OMM is at 75.3 and 24.7 percent respectively. About 64.9 percent of millet farmers are illiterates, 17.7 percent of farmers have education upto primary standard and another 6.8 percent have education upto upper primary standard. Majority of millet farmers, overall, to the extent of 73.8 percent are Scheduled Tribes (STs) followed by other castes (20.5%) and the remaining 5.6 percent are SCs. More than 90 percent of millet farmers of Gajapati and Rayagada district are STs by their social category. Majority of farmers, about 84 percent of millet farmers are Hindus by religion followed by Christianity (16.0%). a sizable chunk of millet farmers are marginal and small farmers. Proportionate share of marginal and small farmers jointly account around 78.1 percent of the total millets farmers as discussed. Overall, for about 60 percent of millet farmers, their residential houses are semi pucca houses followed by kutcha houses and pucca houses. Percentage share of pucca houses in the overall residential housing structures of millet farmers is about 18.2 percent. There are 2.5 male and 2.4 female members per millet farmers’ household. More than 90 percent of the sampled-out millet farmers of Gajapati and Rayagada district are oldest registered millet farmers as they have have joined into OMM in the year 2017-18. The average land owned by marginal, small, medium and large farmers is found as 1.7 acres, 2.7 acres, 4.3 acres and 8.9 acres respectively. Overall, it is found that the average land holding per millet farmer is found at 2.9 acres which is used for millet as well as not millet crops cultivation. The operational land holdings per

millet farmer is found at 3.7 acres. Overall sex ratio in the project area is found at 935. About 60 percent of household members are found employed in agricultural activities as their principal occupation. A miniscule proportion of the total household members roughly 3 percent are employed in other occupations as principal source of income. Main occupation of these 3 percent of people includes daily wage earner, business activities, Govt. and private service, artisan, MFP collection etc. Wage earning and agriculture are the two major sources of subsidiary occupation in the project area. The overall annual household income from principal as well as subsidiary occupation is calculated at Rs. 50052.

Millet Production, Productivity and Package of Practices in the project area

The millet farmers in addition to cultivation of millet, also cultivate paddy, pulses, vegetables, oil seeds, and cash crops. Ragi, suan, Kangu, Janha and kodo are different types of millets cultivated by the farmers. It is found that paddy area per farmer has marginally declined in all of the project districts except Malkangiri, Koraput and Rayagada. In Koraput district there is no change, however, in Malkangiri and Rayagada district, there is marginal increase in paddy area per farmer. Similarly, there is more than 10 percent fall in the pulses areas in Malkangiri district and 5 percent fall of the same in Koraput district. Out of seven districts, in five districts, there is falling tendency of vegetable area per farmer. With respect to oil seeds and cash crops there is also falling tendency in the crop area per farmer in three districts. However, with respect to ragi, except two districts, five districts witnessed positive increase in the land area per farmer.

There is sizable increase in ragi area per farmer in Malkangiri district. Compared to pre project situation, there is about 20 percent increase in ragi area per farmer during post project situation. Overall speaking average operational land holding per farmer has increased from 7.079 acres during pre-project period to 8.799 during post project period, thereby registering 24.3 percent increase in the average operational area per farmer. For ragi crop, it is found that there is about 60 percent increase in monocropping of millets and correspondingly there is sufficient decline mixed and intercropping of millets. During post project period, about more than 85 percent of the ragi farmers have abandoned mixed and intercropping of ragi and have switched over to monocropping of ragi. Similarly, the extent of increase of monocropping of Suan, bajara, Janha, and kodo millets during post project period has increased by 97.3, 200, 42.9 and 68.2 percent respectively. for all types of millets almost in all of the project districts farmers have shifted from traditional broadcasting method of cultivation and adopted package of practices. 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. The selected improved varieties include Arjuna and Chilika, in Gajapati district; Arjuna and Bhairavi in Rayagada district and Nuapaad district; Arhuna, VRT 47 in Kandhamal district; Bhairavi in Malkangiri district; GPU 66, GPU 48, ML 365 in Koraput district. Besides, the project has also successfully promoted a set of packages of practices like improved cultivation methods, better agronomic practices and importance of de-weeding on millet fields.

During pre-project situation Amount of production of ragi per farmer and per acre is found at 1.7 and 2.6 quintals respectively. However, during post project situation, the amount of production per farmer and per acre are found to be at 5.6 and 6.0 Quintal respectively. Considering the total production of suan during pre-project and post project situations separately, the production per acre during pre-project situation is found at 1.7 quintal as against the same at 2.5 quintal during post project situation. Similarly total production of suan per farmer during pre-project and post project situations is calculated at 1.7 and 2.1 Quintals respectively. It is found that kangu production per farmer and per acre during

pre-project situation was at 0.73 and 1.38 quintals respectively. During post project situation, production of kangu per farmers has increased to 0.83 quintals and per acre to 2.35 quintals. Janha production per farmer and per acre during pre-project situation was at 1.28 and 2.32 quintals respectively. During post project situation, production of janha per farmer has increased to 1.45 quintals and per acre to 2.54 quintals.

The total cost of millet cultivation per acre during pre-project period stands at Rs. 2093.1 of which Rs.1301.3 is the operational cost and Rs.791.8 is the labour cost. In per acre analysis also obviously, manure and ploughing charges are found to be the leading costs. Jointly, these two costs account as high as 84 percent of the total operational cost per acre of ragi cultivation. With respect to labour cost per acre of cultivation, it is mainly contributed harvesting time labour cost and transplantation time labour cost. Besides weeding cost is third prominent contributor to labour cost per acre of ragi cultivation. So far as cost of cultivation of ragi per acre during post project situation is concerned, the overall cost is found at Rs. 4650.00 of which Rs. 2319.00 is the operational cost and Rs. 2331.00 is the labour cost. The net income per acre of ragi cultivation has increased from Rs. -943.00 during pre-project period to Rs.13042.00 during post project period.

Household Millet Consumption Pattern in the Project Area

During pre-project situation maximum proportion of households about 85.8 percent were consuming millets during summer season. During winter season about 64.3 percent of households were consuming millets and 66.9 percent during rainy season. Compared to pre project situation, proportion households consuming millets during post project situation has substantially improved in all seasons. Overall 98.5 percent of millet farmers households are found consuming millets during summers season. Similarly, 79.9 percent were consuming millets during winter season and 72.6 percent in rainy seasons. A good majority of households during pre-project and post project situation are consuming millets during summer season. During post project period, more than 95 percent of millets households in all district consume millets during summer season.

During pre-project period, the mean daily household consumption of millets during winter, rainy and summer season is calculated at 0.7 Kg., 0.4 Kg., and 0.5 Kg. respectively. During post project period, the mean daily household consumption of millets during winter, rainy and summer season is found at 0.5 Kg., 0.5 Kg. and 0.4 Kg. respectively. Compared to any other time of the time of the day, millet consumption time during post project period is maximum reported for breakfast time for which it may be stated that millets have emerged as the most preferred breakfast cereal in the project area. During pre-project situation, overall, about 39.6 percent of millet producers were purchasing millets from the market, which has been reduced 18.8 percent in the post project situation. This implies that additionally about 20 percent of millet farmers have become self-sufficient by producing their household millet requirements. The average quantity of millet purchased per annum per millet purchasing household during pre-project and post-project period is calculated at 0.28 and 1.86 quintal respectively. During pre-project period, as high as 83.3 percent of the household requiring purchase of millet for household consumption were purchasing local market as well as receiving wage good. However, during post project situation has brought about a breakthrough in the system of household millet purchase. During post project situation, as high as 86.2 percent of needy households are purchasing millet from PDS. The study views that it is a significant impact of OMM for promoting a vibrant PDS system to bolster household millet consumption in the project area.

Processing and Marketing of millets in the Project Area

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 20 Kms. So, it can be stated that, on an average, households cover an average distance of 11 Kms. to undertake the primary processing of millets. 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 use locally available traditional instruments like "dhinki", made up of wooden logs, and "chakki", made up of two round stone plates. 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. Local middlemen, local haat, local money lender, input supplier and barter are different market channels through which surplus millet is sold by the farmers. 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 79.8 percent of surplus ragi surplus were sold through middlemen and now, during post project period, as maxim as 81 percent of surplus ragi are sold through Mandis.

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. Towards diversification and expansion of millet crops, non-ragi millets should also be accorded equal importance as it is being promoted for ragi illets.
- 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.

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.

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

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/>

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. As per UN Food and Agriculture Organization's data, Millet grows easily in dry climate, have smaller harvesting period and require minimal water quantity (Quoted by APEDA)⁷. 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.⁸

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.⁹ 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 https://agriexchange.apeda.gov.in/Weekly_eReport/Millets_Report.pdf, P-5

⁸ Apetrei, Cristina (2012), "Food Security and Millet Cultivation in the Kumaon Region of Uttarakhand", Research Report for Gene Campaign, August 2012.

⁹ 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’.¹⁰

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/National Watershed Development Project for Rainfed Areas (NWDPA) / River Valley Project (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, Mushroom etc

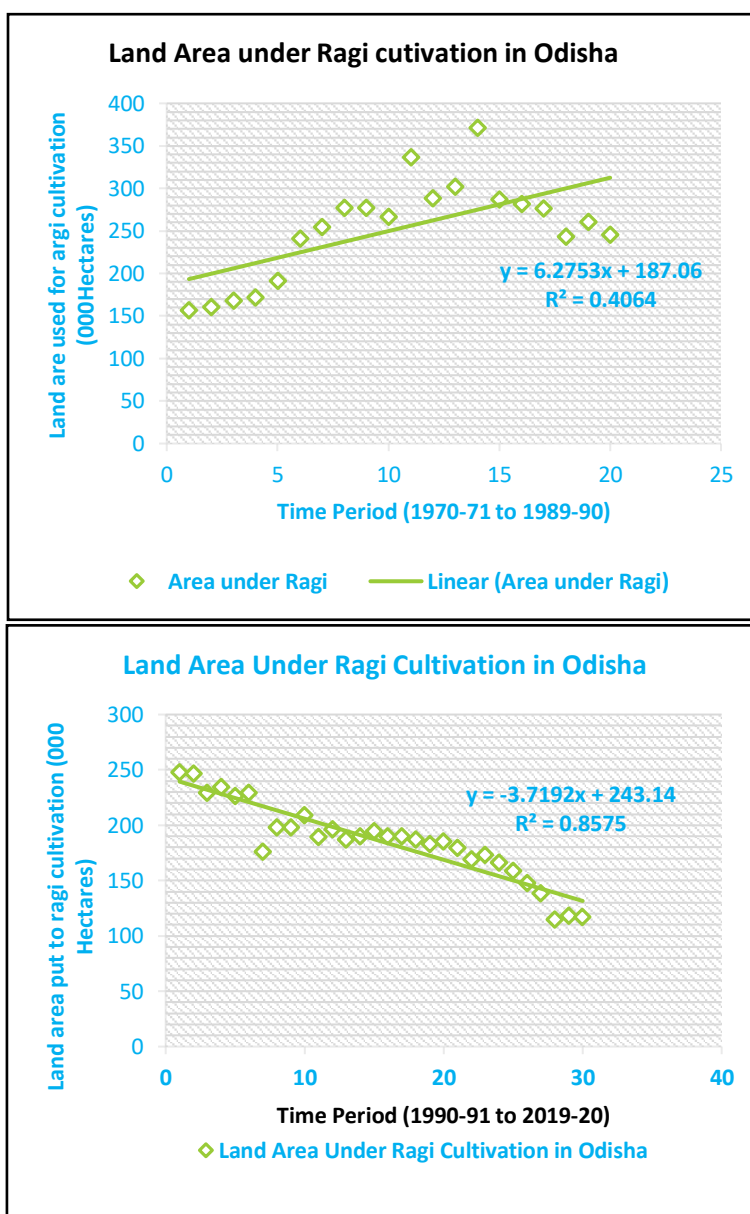
¹⁰ Department of Agriculture & Cooperation, (2014), “National Mission for Sustainable Agriculture (NMSA): Operational Guidelines”, Ministry of Agriculture, Government of India

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 Trend of Millet Production in Odisha

As per available statistics with the Directorate of Agriculture and Food Production, Govt. of Odisha, ragi is a major millet in the state followed by minor millets. The land area under millet cultivation in the state increased during entire 1970s and 1980s. The linearly increasing trend depicts that during the twenty-year time period from 1970-71 to 1989-90, for each successive year, there was 6.27 thousand hectares of land area were added under millet cultivation. However, for the successive twenty-year time period, the trend is continuously diminishing. With each successive year during the period 1990-91 to 2019-20, there is a reduction of about 3.71 thousand hectares of millet land that are diverted for other crops. Similarly, there is also a secularly declining trend in the land area under small millets during last fifty years' time period ranging from 1970-71 to 2019-20. As per Govt. of Odisha statistics, during 1970s the average annual land area under ragi and small millet cultivation stood at 216.53 and 197.73 thousand hectares

respectively. The ragi area per annum increased upto 289.38 hectares during 1980 and thereafter it is found diminishing continuously. During the corresponding period, the land area under small millets have also steadily declined. Perhaps due to lower yield rate of small millets, in the initial phase i.e., small millet farmers have diverted land used for small millets for ragis and in subsequent years, farmers have diverted much of their millet lands including ragi lands for other crops. Despite increased yield rate of ragi as well as small millets over time during all the last five decades, Average annual production of ragi in the state has decreased from 243.79 (000 MT) in 1980s to 131.19 (000 MT) in 2010s. Annual average production of small millets in the state stood at 90.63 (000 MT) in 1980s which has decreased 12.07 (000 MT) during 2010s. Jena and Mishra (2020) in their study also finds that during the 1960s and 1970s there was an increasing trend in area and production of millets and since 1980s, there was a reversal for millets with declining in area and production. The decline started first for small millets in the 1980s



and subsequently since the 1990s for the three major millets – bajra, jowar and ragi. Decomposition of millets production indicated that that decline since 1980s is largely on account of area effect, but also because of yield effect in the 1990s and 2010s.¹¹

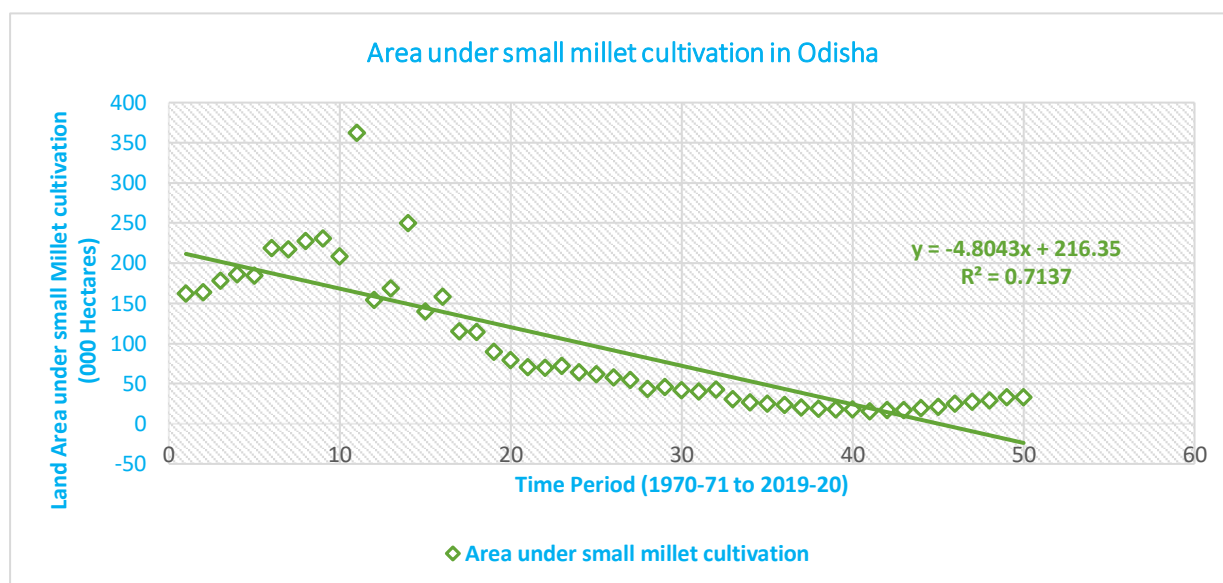


Table-1.1: Production Behaviour of Finger Millets (Ragi) and Small Millets in Odisha

Time Period	Average Annual Production of Millets (Area, Yield and Production)					
	Ragi			Small Millets		
	Area (000 Hectares)	Yield (Kg/ Hectare)	Production (000 MT)	Area (000 Hectares)	Yield (Kg/ Hectare)	Production (000 MT)
1970-71 to 1979-80	216.53	742.10	156.07	197.73	424.20	83.73
1980-81 to 1989-90	289.38	850.60	243.79	163.19	546.20	90.63
1990-91 to 1999-00	219.35	785.20	174.89	58.15	489.80	28.79
2000-01 to 2009-10	189.07	791.20	149.39	26.33	453.60	11.71
2010-11 to 2019-20	148.05	892.70	131.19	23.80	505.00	12.07
All Years	212.48	812.36	171.07	93.84	483.76	45.38

Source: Computed from the time series data provided in “Five Decades of Odisha Agricultural Statistics”, Directorate of Agriculture and Food Production, Govt. of Odisha (2020)

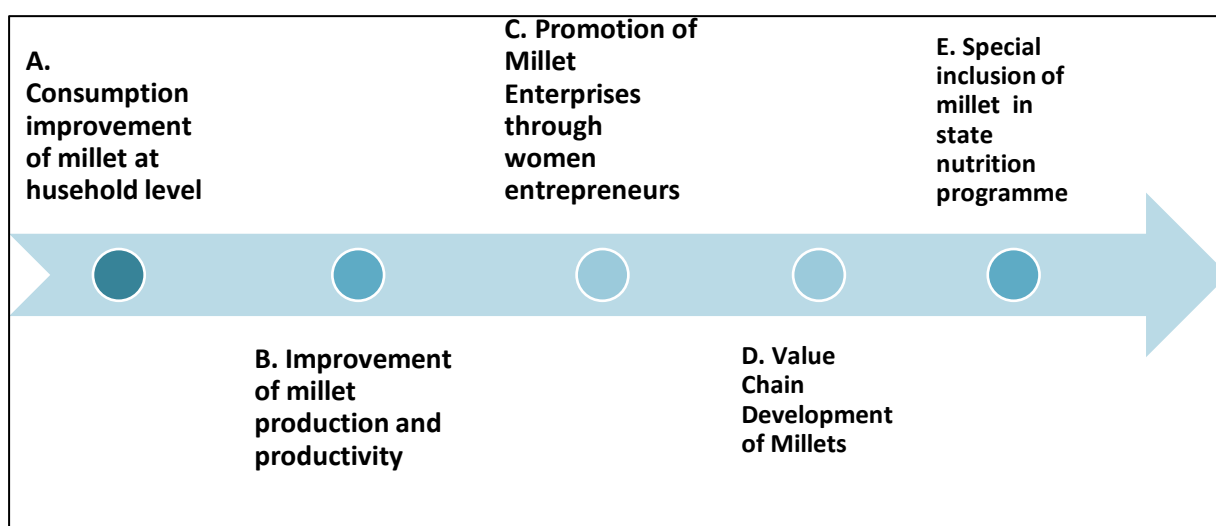
1.4 Special Programme for Millets in Tribal Areas of Odisha

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

¹¹ Jena, Diptimayee & Mishra, Srijit (2020), “Growth, Instability and Decomposition of Millets in Odisha: 1960-61 to 2017-18”, Odisha Economy Discussion Series 7, Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar, September 2020

(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 period 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 Guidelines¹², 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.



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 System of 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

¹² 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.

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 younger seedlings raised in a nursery, in the form of lines with specific spacing.¹³ The programme also supports farmers in adopting improved crop management practices such as weeding, log rolling, crop-cutting, and Non Pesticidal 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

As per the programme guideline, the programme outreach is decided taking into account the intensive tribal areas in contiguous habitations and there is predominance of tribal population with previous history of millet consumption and farming practices.¹⁴ Following this principle, Initially the programme was started in 29 blocks under seven tribal districts, Kalahandi, Nuapada, Kandhamal, Gajapati, Rayagada, Koraput and Malkangiri. These seven districts as located in the Sothern part of Odisha, collectively these districts are levelled as Southern Odisha districts.¹⁵ In the subsequent year, the programme was upscaled to 53 blocks due to additional 25 blocks covered under OMM. In the second phase in 2018-19, there was a further addition of another 17 blocks in the third phase in 2019-20. The latest outreach of the programme by the end of April 2021 is shown in the box given alongside.¹⁶

Programme Outreach of OMM

- 15 Districts
- 84 Blocks
- 1473 Gram Panchayats
- 15292 Villages
- 110448 Farmers

However, the programme outreach during the first phase implementation of the project was limited to thirty blocks under seven districts as mentioned in table 1.2. Out of the thirty blocks covered under the first phase implementation, except Chandrapur block of Rayagada district, in all other twenty-nine blocks the intervention was started in 2017-18 and in Chandrapur block, programme implementation was started in 2018-19. So, the present evaluation study considers all the blocks under first phase implementation except Chandrapur block. Thus, 29 blocks are covered in the study. The details of the blocks covered in the study is further reflected in table 1.5 given ahead.

District wise and block wise area taken up for ragi and non ragi millets under OMM is shown in table 1.2 and table 1.3 respectively. Similarly total number of farmers covered under OMM for all the districts and blocks is shown in table 1.4. With respect to area coverage under ragi, Koraput district is at the forefront followed by Malkangiri and Gajapati districts (Table-1.3). So far as non ragi millets are concerned, Kalahandi, Rayagada and Gapati districts are leading districts in relation to other districts

¹³ 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>

¹⁴ Guidelines for Implementation of “Special Programme for Millets in Tribal Areas of Odisha”, Letter No- 40856, Directorate of Agriculture and Food Production, Govt. of Odisha.

¹⁵ NCDS Study Team, “Baseline Survey: State Report 2016-17, Phase 1 (Special Programme for Promotion of Millets in Tribal Areas of Odisha or Odisha Millets Mission, OMM),” Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar, December, 2019.

¹⁶ OMM official website

(Table-1.4). With respect to farmer coverage under OMM, maximum proportions of farmers are from Koraput district, followed by Gajapati and Malkangiri district (table-1.5).

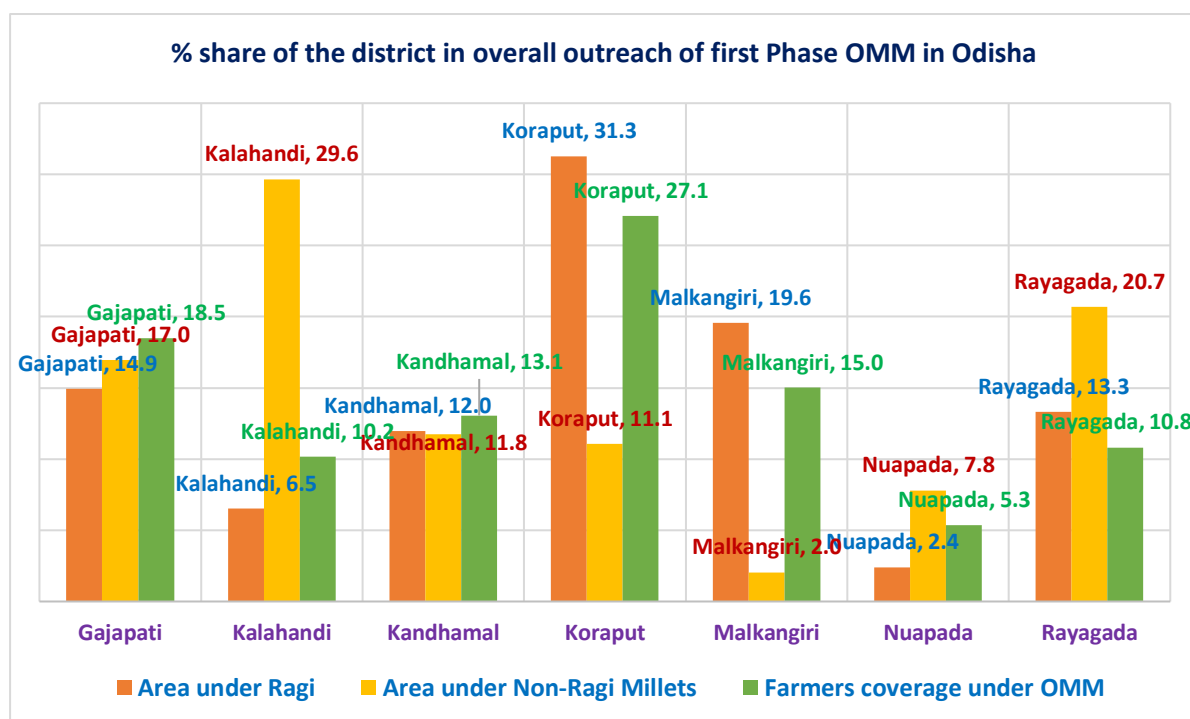


Table –1.2: Coverage of Ragi under first phase OMM Project Intervention

Sl.	District	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	Gajapati	Gumma	174.2	350.2	508.2	1032.6	31.3	14.9
		Mohana	134	253.6	388.6	776.2	23.5	
		R.Udayagiri	202.4	284	338.3	824.7	25.0	
		Rayagada	118.2	215	331.2	664.4	20.1	
		Sub total	628.8	1102.8	1566.3	3297.9	100.0	
2	Kalahandi	Bhwanipatna	2.02	32.2	70.15	104.22	7.2	6.5
		Lanjigarh	45.93	131.33	201.8	379.06	26.3	
		Narla	18.23	168	119.4	305.63	21.2	
		Th.rampur	38.65	195.4	418.4	652.45	45.3	
		Sub total	104.83	526.93	809.6	1441.36	100.0	
3	Kandhamal	Daringbadi	50.4	245.7	250.5	546.6	20.7	12.0
		Kotagarh	26.4	363.6	413.8	803.8	30.4	
		Phiringia	15.2	161.1	251	427.3	16.2	
		Raikia	81	347.1	436.6	864.7	32.7	
		Sub total	173	1117.5	1351.9	2642.4	100.0	
4	Koraput	Boipariguda	169.56	400.6	600	1170.16	17.0	31.3
		Borigumma	125.05	242.2	772.18	1139.43	16.5	
		Dasmantpur	149.86	200.02	420	769.88	11.2	
		Kundra	131.1	344.3	454.9	930.3	13.5	
		Lamtaput	176.07	298.7	559.7	1034.47	15.0	
		Nandapur	197.89	517.2	215.7	930.79	13.5	
		Semiliguda	142.11	307	478.06	927.17	13.4	
		Sub total	1091.64	2310.02	3500.54	6902.2	100.0	
5	Malkangiri	Chitrakonda	161.87	390	596.16	1148.03	26.6	19.6
		Khairaput	124.44	280.88	700.48	1105.8	25.6	
		Korukonda	169.97	354.4	426	950.37	22.0	
		Mathili	231.28	273.2	614.4	1118.88	25.9	
		Sub total	687.56	1298.48	2337.04	4323.08	100.0	
6	Nuapada	Boden	85.71	49.4	138.54	273.65	51.5	2.4
		Komna	21.67	57.8	44.46	123.93	23.3	
		Sinapali	24.03	54.2	55.6	133.83	25.2	
		Sub total	131.41	161.4	238.6	531.41	100.0	
7	Rayagada	Chandrapur	0	189.4	423.2	612.6	20.9	13.3
		Gudari	73.05	260.4	271.2	604.65	20.6	
		Gunpur	160.26	223.2	258.5	641.96	21.9	
		Rayagada	110.48	435.8	532	1078.28	36.7	
		Sub total	343.79	1108.8	1484.9	2937.49	100.0	
		Grand Total	3161.03	7625.93	11288.8	22075.8		100.0

Source: Computed from WASSAN Official data

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

Sl.	Districts	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	Gajapati	Gumma	0	88.6	31.6	120.2	18.32	17.0
		Mohana	0	57.8	21.6	79.4	12.10	
		R.Udayagiri	0	150	66.6	216.6	33.01	
		Rayagada	0	95.4	144.6	240	36.57	
		Sub total	0	391.8	264.4	656.2	100.00	
2	Kalahandi	Bhwanipatna	0	173.6	77.4	251	21.89	29.6
		Lanjigarh	64.55	145.4	216.6	426.55	37.19	
		Narla	49.9	100.4	28	178.3	15.55	
		Th.rampur	0	128.2	162.8	291	25.37	
		Sub total	114.45	547.6	484.8	1146.85	100.00	
3	Kandhamal	Daringbadi	0	25	151.1	176.1	38.68	11.8
		Kotagarh	0	30	103	133	29.21	
		Phiringia	0	17.6	84	101.6	22.31	
		Raikia	0	2	42.6	44.6	9.80	
		Sub total	0	74.6	380.7	455.3	100.00	
4	Koraput	Boipariguda	0	70.6	123.2	193.8	45.25	11.1
		Borigumma	0	0	0	0	0.00	
		Dasmantpur	0	72.7	42	114.7	26.78	
		Kundra	0	2.5	9.4	11.9	2.78	
		Lamtaput	0	0	76.5	76.5	17.86	
		Nandapur	0	0	1.2	1.2	0.28	
		Semiliguda	0	30.2	0	30.2	7.05	
		Sub total	0	176	252.3	428.3	100.00	
5	Malkangiri	Chitrakonda	0	14	64.31	78.31	98.99	2.0
		Khairaput	0	0	0.8	0.8	1.01	
		Korukonda	0	0	0	0	0.00	
		Mathili	0	0	0	0	0.00	
		Sub total	0	14	65.11	79.11	100.00	
6	Nuapada	Boden	0	96	0	96	31.81	7.8
		Komna	0	96	1.8	97.8	32.41	
		Sinapali	0	95	13	108	35.79	
		Sub total	0	287	14.8	301.8	100.00	
7	Rayagada	Chandrapur	0	26	8.2	34.2	4.27	20.7
		Gudari	0	144.4	131	275.4	34.36	
		Gunpur	0	219.4	266.4	485.8	60.62	
		Rayagada	0	0	6	6	0.75	
		Sub total	0	389.8	411.6	801.4	100.00	
		All districts	114.45	1880.8	1873.71	3868.96		100.0

Source: Computed from WASSAN Official data

Table-1.4: Farmer Outreach under first phase intervention OMM

Sl.	District	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	Gajapati	Gumma	610	1405	1918	3933	33.7	18.5
		Mohana	386	955	1280	2621	22.5	
		R.Udayagiri	546	941	916	2403	20.6	
		Rayagada	232	739	1727	2698	23.1	
		Sub total	1774	4040	5841	11655	100.0	
2	Kalahandi	Bhwanipatna	7	310	411	728	11.4	10.2
		Lanjigarh	269	743	1307	2319	36.2	
		Narla	242	549	519	1310	20.4	
		Th.rampur	28	749	1272	2049	32.0	
		Sub total	546	2351	3509	6406	100.0	
3	Kandhamal	Daringbadi	293	1004	1211	2508	30.5	13.1
		Kotagarh	91	1020	1157	2268	27.6	
		Phiringia	55	517	824	1396	17.0	
		Raikia	189	575	1292	2056	25.0	
		Sub total	628	3116	4484	8228	100.0	
4	Koraput	Boipariguda	423	696	1568	2687	15.7	27.1
		Borigumma	298	578	1561	2437	14.3	
		Dasmantpur	353	577	1197	2127	12.5	
		Kundra	263	704	920	1887	11.1	
		Lamtaput	729	715	1177	2621	15.4	
		Nandapur	500	1710	567	2777	16.3	
		Semiliguda	184	874	1468	2526	14.8	
		Sub total	2750	5854	8458	17062	100.0	
5	Malkangiri	Chitrakonda	377	902	1610	2889	30.5	15.0
		Khairaput	303	640	1479	2422	25.6	
		Korukonda	375	647	727	1749	18.5	
		Mathili	506	621	1280	2407	25.4	
		Sub total	1561	2810	5096	9467	100.0	
6	Nuapada	Boden	345	402	642	1389	41.3	5.3
		Komna	92	359	474	925	27.5	
		Sinapali	184	357	510	1051	31.2	
		Sub total	621	1118	1626	3365	100.0	
7	Rayagada	Chandrapur	0	385	680	1065	15.6	10.8
		Gudari	156	600	605	1361	20.0	
		Gunpur	309	874	996	2179	32.0	
		Rayagada	291	824	1099	2214	32.5	
		Sub total	756	2683	3380	6819	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.

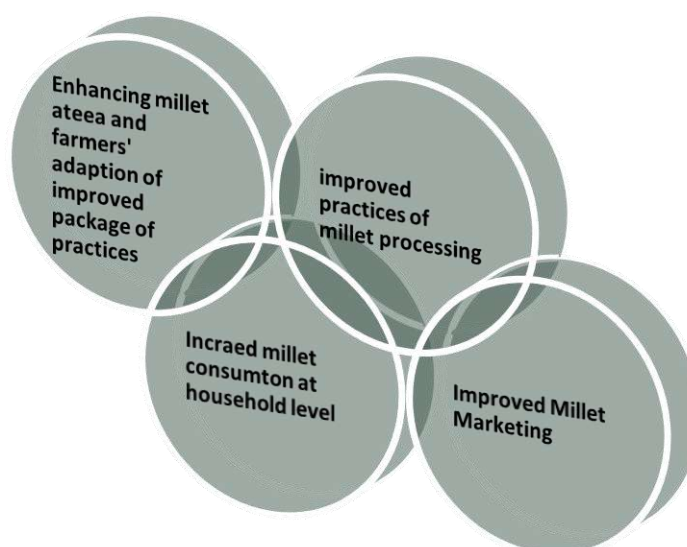
1.7 Objectives

- 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

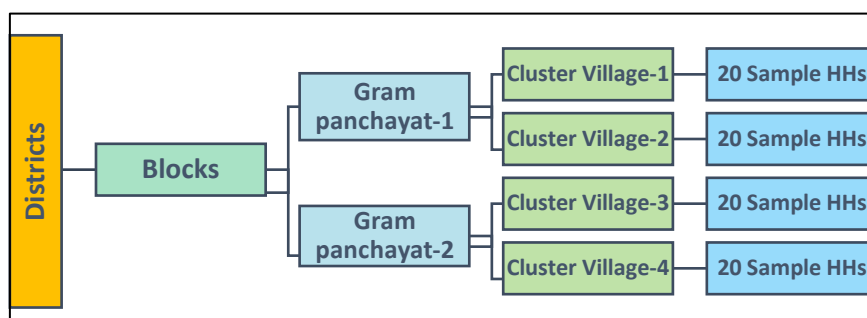


intervention comprises increased millet production through enhancing millet area and adaption of improved package of practices by millet farmers, increased millet consumption at household level, improved practices of millet processing and improved millet marketing in the project area. These are collectively 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	Chitrakonda	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
5	Gajapati	Gumma	Bhubani, Tarbha	Ameisingi & Tidasingi, Buruding & Tarava	80
6		Mohana	Baghamari, Chandiput	Andiragada & Baghamari, Kaliapata & Taramal	80

7		R Udayagiri	Mangarajpur, Sabarapalli	Balidi & Sargisahi Anukampa & Tikemal	80
8		Rayagarh	Ameda, Laxmipur	Gatida & Titli, Gayabaljuba & Raiguma	80
				Sub total	320
9	Kalahandi	Bhawanipatna	Borda, Gurujang	Phapsi & Goikela, Karlapi & Pastiguda	80
10		Lanjigarh	Kankutra, Lanji	Dakriguda & Goicharcha, Paikborhi & Dialbahali	79
11		Narla	Kurmela, Raksi	Bamak & Kirlibeda, Gokhra & Budhipadar	80
12		Thuamul Rampur	Gopalpur, Gunupur	Dakatola & Kumdabahal, Medkatra & Pastiguda	81
				Sub total	320
13	Kandhamal	Daringbadi	Bhramarbadi, Greenbadi	Bhramarbadi & Nuasahi, Dasiketa & Linepada	80
14		Kotagarh	Gugurmaha, Ura	Ladimaha & Tiamaha Atali & Dudumaha	80
15		Phirngia	Bandhaguda, Kelapada	Jhamapakal & Pikaradi Behangia & Kelapada	85
16		Raikia	Karada, Ranaba	Anlapata & Kanadi, Ranaba & Sikiriguda	80
				Sub total	325
17	Koraput	Boipariguda	Boipariguda, Durgaguda	Jhadiguda & Padeiguda, Dumuriguda & Khangarapara	80
18		Boriguma	Benasur, Katragada	Dhuntiguda & Keraput, Mankadiatal & Tarunjiguda	79
19		Dasmantapur	Gadiguda Paika, Phulabeda	Paikapuki & Tamili Badamguda & Paikphulbeda	80
20		Kundra	Banuaguda, Pupugaon	Ghiuriaguda & Kandulguda, Banuaguda & Hentalguda	80
21		Lamtaput	Badigada, Ballel	Ancheipada & Raidel, Chilliba & Ballel	80
22		Nandapur	Atanda, Bheja	Atanda & Barangpali Badliguda & Bheja	80
23		Similiguda	Guntaput, Sadam	Jangarada & Jubarajpeta, Gunthaput & Phuldaba	80
				Sub total	559

24	Nuapada	Boden	Khaira, Nagapada	Sukalpur & Mundagaon Makbiril & Bhuipani	80
25		Komna	Kurumpuri, Michhapali	Khaligaon & Bisibahal Diamunda & Mundapale	81
26		Sinapalli	Ghatmal, Renimunda	Jogabhatta & Pandripani Ranimunda & Maheswara	80
				Sub total	241
27	Rayagada	Gudari	Kalraghati, Khariguda	Nuakereda & Papikhal Tala Khariguda & Grengapadar	80
28		Gunupur	Jaltar, Kulusing	Engraba & Jaltar Abusing & Kumbijal	80
29		Rayagada	Halua, Tadama	Jamulima & Japakhal Nathama & Pirigaon	80
				Sub total	240
	All districts and all blocks				2325

1.8.3 Statistical Instruments

- Household Questionnaire for Millet Farmers
- Format for Facilitating Agency
- Format for CRP/ CBO/ District Coordinator (WASSEN)
- Key Informant Interview (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



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 these districts is outlined in this chapter. The pattern of millet production in these districts are 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 Gajapati District

Gajapati District lies between 18.46 North latitude and 84 .27 East longitude. It is bounded by Ganjam & Andhra Pradesh on the East, Rayagada district on the West, Ganjam & Phulbani districts on the North & Anhdra Pradesh on the South. The district came into existence with effect from 2nd October 1992 after bifurcated from Ganjam District. The district headquarter is Paralakhemundi. There are 1612 revenue villages covered under 129 Gram Panchayats in 7 administrative blocks. Gajapati district comes under North Eastern Ghats Agro-Climate zone and mostly the terrain of the district is plane and undulating. The climate of the district is tropical with hot and dry summer, cold winter and erratic rainfall in monsoon. The maximum



temperature rises up to 42°C during summer months (May & June) and the minimum temperature comes down to 15°C during winter period i.e., in December. The district enjoys tropical climate characterized by hot summer (13.50°C to 44.63°C), cold winters (14.3°C to 37.3°C & rainy seasons (14.3°C to 38.2°C). A Brief statistical Profile of the district is presented in table-2.1.

Table-2.1: Brief Statistical profile of Gajapati District

Sl.	Particulars	Value	Sl.	Particulars	Value
1	Population (In Lakh)	5.7	15	Land Use Pattern (Area in '000 ha.) (2014-15) *	
2	Male (In Lakh)	2.8		Total geographical Area (Sq.km.)	4325
3	Female (In Lakh)	2.9		Forest	51
4	SC (In Lakh)	0.4		Land put to Non-agricultural use	11
5	ST (In Lakh)	3.1		Barren & Non-Cultivable Land	141
6	Others	2.2		Permanent Pasture & Other Agricultural Land	15
7	Total HHs (In '000.)	128.8		Net Area Sown	59
8	Average HHs Size	4.5		Cultivable waste Land	6
9	Sex Ratio (In %)	1032		Old Fallow	8
10	Workers			Current Fallows	13
	Total Worker (In Lakh)	2.9		Misc. Trees and Groves	5
	Main Worker (In Lakh)	1.7		Average Fertilizer Consumption per hectare (In Kg)	31.5
	Marginal Worker (In Lakh)	1.2	16	Irrigation Potential Created (Area in '000 ha.) *	

	Non-Worker (In Lakh)	2.8		Kharif	33.6
11	Literacy Rate (In %)	53.5		Rabi	9.1
12	No. of Job Card Issued	121191	17	No. of Village Electrified	1324
13	No. of Beneficiaries provided employment in MGNREGA	74391	18	No. of Banks	44
14	No. of BPL Families	68763	19	No. of AWC	1442

Source: District Statistical Hand book, Gajapati District 2011, *District at a Glance-2016

2..1.1 Millet Cultivation in Gajapati District

Traditionally, the farmers of Gajapati district, due to presence of large-scale highlands and sloppy lands have been cultivating millets since generations. However, in recent years, there is declining tendency in millet cultivation which can be observed from table 2.2. Compared to 2000s decade, in 2010s the average annual shrinkage of ragi area is about 6.7 percent in Gajapati district. Still, compared to all Odisha situation of the same, Gajapati district stands in an advantageous position as the shrinkage of ragi area is found lower compared to the same at 21.7 percent at all Odisha level. The annual land area under ragi cultivation accounted 5.4 percent of the total land area under ragi cultivation in the state during 2000s which has improved to 6.5 percent in 2010s. Despite good deal of shrinkage in the area under small millets cultivations in the state, there is substantial improvement of the same in Gajapati district. Compared to 2000s, in 2010s, there is positive increase of 42.7 percent in the annual land area of small millets cultivation in the district.

Table-2.2: Area under ragi cultivation in Gajapati district compared to All Odisha

Sl.	Regions	Decadal variation in the average annual land area under ragi and Small Millets cultivation (Land area in 000 hectares)					
		Ragi			Small Millets		
		2000s	2010s	Variation in 2010s over 2000s	2000s	2010s	Variation in 2010s over 2000s
1	Gajapati	10.29	9.60	-6.7	1.24	1.77	42.7
2	All Odisha	189.07	148.05	-21.7	26.33	23.80	-9.6
	Gajapati district as % to all Odisha	5.4	6.5		4.7	7.4	

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

Decadal Variation in average annual Yield Rate of ragi and small millets in Gajapati district compared to all Odisha is shown in table 2.3. The average annual yield rate of ragi in Gajapati district has slightly come down by 0.51 percent in 2010s compared to the same in 2000s. However, corresponding situation at all Odisha level has improved by 12.83 percent. However, in the case of small millets, annual productivity has improved by 10.27 percent in 2010s over 2000s in Gajapati district as against the same at 11.33 percent at all Odisha level. The yield index as detailed out in table 2.3 indicates that there is marginal decline in ragi and increase in small millets in 2010s compared to 2000s. The yield index also suggests that the yield rate of ragi in Gajapati district stands favourable in both the decades compared to all Odisha situation. In the small millets, the yield rate in Gajapati district stands lower compared to all Odisha situation in both the decades.

Table - 2.3 Yield rate of Ragi in Gajapati district compared to All Odisha

Sl.	Regions	Decadal Variation in average annual Yield Rate of ragi and small millets in Gajapati district compared to all Odisha (Yield Rate in Kg/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	% Variation	2000s	2010s	% Variation
1	Gajapati	945.22	940.38	-0.51	475.67	524.50	10.27
2	All Odisha	791.20	892.70	12.83	453.60	505.00	11.33
	Yield index of the district (All Odisha = 100)	119.50	118.88		60.14	66.31	

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 it can be seen from table 2.4, compared to 2010s, the annual production of ragi in 2010s has tended to decrease at All Odisha as well as Gajapati district. However, the extent of decrease is less in Gajapati district compared to all Odisha situation. On the other hand, there is much better improvement in the annual production of small millets in Gajapati district in 2010s compared to 2000s. In 2010s, the annual small millet production has increased by 57.63 percent as against the same at 3.07 percent at all Odisha level. Gajapati district accounting 6.45 percent of the overall annual production of ragi in the state in 2000s has improved slightly improved its position in 2010s by accounting 6.88 percent share in 2010s.

Table-2.4 Ragi Production in Gajapati district compared to All Odisha

Sl.	Regions	Decadal Variation in Volume of Ragi and small millets Production in Gajapati district compared to All Odisha (Production in 000 MT/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	% Variation in 2010s over 2000s	2000s	2010s	% Variation in 2010s over 2000s
1	Gajapati	9.63	9.03	-6.23	0.59	0.93	57.63
2	All Odisha	149.39	131.19	-12.18	11.71	12.07	3.07
	Gajapati district as % to All Odisha	6.45	6.88		5.04	7.71	

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

2.1.2 Odisha Millet Mission in Gajapati District

By the end of Kharif 2019-20, OMM has covered four blocks in Gajapati district. Cumulatively, in all these blocks, there is outreach of OMM in 196 GPs, 890 villages, 9715 farmers and 3700.004 hectares of land area under millet cultivation. The details of progress of OMM in Gajapati district is shown in the table 2.5 given below.

Table-2.5: Progress of Odisha Millet Mission in Gajapati Districts

Sl.	Time Period	Coverage of OMM in Gajapati district				
		Blocks	No. of GPs	No. of Villages/Hamlets	No. of farmers	Land Area (Hectares)
1	Kharif 2017-18	Gumma	4	16	346	115.9
		Mohana	6	45	362	130.35
		R Udayagiri	9	56	623	194.743
		Rayagad	4	20	138	83.771
		Sub Total	23	137	1469	524.764
2	Rabi 2017-18	Gumma	7	18	264	58.2
		Mohana	3	7	23	5.4
		R Udayagiri	6	12	23	10
		Rayagad	5	14	100	37.14
		Sub Total	21	51	410	110.74
3	Kharif 2018-19	Gumma	10	40	688	667.9
		Mohana	14	57	513	308.4
		R Udayagiri	10	40	225	149.4
		Rayagad	9	54	401	270.4
		Sub Total	43	191	1827	1396.1
4	Rabi 2018-19	Gumma	8	28	209	44.8
		Mohana	3	4	11	2.2
		R Udayagiri	6	6	10	4
		Rayagad	9	19	95	39.4
		Sub Total	26	57	325	90.4
5	Kharif 2019-20	Gumma	15	91	1649	437.8
		Mohana	24	148	1273	398.2
		R Udayagiri	23	109	1016	391.4
		Rayagad	21	106	1746	350.6
		Sub Total	83	454	5684	1578
		Total	196	890	9715	3700.004

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

2.2 Kalahandi District

Kalahandi district is one of the southern districts in Odisha. The district lies between 82° 32' to 83° 47' East longitude and between 19° 8' to 20° 25' North latitude. It is bounded by the Bolangir district in north, Rayagada district in south, Kandhamal district in the east and Nuapada district in the west. The climate condition of the district is generally hot with high humidity during March to August and cold during September to February. The monsoon generally breaks during the month of June. The district has an area of 7920 sq. kms and 15.77 lakhs of population as per 2011 census. The district accounts for 5.09 percent of the state's territory and shares 3.76 percent of the state's population. The density of population of the district is 199 per sq. kms., as against 270 persons per sq.km of the state. It has 2253 villages (including 137 un-inhabited villages) covering 13 blocks, under two Subdivisions. As per 2011

census, Schedule Caste and Schedule Tribe population constitute 18.17 and 28.50 percent of the total population of the district respectively.¹⁷

Kalahandi is a part of the KBK (Kalahandi, Bolangir and Koraput) region of the State, that has been considered as one of the most backward regions of the country. Higher incidence of poverty, frequent droughts, distress migration of vast chunk of labour force are some of the age-old characteristics of this region. Kalahandi has suffered over a long period of time from serious droughts, floods and other natural calamities. Deforestation and the collapse of the traditional tank irrigation system have affected the total productivity of the district. Though, the district receives a good amount of rainfall, the rainwater is not harvested properly.¹⁸ A snap shot of socio-economic profile of Kalahandi district is presented in tale-2.6.



Table-2.6: Brief Statistical profile of Kalahandi District

Sl.	Particulars	Value	Sl.	Particulars	Value
1	Population (In Lakh)	15.7	20	Land Use Pattern (Area in '000 ha), 2014-15	
2	Male (In Lakh)	7.8		Forest	101.2
3	Female (In Lakh)	7.9		Land put to Non-agricultural use	46.4
4	Scheduled Caste (In Lakh)	2.9		Barren and Non-Cultivable Land	34.5
5	Scheduled Tribe (In Lakh)	4.5		Permanent Pasture and Other Agricultural Land	25.1
6	Others (In Lakh)	8.4		Net Area Sown	244.4
7	Household (In Lakh)	4.0		Cultivable Waste Land	25.5
8	Average HH Size	3.9		Old Fallow	30.2
9	Sex Ratio	1003		Current Fallows	70.9
10	Total Worker (In Lakh)	7.5		Miscellaneous Trees and Groves	2.2
11	Main Worker (In Lakh)	3.8		Total Area under Survey	580.4
12	Marginal Worker (In Lakh)	3.7	21	Agriculture, 2014-15	
13	Non-Worker (In Lakh)	8.2		Average Fertilizer Consumption (kg/ha)	54.5

¹⁷ District Planning and Monitoring Unit (2017): "District Statistical Handbook, Kalhandi-2015"

¹⁸ Poverty and Human Development Monitoring Agency (PHDMA) (2012): "District Human Development Report, Kalahandi", Planning and Coordination Department, Govt. of Odisha.

14	Work Participation Rate (WPR, %)	47.7		Irrigation, Kharif ('000 ha)	146.9
15	Cultivator as % of Total Worker	19.3		Irrigation, Rabi ('000 ha)	111.3
16	Agricultural Labourers as % of Total Worker	58.1	22	Proportion of Villages Electrified (as on March 2014)	100.0
17	Literacy Rate (%)	59.2	23	Credit Deposit Ratio (as on December 2015)	68.1
18	Total Geographical Area (sq.km)	7920	24	No. of Aanganwadi Centres, 2014-15	2185
19	No. of Job Card Issued (cumulative, March 2015)	301865		HH provided employment as % of demand, MGNREGS, cumulative 2014-15	81.9

Source: District Statistical Hand Book, Kalahandi, 2015

Note: MGNREGS is Mahatma Gandhi National Rural Employment Guarantee Scheme

2.2.1 Millet Cultivation in Kalahandi District

The land area annually diverted for ragi and small millet cultivation in Kalahandi district compared to all Odisha situation during 2000s and 2010s is shown in table 2.7. Compared to 2000s, there is shrinkage of ragi area in Kalahandi district to the extent of 68.81 in 2010s. The corresponding fall at all Odisha level is only 21.70 percent. This amounts to say that the ragi farmers of Kalahandi district are faster in adopting non-ragi crops than all Odisha situation. Similarly, in the case of small millets, there is also shrinkage of land area under small millets in 2010s compared to 2000s. However, such shrinkage at Kalahandi district is found marginally lower compared to all Odisha level. Due to higher land diversion of land from ragi to non ragi crops, the percentage share of ragi lands to all ragi lands in the state has decreased from 3.61 percent in 2000s to 1.44 percent in 2010s. With respect to small millets, Kalahandi district accounting 2.85 percent of the overall small millet area of the state in 2000s has slightly improved to 2.98 percent in 2010s.

Table-2.7: Area under ragi and small millets cultivation in Kalahandi district compared to All Odisha

Sl.	Regions	Decadal variation in the land area under annual ragi and Small Millets cultivation in Kalahandi district compared to all Odisha (Land area in 000 hectares)					
		Ragi			Small Millets		
		2000s	2010s	Variation in 2010s over 2000s	2000s	2010s	Variation in 2010s over 2000s
1	Kalahandi	6.83	2.13	-68.81	0.75	0.71	-5.33
2	All Odisha	189.07	148.05	-21.70	26.33	23.80	-9.61
	Kalahandi district as % to all Odisha	3.61	1.44		2.85	2.98	

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 yield rate of ragi as well as small millets in Kalahandi district has increased in 2010s compared to the immediate past decade 2000s. In case of ragi, the increased yield rate in Kalahandi district is also higher compared to the overall situation prevailing in the state. However, for small millets the decadal variation in yield rate is positive but lower than the state level picture. With respect to yield index as depicted in table 2.8, in 2000s Kalahandi district was unfavourable compared to overall situation as prevailing in the

state. But the situation of the district has improved during 2010s and the district has been able to have a yield index of ragi at 123.47 compared to 100 points for the state. With respect to small millets, the district stands in advantageous position in both decades.

Table-2.8: Yield Rate of ragi and small millets in Kalahandi district compared to All Odisha

Sl.	Regions	Decadal Variation in average annual yield Rate of ragi and small millets in Kalahandi district compared to all Odisha (Yield Rate in Kg/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	Variation in 2010s over 2000s	2000s	2010s	Variation in 2010s over 2000s
1	Kalahandi	753.33	1102.25	46.32	521.56	548.50	5.17
2	All Odisha	791.20	892.70	12.83	453.60	505.00	11.33
	Yield index of the district (All Odisha = 100)	95.21	123.47		114.98	108.61	

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

Despite better yield rate of ragi in 2010s, and as area under ragi cultivation is reduced, resultingly there is reduced level of ragi production in the district. Compared to 2000s, there is more than 50 percent fall in the annual production of ragi in the district, however at the state level, there is only 12.18 percent fall in the annual production of argi during 2010s compared to 2000s. Kalahandi district accounts 1.81 percent of the overall ragi production and 3.31 percent of small millet production in the state during 2010s. The decadal variation of the production volume of ragi and small millets is analysed in table 2.9.

Table-2.9: Ragi and small millets production in Kalahandi district compared to All Odisha

Sl.	Regions	Decadal Variation in Volume of Ragi and small millets Production in Kalahandi district compared to All Odisha (Production in 000 MT/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	Variation in 2010s over 2000s	2000s	2010s	Variation in 2010s over 2000s
1	Kalahandi	5.11	2.38	-53.42	0.38	0.40	5.26
2	All Odisha	149.39	131.19	-12.18	11.71	12.07	3.07
	Kalahandi district as % to all Odisha	3.42	1.81		3.25	3.31	

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

2.2.2 Progress of Odisha Millet Mission in Kalahandi District

By the end of Kharif 2019-20, OMM has covered four blocks in Kalahandi district. Cumulatively, in all these blocks, there is outreach of OMM in 137 GPs, 524 villages, 5801 farmers and 2435.07 hectares of land area under millet cultivation. The details of progress of OMM in Gajapati district is shown in the table 2.10 given below.

Table-2.10: Progress of Odisha Millet Mission in Kalahandi Districts

Sl.	Time Period	Coverage of OMM in Kalahandi district				
		Blocks	No. of GPs	No. of Villages/ Hamlets	No. of farmers	Land Area (Hectares)
1	Kharif 2017-18	Narla	6	20	154	62.72
		Lanjigarh			126	42.2
		Sub Total	6	20	280	104.92
2	Rabi 2017-18	Bhawanipatna	4	4	7	5
		Lanjigarh	4	3	8	8
		Narla	6	11	14	11.5
		Th. rampur	1	3	7	10
		Sub Total	15	21	36	34.5
3	Kharif 2018-19	Bhawanipatna	9	28	397	204.6
		Lanjigarh	8	63	743	278.2
		Narla (Ragi and Gurji)	36	98	561	268.4
		Th. Rampur (Ragi)	8	44	270	110.6
		Sub Total	61	233	1971	861.8
4	Rabi 2018- 19	Bhawanipatna	3	4	5	1.2
5	Kharif 2019-20	Bhawanipatna	8	38	408	323.29
		Lanjigarh	9	90	1308	399.32
		Narla	25	68	520	147.94
		Th. rampur	10	50	1273	562.1
		Sub Total	55	250	3514	1433.85
		Total	137	524	5801	2435.07

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

2.3 Kandhamal District

Kandhamal revenue district came into existence on 1st January, 1994, after Phulbani District was divided into Kandhamal and Boudh Districts of Odisha. The District lies between 19 degree 34' to 20 degree 36' north latitude and 83 degree 34' to 84 degree 34' east longitude. Kandhamal experiences sub-tropical hot and dry climate in summer. Dry and cold climate in winter. The maximum temperature recorded in the district is 45.5 degree C and minimum temperature is 2.0-degree C. The average annual rainfall recorded is 1522.95 mm. The Kandhamal district covering a geographical area of 7654 sq. kms is bounded by Boudh district in the North, by Rayagada & Gajapati districts in the South, by Ganjam and Nayagarh districts in the East and Kalahandi District in the west.

Physiographic ally, the entire district lies in high altitude zone with inter spreading inaccessible terrain of hilly ranges and narrow valley tracts, which guides the socio-economic conditions of people and development of the district. Kandhamal District is located in central Odisha and is bounded by Boudh District on the north, Rayagada District on the south, Ganjam and Nayagarh Districts on the East and Kalahandi District on the west. The district covers an area of 7654 sq.kms. Kandhamal has 2 subdivisions viz. Phulbani, and Balliguda; with 12 blocks and 153 Gram Panchayats. As per 2011 census, total population of the district was 7,33,110. A brief statistical profile of the district is as per table 2.11.



Table 2.11: Brief Statistical Profile of Kandhamal District

Sl.	Particulars	Value	Sl.	Particulars	Value
1	Population (In Lakh)	7.3	17	Land Use Pattern (Area in '000 ha), 2014-15 *	
2	Male (In Lakh)	3.6		Forest	170
3	Female (In Lakh)	3.7		Land put to Non-agricultural use	21
4	Scheduled Caste (In Lakh)	1.2		Barren & Non-Cultivable Land	103
5	Scheduled Tribe (In Lakh)	3.9		Permanent Pasture	13
6	No. of HHs (In Lakh)	1.7		Net Area Sown	57
7	Average HH Size	4.3		Cultivable waste Land	19
8	Sex Ratio	1037		Other Fallow	28
9	Total Worker (In Lakh)	3.3		Current Fallows	28
10	Main Workers (In Lakh)	1.7		Misc. Trees and Groves	1
11	Marginal Worker (In Lakh)	1.9	18	Average Fertilizer Consumption (Kg/H.)	8.3
12	Non-Worker (In Lakh)	3.8	19	Average size of land holding	1.01
13	Work Participation Rate (WPR)	48.5	20	Irrigation Potential ('000 ha)	101.2
14	Literacy Rate (%)	64.1	21	No. of villages electrified	1044
15	No. of job cards issued	1542217	22	No. of BPL Families	154217
16	No of persons provided employment under MGNREGA	130020			

Source: District Statistical Hand book- Kandhamal, 2011, *District at a Glance-2016

2.3.1 Millet Production in Kandhamal District

The millet production in Kandhamal district is analysed on the basis of ragi and small millet production in the district during last two decades 2000s and 2010s. As per table 2.12, area under cultivation of ragi in the district as well as state has declined during 2010s compared to 2000s. But the extent of decrease

of argi area in the district is only 8.45 percent relative to the same for the district at 21.70 percent. This indicates, compared to the state situation, relatively there is less shifting of ragi land for non-ragi crops in Kandhamal district. However, during the corresponding period, there is much higher shifting of the land area of small millets to other crops in the district. Compared to state level scenario, in Kandhamal district during last two decades, there is massive shift of land area under small millets to other crops. There is marginal increase in the percentage share of ragi area of the district as a percentage to all Odisha ragi area in 2010s compared to 2000s. On the other hand, as a percentage to total small millet area of the state, there is marginal decline in small millet area in Kandhamal district.

Table-2.12: Area under ragi and small millets cultivation in Kandhamal district compared to All Odisha

Sl.	Region	Decadal variation in the land area under annual ragi and Small Millets cultivation in Kandhamal district compared to all Odisha (Land area in 000 hectares)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Kandhamal	2.13	1.95	-8.45	0.83	0.54	-34.94
2	All Odisha	189.07	148.05	-21.70	26.33	23.80	-9.61
	Kandhamal district as % to All Odisha	1.13	1.32		3.15	2.27	

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

During the corresponding period between 2000s and 2010s, the yield rate of ragi in Kandhamal district has increased by 42.11 percent in Kandhamal district as against 12.88 percent at all Odisha level. However, during both the decades, the yield rate has remained lower in Kandhamal district that that of all Odisha level. Similar is the case of small millets. There is better improvement in yield rate of small millets in 2010s compared to 2000s. However, the yield rate in Kandhamal district is found lower compared to all Odisha level during both the decades.

Table-2.13: Yield Rate of ragi and small millets in Kandhamal district compared to All Odisha

Sl.	Regions	Decadal Variation in average annual yield Rate of ragi and small millets in Kandhamal district compared to all Odisha (Yield Rate in Kg/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Kandhamal	544.11	773.25	42.11	254.00	411.13	61.86
2	All Odisha	791.20	892.70	12.83	453.60	505.00	11.33
	Yield index of the district (All Odisha = 100)	68.77	86.62		56.00	81.41	

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 production volume of ragi and small millets in Kandhamal district compared to all Odisha situation is depicted in table 2.14. It is found that although there is decrease in annual production of ragi in 2010s

at all Odisha level, there is positive increase in the amount of annual ragi production in Kandhamal district. Compared to average annual ragi production of the district during 2010s has increased by 30.17 percent as against 12.18 percent reduction at all Odisha level. In the case of small millets also, there is very good positive variation in the annual production during 2010s compared to the preceding decade 2010s. The district share in the annual ragi production of the state was at 0.78 percent which has increased to 1.15 percent during 2010s. In regard to small millets, Kandhamal district was accounting about 1.79 percent in 2000s which has increased to 1.91 percent in 2010s.

Table-2.14: Ragi and small millets production in Kandhamal district compared to All Odisha

Sl.	Regions	Decadal Variation in Volume of Ragi and small millets Production in Kandhamal district compared to All Odisha (Production in 000 MT/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Kandhamal	1.16	1.51	30.17	0.21	0.23	9.52
2	All Odisha	149.39	131.19	-12.18	11.71	12.07	3.07
	Kandhamal district as % to All Odisha	0.78	1.15		1.79	1.91	

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

2.3.2 Progress of Odisha Millet Mission in Kandhamal District

By the end of Kharif 2019-20, OMM has covered four blocks in Kandhamal district. Cumulatively, in all these blocks, there is outreach of OMM in 122 GPs, 796 villages, 4991 farmers and 2996.96 hectares of land area under millet cultivation. The details of progress of OMM in Kandhamal district is shown in the table 2.15 given ahead.

Table-2.15: Progress of Odisha Millet Mission in Kandhamal Districts

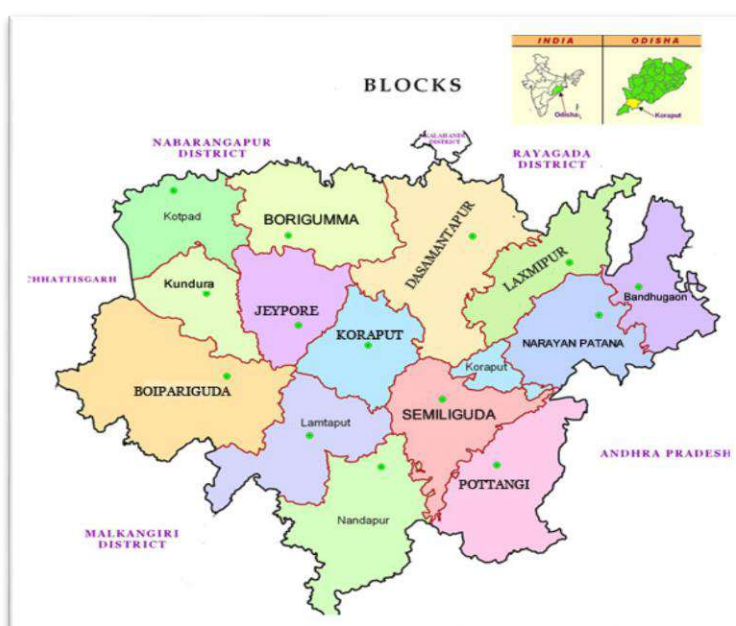
Sl.	Time Period	Coverage of OMM in Kandhamal district				
		Blocks	No. of GPs	No. of Villages/ Hamlets	No. of farmers	Land Area (Hectare)
1	Kharif 2017-18	Daringbadi	4	36	348	20.24
		Kotgarh	1	16	97	0.56
		Phiringia	6	16	52	13.20
		Raikia	4	22	141	64.91
		Sub Total	15	90	638	98.91
2	Rabi 2017-18	Daringbadi	3	4	4	1.00
		Kotgarh	2	5	9	10.00
		Phiringia	3	4	6	3.00
		Raikia	4	24	54	46.00
		Sub Total	12	37	73	60.00
3	Kharif 2018-19	Daringbadi	20	147	1049	281.90
		Kotgarh	14	158	1015	465.40
		Phiringia	11	73	622	443.25
		Raikia	12	90	482	303.40
		Baliguda	4	14	63	32.60

		K Nuagam	7	51	369	107.50
		Tumudibandha	5	48	441	206.00
		Sub Total	73	581	4041	1840.05
4	Rabi 2018- 19	Kotgarh	2	3	3	2.50
		Phiringia	6	17	18	9.00
		Raikia	7	55	189	127.50
		Baliguda	3	3	3	2.50
		Tumudibandha	1	3	8	127.50
		K Nuagam	3	7	18	9.00
		Sub Total	22	88	239	278.00
5	Kharif 2019-20	Daringbadi	27	164	1805	358.40
		Kotgarh	14	119	1570	495.30
		Phiringia	12	191	1165	473.50
		Sub Total	53	474	4540	1327.20
		Total	122	796	4991	2276.96

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

2.4 Koraput District

Koraput district located in the southern part of the state has a total geographical area of 8807 sq. km. Koraput District located between the parallels of 18° 13' to 19° 10' North Latitude and Medians of 82° 5' to 83° 23' east Longitude. The district is situated in the South Eastern region of Odisha surrounded by Rayagada district and Srikakulam of Andhra Pradesh in the east, Nabarangpur district in the North, Malkangiri district in the West and Visakhapatnam of Andhra Pradesh in the South. Physiologically the district is contiguous to the mainland of Eastern Ghat. The different areas in this zone are situated at an altitude of 1501000 meters above the mean sea level. (MSL). The district has famous Deomali hill and small hill range which exists parallelly from East to West. Apart from this Kolab and Machhkund and other smaller tributaries pass through the district. The present district has 2 subdivisions, 14 Tahasils (as recently each Block has been declared as a Tahasil), 14 Community Development Blocks and 226 Gram Panchayats. The entire district comes under the Scheduled area. Total numbers of villages are 2028 out of which 106 are uninhabited villages. There are five assembly Constituency namely Laxmipur, Koraput, Pottangi, Jeypore & Kotpad. 5 towns including three municipality and one NAC. Geomorphologically, except the north western and west-west central part, almost the entire district is occupied by dense forest, highly rugged mountain, interspersed with narrow intermontane valleys. The average attitude of the hilly terrain ranges from 900 to 1400 m amsl. North Western and West-west central parts are characterized by gently undulating plain dotted with isolated hillocks. The Kolab and Indravati river and their



tributaries constitute the main drainage system of the district. The main slope of the district is towards west and north-west. The drainage pattern in the district is controlled by Indravati, Sabari (Kolab), Sileru, Vegavati, Subarnamukhi, Jaryhavati and their tributaries. The river Indravati and Kolab drains the major parts of Koraput district. Most of the tributaries of Kolab river and Indravati river are perennial in nature. The elevation of the hilly terrain ranges from 900 to 1400 mm above mean sea level with the highest peak of 1620 m amsl. The statistical profile of the district is presented in table 2.16.

Table 2.16: Brief Statistical Profile of Koraput District

Sl.	Particulars	Value	Sl.	Particulars	Value
1	Person	13.8	20	AGRICULTURE (2014-15) *	
2	Male	6.8		Total geographical Area (Sq. kms.)	8807
3	Female	7.0		Land Use Pattern (Area in '000 ha.)	
4	SC	2.0		Forest	81
5	ST	7.0		Land put to Non-agricultural use	47
6	Others	4.8		Barren & Non-Cultivable Land	144
7	Total HHs	3.4		Permanent Pasture & Other Agricultural Land	20
8	Average HH Size (In Nos.)	4.1		Net Area Sown	192
9	Sex Ratio (In %)	1032		Cultivable waste Land	16
10	Workers (In Lakh)			Old Fallow	24
11	Total Workers	6.9		Current Fallows	50
12	Main Worker	4.0		Misc. Trees and Groves	33
13	Marginal Worker	3.0		Average Fertilizer Consumption per ha (In Kg)	43.6
14	Non-Worker	6.9	21	Irrigation Potential Created (Area in '000 ha.) *	
15	WPR (In %)	50.3		Kharif	110.2
16	Literacy Rate (In %)	49.2		Rabi	43.5
17	No. of BPL Families	12688	22	No. of Village Electrified	1205
18	No. of Job Card Issued	276537	23	No. of Banks	78
19	No. of Beneficiaries provided employment in MGNREGS	178459	24	No. of AWCs	1488

Source: District Statistical Hand book, Koraput-2011, *District at a Glance-2016

2.4.1 Millet Production in Koraput district

Millet production in the district is shown in terms of decadal variation in the average annual area diverted for ragi and small millet cultivation in 2010s compared to 2000s. As per table 2.17, it is revealed that average annual land area used for ragi cultivation is reduced by 10.20 percent in 2010s compared to 2000s in Koraput district. However, diversion of ragi lands for other crops in Koraput district is found lower compared to the state figures. In the case of small millets, in 2010s, there is positive increase in land area under small millet cultivation. There is also positive improvement in the proportionate share of Koraput district in the total quantity of land under ragi and small millets cultivation in the state.

Tale-2.17: Area under ragi and small millets cultivation in Koraput district compared to All Odisha

Sl.	Region	Decadal variation in the land area under annual ragi and Small Millets cultivation in Koraput district compared to all Odisha (Land area in 000 hectares)					
		Ragi			Small Millets		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Koraput	70.99	63.75	-10.20	8.34	8.43	1.08
2	All Odisha	189.07	148.05	-21.70	26.33	23.80	-9.61
	Koraput district as % to All Odisha	37.55	43.06		31.67	35.42	

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 2.18, it is evidenced that the yield rate of ragi as well as small millets in Koraput district stands lower compared to the all-Odisha average picture during 2000s and 2010s, albeit positive increase in 2010s over 2000s in Koraput district. The yield rate of ragi in Koraput district in 2010s has increased by 24.29 percent compared to 2000s. During the corresponding period, the yield rate of small millets has increased by 21.82 percent. There is improvement in yield index for ragi as well as small millets in 2010s compared to 2000s.

Table-2.18: Yield Rate of ragi and small millets in Koraput district compared to All Odisha

Sl.	Regions	Decadal Variation in average annual yield Rate of ragi and small millets in Koraput district compared to all Odisha (Yield Rate in Kg/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Koraput	709.11	881.38	24.29	368.78	449.25	21.82
2	All Odisha	791.20	892.70	12.83	453.60	505.00	11.33
	Yield index of the district (All Odisha = 100)	89.62	98.73		81.30	88.96	

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

Despite negative variation in average annual production of ragi at all Odisha level in 2010s, there is positive increase in the average annual production of ragi in Koraput district. The average annual ragi production in Koraput district increased by 11.29 percent in 2010s compared to 2000s. Koraput district has a sizable share in the overall production of ragi and small millets in the state. Compared to the situation prevailing in 2000s, the percentage share of the district in the overall state's ragi and small millets production has tended to increase in 2010s. The decadal variation in the volume of production of ragi and small millets is presented in table 2.19.

Table-2.19: Ragi and small millets production in Koraput district compared to All Odisha

Sl.	Regions	Decadal Variation in Volume of Ragi and small millets Production in Koraput district compared to All Odisha (Production in 000 MT/ Hectare)					
		Ragi			Small Millets		
		2000s	2010s	% Variation over 2010 (%)	2000s	2010s	% Variation over 2010 (%)
1	Koraput	50.47	56.17	11.29	3.24	3.91	20.68
2	All Odisha	149.39	131.19	-12.18	11.71	12.07	3.07
	Koraput district as % to All Odisha	33.78	42.82		27.67	32.39	

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

2.4.2 Progress of Odisha Millet Mission in Koraput District

By the end of Kharif 2019-20, OMM has covered seven blocks in Koraput district. Cumulatively, in all these blocks, there is outreach of OMM in 204 GPs, 1197 villages, 19007 farmers and 7318.91 hectares of land area under millet cultivation. The details of progress of OMM in Koraput district is shown in the table 2.20 given below.

Table-2.20: Progress of Odisha Millet Mission in Koraput Districts

Sl.	Time Period	Coverage of OMM in Koraput district				
		Blocks	No. of GPs	No. of Villages/ Hamlets	No. of farmers	Land Area (Hectares)
1	Kharif 2017-18	Nandapur	5	15	500	202.35
		Boriguma	3	24	297	125.05
		Boipariguda	4	26	360	152.97
		Kundra	4	23	239	123.81
		Lamtaput	5	33	729	174.65
		Semiliguda	7	33	184	205.49
		Dasmantapur	5	48	353	150.12
		Sub Total	33	202	2662	1134.45
2	Rabi 2017-18	Boipariguda	5	8	87	51.95
		Kundra	3	3	24	9.45
		Sub Total	8	11	111	61.40
3	Kharif 2018-19	Nandapur	12	49	1929	609.00
		Boriguma	4	36	532	241.80
		Boipariguda	10	65	791	341.00
		Kundra	11	62	647	284.80
		Lamtaput	9	39	691	270.80
		Semiliguda	14	63	1011	339.32
		Dasmantapur	5	36	941	262.02
		Sub Total	65	350	6542	2348.74
4	Rabi 2018-19	Boipariguda	5	11	90	30.80
		Kundra	5	12	55	20.00
		Sub Total	10	23	145	50.80

5	Kharif 2019-20	Nandapur	12	33	590	225.60
		Boriguma	14	64	1339	535.60
		Boipariguda	13	98	1534	629.20
		Kundra	16	116	1125	455.20
		Lamtaput	10	108	1809	663.60
		Semiliguda	14	83	1468	480.20
		Dasmantapur	9	109	1682	734.12
		Sub Total	88	611	9547	3723.52
		Total	204	1197	19007	7318.91

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

2.5 Malkangiri District

Malkangiri District is named after its headquarters town, Malkangiri. During formation of Odisha Province in 1936, Malkangiri was a 'Taluk' of Nabrangpur sub-division 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 districts 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 2.21: 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 Hand Book, Malkangiri, 2015 and *District at a Glance-2016

2.5.1 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-2.22: 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-2.23: 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-2.24: 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.

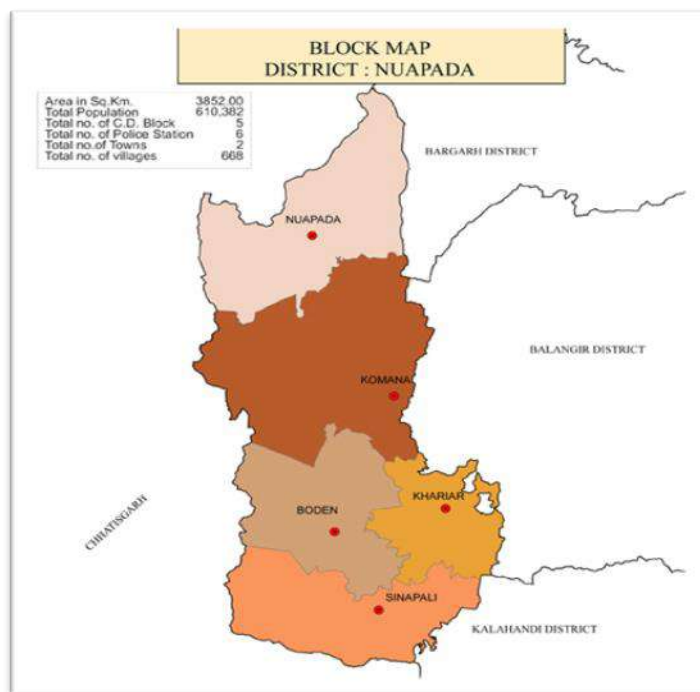
Table- 2.25: Progress of Odisha Millet Mission in Malkangiri District

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

2.6 Nuapada District

Nuapada District belongs to state of Odisha, India. The district is located in the western part of Odisha. It lies between 20-degree N and 21 degree 5' latitude and 82 degree 40' E longitude. The boundaries of Nuapada extends in the north, west and south to Raipur District of Chattishgarh and in the east to Bargarh, Balangir and Kalahandi Districts of Odisha. This district is spread over a geographical area of 3,852 sq. Kms. The administrative headquarters of the District is located at Nuapada itself. The District of Nuapada was a part of Undivided Kalahandi District till early March 1993, but for the administrative convenience, Kalahandi District was divided into two parts i.e., Kalahandi and



Nuapada vide State Government Notification No. DRC-44/93/14218/R. dated 27 March 1993. Present Nuapada District comprises one sub-division (Nuapada), and five Blocks (Khariar, Sinapalli, Boden, Nuapada and Komna). The plains of Naupada subdivision fringed by rugged hill ranges stretch southward, which belong to the main line of the Eastern Ghats and contains extensive plateaus of about 4000 ft (1200 m) in elevation with long tropical grass grown over them. The hill sides rising up precipitously from the plains are covered with dense sal forests. There are 670 nos. of Revenue villages in the district with a population of 6,10,382 as per 2011 census. The total number of rural households in the district stands at 1,44,299. The total Scheduled Caste (SC) Scheduled Tribe (ST) population comprise 13.46 % and 33.80 % respectively of the total district population. A snap shot profile of Nuapada district is presented in table 2.26.

Table 2.26: Brief Statistical Profile of Nuapada 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		Total Geographical Area (sq.km)	3852
3	Female (In Lakh)	3.1		Forest	43
4	Scheduled Caste (In Lakh)	0.8		Land put to Non-agricultural use	25
5	Scheduled Tribe (In Lakh)	2.1		Barren & Non-Cultivable Land	8
6	Others (In Lakh)	3.2		Permanent Pasture	17
7	Household (HH) (In Lakh)	1.5		Net Area Sown	109
8	Average HH Size	4.0		Cultivable waste Land	9
9	Sex Ratio	1021		Other Fallow	10

10	Total Worker (In Lakh)	3.1		Current Fallows	23
11	Main Workers (In Lakh)	1.5		Misc. Trees and Groves	1
12	Marginal Workers (In Lakh)	1.5	19	Agriculture, 2014-15*	
13	Non-Workers (In Lakh)	3.0		Average Fertilizer Consumption (Kg/ha)	38.2
14	Work Participation Rate (WPR)	50.1		Irrigation Potential ('000 ha)	104.4
15	Literacy Rate (%)	57.3	20	Proportion of Villages Electrified (as on March 2014)	100.0
16	No. of Job Card Issued	123295	21	Credit Deposit Ratio (2012)	34.8
17	HH provided employment in MGNREGS	79857	22	No. of Aanganwadi Centres (AWCs), 2016	1356

*District at a Glance-2016, Note: MGNREGS is Mahatma Gandhi National Rural Employment Guarantee Scheme

2.6.1 Production of Millets in Nuapada district

As per table 2.27, ragi area in 2010s compared to 2000 has decreased by 33.77 percent in Nuapada district. During the corresponding period, at the state level it has decreased by 21.77 percent. This implies relatively there is more shifting of land from ragi cultivation to other crops in Nuapada district in relation to the overall state picture. However, for small millets there is positive increase in the land area in 2010s compared to 2000s. The proportionate share of Nuapada district in overall annual ragi production of the state has declined from 2.04 percent in 2010s compared to 2000s.

Table-2.27: Area under ragi and small millets cultivation in Nuapada district compared to All Odisha

Sl.	Regions	Decadal variation in the land area under annual ragi and Small Millets cultivation in Nuapada district compared to all Odisha (Land area in 000 hectares)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Nuapada	3.85	2.55	-33.77	2.84	2.88	1.41
2	All Odisha	189.07	148.05	-21.70	26.33	23.80	-9.61
	Nuapada district as % to All Odisha	2.04	1.72		10.79	12.10	

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 2.28, the yield rate of ragi in Nuapada district tends to increase by 4.71 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 Nuapada district in comparison to state level performance of the same depicts lower status of the district during both the decades. On the other hand, in the case of small millets, the yield index is improved in 2010s compared to 2010s. The decadal variation in yield rate for the district is better in Nuapada district in comparison to the state level.

Table-2.28: Yield Rate of ragi and small millets in Nuapada district compared to All Odisha

Sl.	Regions	Decadal Variation in average annual yield Rate of ragi and small millets in Nuapada district compared to all Odisha (Yield Rate in Kg/ Hectare)	
		Ragi	Small Millet

		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Nuapada	670.33	701.88	4.71	440.22	537.25	22.04
2	All Odisha	791.2	892.7	12.83	453.6	505	11.33
	Yield index of the district (All Odisha = 100)	84.72	78.62		97.05	106.39	

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 Nuapada district compared to all Odisha is separately analysed for 2000s and 2010s in table 2.29. 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 higher compared to all Odisha level. Percentage share of the district in the total ragi production of the district stood at 1.70 percent in 2000s which has slightly decreased to 1.37 percent in 2010s. In the case of production volume of small millets, there is 28.10 percent average annual increase in 2010s compared to 2000s in the district which is much higher compared to state level figure during the corresponding period.

Table-2.29: Ragi and small millets production in Nuapada district compared to All Odisha

Sl.	Regions	Decadal Variation in Volume of Ragi and small millets Production in Nuapada district compared to All Odisha (Production in 000 MT/ Hectare)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Nuapada	2.54	1.8	-29.13	1.21	1.55	28.10
2	All Odisha	149.39	131.19	-12.18	11.71	12.07	3.07
	Nuapada district as % to All Odisha	1.70	1.37		10.33	12.84	

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

2.6.2 Progress of Odisha Millet Mission in Nuapada District

By the end of Kharif 2019-20, OMM has covered three blocks in Nuapada district. Cumulatively, in all these blocks, there is outreach of OMM in 87 GPs, 198 villages, 4977 farmers and 3765.87 hectares of land area under millet cultivation. The details of progress of OMM in Malkangiri district is shown in the table 2.30 given ahead.

Table-2.30: Progress of Odisha Millet Mission in Nuapada Districts

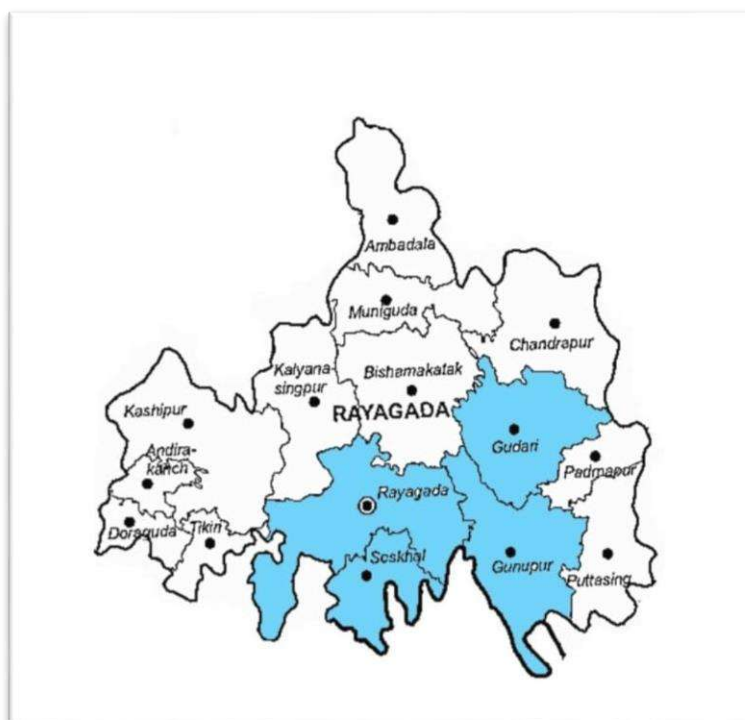
Sl.	Time Period	Coverage of OMM in Nuapada district				
		Blocks	No. of GPs	No. of Villages/ Hamlets	No. of farmers	Land Area (Hectare)
1	Kharif 2017-18	Boden	3	8	337	208.30
		Komna	2	4	92	52.64
		Sinapalli	4	8	144	44.37
		Sub Total	9	20	573	305.31
2	Rabi 2017-18	Boden	3	7	345	211.80

		Komna	2	4	93	93.00
		Sinapalli	4	8	184	159.02
		Sub Total	9	19	622	463.82
3	Kharif 2018-19	Boden	7	23	421	372.00
		Komna	8	14	389	601.25
		Sinapalli	15	30	357	146.00
		Sub Total	30	67	1167	1119.25
4	Rabi 2018-19	Boden				
		Komna				
		Sinapalli	3	4	15	4.20
		Sub Total	3	4	15	4.20
5	Khari 2019-20	Boden	9	29	900	874.42
		Komna	11	27	900	427.70
		Sinapalli	16	32	800	571.15
		Sub Total	36	88	2600	1873.27
		Total	87	198	4977	3765.85

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

2.7 Rayagada District

Rayagada district is one of the Southern located districts in Odisha. It lies between 82° 54' to 84° 2' East longitude and between 19° 35' to 19° 58' North latitude. It is bounded by the Kandhamal district in north, Andhrapradesh in south, Gajapati district in the east and Koraput district in the west. The district has an area of 7073 sq.kms and 9.68 lakhs of population as per 2011 census. The district accounts for 4.54 percent of the state territory and shares 2.31 percent of the state population. The density of population of the district is 137 per sq. kms., as against 270 persons per sq.km of the state. It has 2665 villages (including 197 un-inhabited villages) covering 11 blocks, 11 Tahasils and 2 Subdivisions. As per 2011 census the schedule caste population is 139514 (14.4 %) and schedule tribe population 541905 (56.0%).



The district lies between 82°54' to 84°2' longitude East and from 19°0' to 19°58' North Latitude. It extends in the east upto Gajapati district and in the west upto Koraput district and part of Kalahandi district, in the south up to Parvathipuram sub-division of Andhra Pradesh and in the north upto Kalahandi and Phulbani district of Odisha. The total Geographical area of the district is 7073.00Sq. Kms.

Rayagada district is situated in the Eastern Ghat's Agro Climatic region. Soil type of the district is mostly acidic and red laterite in nature. However sandy loam and black soil are also found in some parts of the district. The main river flows in the district are Bansadhara and Nagabali. A brief socio-economic profile of the district is presented in the following table 2.31.

Table 2.31: Brief Statistical Profile of Rayagada District

Sl.	Particulars	Value	Sl.	Particulars	Value
1	Population (in Lakh)	9.7	20	Total Geographical Area (sq.km)	7073
2	Male (in Lakh)	4.7	21	Land Use Pattern (Area in '000 ha), (2014-15) *	
3	Female (in Lakh)	5.0		Forest	101
4	Scheduled Caste (in Lakh)	14.4		Land put to Non-agricultural use	30
5	Scheduled Tribe (in Lakh)	56.0		Barren and Non-Cultivable Land	204
6	Others (in Lakh)	29.6		Permanent Pasture and Other Agricultural Land	10
7	HHs (in Lakh)	2.0		Net Area Sown	144
8	Average HH Size	4.8		Cultivable Waste Land	9
9	Sex Ratio	1051		Old Fallow	23
10	Total Worker (In Lakh)	4.7		Current Fallows	42
11	Main Worker (In Lakh)	2.3		Miscellaneous Trees and Groves	9
12	Marginal Worker (In Lakh)	2.4	22	Agriculture, 2014-15 *	
13	Non-Worker (In Lakh)	5.1		Fertilizer Consumption (kg/ha)	54.8
14	Work Participation Rate (WPR, %)	48.3		Irrigation, Kharif ('000 ha)	71.6
15	Cultivator as % of Total Worker	49.8		Irrigation, Rabi ('000 ha)	28.1
16	Agricultural Labourers as % of Total Worker	4.8	23	Proportion of Villages Electrified (as on March 2014)	28.8
17	Literacy Rate (%)	49.8	24	Credit Deposit Ratio (as on December 2015)	38.2
18	HHs provided employment through MGNREGS, cumulative 2014-15	75826	25	No. of Aanganwadi Centres, 2014-15	
19	No. of Job Card Issued (cumulative, March 2015)	184488	26		

Source: *District Statistical Hand Book, Rayagada, 2011*, *District at a Glance-2016

2.7.1 Production of Millets in Rayagada district

Millet production in the district is shown in terms of decadal variation in the average annual area diverted for ragi and small millet cultivation in 2010s compared to 2000s. As per table 2.32, it is revealed that average annual land area used for ragi cultivation is reduced by 21.30 percent in 2010s compared to 2000s in Rayagada district. However, diversion of ragi lands for other crops in Rayagada district is found almost similar to the overall situation of the state. In the case of small millets, in 2010s, there is decrease in land area under small millet cultivation. The average annual land area used for ragi and small millets cultivation in district as a percentage to respective state area is almost constant during both the decades.

Table-2.32: Area under ragi and small millets cultivation in Rayagada district compared to All Odisha

Sl.	Regions	Decadal variation in the land area under annual ragi and Small Millets cultivation in Rayagada district compared to all Odisha (Land area in 000 hectares)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Rayagada	25.78	20.29	-21.30	2.76	2.44	-11.59
2	All Odisha	189.07	148.05	-21.70	26.33	23.8	-9.61
	Rayagada district as % to all Odisha	13.64	13.70		10.48	10.25	

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 2.33, the yield rate of ragi in Rayagada district tends to decrease by 12.24 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 Rayagada district in comparison to state level performance of the same depicts higher status of the district in 2000s which has become lowered in 2010s. On the other hand, in the case of small millets, the yield index is declined in 2010s compared to 2000s. The decadal variation in yield rate for the district is lower in Rayagada district in comparison to the state level.

Table-2.33: Yield Rate of ragi and small millets in Rayagada district compared to All Odisha

Sl.	Regions	Decadal Variation in average annual yield Rate of ragi and small millets in Rayagada district compared to all Odisha (Yield Rate in Kg/ Hectare)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Rayagada	882.22	774.25	-12.24	568.89	582.75	2.44
2	All Odisha	791.20	892.70	12.83	453.60	505.00	11.33
	Yield index of the district (All Odisha = 100)	111.50	86.73		125.42	115.40	

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 Rayagada district compared to all Odisha is separately analysed for 2000s and 2010s in table 2.34. 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 higher compared to all Odisha level. Percentage share of the district in the total ragi production of the district stood at 15.11 percent in 2000s which has slightly decreased to 11.37 percent in 2010s. In the case of production volume of small millets, there is 10.67 percent average annual decrease in 2010s compared to 2000s in the district. There is overall increasing tendency of the total volume of production of small millets in the state during the corresponding period.

Table-2.34: Ragi and small millets production in Rayagada district compared to All Odisha

Sl.	Regions	Decadal Variation in Volume of Ragi and small millets Production in Rayagada district compared to All Odisha (Production in 000 MT/ Hectare)					
		Ragi			Small Millet		
		2000s	2010s	Decadal Variation (%)	2000s	2010s	Decadal Variation (%)
1	Rayagada	22.58	15.39	-31.84	1.50	1.34	-10.67
2	All Odisha	149.39	131.19	-12.18	11.71	12.07	3.07
	Rayagada district as % to all Odisha	15.11	11.73		12.81	11.10	

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

2.7.2 Progress of Odisha Millet Mission in Rayagada District

By the end of Kharif 2019-20, OMM has covered four blocks Gunupur, Raygada, Gudari and Kshipur in Rayagada district. The outreach is extended to 579 villages, 5431 farmers and 4332.94 hectares of land area under millet cultivation. The details of progress of OMM in Rayagada district is shown in the table 2.35 given below.

Table-2.35: Progress of Odisha Millet Mission in Rayagada District

Sl.	Time Period	Coverage of OMM in Rayagada district				
		Blocks	No. of GPs	No. of Villages/ Hamlets	No. of farmers	Land Area (Hectare)
1	Kharif 2017-18	Gunupur	9	52	309	394
		Gudari	5	22	130	144.5
		Rayagada	3	22	256	238
		Sub Total	17	96	695	776.5
2	Rabi 2017-18	Gudari	4	9	26	36
		Rayagada	3	4	35	31
		Sub Total	7	13	61	67
3	Kharif 2018-19	Gunupur	18	97	874	1095
		Rayagada	11	71	835	759
		Sub Total	29	168	1709	1854
4	Rabi 2018-19	Gudari	7	23	77	34.8
		Gunupur	3	5	12	7.6
		Kasipur	6	15	145	57.24
		Rayagada	7	14	87	63
		Sub Total	23	57	321	162.64
5	Khari 2019-20	Gudari	11	74	606	951
		Gunupur	28	79	940	521.8
		Rayagada	15	92	1099	
		Sub Total	54	245	2645	1472.8
		Total	130	579	5431	4332.94

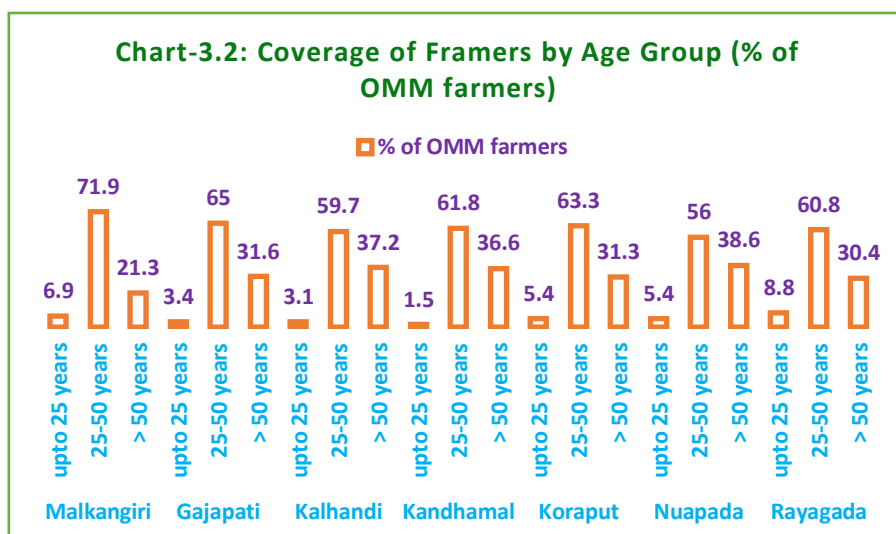
Source: Compiled from the Tracking Sheets of State Odisha Millet Mission

Chapter-III: Socio Economic Characteristics of Millet Farmers' Households

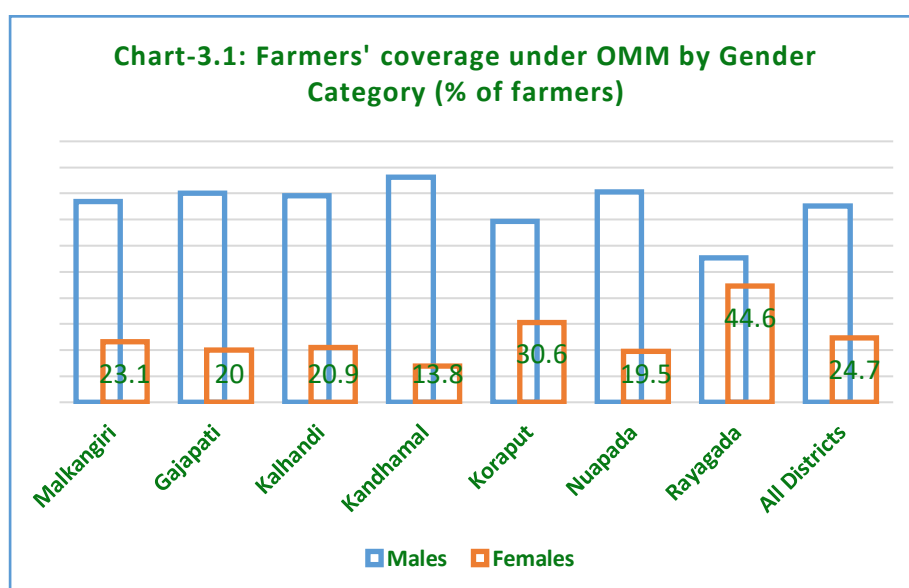
The farmer households supported under OMM for undertaking millet production in their lands is defined as millet households in the ongoing study. The study covers a sample of 2240 millet households spread across 29 blocks under seven districts of Odisha. Details of the sample coverage is already discussed 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 Age Group and Sex Category of Millet Farmers

Millet farmers have been classified under three age groups as upto 25 years, 25 to 50 years and above 50 years of age group. Majority of millet farmers covered under OMM are under the age group of 25-50 years followed by more than 50 years age group. This pattern of age group of millet farmers is witnessed in all of the districts covered in the study.



Coverage of male farmers under OMM is more than 75 percent in all of the districts except Koraput and Rayagada districts. In Rayagada district coverage of women farmers is as high as 44.6 percent. From the following table 3.1, it is depicted that overall coverage of male and female farmers under OMM is at 75.3 and 24.7 percent respectively. District wise distribution of gender category and age category of millet farmers can be glanced



from the charts given alongside.

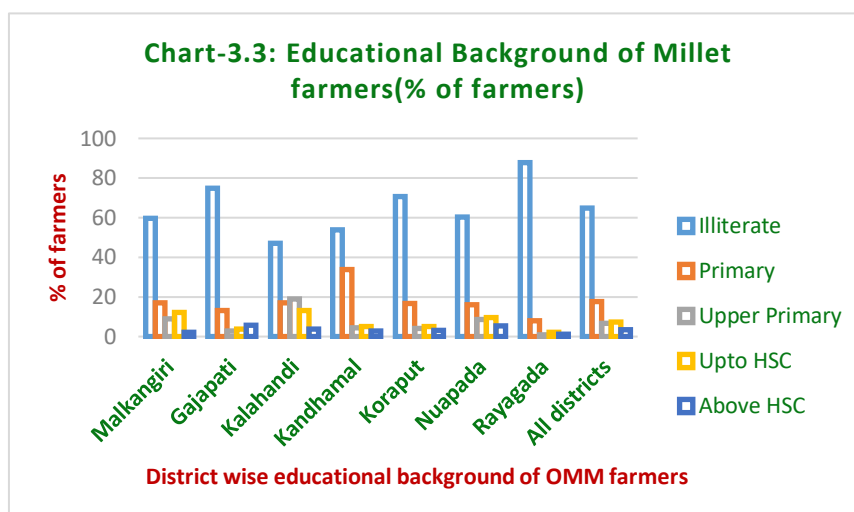
Table-3.1: Millet Farmers by Age Group and Sex Category

Sl.	Districts	Age Group	No. of millet farmers by sex category					
			Males	# %	Females	# %	Total	## %
1	Malkangiri	upto 25 years	13	59.1	9	40.9	22	6.9
		25-50 years	182	79.1	48	20.9	230	71.9
		> 50 years	51	75.0	17	25.0	68	21.3
		Sub total	246	76.9	74	23.1	320	100.0
2	Gajapati	upto 25 years	6	54.5	5	45.5	11	3.4
		25-50 years	165	79.3	43	20.7	208	65.0
		> 50 years	85	84.2	16	15.8	101	31.6
		Sub total	256	80.0	64	20.0	320	100.0
3	Kalhandi	upto 25 years	8	80.0	2	20.0	10	3.1
		25-50 years	147	77.0	44	23.0	191	59.7
		> 50 years	98	82.4	21	17.6	119	37.2
		Sub total	253	79.1	67	20.9	320	100.0
4	Kandhamal	upto 25 years	4	80.0	1	20.0	5	1.5
		25-50 years	168	83.6	33	16.4	201	61.8
		> 50 years	108	90.8	11	9.2	119	36.6
		Sub total	280	86.2	45	13.8	325	100.0
5	Koraput	upto 25 years	11	36.7	19	63.3	30	5.4
		25-50 years	241	68.1	113	31.9	354	63.3
		> 50 years	136	77.7	39	22.3	175	31.3
		Sub total	388	69.4	171	30.6	559	100.0
6	Nuapada	upto 25 years	10	76.9	3	23.1	13	5.4
		25-50 years	108	80.0	27	20.0	135	56.0
		> 50 years	76	81.7	17	18.3	93	38.6
		Sub total	194	80.5	47	19.5	241	100.0
7	Rayagada	upto 25 years	11	52.4	10	47.6	21	8.8
		25-50 years	70	47.9	76	52.1	146	60.8
		> 50 years	52	71.2	21	28.8	73	30.4
		Sub total	133	55.4	107	44.6	240	100.0
	All Districts		1750	75.3	575	24.7	2325	

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3.2 Education

Good deal of millet farmers covered under OMM is found as illiterates and the percentage share of such farmers is relatively higher. Overall, around 64.9 percent of millet farmers are illiterates. About 17.7 percent of farmers have education upto primary standard and another 6.8 percent have education



upto upper primary standard. Thus, combined share of illiterate, primary and upper primary group stands at around 90 percent. The remaining portion of OMM farmers about 10 percent have educational background above primary level. Comparatively, a greater number of millet farmers of Malkangiri and Kalahandi district have education beyond Upper Primary level.

Tbale-3.2: Millet Farmers by Educational Background

Sl.	District	No. of millet farmers by educational background					Total
		Illiterate	Primary	Upper Primary	Upto HSC	Above HSC	
1	Malkangiri	191	54	29	39	7	320
2	Gajapati	239	42	9	12	18	320
3	Kalahandi	151	54	61	42	12	320
4	Kandhamal	175	110	14	17	9	325
5	Koraput	396	94	23	29	17	559
6	Nuapada	145	39	21	23	13	241
7	Rayagada	211	19	2	5	3	240
	All districts	1508	412	159	167	79	2325
		% Share to corresponding district total					
1	Malkangiri	59.7	16.9	9.1	12.2	2.2	100.0
2	Gajapati	74.7	13.1	2.8	3.8	5.6	100.0
3	Kalahandi	47.2	16.9	19.1	13.1	3.8	100.0
4	Kandhamal	53.8	33.8	4.3	5.2	2.8	100.0
5	Koraput	70.8	16.8	4.1	5.2	3.0	100.0
6	Nuapada	60.2	16.2	8.7	9.5	5.4	100.0
7	Rayagada	87.9	7.9	0.8	2.1	1.3	100.0
	All districts	64.9	17.7	6.8	7.2	3.4	100.0

3.3 Social Category

Classification of millet farmers on the basis of social category reveals that majority of millet farmers, overall, to the extent of 73.8 percent are Scheduled Tribes (STs) followed by other castes (20.5%) and the remaining 5.6 percent are SCs. More than 90 percent of millet farmers of Gajapati and Rayagada

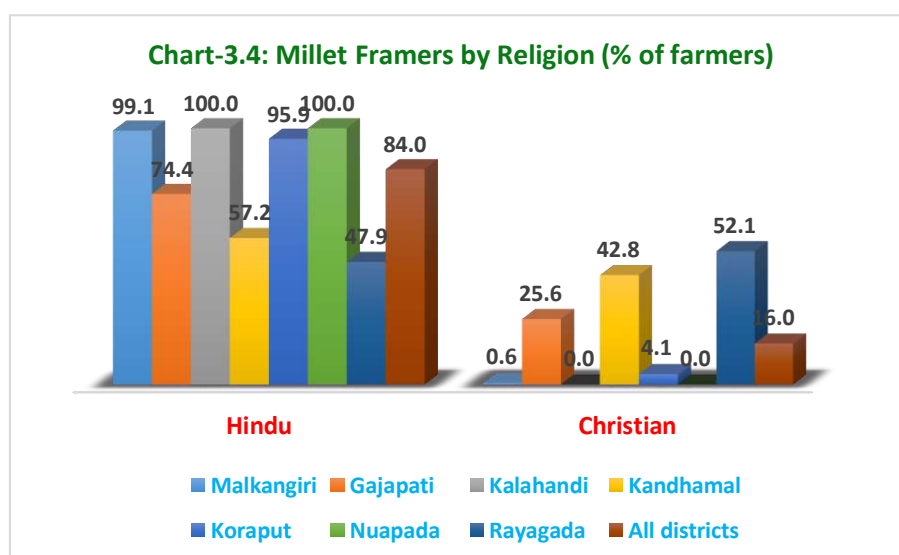
district are STs by their social category. As the millet areas covered under OMM intervention are tribal dominated pockets, obviously significant chunk of millet farmers are STs by their social category.

Table-3.3: Millet Farmers by social category

Sl.	District	No. of millet farmers by social category (%)							
		SC	%	ST	%	Others	%	Total	%
1	Malkangiri	7	2.2	271	84.7	42	13.1	320	100.0
2	Gajapati	18	5.6	298	93.1	4	1.3	320	100.0
3	Kalahandi	46	14.4	159	49.7	115	35.9	320	100.0
4	Kandhamal	2	0.6	231	71.1	92	28.3	325	100.0
5	Koraput	35	6.3	329	58.9	195	34.9	559	100.0
6	Nuapada	3	1.2	209	86.7	29	12.0	241	100.0
7	Rayagada	20	8.3	220	91.7		0.0	240	100.0
	All districts	131	5.6	1717	73.8	477	20.5	2325	100.0

3.4 Religion

With respect to religion, overall 84 percent of millet farmers are Hindus by religion followed by Christianity (16.0%). In Kalhandi and Nuapada district, all of the millet farmers are Hindus by their religion. A good proportion of millet farmers of Rayagada Kandhamal and Gajapati district are with Christianity religion. Millet farmers



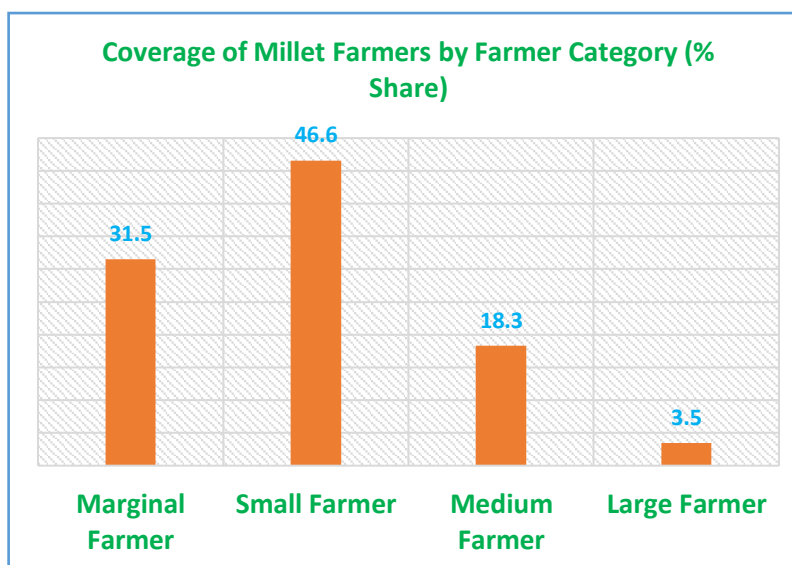
based upon their religious beliefs is shown in the chart given alongside.

Table-3.4: Millet Farmers by religion

Sl.	Districts	No. of millet farmers by religion				% Share to corresponding district total			
		Hindu	Christian	Muslim	Total	Hindu	Christian	Muslim	Total
1	Malkangiri	317	2	1	320	99.1	0.6	0.3	100.0
2	Gajapati	238	82		320	74.4	25.6	0.0	100.0
3	Kalahandi	320			320	100.0	0.0	0.0	100.0
4	Kandhamal	186	139		325	57.2	42.8	0.0	100.0
5	Koraput	536	23		559	95.9	4.1	0.0	100.0
6	Nuapada	241			241	100.0	0.0	0.0	100.0
7	Rayagada	115	125		240	47.9	52.1	0.0	100.0
	All districts	1953	371	1	2325	84.0	16.0	0.0	100.0

3.5 Farmer Category

As per table 3.5, millet farmers of the project area on the basis of their operational land holdings are classified under four categories as marginal farmers, small farmers, medium farmers and large farmers. Overall, a sizable chunk of millet farmers are marginal and small farmers. Proportionate share of marginal and small farmers jointly account around 78.1 percent of the total millets farmers as discussed. The



proportionate share of medium and large farmers stands at 18.3 and 3.5 percent respectively. Incidence of medium category farmers in Malkangiri and Nuapada districts is found comparatively higher relative to other districts.

Table-3.5: Farmer Category

Sl.	Districts	No. of millet farmers by farmer category				
		Marginal Farmer	Small Farmer	Medium Farmer	Large Farmer	Total
1	Malkangiri	20	181	108	11	320
2	Gajapati	168	87	53	12	320
3	Kalahandi	59	180	73	8	320
4	Kandhamal	58	226	29	12	325
5	Koraput	196	251	81	31	559
6	Nuapada	16	138	80	7	241
7	Rayagada	216	21	2	1	240
	All districts	733	1084	426	82	2325
		% Share to corresponding district total				
1	Malkangiri	6.3	56.6	33.8	3.4	100.0
2	Gajapati	52.5	27.2	16.6	3.8	100.0
3	Kalahandi	18.4	56.3	22.8	2.5	100.0
4	Kandhamal	17.8	69.5	8.9	3.7	100.0
5	Koraput	35.1	44.9	14.5	5.5	100.0
6	Nuapada	6.6	57.3	33.2	2.9	100.0
7	Rayagada	90.0	8.8	0.8	0.4	100.0
	All districts	31.5	46.6	18.3	3.5	100.0

3.6 Housing Structure

The housing structures of millet farmers is classified under pucca houses, semi pucca house and kutcha houses as it is depicted in table 3.6. Overall, for about 60 percent of millet farmers, their residential houses are semi pucca houses followed by kutcha houses and pucca houses. Percentage share of pucca houses in the overall residential housing structures of millet farmers is about 18.2 percent. Incidence of pucca houses is found maximum in Nuapada district and lowest in Kandhamal district. As it can be seen from the chart given alongside, except Malkangiri district, semi pucca houses outnumber other types of houses in all the districts.

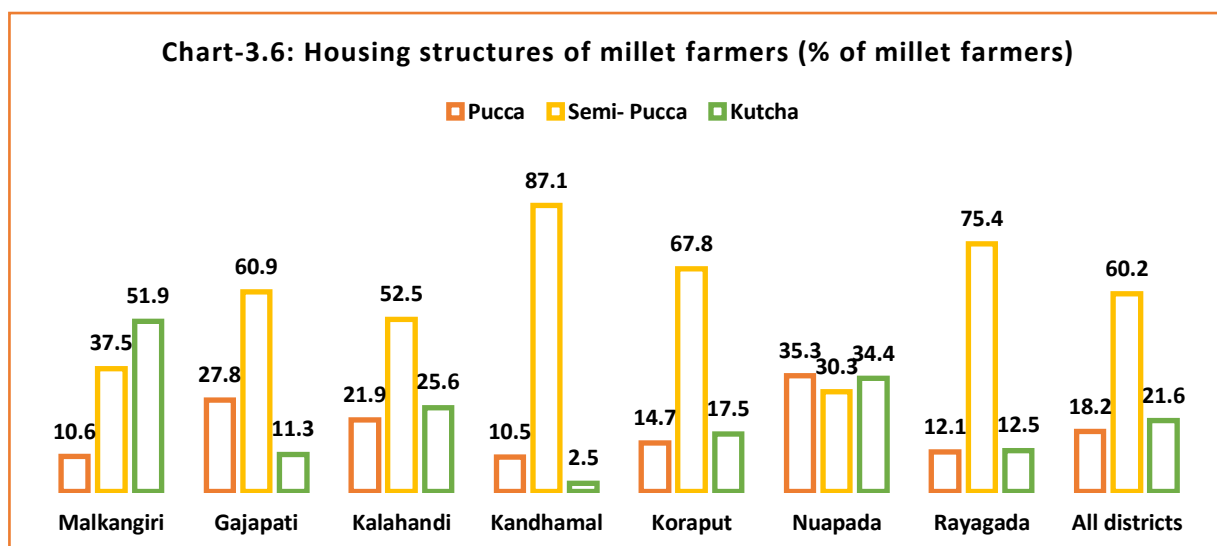


Table-3.6: House Structure

Sl.	Districts	No. of millet farmers by house structure				% Share to corresponding district total			
		Pucca	Semi-Pucca	Kutcha	Total	Pucca	Semi-Pucca	Kutcha	Total
1	Malkangiri	34	120	166	320	10.6	37.5	51.9	100.0
2	Gajapati	89	195	36	320	27.8	60.9	11.3	100.0
3	Kalahandi	70	168	82	320	21.9	52.5	25.6	100.0
4	Kandhamal	34	283	8	325	10.5	87.1	2.5	100.0
5	Koraput	82	379	98	559	14.7	67.8	17.5	100.0
6	Nuapada	85	73	83	241	35.3	30.3	34.4	100.0
7	Rayagada	29	181	30	240	12.1	75.4	12.5	100.0
	All districts	423	1399	503	2325	18.2	60.2	21.6	100.0

3.7 Household Structure

A household structure comprises of male as well as female members. As it can be seen from table 3.7, overall, there are 2.5 male and 2.4 female members per each millet farmers' household.

Proportionate share of female members is equal to male members in Malkangiri and Nuapada districts. Exceptionally, in Rayagada district, female members per household is higher than that of male

members. Except these three districts male members outnumber female members in other districts like Gajapati, Kalahandi, Kandhamal and Koraput. The overall family size is found at 4.9 members per millet household, which is found higher in Malkangiri, Gajapati, Kandhamal and Nuapada districts.

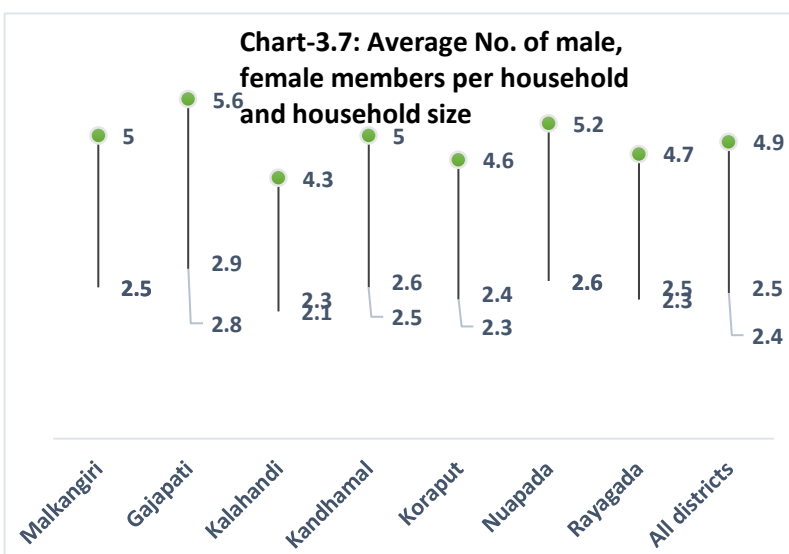
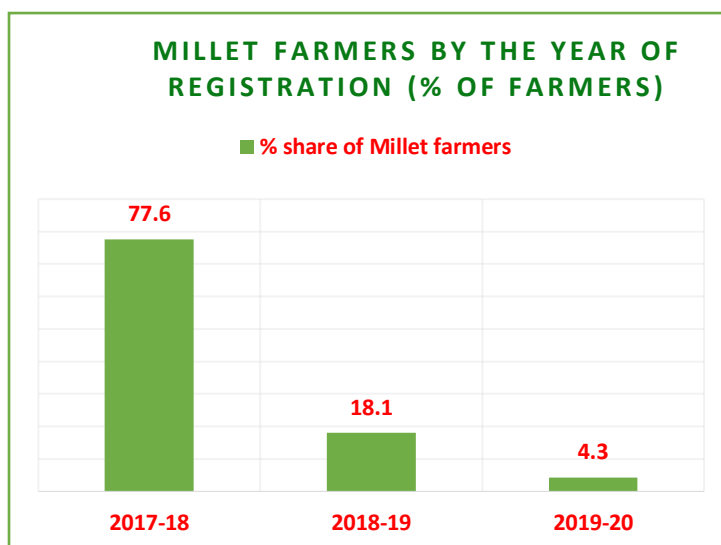


Table-3.7: No of members per household

Sl.	Districts	Number of household members per millet household		
		Male members in family	Female members in family	Total members in family
1	Malkangiri	2.5	2.5	5.0
2	Gajapati	2.9	2.8	5.6
3	Kalahandi	2.3	2.1	4.3
4	Kandhamal	2.6	2.5	5.0
5	Koraput	2.4	2.3	4.6
6	Nuapada	2.6	2.6	5.2
7	Rayagada	2.3	2.5	4.7
	All districts	2.5	2.4	4.9

3.8 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 3.8, overall 77.6 percent of the farmers have joined into OMM in 2017-18 year, followed by 18.1 percent in 2018-19 and 4.3 percent in 2019-20. During first phase intervention of OMM, good majority of farmers have joined into OMM in the year 2017-18 year owing to



the awareness generation programme under OMM through the CRPs. As per the opinion of CRPs, soon after the implementation of OMM, farmers were made aware about the benefits of millet cultivation and resultingly majority of potential millet farmers turned out in the first year of intervention. More than 90 percent of the sampled-out millet farmers of Gajapati and Rayagada districts are oldest registered millet farmers as they have joined into OMM in the year 2017-18. Similarly, more than 75 percent of millet farmers of Malkangiri, Kalahandi, and Koraput districts have registered in the initial year of OMM intervention. In the districts like Kalahandi and Nuapada by the end of second year of intervention of OMM about 90 percent of millet farmers were cumulatively registered under OMM. Remaining minimum proportion of targeted millet farmers in all of the OMM districts were registered in the year 2019-20.

Tbale-3.8: Year of joining as a farmer under OMM

Sl.	Districts	Number of millet farmers by year of registration in OMM			
		2017-18	2018-19	2019-20	All Years
1	Malkangiri	275	33	12	320
2	Gajapati	308	11	1	320
3	Kalahandi	244	64	12	320
4	Kandhamal	131	157	37	325
5	Koraput	492	49	18	559
6	Nuapada	115	106	20	241
7	Rayagada	239	1		240
	All districts	1804	421	100	2325
		% Share to corresponding district total			
1	Malkangiri	85.9	10.3	3.8	100.0
2	Gajapati	96.3	3.4	0.3	100.0
3	Kalahandi	76.3	20.0	3.8	100.0
4	Kandhamal	40.3	48.3	11.4	100.0
5	Koraput	88.0	8.8	3.2	100.0
6	Nuapada	47.7	44.0	8.3	100.0
7	Rayagada	99.6	0.4	0.0	100.0
	All districts	77.6	18.1	4.3	100.0

3.9 Landholding pattern

Millet farmers' farming pattern is influenced by their operational land holdings which comprises of their own land holding and shared in land. The shared in land are the type of land owned by other persons, but with some revenue sharing contract, these lands are cultivated by the sampled farmers covered in the study. Besides, as majority of millet farmers are tribal farmers, they have been cultivating some forest land since generation which have been viewed as encroachment of Govt. land. Thus, the land holding pattern in this section is analysed considering the average amount of land owned, shared in and encroached by the millet farmers.

Farmer category wise average land owned by millet farmers as depicted in table 3.9 reveals that the average land owned by marginal, small, medium, and large farmers is found as 1.7 acres, 2.7 acres, 4.3 acres and 8.9 acres respectively. Overall, it is found that the average land holding per millet farmer is found at 2.9 acres.

Table-3.9: Farmer Category wise land owned (Acres)

Sl.	Districts	Average land owned by millet farmers by farmers' category				
		Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
1	Malkangiri	1.8	3.0	4.8	8.5	3.8
2	Gajapati	1.3	2.4	2.9	5.3	2.0
3	Kalahandi	1.9	3.0	4.9	11.3	3.5
4	Kandhamal	1.3	2.2	4.5	13.7	2.6
5	Koraput	2.4	2.9	4.4	7.8	3.2
6	Nuapada	1.6	2.6	4.1	10.9	3.3
7	Rayagada	1.5	2.0	1.0	8.0	1.6
	All districts	1.7	2.7	4.3	8.9	2.9

As per table 3.10, overall shared in land per millet farmer is calculated at 1.8 acres which is for marginal, small, medium, and large farmers is found at 1.3 acres, 1.7 acres, 2.7 acres and 2.1 acres respectively.

Table-3.10: Farmer category wise shared in land

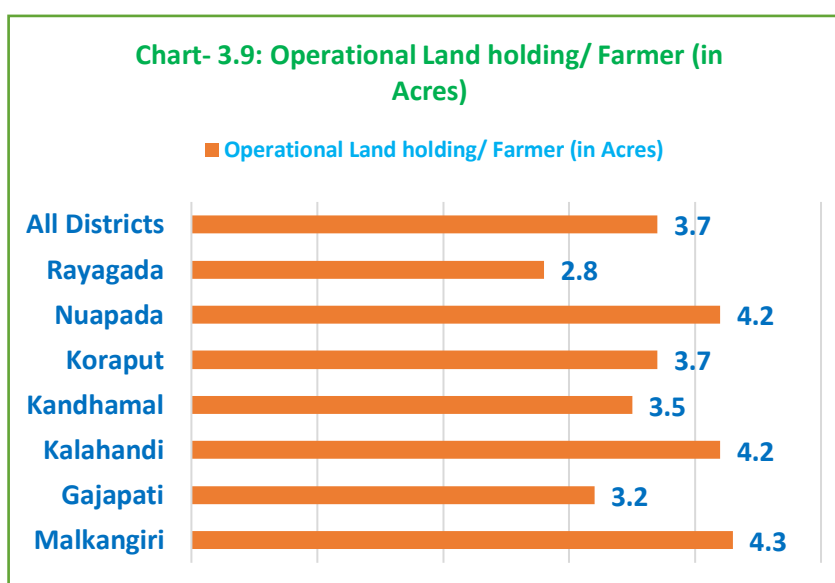
Sl.	Districts	Average land shared in by millet farmers by farmers' category				
		Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
1	Malkangiri	1.7	1.8	2.7	5.0	2.3
2	Gajapati	1.2	1.3	1.4	3.0	1.2
3	Kalahandi	2.1	1.6	2.7		2.0
4	Kandhamal	1.8	1.6			1.6
5	Koraput	1.3	1.9	3.0	1.7	1.9
6	Nuapada	1.5	1.5	2.9	2.0	2.1
7	Rayagada	1.2	2.0	3.5		1.4
	All districts	1.3	1.7	2.7	2.1	1.8

Overall encroached land per farmer in the project area is calculated at 1.8 acres, which stands higher for medium and large farmers compared to marginal and small farmers. The average amount of encroached land for large, medium, small and marginal farmers is 4.4 acres, 2.9 acres, 1.6 acres and 1.4 acres respectively.

Table-3.11: Farmer Category wise encroached land

Sl.	Districts	Average land encroached in by millet farmers by farmers' category				
		Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
1	Malkangiri		1.9	3.8	4.9	2.9
2	Gajapati	1.2	1.5	1.4	1.6	1.3
3	Kalahandi	1.2	2.6	3.8	7.0	2.6
4	Kandhamal	1.2	1.2	4.5	6.1	1.9
5	Koraput	1.0	1.4	2.2	2.8	1.5
6	Nuapada	0.2	1.8	3.0	4.3	2.5
7	Rayagada	1.5	1.9	2.0	3.0	1.6
	All districts	1.4	1.6	2.9	4.4	1.8

As indicated in table 3.12, overall, the operational land holdings per millet farmer is found at 3.7 acres. The overall operational land holding is found maximum for the millet farmers of Malkangiri district followed by Kalahandi and Nuapada districts. The operational land holding of marginal, small, medium and large farmers is found at 2.4, 3.3, 5.6 and 10.8 acres respectively.

**Table-3.12: Farmer Category wise average operational landholding (Acres)**

Sl.	Districts	Average Operational Land holding (Acres) of millet farmers by farmers' category				
		Marginal Farmers (<1.0 Ha.)	Small Farmers (1-2 Ha.)	Medium Farmers (2-4 Ha.)	Large Farmers (> 4 Ha.)	Total
1	Malkangiri	1.8	3.3	5.8	10.8	4.3
2	Gajapati	2.4	3.8	3.7	6.4	3.2
3	Kalahandi	2.3	3.7	6.1	12.2	4.2
4	Kandhamal	1.5	2.8	6.3	17.9	3.5
5	Koraput	2.5	3.4	5.5	8.7	3.7
6	Nuapada	1.8	3.1	5.7	14.3	4.2
7	Rayagada	2.6	4.2	5.5	11.0	2.8
	All districts	2.4	3.3	5.6	10.8	3.7

3.10 Sex Ratio

Generally, number of females per 1000 males is defined as sex ratio. Considering all the districts covered under OMM, the overall sex ratio is found at 935. Except Rayagada district the sex ratio in the project area is found below 1000. Inter district comparison of sex ratio as analysed in table 3.13 indicates that it is the highest in Rayagada district and lowest at Koraput and Kalahandi district. It is further revealed that altogether there are 11349 household members comprising of 5866 male members and 5483 female members for 2325 millet farmer households covered in the study.

Table-3.13: Number of household members by sex category

Sl.	Districts	Males	Females	Total	Sex Ratio
1	Malkangiri	811	778	1589	959
2	Gajapati	922	847	1769	919
3	Kalahandi	725	656	1381	905
4	Kandhamal	849	776	1625	914
5	Koraput	1359	1229	2588	904
6	Nuapada	637	606	1243	951
7	Rayagada	563	591	1154	1050
	All districts	5866	5483	11349	935

3.11 Age Group

The age group of household members as shown in the following table 3.15 reveals that majority of household members are in the age group of 40-60 years followed by 20-40 years. These two groups jointly account around 87 percent of the overall population among the millet farmers' households. Similar pattern is noticed in all of the districts covered in the study.

Table3.15: Household members' Age Group

Sl.	Districts	No. of household members by age group				
		Upto 20 Years	20-40 Years	40-60 Years	60-80 Years	All Age Groups
1	Malkangiri	16	748	697	128	1589
2	Gajapati	5	550	949	265	1769
3	Kalahandi	0	469	747	165	1381
4	Kandhamal	0	459	970	196	1625
5	Koraput	15	1020	1222	331	2588
6	Nuapada	6	368	588	281	1243
7	Rayagada	6	481	538	129	1154
	All districts	48	4095	5711	1495	11349
		% of household members				
1	Malkangiri	1.0	47.1	43.9	8.1	100.0
2	Gajapati	0.3	31.1	53.6	15.0	100.0
3	Kalahandi	0.0	34.0	54.1	11.9	100.0
4	Kandhamal	0.0	28.2	59.7	12.1	100.0
5	Koraput	0.6	39.4	47.2	12.8	100.0
6	Nuapada	0.5	29.6	47.3	22.6	100.0
7	Rayagada	0.5	41.7	46.6	11.2	100.0
	All districts	0.4	36.1	50.3	13.2	100.0

3.12 Educational Background of Household members

As it can be seen from the following table 3.16, among the overall household members, 4.2 percent of the total household members have yet to start their education as they have not attained school going age. Overall, majority of household members about 34.2 percent of household members are illiterates. Another 6.8 percent have education upto primary standard. Only about 10.8 percent have educational background above HSC standard.

Table-3.16: Educational Background of household members

Sl.	Districts	Schooling yet to be started	Illiterate	Primary	Upper Primary	Upto HSC	Above HSC	Total
1	Malkangiri	124	480	97	376	410	102	1589
2	Gajapati	34	686	143	196	397	313	1769
3	Kalahandi	42	378	68	361	383	149	1381
4	Kandhamal	48	427	148	454	352	196	1625
5	Koraput	155	937	159	472	606	259	2588
6	Nuapada	68	337	67	288	366	117	1243
7	Rayagada	0	636	86	143	204	85	1154
	All districts	471	3881	768	2290	2718	1221	11349
% Share to corresponding district total								
1	Malkangiri	7.8	30.2	6.1	23.7	25.8	6.4	100.0
2	Gajapati	1.9	38.8	8.1	11.1	22.4	17.7	100.0
3	Kalahandi	3.0	27.4	4.9	26.1	27.7	10.8	100.0
4	Kandhamal	3.0	26.3	9.1	27.9	21.7	12.1	100.0
5	Koraput	6.0	36.2	6.1	18.2	23.4	10.0	100.0
6	Nuapada	5.5	27.1	5.4	23.2	29.4	9.4	100.0
7	Rayagada	0.0	55.1	7.5	12.4	17.7	7.4	100.0
	All districts	4.2	34.2	6.8	20.2	23.9	10.8	100.0

3.13 Main Occupation of Household Members

As per the following table 3.18, it is revealed that there are 12 occupational categories under which the respective occupations of household members are included. However, students, Housewives and non-working people/pensioners jointly account around 37 percent of the overall population. Remaining people are predominantly employed in agricultural activities. About 60 percent of household members are found employed in agricultural activities as their principal occupation. A miniscule proportion of the total household members roughly 3 percent are employed in other occupations as principal source of income. Main occupation of these 3 percent of people includes daily wage earner, business activities, Govt. and private service, artisan, MFP collection etc.

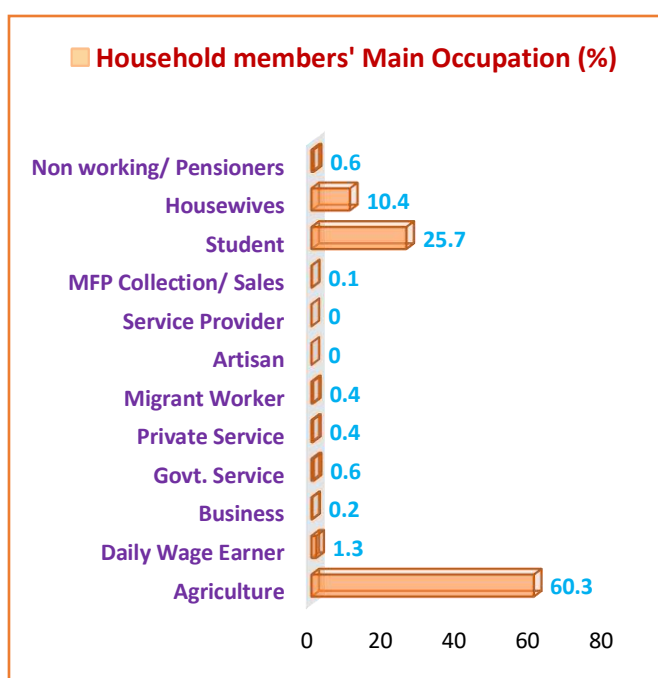


Table3.18: Main Occupation of household members

Sl.	Districts	Number of household members by main occupation												
		Agriculture	Daily wage earner	Business/ Enterprise	Govt. service	Private Service	Migrant worker	Artisan	Service Provider	MFP Collection and sales	Student	Housewife	Non Working/ Pensioners	Total
1	Malkangiri	751	13	4	16	7	5	1			543	248	1	1589
2	Gajapati	1350	31	4	18	8	3	2	1	2	329	19	2	1769
3	Kalahandi	692	21	3	13	11	18				380	237	6	1381
4	Kandhamal	768	36	3		4					545	212	57	1625
5	Koraput	1592	16	3	11	5	4		1		712	243	1	2588
6	Nuapada	622	21	2	9	5	12				349	217	6	1243
7	Rayagada	1069	8	1	3	4	1			8	58	2		1154
	All districts	6844	146	20	70	44	43	3	2	10	2916	1178	73	11349
	% Share	60.3	1.3	0.2	0.6	0.4	0.4	0.0	0.0	0.1	25.7	10.4	0.6	100.0

3.14 Subsidiary Occupation of household Members

With respect to household members' subsidiary occupation, as per table 3.19, it is evident that a significant majority of household member are engaged as daily wage earners and about 76.5 percent of household members are found with wage earning as their subsidiary occupation. Wage earning is followed by agriculture. Overall, about 16.3 percent of household members are found with agriculture as their subsidiary occupation. The analysis suggests that wage earning and agriculture are the two major sources of subsidiary occupation in the project area. Subsidiary occupation category wise, household members' employment pattern is depicted in the chart given below.

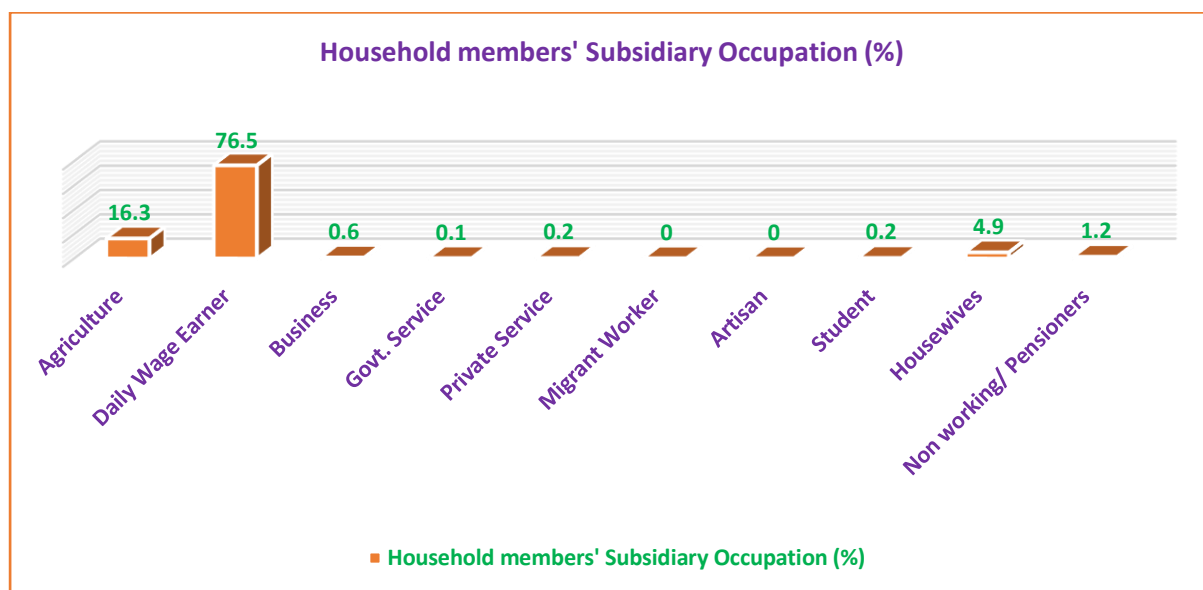


Table-3.19: Subsidiary occupation of household members

Sl.	Districts	Number of household members by subsidiary occupation										
		Agriculture	Daily wage earner	Business/ Enterprise	Govt. service	Private Service	Migrant worker	Artisan	Student	Housewife	Non Working/ Pensioners	Total
1	Malkangiri	245	1171	16		2			1	152	2	1589
2	Gajapati	96	1664			1	1	2	3	2		1769
3	Kalahandi	204	1010	10	2	5	3		16	91	40	1381
4	Kandhamal	772	687	3	3	3				80	77	1625
5	Koraput	227	2222	20	1	10			2	104	2	2588
6	Nuapada	224	859	13	1	3	1		1	126	15	1243
7	Rayagada	82	1067	1				1	2		1	1154
	All districts	1850	8680	63	7	24	5	3	25	555	137	11349
	% Share	16.3	76.5	0.6	0.1	0.2	0.0	0.0	0.2	4.9	1.2	100.0

3.15 Average Income per Earning Member of a Household

The average household income is arrived by considering all occupations of all household members engaged in different economic activities under primary as well as subsidiary occupation. The overall annual household income from principal as well as subsidiary occupation is calculated at Rs. 50052. As it is found that agriculture and wage earning are two top most occupations in the project area, the average annual income per earning member engaged in agriculture and wage earning is found at Rs. 48682.00 and Rs. 51317.00 respectively. Other occupations as principal or subsidiary are found having minimum proportionate share in the project area.

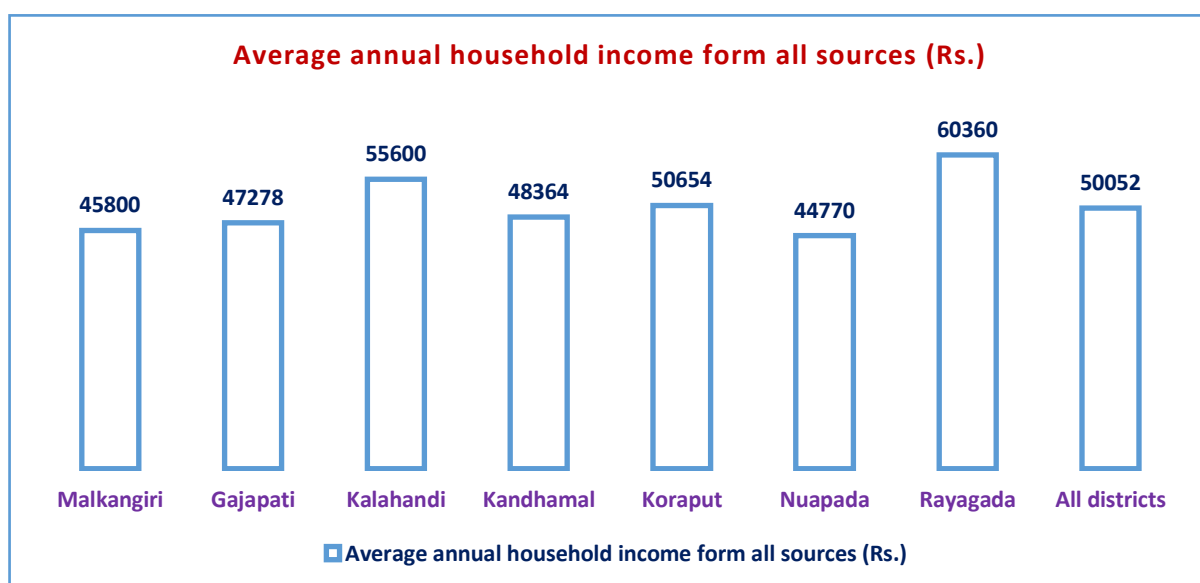


Table-3.20: Household level average land holding and average annual income

Sl.	Districts	Average Household Annual Income from all sources (Rs.)							
		Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
1	Agriculture	43669	80541	49244	48522	52123	42868	78224	48682
2	Daily wage earner	45715	56041	54514	44514	52941	45435	71185	51317
3	Business/Enterprise	51334	35000	66800	69334	85158	49769	168000	68939
4	Govt. service	62907	87722	253667	256667	87500	109889	180000	244221
5	Private Service	74667	33000	89600	122833	161000	65933	68750	94886
6	Migrant worker	28600	115333	65556	0	27333	55083	0	68015
7	Artisan	0	50000	0	0	0	0	75000	65000
8	Service Provider	0	25000	0	0	25000	0	0	25000
9	MFP Collection and sales	0	0	0	0	0	0	25000	25000
10	Student	21400	10000	84667	24500	20346	19286	0	56987
11	Housewife	42542	41133	46376	46566	51326	43346	0	45807
12	Non-Working/ Pensioners	50000	20000	48838	46658	50000	56200	20000	50012
	Total	45800	47278	55600	48364	50654	44770	60360	50052

Concluding Remarks

Majority of millet farmers covered under OMM are under the age group of 25-50 years followed by more than 50 years age group. Overall coverage of male and female farmers under OMM is at 75.3 and 24.7 percent respectively. About 64.9 percent of millet farmers are illiterates, 17.7 percent of farmers have education upto primary standard and another 6.8 percent have education upto upper primary standard. Majority of millet farmers, overall, to the extent of 73.8 percent are Scheduled Tribes (STs) followed by other castes (20.5%) and the remaining 5.6 percent are SCs. More than 90 percent of millet farmers of Gajapati and Rayagada district are STs by their social category. Majority of farmers, about 84 percent of millet farmers are Hindus by religion followed by Christianity (16.0%). a sizable chunk of millet farmers are marginal and small farmers. Proportionate share of marginal and small farmers jointly account around 78.1 percent of the total millets farmers as discussed. Overall, for about 60 percent of millet farmers, their residential houses are semi pucca houses followed by kutcha houses and pucca houses. Percentage share of pucca houses in the overall residential housing structures of millet farmers is about 18.2 percent. There are 2.5 male and 2.4 female members per millet farmers' household. More than 90 percent of the sampled-out millet farmers of Gajapati and Rayagada district are oldest registered millet farmers as they have have joined into OMM in the year 2017-18. the average land owned by marginal, small, medium and large farmers is found as 1.7 acres, 2.7 acres, 4.3 acres and 8.9 acres respectively. Overall, it is found that the average land holding per millet farmer is found at 2.9 acres. The operational land holdings per millet farmer is found at 3.7 acres. Overall sex ratio in the project area is found at 935. About 60 percent of household members are found employed in agricultural activities as their principal occupation. A miniscule proportion of the total household members roughly 3 percent are employed in other occupations as principal source of income. Main occupation of these 3 percent of people includes daily wage earner, business activities, Govt. and private service, artisan, MFP collection etc. Wage earning and agriculture are the two major sources of subsidiary occupation in the project area. The overall annual household income from principal as well as subsidiary occupation is calculated at Rs. 50052.



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

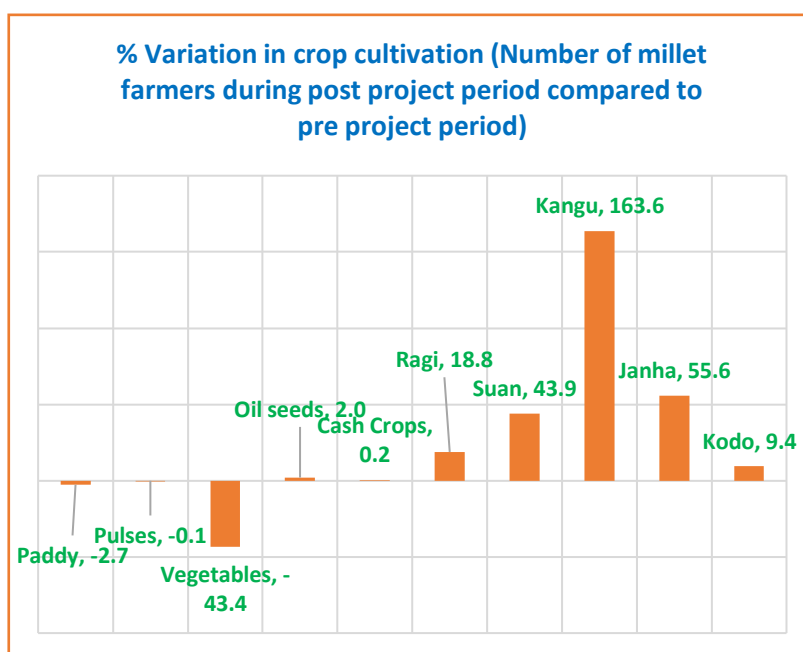
One of the objectives of the study is to outline the millet production, Productivity and Package of Practices in the project area. On the basis of empirical data obtained from millet farmers the pattern of millet production, productivity and package of practices adopted by the farmers, the objectives 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 Cropping Pattern

Cropping 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 produce millet along with other crops. 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 districts. 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, it is found that the number of farmers cultivating paddy during post project period has declined 2.7 percent, pulses by 0.1 percent, and vegetables by 43.4 percent. For other crops there are positive variation in the post project situation compared to pre project situation. Number of farmers practicing oilseed cultivation has marginally increased by 2 percent and cash crops by 0.2 percent. So far as different millets are concerned, number of farmers cultivating ragi

during post project situation has increased by 18.8 percent which is 43.9 percent for suan, 163.6 percent for kangu, 55.6 percent for Janha and 9.6 percent for Kodo. Pattern of change in crop mix for all of the project districts are highlighted in the charts given ahead.



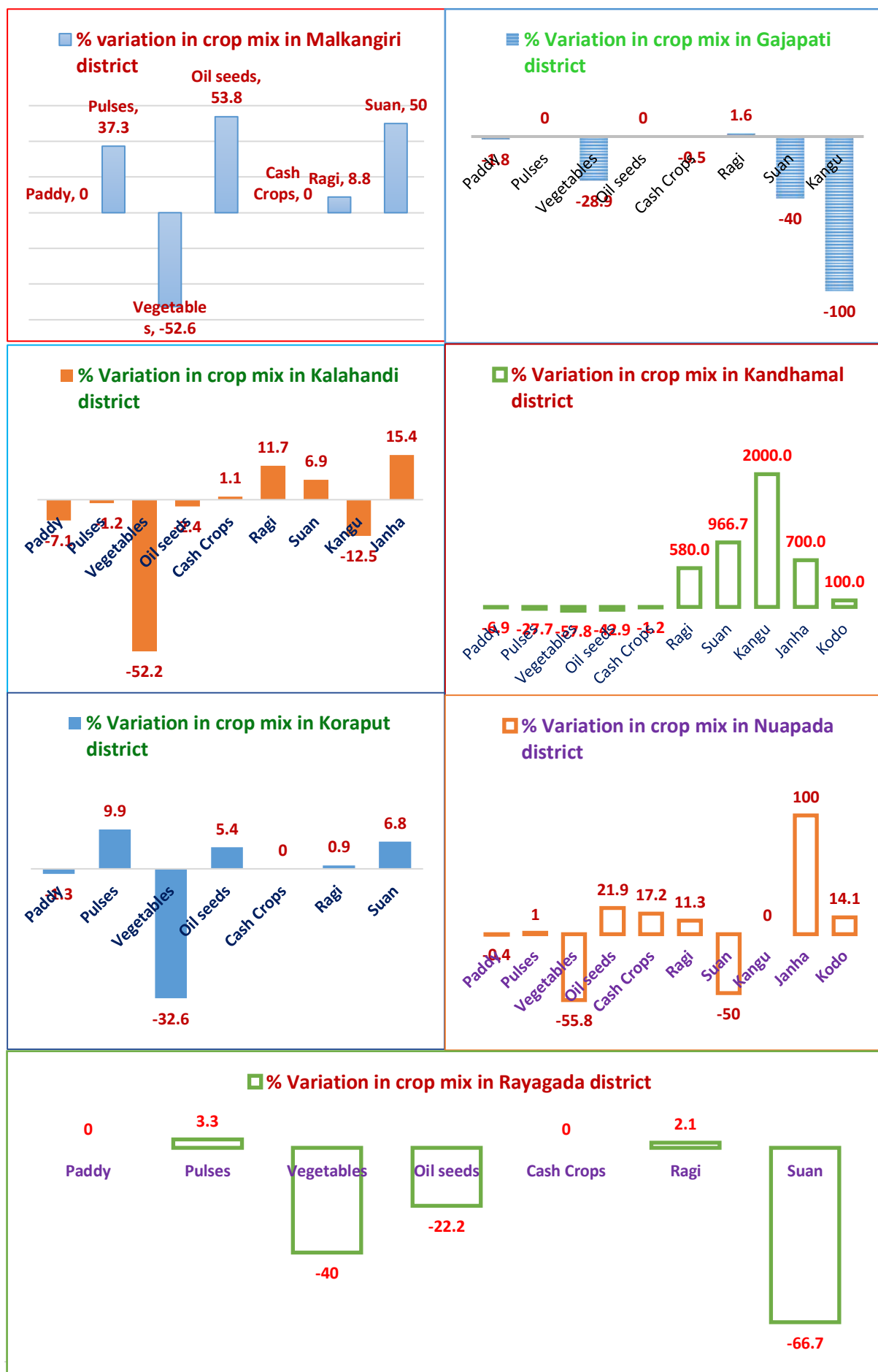


Table-4.1: Crop mix among the farmers of project area (No. of Farmers cultivating the crops in all seasons)

Sl.	Districts	Time Period	Overall agricultural practices of sample farmers (No. of farmers)							
			Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
1	Paddy	Before Project	319	277	310	319	527	239	100	2091
		After Project	319	272	288	297	520	238	100	2034
		% Variation	0.0	-1.8	-7.1	-6.9	-1.3	-0.4	0.0	-2.7
2	Pulses	Before Project	59	91	171	155	161	197	121	955
		After Project	81	91	169	112	177	199	125	954
		% Variation	37.3	0.0	-1.2	-27.7	9.9	1.0	3.3	-0.1
3	Vegetables	Before Project	38	90	67	166	233	52	80	726
		After Project	18	64	32	70	157	23	48	411
		% Variation	-52.6	-28.9	-52.2	-57.8	-32.6	-55.8	-40.0	-43.4
4	Oil seeds	Before Project	13	3	83	14	37	32	18	200
		After Project	20	3	81	8	39	39	14	204
		% Variation	53.8	0.0	-2.4	-42.9	5.4	21.9	-22.2	2.0
5	Cash Crops	Before Project	4	184	91	250	233	29	113	904
		After Project	4	183	92	247	233	34	113	906
		% Variation	0.0	-0.5	1.1	-1.2	0.0	17.2	0.0	0.2
6	Ragi	Before Project	294	312	256	45	543	212	234	1896
		After Project	320	317	286	306	548	236	239	2252
		% Variation	8.8	1.6	11.7	580.0	0.9	11.3	2.1	18.8
7	Suan	Before Project	12	5	58	6	59	2	6	148
		After Project	18	3	62	64	63	1	2	213
		% Variation	50.0	-40.0	6.9	966.7	6.8	-50.0	-66.7	43.9
8	Kangu	Before Project		1	8	1		1		11
		After Project		0	7	21		1		29
		% Variation		-100.0	-12.5	2000.0		0.0		163.6
9	Janha	Before Project			13	1	2	1	1	18
		After Project			15	8	2	2	1	28
		% Variation			15.4	700.0	0.0	100.0	0.0	55.6
10	Kodo	Before Project			40	1		64	1	106
		After Project			40	2		73	1	116
		% Variation			0.0	100.0		14.1	0.0	9.4

4.2 Crop Area

Crop wise land area cultivated per farmer, also known as land utilisation pattern during pre-project period compared to post project period is separately shown for all the project districts in the following table 4.2. It is found that paddy area per farmer has marginally declined in all of the project districts except Malkangiri, Koraput and Rayagada. In Koraput district there is no change, however, in Malkangiri and Rayagada district, there is marginal increase in paddy area per farmer. Similarly, there is more than 10 percent fall in the pulse areas in Malkangiri district and 5 percent fall of the same in Koraput district. Out of seven districts, in five districts, there is falling tendency of vegetable area per farmer. With respect to oil seeds and cash crops there is also falling tendency in the crop area per farmer in three districts. However, with respect to ragi, except two districts, five districts witnessed positive increase in the land area per farmer. There is sizable increase in ragi area per farmer in Malkangiri district. Compared to pre project situation, there is about 20 percent increase in ragi area per farmer during post project situation. Except Kandhamal and Rayagada, ragi area per farmer has improved in all of the project districts. The suan are per farmer has significantly declined in all districts except Malkangiri district.

Overall speaking the land use pattern per farmer has increased from 7.079 acres during pre-project period to 8.799 during post project period, thereby registering 24.3 percent increase in the average land use pattern per farmer. Considering all the districts together, crop wise variation in land area cultivated during post project period compared to pre project period as shown in the chart given below suggests that compared to pre project situation, there is no significant difference in the area under different crops per farmer during post project situation. This is to that OMM has been implemented in those areas, where the farmers were already habituated with millet cultivation for which even though there appear minor differences in land area per farmer during the said periods, however, good deal of difference can't be traced out. On the basis of such analysis, it can be inferred that area under millet crops per farmer has not been much changed despite OMM project intervention. Although good deal of variation in number of farmers undertaking millet cultivation are noticed as per the analysis under previous section, however there is not much difference in the area under millet crops per farmer.

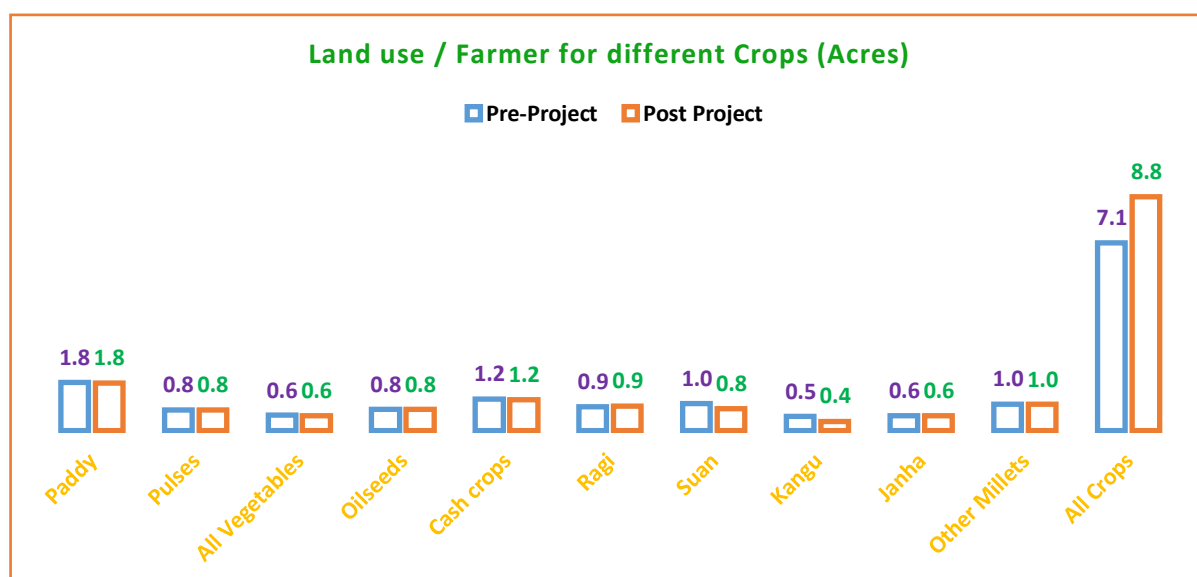


Table-4.2: Area under crop per farmer in all seasons in post project period compared to pre project period (Land area in Acres)

Sl.	Districts	Time Period	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
1	Paddy	Pre-Project	2.715	1.094	1.873	1.361	1.691	2.55	1.087	1.814
		Post Project	2.723	1.088	1.823	1.32	1.691	2.529	1.102	1.801
		% Variation	0.3	-0.5	-2.7	-3.0	0.0	-0.8	1.4	-0.7
2	Pulses	Pre-Project	0.808	0.859	0.754	0.571	0.974	0.682	0.914	0.78
		Post Project	0.697	0.859	0.771	0.664	0.922	0.685	0.912	0.789
		% Variation	-13.7	0.0	2.3	16.3	-5.3	0.4	-0.2	1.2
3	All vegetables	Pre-Project	0.364	0.706	0.492	0.493	0.666	0.393	0.629	0.576
		Post Project	0.335	0.706	0.458	0.51	0.645	0.37	0.604	0.56
		% Variation	-8.0	0.0	-6.9	3.4	-3.2	-5.9	-4.0	-2.8
4	Oilseeds	Pre-Project	1.177	0.833	0.989	0.696	0.72	0.363	0.633	0.796
		Post Project	1.05	0.833	1.007	0.719	0.703	0.373	0.636	0.792
		% Variation	-10.8	0.0	1.8	3.3	-2.4	2.8	0.5	-0.5
5	Cash crops	Pre-Project	0.475	1.291	1.471	0.918	1.158	1.836	1.348	1.193
		Post Project	0.475	1.282	1.533	0.84	1.134	1.856	1.296	1.169
		% Variation	0.0	-0.7	4.2	-8.5	-2.1	1.1	-3.9	-2.0
6	Ragi	Pre-Project	1	0.972	0.871	0.72	0.952	0.573	0.999	0.91
		Post Project	1.207	0.973	0.976	0.673	0.987	0.626	0.977	0.933
		% Variation	20.7	0.1	12.1	-6.5	3.7	9.2	-2.2	2.5
7	Suan	Pre-Project	0.896	0.9	1.012	0.458	1.096	0.55	1.167	1.01
		Post Project	0.958	0.5	0.988	0.373	1.145	0.1	1	0.837
		% Variation	6.9	-44.4	-2.4	-18.6	4.5	-81.8	-14.3	-17.1
8	Kangu	Pre-Project		0.5	0.538	0.5		0.5		0.527
		Post Project			0.471	0.31		0.5		0.355
		% Variation		-100.0	-12.5	-38.0		0.0		-32.6
9	Janha	Pre-Project			0.565	0.5	0.3	1	0.5	0.553
		Post Project			0.657	0.375	0.3	1	0.5	0.57
		% Variation			16.3	-25.0	0.0	0.0	0.0	3.1
10	Kodo	Pre-Project			1.042	0.25		0.957	3	1.002
		Post Project			1.085	0.25		0.925	3	0.993
		% Variation			4.1	0.0		-3.3	0.0	-0.9
All Crops (GCA/ Farmer)		Pre-Project	7.435	6.655	7.462	5.217	7.257	6.947	6.777	7.079
		Post Project	7.445	6.241	9.769	6.034	7.527	8.964	10.027	8.799
		% Variation	0.1	-6.2	30.9	15.7	3.7	29.0	48.0	24.3

4.3 Package of Practices for Millet Production

4.3.1 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 millet 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 there is about 60 percent increase in monocropping of millets and correspondingly there is sufficient decline mixed and intercropping of millets. During post project period, more than 85 percent of the ragi farmers have abandoned mixed and intercropping of ragi and have switched over to monocropping of ragi. Similarly, the extent of increase of monocropping of Suan, kangu, Janha, and kodo millets during post project period has increased by 97.3, 100, 23.5 and 69.6 percent respectively. Correspondingly importance of mixed and intercropping of all types of millets has been reduced sufficiently as can be noticed from the following table. The analysis suggests OMM has been quite instrumental in encouraging millet farmers to opt for monocropping of millets towards higher productivity of millets.

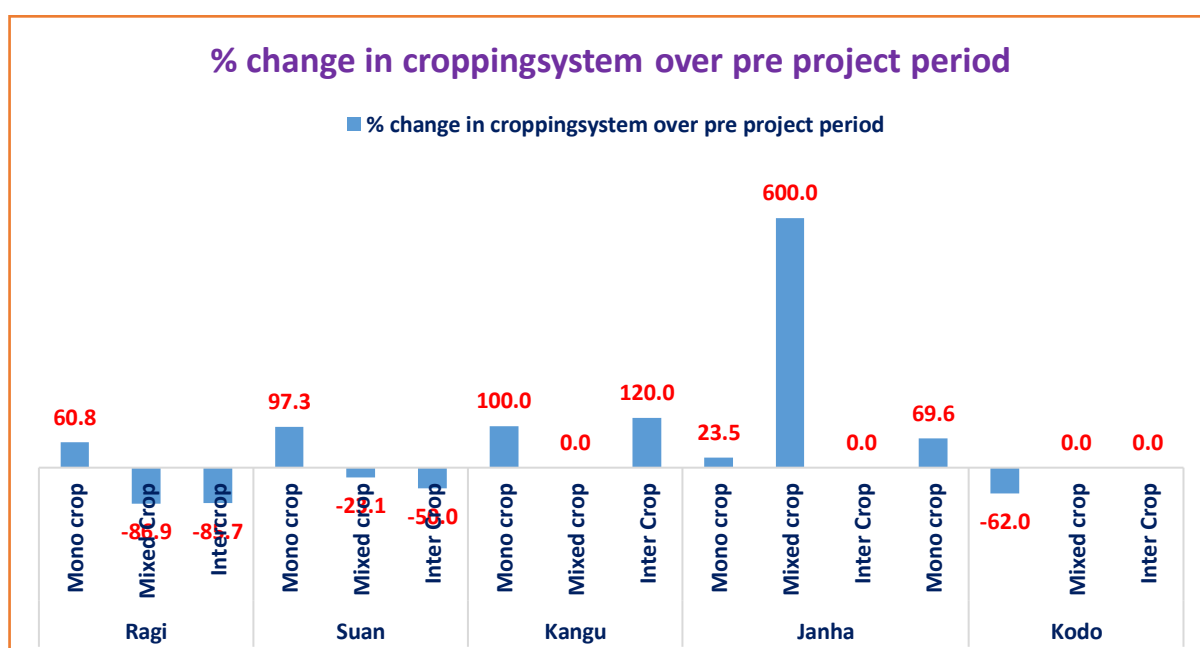


Table-4.3: Method of cropping system followed for cultivating different types of millets in the project area

Sl.	Districts	Methods of cropping system during Pre-Project Period (No. of farmers)														
		Ragi			Suan			Kangu			Janha			Kodo		
		Mono crop	Mixed Crop	Intercrop	Mono crop	Mixed crop	Inter Crop	Mono crop	Mixed crop	Inter Crop	Mono crop	Mixed crop	Inter Crop	Mono crop	Mixed crop	Inter Crop
1	Malkangiri	169	123	1	11											
2	Gajapati	295	3					1								
3	Kalahandi	172	82	4	34	19	1	4		4	12	1		28	12	
4	Kandhamal	36	5			5				1	1				1	
5	Koraput	370	184	1	28	15	1				2					
6	Nuapada	84	124	1	1			1			1			28	36	
7	Rayagada	225	14								1				1	
	All districts	1351	535	7	74	39	2	6		5	17	1		56	50	
Methods of cropping system during Post-Project Period (No. of farmers)																
1	Malkangiri	317	1	1	13											
2	Gajapati	281	17													
3	Kalahandi	287	7		53	2	1	1	1	5	13	2		40		
4	Kandhamal	265	36		37	25		10	5	6	5	3			2	
5	Koraput	557			42	3					1	1				
6	Nuapada	236			1			1			1	1		55	16	2
7	Rayagada	230	9								1				1	
	All districts	2173	70	1	146	30	1	12	6	11	21	7		95	19	2
% Variation in post project period compared to pre project period																
1	Malkangiri	87.6	-99.2	0.0	18.2											
2	Gajapati	-4.7	466.7					-100.0								
3	Kalahandi	66.9	-91.5	-100.0	55.9	-89.5	0.0	-75.0		25.0	8.3	100.0		42.9	-100.0	
4	Kandhamal	636.1	620.0			400.0				500.0	400.0				100.0	
5	Koraput	50.5	-100.0	-100.0	50.0	-80.0	-100.0				-50.0					
6	Nuapada	181.0	-100.0	-100.0	0.0			0.0			0.0			96.4	-55.6	
7	Rayagada	2.2	-35.7								0.0				0.0	
	All districts	60.8	-86.9	-85.7	97.3	-23.1	-50.0	100.0		120.0	23.5	600.0		69.6	-62.0	

4.3.2 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 for all types of millets almost in all of the project districts farmers have shifted from traditional broadcasting method of cultivation and adopted other improved methods of cultivation. It is further observed that there is substantial improvement of SMI method in all types of millets compared to other two methods like LS and LT. During interaction with Community Resource Persons (CRPs)¹⁹ it was elicited that CRPs are providing continuous hand holding support to millet farmers for scientific method of cultivation rather than traditional broadcasting method. Besides, there is also Govt. subsidy to farmers to adopt modern methods of cultivation. This has encouraged farmers for better adoption of SMI cultivation. Few of the millet farmers of Kalahandi and Kandhamal districts continue to pursue line sowing (LS) owing to climate risks like long dry spells leading to ageing of seedlings.



¹⁹ CRPs are the frontline workers appointed by the project to provide handholding support to millet farmers at grass root or community level.

Table-4.4: Agronomic practices followed for cultivating different types of millets in the project area

Sl.	Districts	Agronomic Practices during Pre-Project Period (No. of farmers)																			
		Ragi				Suan				Kangu				Janha				Other millets (Kodo)			
		SMI	LT	LS	Broad casting	SMI	LT	LS	Broad casting	SMI	L T	LS	Broad casting	SMI	LT	LS	Broad casting	SMI	LT	LS	Broad casting
1	Malkangiri		10		283				11												
2	Gajapati				298								1								
3	Kalahandi	1	16	1	239	2	1	1	51				8			1	12				40
4	Kandhamal		1		40				5				1				1				1
5	Koraput	1	2		552				44					1	1						
6	Nuapada	2	21	3	183				1	1							1	1	1		62
7	Rayagada	2			237												1				1
	All districts	6	50	4	1832	2	1	1	112	1			10	1	1	1	15	1	1		104
Agronomic Practices during Post-Project Period (No. of farmers)																					
1	Malkangiri	31	253		33	2			12												
2	Gajapati	295	3		0																
3	Kalahandi	213	67	11	5	5	12	16	23	1	1		5	1	4	10		2		28	10
4	Kandhamal	137	159	4	2	3	21	1	37	1	2	15	3	3	1	1	4		2		
5	Koraput	406	129	1	21	1	2		42					2							
6	Nuapada	91	131	1	13				1				1				1	12	1	1	59
7	Rayagada	239			0											1				1	
	All districts	1412	742	17	74	11	35	17	115	2	3	15	9	6	5	12	5	14	3	30	69

4.3.3 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 better is the 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 during post project period, more than two time weeding for ragi, suan, janha and kodo has increased by 24.5, 31.8, 21.4 and 14.3 percent respectively. During pre-project period, bajara was not cultivated by the sample farmers. However, due to OMM intervention, a miniscule of farmers have adopted bajra cultivation in the project area. The analysis suggests that in addition to promoting the outreach of existing millets among a greater number of farmers, the OMM has also successfully promoted new varieties of millets in the project area. Besides, the project has also successfully promoted a set of packages of practices like improved cultivation methods, better agronomic practices and importance of de-weeding on millet fields.



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

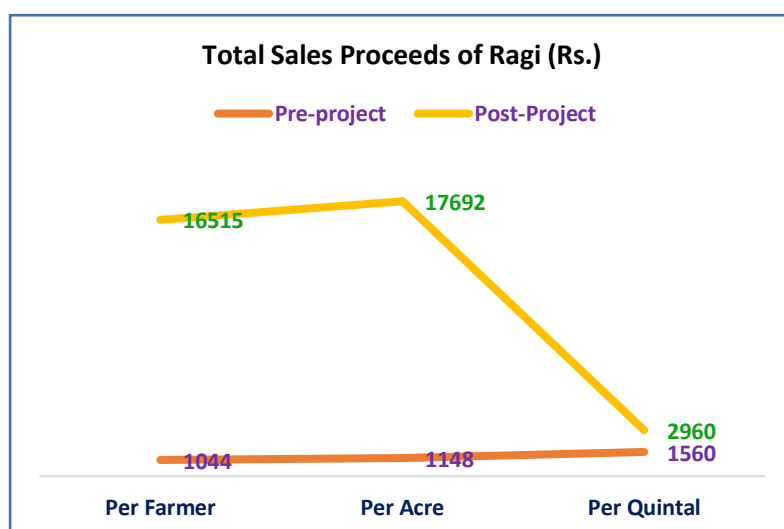
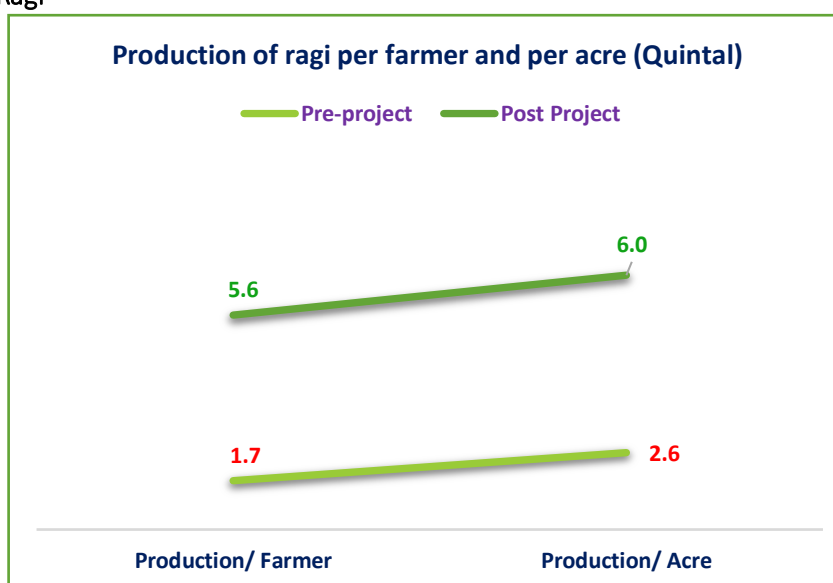
Sl.	Districts	Weeding practices followed during Pre-Project Period (No. of farmers)														
		Ragi			Suan			Kangu			Janha			Other Millets (Kodo)		
		One time	Two times	More than two times	One time	Two times	More than two times	One time	Two times	More than two times	One time	Two times	More than two times	One time	Two times	More than two times
1	Malkangiri			320			11									
2	Gajapati		298	22												
3	Kalahandi	1	51	268	1	21	33						12		11	39
4	Kandhamal		41	284		5									2	1
5	Koraput		320	239			43					1	1			
6	Nuapada		6	235			1	1					1	1	5	51
7	Rayagada		231	9								1				
	All districts	1	947	1377	1	26	88	1				2	14	1	18	91
		Weeding practices followed during Post-Project Period (No. of farmers)														
1	Malkangiri		1	269			14									
2	Gajapati		6	292												
3	Kalahandi	1	1	111		11	43			2		1	14		4	38
4	Kandhamal		72	200		48	14		2	4		8	2		18	4
5	Koraput		12	448			44					2				
6	Nuapada		3	161			1			1			1			62
7	Rayagada		1	233								1				
	All districts	1	96	1714		59	116		2	7		12	17		22	104
		% Deviation over pre project period														
1	Malkangiri			-15.9			27.3									
2	Gajapati		-98.0	1227.3												
3	Kalahandi	0.0	-98.0	-58.6	-100.0	-47.6	30.3						16.7		-63.6	-2.6
4	Kandhamal		75.6	-29.6		860.0									800.0	300.0
5	Koraput		-96.3	87.4			2.3					100.0	-100.0			
6	Nuapada		-50.0	-31.5			0.0	-100.0					0.0	-100.0	-100.0	21.6
7	Rayagada		-99.6	2488.9								0.0				
	All districts	0.0	-89.9	24.5	-100.0	126.9	31.8	-100.0				500.0	21.4	-100.0	22.2	14.3

4.4 Behaviour of Production of Millets

The production behaviour is separately analysed for all major varieties of reported millets. The behaviour of production of millets is examined in terms of amount of millet produced per farmer, per acre of land area. Moreover, sales proceeds per farmer, per acre and per quintal of production is also analysed with the objective of assessing the overall behaviour of millet production in the project area. Considering the number of sampled out farmers and the area under millet crops of the sample farmers, per farmer and per acre production volume is estimated by dividing the total production of all farmers with respect to sampled out farmers and their operational landholding used for millet cultivation. While calculating sales proceeds, only marketable surplus part of the whole production is considered because a millet farmers witnesses cash inflow for this part of production. Based on these parameters, the behaviour of millet production is separately analysed for pre project and post project period.

4.4.1 Production behaviour of Ragi

Ragi emerges as the single most leading millet and practiced by of majority of millet farmers in the project area. As per table 4.6, the amount of production of ragi per farmer and per acre is found at 1.7 and 2.6 quintals respectively during pre-project situation. However, during post project situation, the amount of production per farmer and per acre are found to be at 5.6 and 6.0 Quintal respectively.



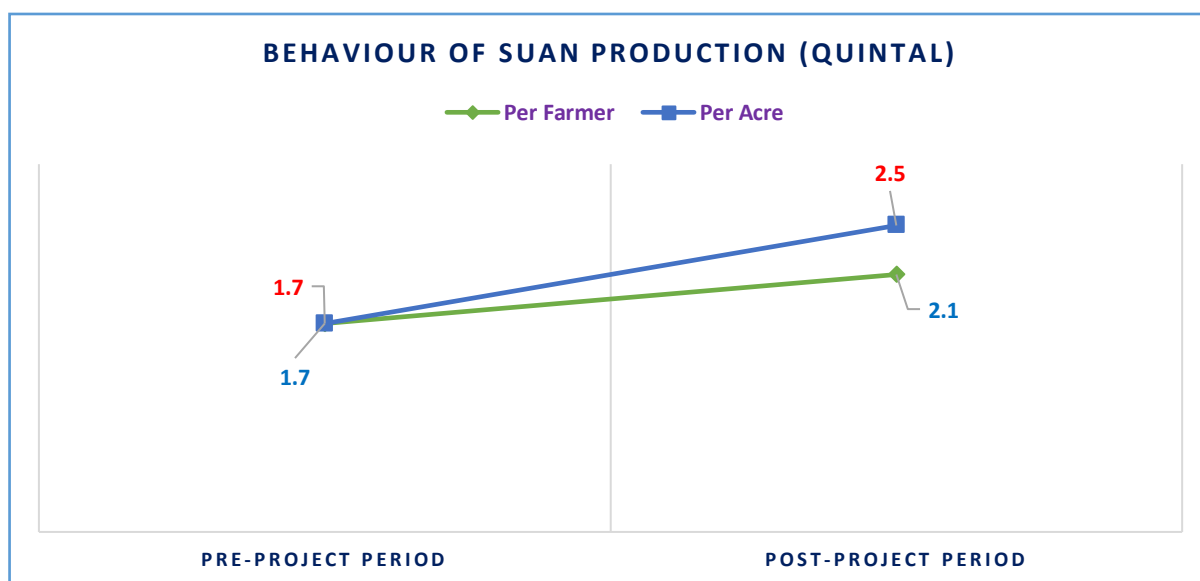
District wise pattern of change in the production behaviour of ragi during post project situation compared to pre project situation is separately shown in the following table. The changes in other indicators for assessing the production behaviour of ragi during pre and post project situation are shown in separate charts given alongside.

Table-4.6: Production and Value of Ragi (Area in Acres and production in Quintal)

Sl.	Districts	Pre-project Period												
		No. of farmer involved in ragi cultivation	Area under ragi cultivation	Total Production	Qty used for self-consumption	Quantity retained for seed purposes	Production /Farmer	Production /Acre	Post-Harvest Loss @ 5 percent of total production	Marketable Surplus (MS)	Total Sales Proceeds from MS	Total Sales Proceeds /Framer (Rs.)	Total Sales Proceeds/ Acre (Rs.)	Total Sales Proceeds/ Quintal of marketable surplus
1	Malkangiri	294	294.1	454.6	168.3	25.245	1.5	2.5	22.7	238.3	333655	1135	1134	1400
2	Gajapati	312	303.3	433.3	333.4	50.01	1.4	2.1	21.7	28.2	43749	140	144	1550
3	Kalahandi	256	223	527.2	107.7	16.155	2.1	4.9	26.4	377.0	622025	2430	2789	1650
4	Kandhamal	45	32.4	175	35.5	5.325	3.9	4.6	8.8	125.4	149256	3317	4607	1190
5	Koraput	543	516.8	744.2	487.4	73.11	1.4	2.7	37.2	146.5	204779	377	396	1398
6	Nuapada	212	121.4	320.2	75.8	11.37	1.5	2.6	16.0	217.0	345062	1628	2842	1590
7	Rayagada	234	233.7	475.3	274.2	27.42	2.0	1.9	23.8	149.9	269847	1153	1155	1800
	All districts	1896	1724.7	3129.8	1482.2	222.33	1.7	2.6	156.5	1268.8	1979297	1044	1148	1560
Post Project Period														
1	Malkangiri	320	386.3	1515.3	184.3	55.3	4.7	3.9	75.8	1199.9	4485288	14017	11612	2960
2	Gajapati	317	308.5	1768.1	120.1	36.0	5.6	5.7	88.4	1523.6	5233576	16510	16967	2960
3	Kalahandi	286	279.1	1592.4	141.0	42.3	5.6	5.7	79.6	1329.5	4713504	16481	16888	2960
4	Kandhamal	306	206.0	2421.2	121.2	36.4	7.9	5.8	121.1	2142.6	7166752	23421	34790	2960
5	Koraput	548	541.0	2991.1	268.2	80.5	5.5	5.5	149.6	2492.9	8853656	16156	16365	2960
6	Nuapada	236	147.8	936.1	94.1	28.2	4.0	6.3	46.8	767.0	2770856	11741	18751	2960
7	Rayagada	239	233.6	1340.8	93.6	28.1	5.6	5.7	67.0	1152.1	3968768	16606	16990	2960
	All districts	2252	2102.2	12565	1022.5	306.8	5.6	6.0	628.3	10607.5	37192400	16515	17692	2960

4.4.2 Production Behaviour of Suan (Little Millet)

Suan is found to be second most important millet cultivated by the millet farmers of the project area. The analysis as provided in the following table 4.7 reveals that during pre-project situation 148 farmers had cultivated Suan on 149.45 acres of land. The situation seems to have been improved during post project situation and during this period 213 farmers had cultivated suan on 178.18 acres of land. Considering the total production of suan during pre-project and post project situations separately, the production per acre during pre-project situation is found at 1.7 quintal as against the same at 2.5 quintal during post project situation. Similarly total production of suan per farmer during pre-project and post project situations is calculated at 1.7 and 2.1 Quintals respectively.



The behaviour of sales proceeds from Suan is analysed in terms of Sales Proceeds/ Quintal, Sales Proceeds/ farmer and sales proceeds/ acre. As per the following chart it is evident that, all these three sales proceeds' indicators have improved very much during post project situation compared to the same during pre-project situation.

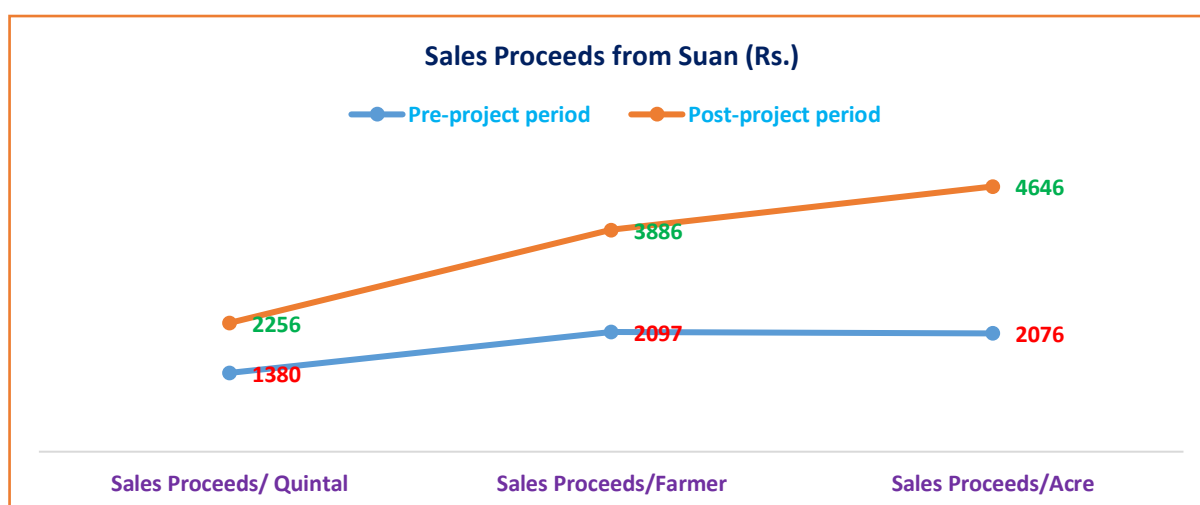
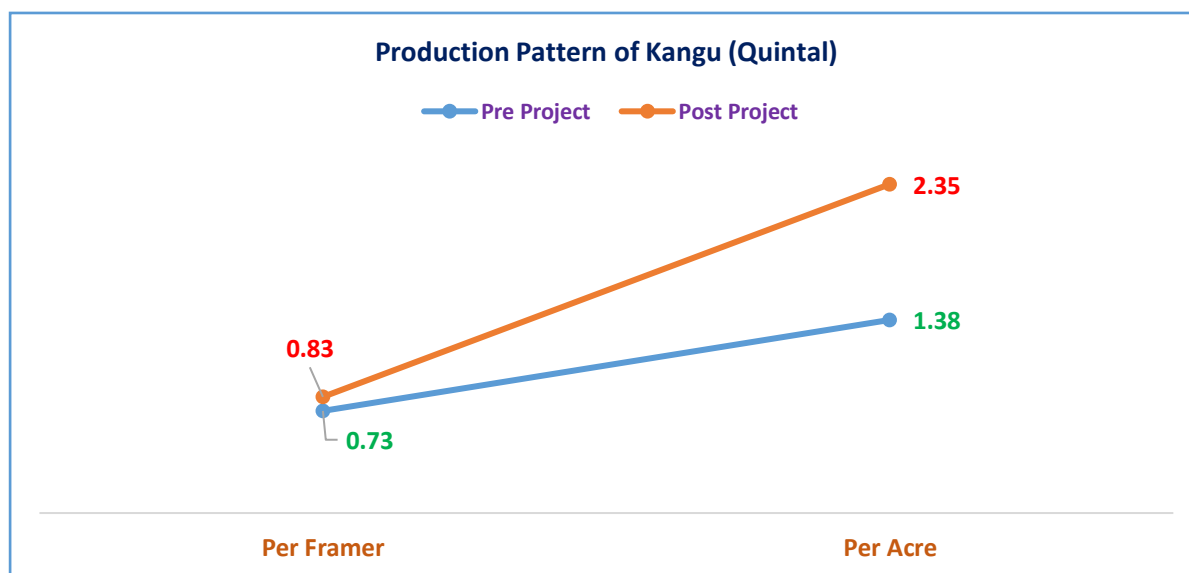


Table-4.7: Production and Value of Suan

Sl.	District	No. of sampled farmers	Area under Suan cultivation	Total Production (Quintal)	Qty. used for self-consumption	Qty. retained for seeds	Production/ Farmer (Quintal)	Production / Acre	Post-harvest loss @5 percent of TP	Marketable Surplus	Total Sales Proceeds (Rs.)	Sales Proceeds/ Quintal	Sales Proceeds/Farmer	Sales Proceeds/Acre
Pre Project-Period														
1	Malkangiri	12	10.75	22.4	1.2	0.7	1.9	2.1	1.1	19.4	21825	1126	1819	2030
2	Gajapati	5	4.5	0	0	0	0.0	0.0	0.0	0.0	0		0	0
3	Kalahandi	58	58.7	97.1	3.9	5.3	1.7	1.7	4.9	83.0	119774	1442	2065	2040
4	Kandhamal	6	2.75	3.4	0	0.1	0.6	1.2	0.2	3.1	1306	417	218	475
5	Koraput	59	64.65	132.1	1	5.3	2.2	2.0	6.6	119.2	166613	1398	2824	2577
6	Nuapada	2	1.1	0.4	0	0.3	0.2	0.4	0.0	0.1	800	10000	400	727
7	Rayagada	6	7											
	All districts	148	149.45	255.5	6.2	11.6	1.7	1.7	12.8	224.9	310318	1380	2097	2076
Post Project Period														
1	Malkangiri	18	17.25	49.1	3.3	1.4	2.7	2.8	2.5	41.9	100200	2389	5567	5809
2	Gajapati	3	1.5	0	0	0	0.0	0.0	0.0	0.0				
3	Kalahandi	62	61.28	147.6	14.6	7.1	2.4	2.4	7.4	118.5	318928	2691	5144	5204
4	Kandhamal	64	23.9	88.3	21.4	2.5	1.4	3.7	4.4	60.0	120805	2014	1888	5055
5	Koraput	63	72.15	166.7	5.5	6.8	2.6	2.3	8.3	146.1	348000	2383	5524	4823
6	Nuapada	1	0.1	0.8	0.4	0.1	0.8	0.8	0.0	0.3	880	3385	880	8800
7	Rayagada	2	2											
	All districts	213	178.18	452.6	45.3	17.7	2.1	2.5	22.6	367.0	827813	2256	3886	4646

4.4.3 Production Behaviour of Kangu (Foxtail Millet)

Although Ragi and suan are more prevalent among the farmers, still a small proportion of farmers do cultivate Kangu in Gajapati, Kalhandi, Kandhamal and Nuapada districts. As per table 4.8, it is found that kangu production per farmer and per acre during pre-project situation was at 0.73 and 1.38 quintals respectively. During post project situation, production of kangu per farmers has increased to 0.83 quintals and per acre to 2.35 quintals. Inter district variation in the production pattern can be observed from the statements given in the following table.



The behaviour of sales proceeds from Kangu is analysed in terms of Sales Proceeds/ Quintal, Sales Proceeds/ farmer and sales proceeds/ acre. As per the following chart it is evident that, two of the three sales proceeds' indicators have decreased during post project situation compared to the same during pre-project situation. The sales proceeds indicators like Sales Proceeds/ quintal and sales proceeds/ farmer have tended to decrease during post project situation, however, sales proceeds per acre have increased.

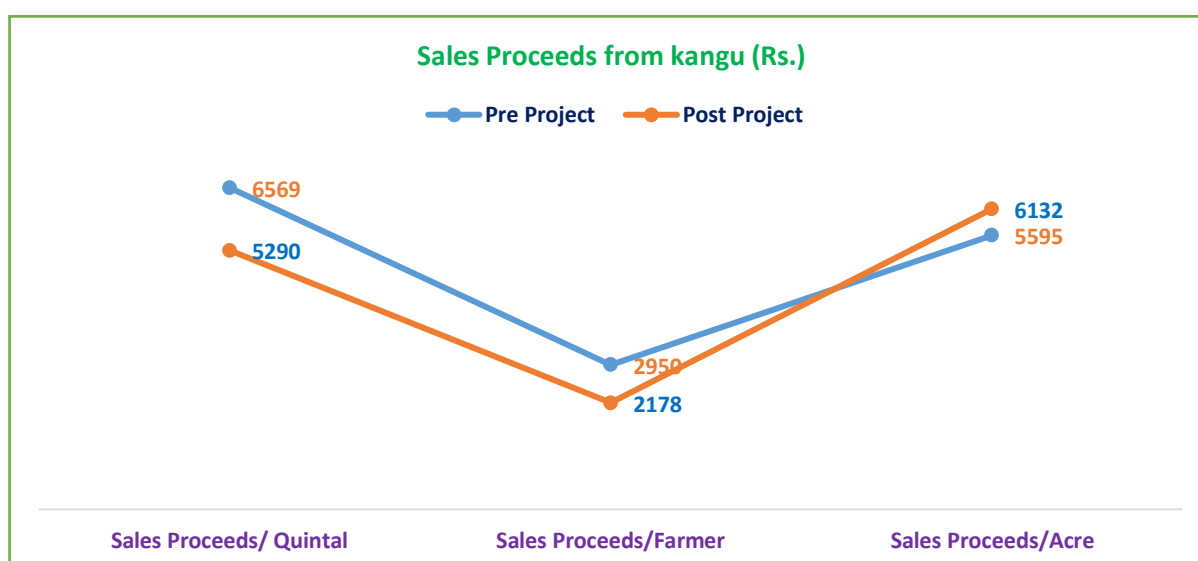
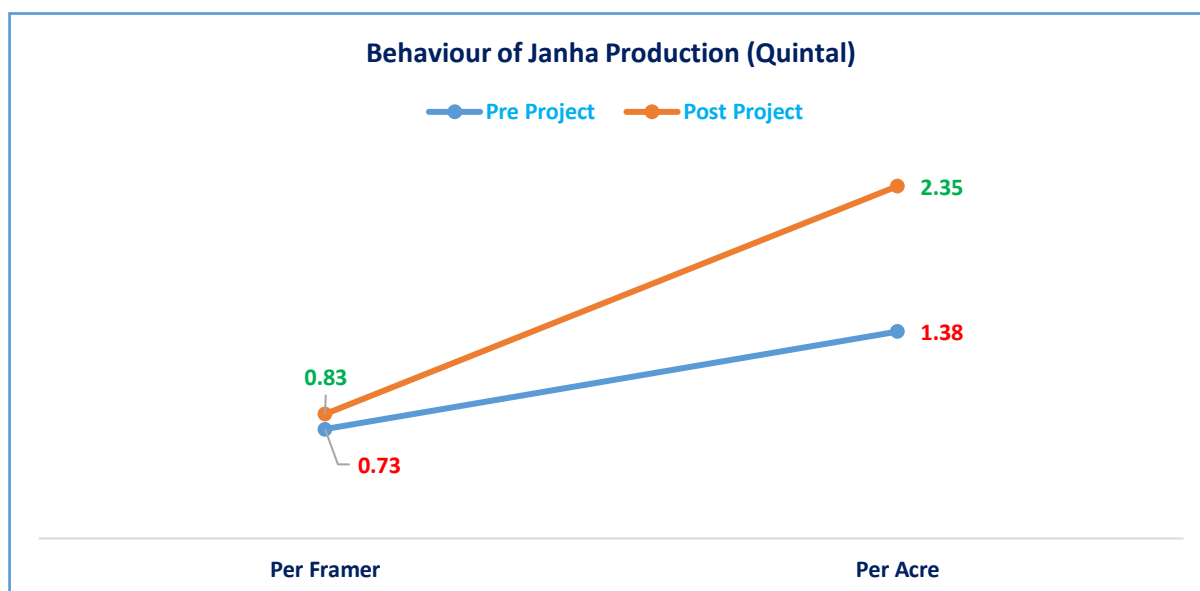


Table-4.8: Production and Value of Kangu

Sl.	Districts	No. of Framers	Area under kangu cultivation	Total Production	Qty used for self-consumption	Qty used for seeds	Production/ Farmer	Production/ Acre	Post-harvest loss @5%	Marketable Surplus	Total Sales Proceeds (Rs.)	Sales Proceeds/ Quintal (Rs.)	Sales Proceeds/ Farmer (Rs.)	Sales Proceeds/Acre (Rs.)
Pre- Project														
1	Malkangiri													
2	Gajapati	1	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0		0	0
3	Kalahandi	8	4.30	7.20	1.40	0.56	0.90	1.67	0.36	4.88	30600	6270	3825	7116
4	Kandhamal	1	0.50	0.30	0.00	0.00	0.30	0.60	0.02	0.29	300	1053	300	600
5	Koraput			0.00	0.00	0.00			0.00	0.00	0			
6	Nuapada	1	0.50	0.80	0.50	0.20	0.80	1.60	0.04	0.06	900	15000	900	1800
7	Rayagada													
	All districts	11	5.80	8.00	1.90	0.76	0.73	1.38	0.40	4.94	32450	6569	2950	5595
Post-Project														
1	Malkangiri			0.00	0.00	0.00			0.00	0.00	0			
2	Gajapati			0.00	0.00	0.00			0.00	0.00	0			
3	Kalahandi	7	3.30	11.60	2.40	0.72	1.66	3.52	0.58	7.90	50770	6427	7253	15385
4	Kandhamal	21	6.50	12.10	5.60	1.68	0.58	1.86	0.61	4.22	11290	2679	538	1737
5	Koraput			0.00	0.00	0.00			0.00	0.00	0			
6	Nuapada	1	0.50	0.90	0.50	0.15	0.90	1.80	0.05	0.21	1100	5366	1100	2200
7	Rayagada													
	All districts	29	10.30	24.20	8.50	2.55	0.83	2.35	1.21	11.94	63160	5290	2178	6132

4.4.4 Production Behaviour of Janha (Sorghum)

Like kangu, janha is also cultivated by few millet farmers in five out of seven project districts. Except Malkangiri and Gajapati, janha millet is reported in the remaining five OMM project districts. As per table 4.9, it is found that janha production per farmer and per acre during pre-project situation was at 1.28 and 2.32 quintals respectively. During post project situation, production of janha per farmer has increased to 1.45 quintals and per acre to 2.54 quintals. Inter district variation in the production pattern can be observed from the statements given in the following table.



The behaviour of sales proceeds from janha is analysed in terms of Sales Proceeds/ Quintal, Sales Proceeds/ farmer and sales proceeds/ acre. As per the following chart it is evident that, two of the three sales proceeds' indicators have decreased during post project situation compared to the same during pre-project situation. The sales proceeds indicators like Sales Proceeds/ quintal and sales proceeds/ farmer have tended to decrease during post project situation, however, sales proceeds per acre have increased.

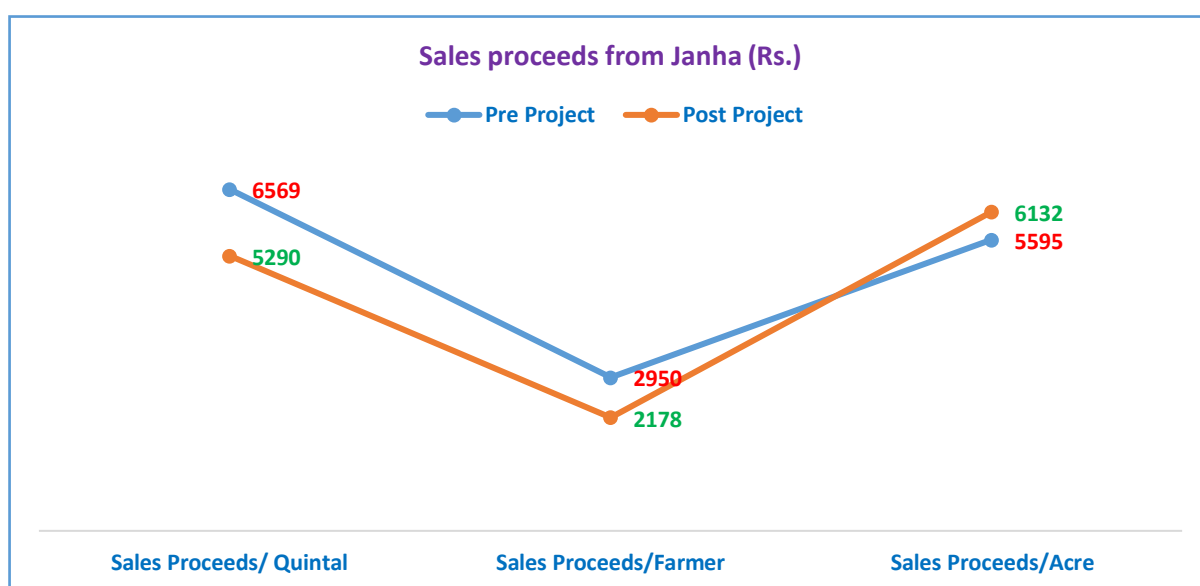


Table-4.9: Production and Value of Janha

Sl.	District	No. of Farmers	Area under Janha cultivation (Acres)	Total Production (Quintal)	Qty used for self-consumption	Qty used for seeds	Production/Farmer	Production/Acre	Post-harvest loss @2%	Marketable Surplus (Quintal)	Total Sales Proceeds (Rs.)	Sales Proceeds/Quintal (Rs.)	Sales Proceeds/Farmer (Rs.)	Sales Proceeds/Acre (Rs.)
Pre-Project Period														
1	Malkangiri													
2	Gajapati													
3	Kalahandi	13	7.35	16.75	3.1	0.31	1.29	2.28	0.34	13.01	31600	2430	2431	4299
4	Kandhamal	1	0.5	1.625	0.1	0.01	1.63	3.25	0.03	1.48	2400	1619	2400	4800
5	Koraput	2	0.6	1.5	0.1	0.01	0.75	2.50	0.03	1.36	6680	4912	3340	11133
6	Nuapada	1	1	1.25	0.5	0.05	1.25	1.25	0.03	0.68	500	741	500	500
7	Rayagada	1	0.5	2	1.5	0.15	2.00	4.00	0.04	0.31	180	581	180	360
	All districts	18	9.95	23.125	5.3	0.53	1.28	2.32	0.46	16.83	41360	2457	2298	4157
Post-Project Period														
1	Malkangiri													
2	Gajapati													
3	Kalahandi	15	9.85	27.625	3.6	0.36	1.84	2.80	0.55	23.11	94100	4071	6273	9553
4	Kandhamal	8	3	5.375	2.2	0.22	0.67	1.79	0.11	2.85	5250	1844	656	1750
5	Koraput	2	0.6	4.5	0.1	0.01	2.25	7.50	0.09	4.30	13850	3221	6925	23083
6	Nuapada	2	2	1.625	0.2	0.02	0.81	0.81	0.03	1.37	4500	3279	2250	2250
7	Rayagada	1	0.5	1.5	0.2	0.02	1.50	3.00	0.03	1.25	2575	2060	2575	5150
	All districts	28	15.95	40.5	6.3	0.63	1.45	2.54	0.81	32.76	120275	3671	4296	7541

4.4.5 Production Behaviour of Kodo (Ditch Millet)

In the OMM project area kodo millet is cultivated mainly in Kalahandi and Nuapada district. However few farmers of Rayagada and Kandhamal district are also found cultivating kodo millets during pre-project as well as post project periods. The details of production of kodo millets in the OMM project area is separately analysed for pre project and post project period in table 4.10. It is found that production of kodo millet per acre of land area and similarly production per farmer has slightly declined during post project period in comparison to pre project period. However, in two major kodo millet producing districts, Kalahandi and Nuapada, production of kodo millet per farmer and per acre has marginally increased during post project period compared to pre project period.



Table-4.10: Production and Value of Kodo Millets

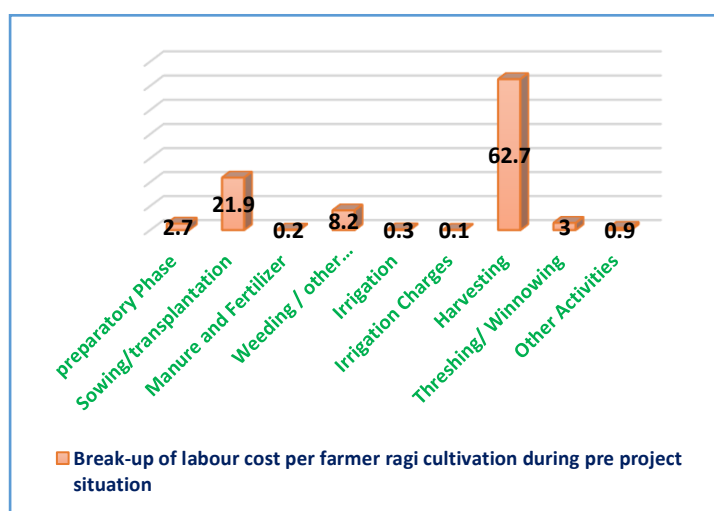
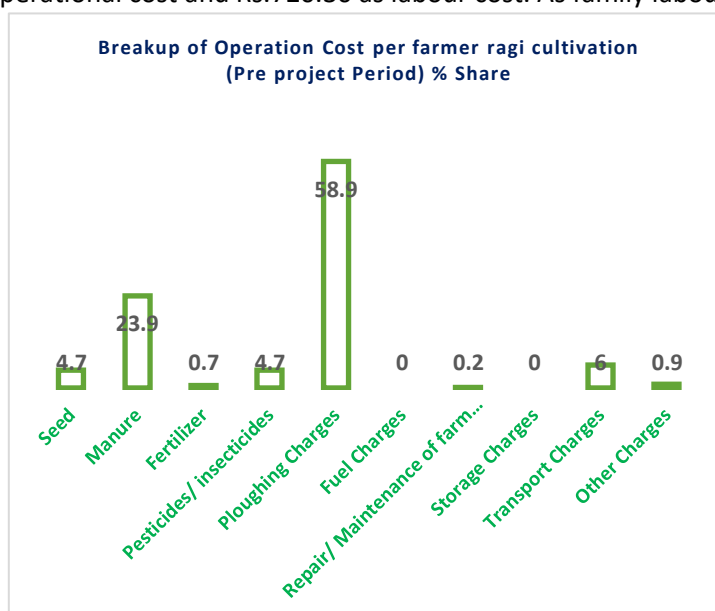
Sl.	District	No. of Farmers	Area under cultivation (Acres)	Total Production (Quintal)	Qty used for self-consumption	Qty used for seeds	Production/Farmer	Production/Acre	Post-harvest loss @2%	Marketable Surplus (Quintal)	Total Sales Proceeds (Rs.)	Sales Proceeds/Quintal (Rs.)	Sales Proceeds/Farmer (Rs.)	Sales Proceeds/Acre (Rs.)
Pre-Project Period														
1	Malkangiri													
2	Gajapati													
3	Kalahandi	40	41.68	46.3	5.15	4.29	1.2	1.1	0.93	37.94	145732	3841	3643	3496
4	Kandhamal	1	0.25	0.5	0.5		0.5	2.0	0	0	0	0	0	0
5	Koraput													
6	Nuapada	64	61.25	79.42	3.33	2.88	1.2	1.3	1.59	69.65	166135	2385	2596	2712
7	Rayagada	1	3	5.26	4.59	0.3	5.3	1.8	0.11				0	0
	All districts	106	106.18	132.9	14.99	7.47	1.3	1.3	2.66	107.59	311867	2899	2942	2937
Post-Project Period														
1	Malkangiri													
2	Gajapati													
3	Kalahandi	40	43.4	47.8	14.34	1.14	1.2	1.1	0.96	53.17	265815	4999	6645	6125
4	Kandhamal	2	0.5	1.9	2.69	0.28	1.0	3.8	0.07	2.69	5400	2007	2700	10800
5	Koraput													
6	Nuapada	73	67.525	86.41	15.38	2.82	1.2	1.3	1.73	15.38	30361	1974	416	450
7	Rayagada	1	3				0.0	0.0	0				0	0
	All districts	116	115.188	137.61	32.41	4.24	1.2	1.2	2.75	159.64	574830	3601	4955	4990

4.6 Cost of Cultivation of Millet

For calculating the cost of cultivation of millet, cost per farmer and per acre for ragi cultivation is calculated during pre-project and post project situation. From the previous analysis, it is ample clear that ragi is the major millet being cultivated by the millet farmers of the project area. ***The cost of production of ragi is calculated in this section to examine the cost behaviour of millet production. During household survey, the interaction with millet farmers suggests that there is not much difference in the cost pattern of cultivating all types of millets. So, for examining the cost of cultivation of millet, the cost of cultivation of ragi is considered as proxy for all types of millets found in the OMM project area.*** From the following table, it is understood that the overall cost covers two components as operational cost and labour cost. The details of operational cost and labour cost per farmer and per acre is discussed for all the study districts separately.

4.6.1 Cost of cultivation during Pre-Project Period

As it is indicated in table 4.11, the overall cost of cultivating ragi per farmer stands at Rs.1904.00 of which Rs. 1183.7 constitutes to be the operational cost and Rs.720.30 as labour cost. As family labour are also involved in the millet cultivation process, so, in order to arrive at labour cost, the imputed value of family labour is also considered. There are inter district difference in per famer cost of cultivation. This may be partially due to differences in millet areas per farmer. Comparatively per farmer cost of ragi cultivation is found relatively higher in Gajapati district followed by Rayagada and Koraput districts compared to other OMM districts. So far as components of operational cost per farmer is concerned, ploughing charges and manure cost jointly account more than 80 percent of the total operational cost.



With respect to labour cost of cultivation per farmer, it is noticed that labour cost for harvesting constitutes a sizable proportion of total labour cost. It is found that labour cost for harvesting millet has a share of about 62.7 of the overall labour cost. It is followed by sowing/ transportation cost. These two costs are predominant components of the total labour cost involved in per farmer ragi cultivation. This is to note that these two costs jointly account around 84 percent of

the total labour cost. During these two phases like sowing/transplantation and harvesting phase millet farmers most often have to hire labourers for smoothening the work process.

The cost of cultivation of millet comprising of operational cost and labour cost is analysed in table 4.12. It is found that the total cost of millet cultivation per acre during pre-project period stands at Rs. 2093.1 of which Rs.1301.3 is the operational cost and Rs.791.8 is the labour cost. In per acre analysis also obviously, manure and ploughing charges are found to be the leading costs. Jointly, these two costs account as high as 84 percent of the total operational cost per acre of ragi cultivation. From the

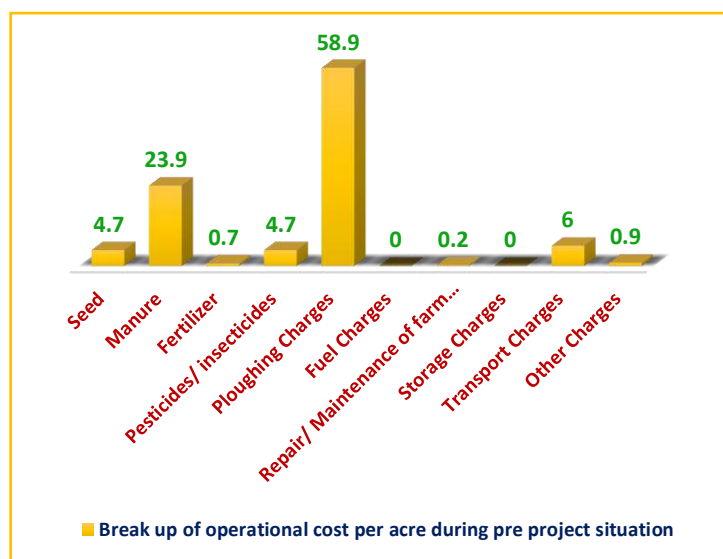
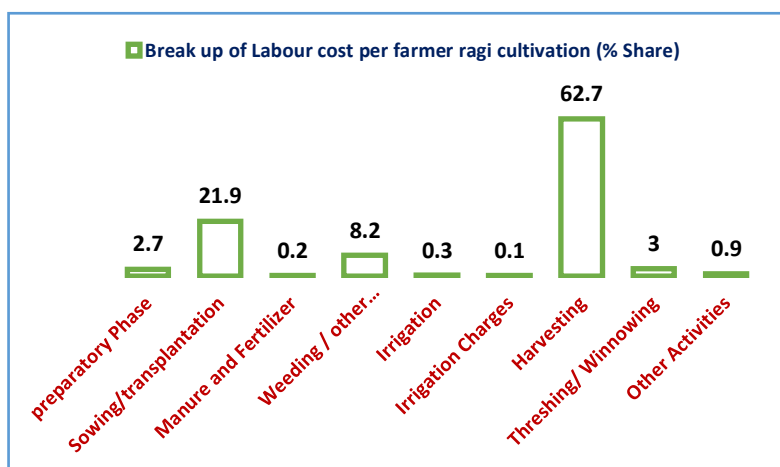


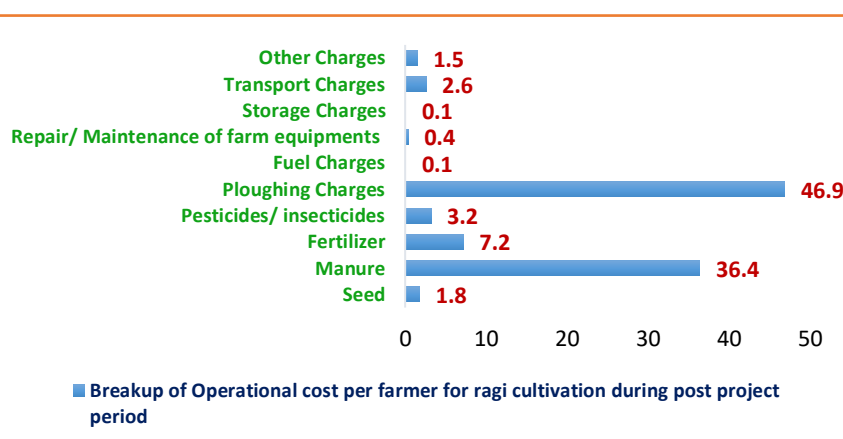
chart given alongside, it can be observed that although the cost on manure accounts around 23.9 percent of operational cost, however cost on chemical fertilizer is less than one percent of the total operational cost. The inter district variation in per acre operational cost indicates that compared to other districts it is relatively higher in Gajapati, Rayagada and Koraput districts.



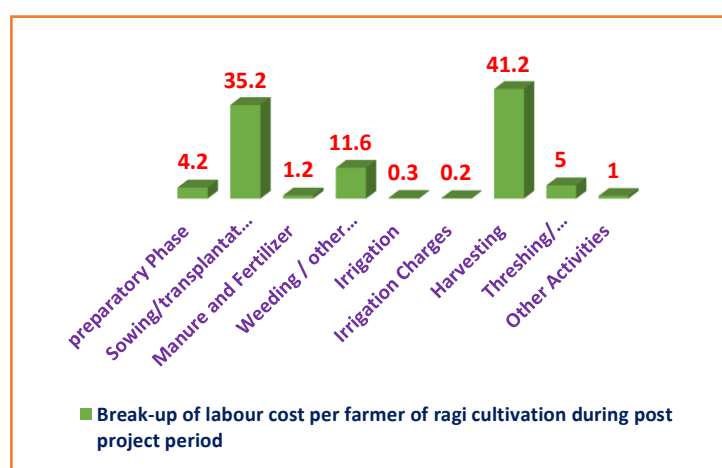
With respect to labour cost per acre of cultivation, it is mainly contributed harvesting time labour cost and transplantation time labour cost. Besides weeding cost is third prominent contributor to labour cost per acre of ragi cultivation. These three costs jointly account around 93 percent of the overall labour cost associated with ragi cultivation.

4.6.2 Cost of cultivation during Post-Project Period

Cost of cultivation of ragi per farmer and per acre during post project period is analysed in tables 4.13 and 4.14. Overall cost of cultivation of ragi per acre is calculated at Rs. 4341.00 of which the total operational cost and labour cost are found at Rs. 2176.00 and Rs.2165 respectively. Inter



district variation in total cost per farmer in ragi cultivation reveals that like pre project situation it is relatively higher in the same districts like Gajapati, Rayagada and Koraput districts. The main contributors to operational cost include ploughing charges, manure, fertilizers and pesticides. During pre-project situation, percentage share of fertilizer in the operational cost per farmer was roughly one percent which has increased to 7 percent during post project situation. This may be stated that farmers are spending seven times higher on fertilizer use for millet cultivation compared to pre project situation.

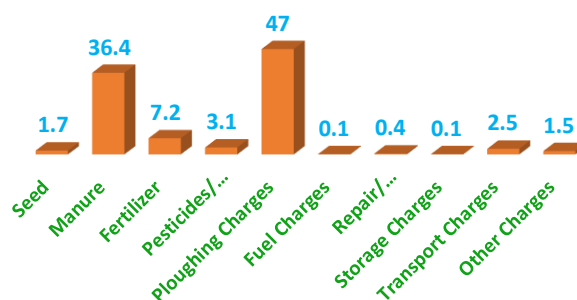


With respect to per acre cultivation of ragi, the overall cost is calculated to be at Rs. 4341.00 of which Rs. 2165.00 is the operational cost and Rs. 2176.00 is the labour cost. Like pre project situation, during post project period also manure and ploughing are found major components of operational cost. Whereas, sowing /transplantation, and harvesting are major components of labour cost. However, in percentage terms to, these stated components

have decreased by around 10 percent in respective total costs per farmer.

So far as cost of cultivation of ragi per acre during post project situation is concerned, the overall cost is found at Rs. 4650.00 of which Rs. 2319.00 is the operational cost and Rs. 2331.00 is the labour cost. Like other scenarios discussed previously manure and ploughing are found major components of operational cost. Whereas, sowing /transplantation, and harvesting are major components of labour cost. Inter district variation suggests that Gajapati, Rayagada and Koraput stands higher with respect to labour cost as well as labour cost. In labour cost aspect, cost of labour per acre is found almost at par with Gajapati district.

Breakup of operational cost per acre of ragi cultivation during post project period



Break-up of labour cost per acre of ragi cultivation during post project period

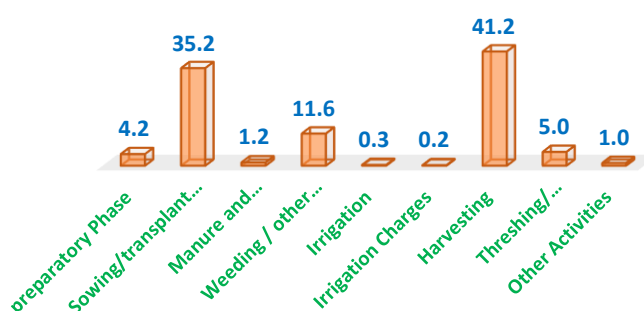


Table-4.11: Cost of cultivation of ragi millet per farmer during Pre-project Period

Sl.	Components of cost	Cost of cultivation (in Rs.) of millet per Farmer during pre-project period								% Share in overall costs
		Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Districts	
i	No. of sample out farmers	294	312	256	45	543	212	234	1896	
ii	Land area under ragi crop	294.1	303.33	222.95	32.4	516.8	121.42	233.7	1724.7	
I	Operating Cost component									
1	Seed	0.0	94.9	69.1	53.9	59.3	2.5	95.8	55.3	4.7
2	Manure	68.9	505.9	40.4	67.1	428.7	11.8	469.7	283.0	23.9
3	Fertilizer	22.8	10.4	0.0	1.8	9.2	0.0	2.8	8.3	0.7
4	Pesticides/ insecticides	0.0	117.0	0.0	0.0	68.2	0.0	136.1	55.6	4.7
5	Ploughing Charges	574.3	878.5	685.6	95.6	762.2	422.3	832.9	696.8	58.9
6	Fuel Charges	0.0	0.5	0.0	2.2	0.0	0.0	0.0	0.1	0.0
7	Repair/ Maintenance of farm equipments	0.0	6.3	1.2	1.3	3.0	0.0	3.3	2.5	0.2
8	Storage Charges	0.0	0.5	1.6	0.0	0.4	0.0	0.4	0.4	0.0
9	Transport Charges	16.7	123.7	83.1	1.1	87.3	0.0	99.1	71.4	6.0
10	Other Charges	8.2	5.7	48.2	10.1	2.9	0.0	3.6	10.2	0.9
	Total Operating expenses	690.8	1743.4	929.1	233.1	1421.2	436.6	1643.7	1183.7	100.0
II	Labour Cost Component									
12	preparatory Phase	0.0	25.7	42.3	52.4	17.0	0.5	25.2	19.2	2.7
13	Sowing/transplantation	58.3	229.2	226.0	27.8	182.9	29.9	195.9	157.8	21.9
14	Manure and Fertilizer	0.7	2.2	1.4	5.1	2.0	0.5	0.4	1.5	0.2
15	Weeding / other interculture	62.1	35.3	134.4	37.8	76.2	23.1	4.1	59.4	8.2
16	Irrigation	0.7	3.8	5.7	4.4	1.1	0.0	0.0	1.9	0.3
17	Irrigation Charges	0.0	0.0	0.0	4.4	1.7	0.0	0.0	0.6	0.1
18	Harvesting	494.6	515.8	206.8	46.7	559.2	317.7	530.2	451.7	62.7
19	Threshing/ Winnowing	6.1	29.6	45.5	13.3	19.3	3.8	26.9	21.5	3.0
20	Other Activities	3.1	9.7	28.7	1.1	0.8	1.9	1.5	6.6	0.9
21	Total Labour cost	625.5	851.3	690.7	193.1	860.2	377.3	784.3	720.3	100.0
	Total Cost (I+II)	1316.3	2594.7	1619.9	426.2	2281.4	814.0	2428.0	1904.0	

Table- 4.12: Cost of cultivation of ragi millet per Acre of land during Pre-project Period

Sl.	Components of cost	Cost of cultivation (in Rs.) per Acre during pre-project period								% Share in Overall costs
		Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Districts	
i	No. of sample out farmers	294	312	256	45	543	212	234	1896	
ii	Land area under ragi crop	294.1	303.33	222.95	32.4	516.8	121.42	233.7	1724.7	
I	Operating Cost component									
1	Seed	0.0	97.6	79.3	74.8	62.3	4.4	95.9	60.8	4.7
2	Manure	68.9	520.4	46.4	93.2	450.4	20.6	470.3	311.1	23.9
3	Fertilizer	22.8	10.7	0.0	2.5	9.7	0.0	2.8	9.1	0.7
4	Pesticides/ insecticides	0.0	120.3	0.0	0.0	71.7	0.0	136.3	61.1	4.7
5	Ploughing Charges	574.1	903.6	787.3	732.7	800.8	737.4	834.0	766.0	58.9
6	Fuel Charges	0.0	0.6	0.0	3.1	0.0	0.0	0.0	0.2	0.0
7	Repair/ Maintenance of farm equipments	0.0	6.4	1.3	1.9	3.2	0.0	3.3	2.7	0.2
8	Storage Charges	0.0	0.5	1.8	0.0	0.4	0.0	0.4	0.5	0.0
9	Transport Charges	16.7	127.3	95.4	1.5	91.7	0.0	99.2	78.5	6.0
10	Other Charges	8.2	5.9	55.3	14.0	3.1	0.0	3.6	11.3	0.9
	Total Operating expenses	690.6	1793.3	1066.9	923.7	1493.2	762.4	1645.8	1301.3	100.0
II	Labour Cost Component									
12	preparatory Phase	0.0	26.4	48.5	72.8	17.9	0.8	25.2	21.1	2.7
13	Sowing/transplantation	58.3	235.7	259.5	238.6	192.1	52.1	196.2	173.5	21.9
14	Manure and Fertilizer	0.7	2.3	1.6	7.1	2.1	0.8	0.4	1.6	0.2
15	Weeding / other interculture	62.1	36.3	154.3	52.5	80.1	40.4	4.1	65.3	8.2
16	Irrigation	0.7	4.0	6.5	6.2	1.2	0.0	0.0	2.1	0.3
17	Irrigation Charges	0.0	0.0	0.0	6.2	1.7	0.0	0.0	0.6	0.1
18	Harvesting	494.4	530.5	237.5	364.8	587.6	554.8	530.9	496.6	62.7
19	Threshing/ Winnowing	6.1	30.4	52.3	108.5	20.3	6.6	27.0	23.7	3.0
20	Other Activities	3.1	10.0	33.0	6.5	0.8	3.3	1.5	7.2	0.9
21	Total Labour cost	625.3	875.6	793.1	863.2	903.9	658.8	785.3	791.8	100.0
	Total Cost (I+II)	1315.9	2668.9	1860.0	1786.9	2397.1	1421.2	2431.1	2093.1	

Table-4.13: Cost of cultivation of Ragi millet per farmer during post project Period

Sl.	Components of cost	Cost of cultivation (in Rs.) of ragi millet per farmer during post-project period								% Share in overall Costs
		Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Districts	
i	No. of sample out farmers	320	317	286	306	548	236	239	2252	
ii	Land area under ragi crop	386.25	308.45	279.1	206	541	147.77	233.6	2102.17	
I	Operating Cost component									
1	Seed	7	43	66	80	28	5	40	38	1.8
2	Manure	388	1559	89	412	1144	39	1549	789	36.4
3	Fertilizer	645	18	9	3	207	66	19	155	7.2
4	Pesticides/ insecticides	19	157	0	1	101	2	177	69	3.2
5	Ploughing Charges	1029	1244	1051	558	1195	649	1193	1016	46.9
6	Fuel Charges	4	2	3	0	1	0	1	2	0.1
7	Repair/ Maintenance of farm equipments	0	5	8	39	1	0	6	8	0.4
8	Storage Charges	0	0	1	8	2	0	0	2	0.1
9	Transport Charges	78	0	129	61	76	8	3	56	2.6
10	Other Charges	23	27	75	73	16	0	17	32	1.5
11	Total Operating expenses	2192	3054	1433	1236	2771	770	3004	2165	100.0
II	Labour Cost Component									
12	preparatory Phase	8	62	128	339	55	0	63	92	4.2
13	Sowing/transplantation	1546	620	603	298	896	627	554	766	35.2
14	Manure and Fertilizer	5	68	2	4	39	6	42	26	1.2
15	Weeding / other interculture	20	425	302	289	251	2	491	253	11.6
16	Irrigation	19	12	5	1	3	0	0	6	0.3
17	Irrigation Charges	4	0	0	0	3	23	0	4	0.2
18	Harvesting	1224	1132	393	362	1152	552	1196	897	41.2
19	Threshing/ Winnowing	102	61	169	274	85	10	56	109	5.0
20	Other Activities	20	14	67	36	12	5	5	22	1.0
21	Total Labour cost	2947	2393	1669	1602	2494	1224	2407	2176	100.0
	Total cost (I+II)	5139	5447	3102	2838	5265	1993	5411	4341	

Table -4.14: Cost of cultivation of Ragi millet per Acre during post project Period

Sl.	Components of cost	Total cost of cultivation (in Rs.) during post-project period								% Share in Overall costs
		Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Districts	
i	No. of sample out farmers	320	317	286	306	548	236	239	2252	
ii	Land area under ragi crop	386.25	308.45	279.1	206	541	147.77	233.6	2102.17	
I	Operating Cost component									
1	Seed	6	44	67	119	28	8	40	40	1.7
2	Manure	322	1602	91	612	1159	62	1585	845	36.4
3	Fertilizer	534	18	10	4	209	106	19	166	7.2
4	Pesticides/ insecticides	16	161	0	2	103	3	181	73	3.1
5	Ploughing Charges	852	1278	1077	829	1211	1037	1220	1089	47.0
6	Fuel Charges	3	2	4	0	1	0	1	2	0.1
7	Repair/ Maintenance of farm equipments	0	5	9	58	1	0	6	9	0.4
8	Storage Charges	0	0	1	12	2	0	0	2	0.1
9	Transport Charges	64	0	133	91	77	13	3	59	2.5
10	Other Charges	19	28	77	108	16	0	18	34	1.5
11	Total Operating expenses	1816	3138	1468	1835	2806	1229	3073	2319	100.0
II	Labour Cost Component									
12	preparatory Phase	6	64	131	504	55	0	65	99	4.2
13	Sowing/transplantation	1280	637	618	442	907	1001	567	821	35.2
14	Manure and Fertilizer	4	70	3	6	39	9	43	28	1.2
15	Weeding / other interculture	17	437	309	429	254	3	502	272	11.7
16	Irrigation	16	12	5	1	3	0	0	6	0.3
17	Irrigation Charges	4	0	0	0	3	37	0	4	0.2
18	Harvesting	1014	1163	402	537	1167	882	1224	961	41.2
19	Threshing/ Winnowing	85	62	173	408	86	16	57	117	5.0
20	Other Activities	17	14	68	53	12	7	5	24	1.0
21	Total Labour cost	2442	2460	1710	2380	2527	1954	2463	2331	100.0
	Total cost (I+II)	4258	5598	3179	4215	5333	3183	5536	4650	

4.7 Use of Manure and Chemical Fertilizer in Ragi Cultivation

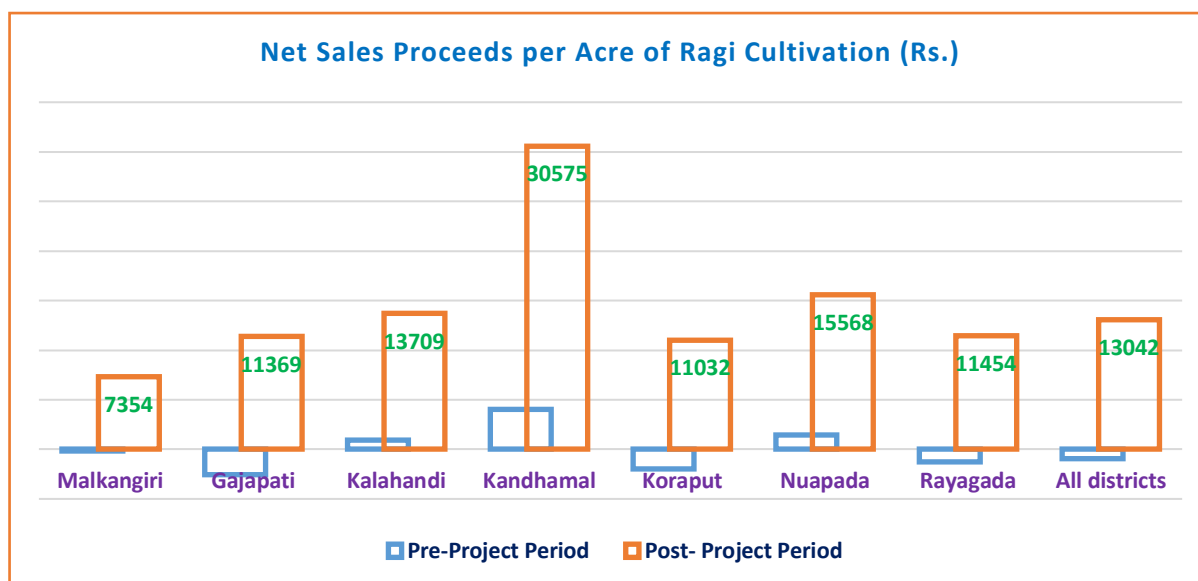
One of the objectives of OMM intervention is to improve organic cultivation of millet for which farmers are motivated to use more use of manure and less use of chemical fertilizer. As per table 4.15, it is found that during pre-project period manure and fertilizer application for ragi cultivation was limited to 46 and 5 percent respectively. During post project period, adaptation of manure use has increased by about 20 percent and fertilizer use by about 15 percent of the farmers.

Table-4.15: Use of manure and fertilizer by millet farmers

Sl.	Districts	No. of farmers				
		Pre Project-Period		Post Project period		Total
		Manure	Fertilizer	Manure	Fertilizer	
1	Malkangiri	26	9	125	199	320
2	Gajapati	300	48	300	29	320
3	Kalahandi	68		96	8	320
4	Kandhamal	37	1	320	11	325
5	Koraput	398	53	446	169	559
6	Nuapada	2		14	46	241
7	Rayagada	239	6	239	22	240
	All districts	1070	117	1540	484	2325
		% Of farmers				
1	Malkangiri	8.1	2.8	39.1	62.2	100.0
2	Gajapati	93.8	15.0	93.8	9.1	100.0
3	Kalahandi	21.3	0.0	30.0	2.5	100.0
4	Kandhamal	11.4	0.3	98.5	3.4	100.0
5	Koraput	71.2	9.5	79.8	30.2	100.0
6	Nuapada	0.8	0.0	5.8	19.1	100.0
7	Rayagada	99.6	2.5	99.6	9.2	100.0
	All districts	46.0	5.0	66.2	20.8	100.0

4.8 Net Income from Millet Cultivation (Ragi)

With the objective of assessing net income per acre of millet cultivation, the net sales proceeds of ragi are analysed. Ragi is found to be the major millet type having maximum outreach under OMM and other millets are selectively practiced by limited number of farmers in limited areas. Net income per acre of ragi cultivation is arrived at by deducting total cost per acre from total sales proceeds per acre in ragi cultivation by the project area farmers. Further, to understand the pattern of changes in net income, the net income per acre of ragi cultivation during post project period for each of the project district is compared to the corresponding figures during pre-project period. The economics of ragi cultivation as depicted in table 4.16 reveals that the net income per acre of ragi cultivation was overall negative during pre-project situation. Out of seven districts, it was negative in four districts. However, there is positive sales proceeds in all the districts. Net income per acre of ragi cultivation stands at Rs. 13042.00 during post project situation. This can be stated that OMM is instrumental to contribute very much positively towards the viability of ragi cultivation. During pre-project period, as a result of loss in ragi cultivation, farmers were diverting their lands for other crops for which there was continuous shrinkage of millet area at the district and state level.

**Table -4.16: Economics of Ragi Cultivation**

Sl.	District	Total Sales Proceeds/ Acre (Rs.)	Total Cost/ Acre (Rs.)	Net Income/ Acre
Pre-Project Period				
1	Malkangiri	1134	1316	-182
2	Gajapati	144	2669	-2525
3	Kalahandi	2789	1860	929
4	Kandhamal	4607	592	4015
5	Koraput	396	2397	-2001
6	Nuapada	2842	1421	1421
7	Rayagada	1155	2431	-1276
	All districts	1148	2093	-945
Post Project Period				
1	Malkangiri	11612	4258	7354
2	Gajapati	16967	5598	11369
3	Kalahandi	16888	3179	13709
4	Kandhamal	34790	4215	30575
5	Koraput	16365	5333	11032
6	Nuapada	18751	3183	15568
7	Rayagada	16990	5536	11454
	All districts	17692	4650	13042

4.9 Seed related Practices

Seed is one of the most important inputs that enhance agriculture productivity. Use of quality seeds appropriate to the regions is expected to promote productivity of millets. OMM has special focus for the use of quality seeds by the millet farmers. The OMM programme in addition to promoting improved agronomic practices like SMI cultivation, Line transplantation/Sowing also encourages for Seed Replacement, and Varietal Replacement. Present section on the basis of primary data obtained from millet farmers analyses seed related practices of the millet farmers separately for different varieties of reported millets ragi, suan, kangu, Janha and kodo millets. As per OMM Guidelines, OMM

also establishes a functional seed system managed by farmers at a cluster (Gram Panchayat) level to support millet-based crop systems and to promote improved agronomic practices.²⁰

4.9.1 Ragi

The seed related practices of ragi farmers are analysed for the post project situation compared to pre project situation in table 4.17. It is found that quantity of seeds used per farmer has reduced from 16.6 Kg per farmer for the total operational millet area during pre-project situation to 6.8 Kg for the same during post project situation. Proportionate share of farmers using own seeds in cultivation has tended to reduce from 99.6 percent to 67.7 percent. Overall, about 32.3 percent of ragi farmers are using certified seeds during post project situation. Previously use of certified seeds by ragi farmers was almost nil. About 99 percent of farmers are found satisfied about the access and use of good quality seeds. About 96 percent of farmers are also found satisfied about the sufficient availability of quality seeds. There is market improvement in the adaptation behaviour of farmers in the areas of seed treatment and germination test before using the seed for cultivation purposes. In this way, more than 60 percent of farmers are found very much mainstreamed on the standard practices for seed use. About 47.5 percent of ragi farmers are found having access and usage of community seed centre. It is calculated that the farmers depending on community seed centres have obtained on an average 1.2 Kg per cropping season during post project situation. As it can also be seen from the following table, during pre-project situation also, the ragi farmers were obtaining seeds from community seed centres promoted by different NGOs. The discussion with OMM CRPs and block level officials revealed that during pre-project situation NGOs like Parivartan in Malkangiri district, M S Swaminathan Research Foundation (MSSRF) and Dhan Foundation in Koraput district, Ahimsha Club in Nuapda district etc. had promoted community seed centres and encouraged millet farmers to use seeds from community seed centre in the event of finding difficulties in arranging own seeds for cultivation.

²⁰ OMM Guidelines, National Food Security Mission Cell, Directorate of Agriculture and Food Production, Govt. of Odisha, dated 25.11.2016.

Table-4.17: Details of seed particulars of ragi during pre-project Period

Sl.	Seed particulars	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
Pre Project-Period									
1	No. of millet farmers reporting ragi cultivation	294	312	256	45	543	212	234	1896
2	% of millet farmers reporting ragi cultivation	91.9	97.5	80.0	13.8	97.1	88.0	97.5	81.5
3	Quantity of seed used per farmer (Kg)	10.0	11.7	6.4	1.9	8.7	5.7	7.0	7.3
4	Proportionate share of own seed in the overall seed use by the farmer	99.6	100.0	98.1	97.4	99.9	99.2	100.0	99.6
5	Proportionate share of certified seed in the overall seed use by the farmer	0.4	0.0	1.9	2.6	0.1	0.8	0.0	0.4
6	% of farmers saying about the access and use of good quality ragi seeds	90.9	0.6	36.9	12.6	41.7	88.8	0.4	38.7
7	% of farmers saying about the sufficiency of seeds	95.2	88.1	96.5	57.8	89.9	98.6	91.0	91.7
8	% of farmers undertook seed treatment before sowing	2.4	0.3	3.5	13.3	0.4	0.9	7.3	2.3
9	% of farmers undertook germination test of seeds before sowing	0.0	0.0	0.0	15.6	0.0	0.0	0.4	0.4
10	% of farmers obtained seeds from community seed centre	2.7	0.0	9.8	0.0	0.7	2.8	0.4	2.3
11	Seeds from community seed centre/ Farmer (Kg)	1.6	0.0	2.1	0.0	1.8	2.0	2.0	2.0
Post Project Period									
1	No. of farmers reporting ragi cultivation	320	317	286	306	548	236	239	2252
2	% of farmers reporting ragi cultivation	100.0	99.1	89.4	94.2	98.0	97.9	99.6	96.9
3	Quantity of seed used per farmer (Kg)	9.3	5.4	6.3	8.7	10.4	4.8	2.6	6.8
4	Proportionate share of own seed in the overall seed use by the farmer	96.3	51.7	34.3	93.1	76.6	92.4	13.4	67.7
5	Proportionate share of certified seed in the overall seed use by the farmer	3.8	48.3	65.7	6.9	23.4	7.6	86.6	32.3
6	% of farmers saying about the access and use of good quality ragi seeds	98.8	93.8	87.5	96.9	99.5	92.1	99.6	95.8
7	% of farmers saying about the sufficiency of seeds	92.8	93.8	88.1	97.8	90.7	91.3	99.6	93.0
8	% of farmers undertook seed treatment before sowing	9.4	93.8	69.4	97.2	61.7	2.9	99.6	62.8
9	% of farmers undertook germination test of seeds before sowing	1.6	94.6	64.7	99.0	58.6	0.4	100.0	60.1
10	% of farmers obtained seeds from community seed centre	1.9	94.6	56.6	14.1	58.2	0.4	100.0	47.5
11	Seeds from community seed centre/ Farmer (Kg)	4.2	1.0	1.6	1.8	1.0	22.0	1.0	1.2

4.9.2 Suan

The seed related practices of suan farmers are analysed for the post project situation compared to pre project situation in table 4.18. It is found that quantity of seeds used per farmer has increased from 0.5 Kg during pre-project situation to 1.6 Kg during post project situation. Proportionate share of farmers using own seeds in cultivation has tended to increase from 75 percent during pre-project period to 79.3 percent during post project situation. Overall, about 20.7 percent of suan farmers are using certified seeds during post project situation. However, about 75 percent of farmers are found satisfied about the access and use of good quality seeds. About 80.3 percent of farmers are also found satisfied about the sufficient availability of quality seeds. More than 40 percent of suan farmers are found adopting standard practices like seed treatment and germination test before using the seed for cultivation. Only 3.8 percent of suan farmers are found having access and usage of community seed centre. It is calculated that the farmers depending on community seed centres have obtained on an average 2.5 Kg per cropping season

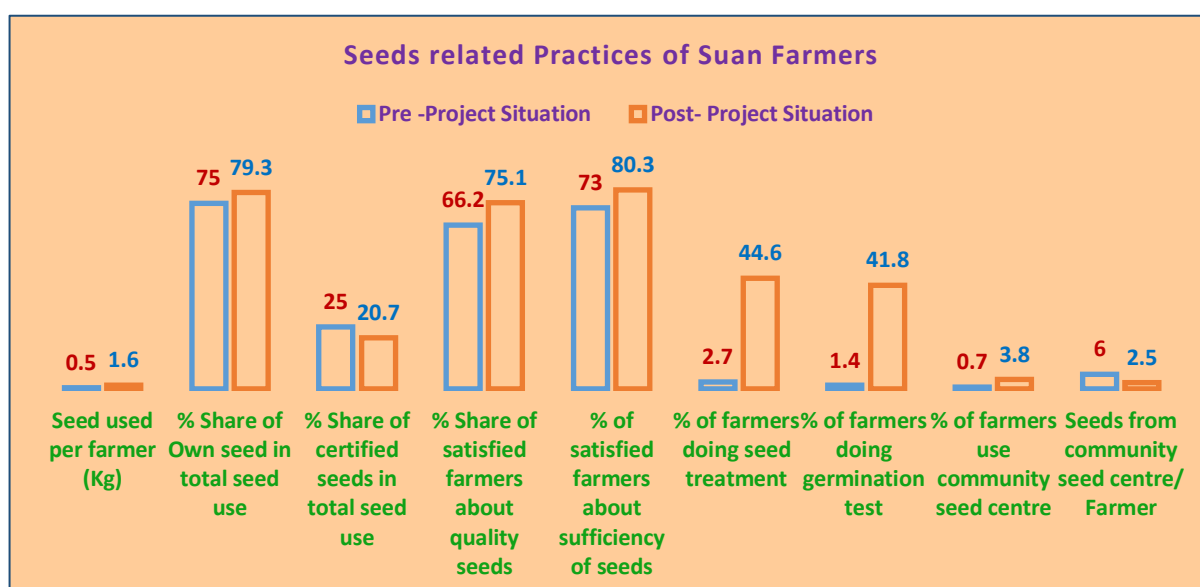


Table-4.18: Details of seed particulars of Suan during pre-project Period

Sl.	Seed particulars	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
Pre Project-Period									
1	No. of farmers reporting Suan cultivation	12	5	58	6	59	2	6	148
2	Quantity of seed used per farmer (Kg)	0.18		0.96	0.05	1.3	0.01		0.5
3	Proportionate share of own seed in the overall seed use by the farmer	58.3	0.0	87.9	83.3	79.7	50.0	0.0	75.0
4	Proportionate share of certified seed in the overall seed use by the farmer	41.7	100.0	12.1	16.7	20.3	50.0	100.0	25.0
5	% of farmers saying about the access and use of good quality ragi seeds	58.3	0.0	65.5	83.3	79.7	50.0	0.0	66.2
6	% of farmers saying about the sufficiency of seeds	58.3	0.0	86.2	66.7	78.0	50.0	0.0	73.0
7	% of farmers undertook seed treatment before sowing	0.0	0.0	6.9	0.0	0.0	0.0	0.0	2.7
8	% of farmers undertook germination test of seeds before sowing	0.0	0.0	3.4	0.0	0.0	0.0	0.0	1.4
9	% of farmers obtained seeds from community seed centre	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Seeds from community seed centre/ Farmer (Kg)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Post Project Period									
1	No. of farmers reporting Suan cultivation	18	3	62	64	63	1	2	213
2	Quantity of seed used per farmer (Kg)	0.4		2.3	1.9	3.2	0.1		1.6
3	Proportionate share of own seed in the overall seed use by the farmer	44.4	0.0	82.3	93.8	77.8	100.0	0.0	79.3
4	Proportionate share of certified seed in the overall seed use by the farmer	55.6	100.0	17.7	6.3	22.2	0.0	100.0	20.7
5	% of farmers saying about the access and use of good quality ragi seeds	44.4	0.0	67.7	95.3	76.2	100.0	0.0	75.1
6	% of farmers saying about the sufficiency of seeds	44.4	0.0	83.9	96.9	76.2	100.0	0.0	80.3
7	% of farmers undertook seed treatment before sowing	5.6	0.0	50.0	96.9	1.6	0.0	0.0	44.6
8	% of farmers undertook germination test of seeds before sowing	0.0	0.0	43.5	96.9	0.0	0.0	0.0	41.8
9	% of farmers obtained seeds from community seed centre	0.0	0.0	9.7	3.1	0.0	0.0	0.0	3.8
10	Seeds from community seed centre/ Farmer (Kg)	0.0	0.0	1.5	4	0.0	0.0	0.0	2.5

4.9.3 Kangu

Kangu cultivation is practiced by limited number of farmers during and after project intervention. As it is already mentioned OMM has significant inroads for ragi cultivation and a ragi is major millet in the project area where as other type of millets are minor millets. Kangu in the OMM area is viewed to be a minor millet in view of its very much limited presence. The seeds practices of kangu farmers are discussed in table 4.19. The seeds related behaviour of Kangu farmers during post project period compared to pre project period is highlighted in the chart given below.

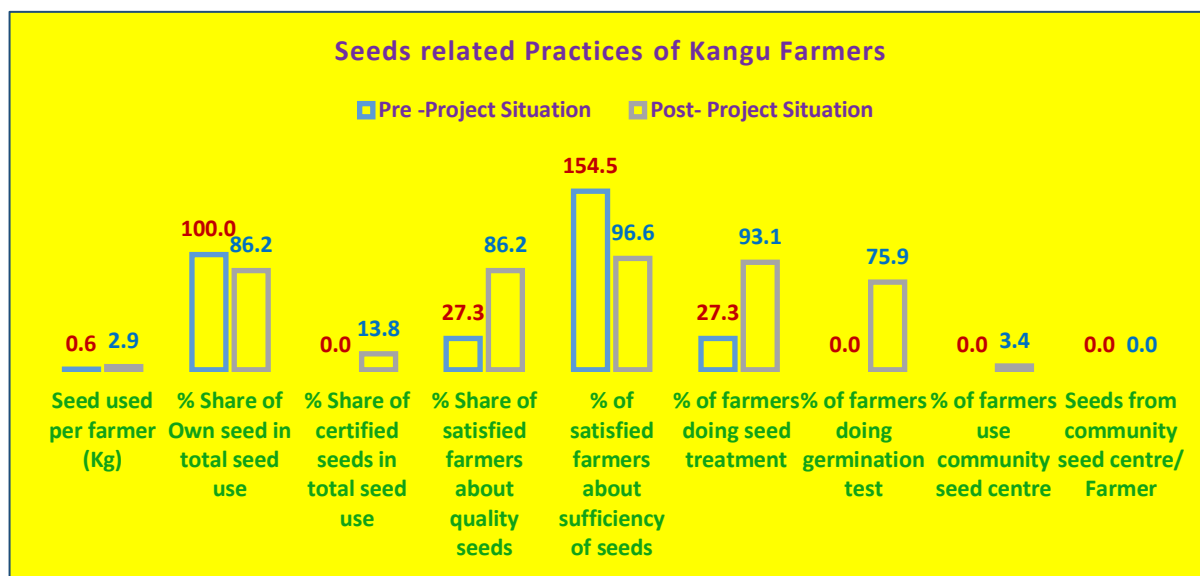


Table-4.19: Details of seed particulars of Kangu during pre-project Period

Sl.	Seed particulars	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
Pre Project-Period									
1	No. of farmers reporting Kangu cultivation		1	8	1		1		11
2	Quantity of seed used per farmer (Kg)		NA	0.6	NA		NA		0.6
3	Proportionate share of own seed in the overall seed use by the farmer		100.0	100.0	100.0		100.0		100.0
4	Proportionate share of certified seed in the overall seed use by the farmer		-	-	-		-		-
5	% of farmers saying about the access and use of good quality ragi seeds		0.0	12.5	100.0		100.0		27.3
6	% of farmers saying about the sufficiency of seeds			100.0	100.0		100.0		154.5
7	% of farmers undertook seed treatment before sowing		0.0	12.5	100.0		100.0		27.3
8	% of farmers undertook germination test of seeds before sowing			0.0	0.0		0.0		0.0
9	% of farmers procured seeds from community seed centre		0.0	0.0	0.0		0.0		0.0
10	Seeds from community seed centre/ Farmer (Kg)		0.0	0.0	0.0		0.0		0.0
Post Project Period									
1	No. of farmers reporting Kangu cultivation		0.0	7	21		1		29
2	Quantity of seed used per farmer (Kg)			6.7	1.5		4.0		2.9
3	Proportionate share of own seed in the overall seed use by the farmer			100.0	81.0		100.0		86.2
4	Proportionate share of certified seed in the overall seed use by the farmer			0.0	19.0		0.0		13.8
5	% of farmers saying about the access and use of good quality ragi seeds			57.1	95.2		100.0		86.2
6	% of farmers saying about the sufficiency of seeds			100.0	95.2		100.0		96.6
7	% of farmers undertook seed treatment before sowing			100.0	95.2		0.0		93.1
8	% of farmers undertook germination test of seeds before sowing			100.0	90.5		0.0		75.9
9	% of farmers obtained seeds from community seed centre				4.8				3.4
10	Seeds from community seed centre/ Farmer (Kg)				NA				NA

4.9.4 Kodo

Like kango, lodo millet is practiced in limited OMM areas by very much limited number of farmers. Kodo millet is also viewed as a minor millet. The seeds related behaviour of Kodo millet farmers are analysed in table 4.20. The seeds related behaviour of kodo farmers during post project period compared to pre project period is highlighted in the chart given below

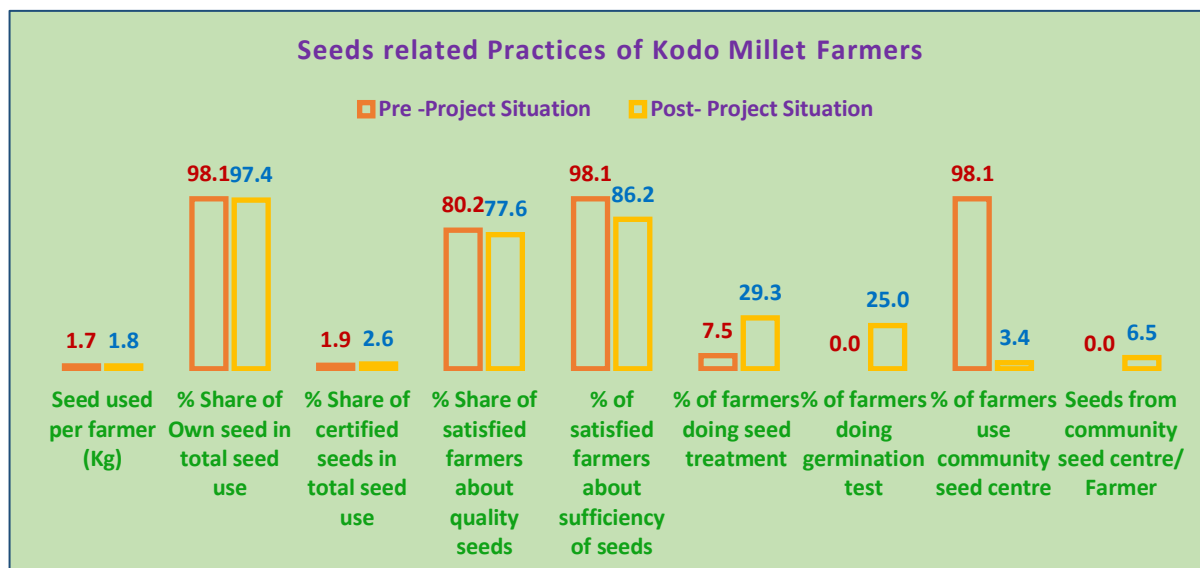


Table-4.20: Details of seed particulars of other millet (Kodo) during pre-project Period

Sl.	Seed particulars	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
Pre Project-Period									
1	No. of farmers reporting Kodo cultivation			40	1		64	1	106
2	Quantity of seed used per farmer (Kg)			2.3		0.2	4.1	0.1	1.7
3	Proportionate share of own seed in the overall seed use by the farmer			97.5	0.0		98.4	0.0	98.1
4	Proportionate share of certified seed in the overall seed use by the farmer			2.5		100.0	1.6		1.9
5	% of farmers saying about the access and use of good quality ragi seeds			47.5	0.0		98.4	0.0	80.2
6	% of farmers saying about the sufficiency of seeds			100.0	0.0		100.0	0.0	98.1
7	% of farmers undertook seed treatment before sowing			15.0	0.0		1.6	0.0	7.5
8	% of farmers undertook germination test of seeds before sowing				0.0				
9	% of farmers obtained seeds from community seed centre			0.0	0.0	0.0	0.0	0.0	0.0
10	Seeds from community seed centre/ Farmer (Kg)			0.0	0.0	0.0	0.0	0.0	0.0
Post Project Period									
1	No. of farmers reporting Kodo cultivation			40	2		73	1	116
2	Quantity of seed used per farmer (Kg)			3.1	1.1	0.0	4.5	0.1	1.8
3	Proportionate share of own seed in the overall seed use by the farmer			97.5	650.0		80.8	0.0	97.4
4	Proportionate share of certified seed in the overall seed use by the farmer			2.5	-550.0	100.0	19.2	100.0	2.6
5	% of farmers saying about the access and use of good quality ragi seeds			67.5	100.0		80.8	0.0	77.6
6	% of farmers saying about the sufficiency of seeds			100.0	0.0		79.5	0.0	86.2
7	% of farmers undertook seed treatment before sowing			80.0	100.0				29.3
8	% of farmers undertook germination test of seeds before sowing			67.5	100.0				25.0
9	% of farmers obtained seeds from community seed centre			7.5	0.0		1.4	0.0	3.4
10	Seeds from community seed centre/ Farmer (Kg)			7			6		6.5

4.10 Varieties of Ragi Cultivated

Varieties of ragi cultivated in the OMM project area is highlighted in the following table 4.21. 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 selected improved varieties include Arjuna and Chilika, in Gajapati district; Arjuna and Bhairavi in Rayagada district and Nuapada district; Arhuna, VRT 47 in Kandhamal district; Bhairavi in Malkangiri district; GPU 66, GPU 48, ML 365 in Koraput district.

Table-4.21: 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
		Mathili	Rishka, Sana Mandia, Bada Mandia, Dhala Mandia	Bhairavi
		Chitrakonda	Mami Mandia, Bada Mandia, Dhala Mandia	
		Korkunda	Sana Mandia, Bada Mandia, Dhala Mandia	Bhairabi
2	Gajapati	Gumma	Sana Mandia, Bada Mandia, Kartika, Dushara	Arjuna
		Mohana	Sana Tara, Bada Tara, Dhala Mandia, Pata Mandia, Bagada, Budha, Kala guduli, Hata Bhangra, Kanta Mera,	Chilika, Bhairavi, Arjuna
		R Udayagiri	Bada Mandia, Tara, Mojala,	Arjuna
3	Kalahandi	Bhawanipatna	Jhupa, Dushara, Miki	
		Lanjigarh	Telenga, Dushara, Bada Mandia, Bhodo, Miki, Lal Suru	
		Th. Rampur	Telenga, Dushara, Bada Mandia,	
		Narla	Lal Suru, Dushara, Telenga, Budha	
4	Kandhamal	Daringbadi	Koiri, Marti Mada	
		Firingia	Budha, Kalia, Mami, Bapi, Vruka, Chaulia	Arjuna
		Kotagarh	Majhia Sikha, Koiri, Marti Mada,	VRT 47
		Raikia	Jantri,, Budha, Chaulia, Tara, Hadabhanga, Sana Tara, Mami, Kalia	Bhairavi
5	Koraput	Boipariguda	Kala Kerenga, Tara, Ladoo, Richika, Dushara, Kadali, Dumuri	
		Boriguma	Bada Mandia, Chilika, Telenga, Bati	
		Kundra	Bada Mandia, Telenga, Bati	Chilika
		Similiguda	Bada Mandia, Mami, Kala Kerenga, Dushara	Bhairavi, GPU-66, GPU-48
		Dashmantapur	Kala Kerenga, Dushara, Mami, Kalia, Bada Mandia	Bhairavi, ML-365
		Nandapur	Kalia, Bada Mandia, Mami, Kala Keranga, Tara	Bhairavi
		Lamtaput	Bada Mandia, Sana Mandia, Keranga, Dushara, Mami, Tara, Ladoo Mandia, Dumuri	
6	Nuapada	Sinapalli	Dushara, Bada Mandia	
		Boden	Dushara, Bhodo, Bada Mandia, Parua Khai	
		Komna	Lalsuru, Dushara, Bada Mandia, Bhodo	Arjuna

7	Rayagada	Gunupur	Bada Mandia, Sana Mandia, Dushara, Telenga, Karkati	
		Rayagada	Bada Mandia, Sana Mandia, Dushara, Telenga, Karkati	
		Gudari	Bada Mandia, Sana Mandia, Dushara,	

Concluding Remarks

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. It is found that paddy area per farmer has marginally declined in all of the project districts except Malkangiri, Koraput and Rayagada. In Koraput district there is no change, however, in Malkangiri and Rayagada district, there is marginal increase in paddy area per farmer. Similarly, there is more than 10 percent fall in the pulse areas in Malkangiri district and 5 percent fall of the same in Koraput district. Out of seven districts, in five districts, there is falling tendency of vegetable area per farmer. With respect to oil seeds and cash crops there is also falling tendency in the crop area per farmer in three districts. However, with respect to ragi, except two districts, five districts witnessed positive increase in the land area per farmer.

There is sizable increase in ragi area per farmer in Malkangiri district. Compared to pre project situation, there is about 20 percent increase in ragi area per farmer during post project situation. Overall speaking the Gross Cropped area per farmer, otherwise called average operational land holding per farmer has increased from 7.079 acres during pre-project period to 8.799 during post project period, thereby registering 24.3 percent increase in the average operational area per farmer. For ragi crop, it is found that there is about 60 percent increase in monocropping of millets and correspondingly there is sufficient decline mixed and intercropping of millets. During post project period, about more than 85 percent of the ragi farmers have abandoned mixed and intercropping of ragi and have switched over to monocropping of ragi. Similarly, the extent of increase of monocropping of Suan, bajara, Janha, and kodo millets during post project period has increased by 97.3, 200, 42.9 and 68.2 percent respectively. for all types of millets almost in all of the project districts farmers have shifted from traditional broadcasting method of cultivation and adopted other scientific methods of cultivation. In addition to promoting the outreach of existing millets among a greater number of farmers, the OMM has also successfully promoted new varieties of millets in the project area. Besides, the project has also successfully promoted a set of packages of practices like improved cultivation methods, better agronomic practices and importance of de-weeding on millet fields.

During pre-project situation Amount of production of ragi per farmer and per acre is found at 1.7 and 2.6 quintals respectively. However, during post project situation, the amount of production per farmer and per acre are found to be at 5.6 and 6.0 Quintal respectively. Considering the total production of suan during pre-project and post project situations separately, the production per acre during pre-project situation is found at 1.7 quintal as against the same at 2.5 quintal during post project situation. Similarly total production of suan per farmer during pre-project and post project situations is calculated at 1.7 and 2.1 Quintals respectively. It is found that kangu production per farmer and per acre during pre-project situation was at 0.73 and 1.38 quintals respectively. During post project situation, production of kangu per farmers has increased to 0.83 quintals and per acre to 2.35 quintals.

Janha production per farmer and per acre during pre-project situation was at 1.28 and 2.32 quintals respectively. During post project situation, production of janha per farmer has increased to 1.45 quintals and per acre to 2.54 quintals.

The total cost of millet cultivation per acre during pre-project period stands at Rs. 2093.1 of which Rs.1301.3 is the operational cost and Rs.791.8 is the labour cost. In per acre analysis also obviously, manure and ploughing charges are found to be the leading costs. Jointly, these two costs account as high as 84 percent of the total operational cost per acre of ragi cultivation. With respect to labour cost per acre of cultivation, it is mainly contributed harvesting time labour cost and transplantation time labour cost. Besides weeding cost is third prominent contributor to labour cost per acre of ragi cultivation. So far as cost of cultivation of ragi per acre during post project situation is concerned, the overall cost is found at Rs. 4650.00 of which Rs. 2319.00 is the operational cost and Rs. 2331.00 is the labour cost. The net income per acre of ragi cultivation has increased from Rs. -943.00 during pre-project period to Rs.13042.00 during post project period.



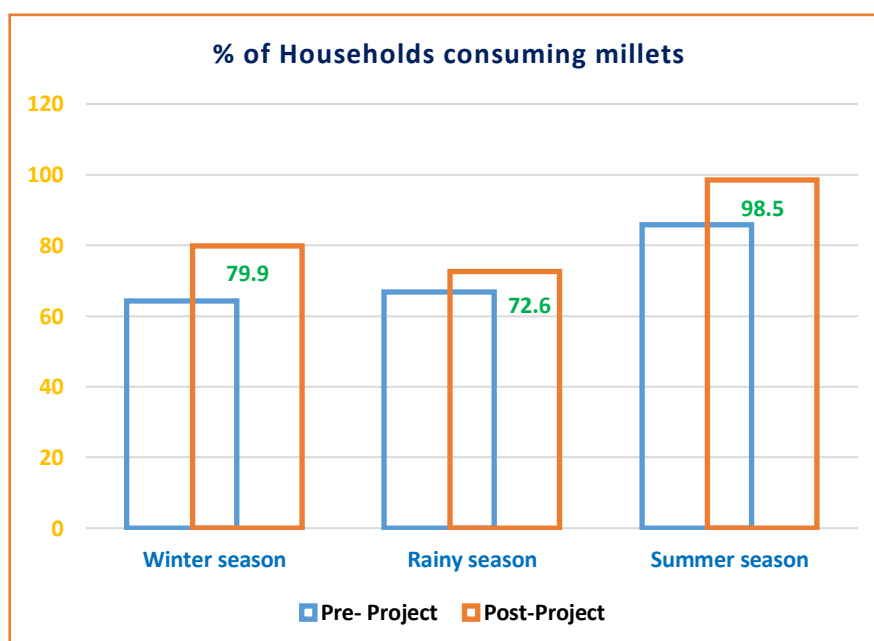
Chapter-V: Assessment of Household Millet Consumption Pattern in the Project Area

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.²¹ In this chapter, an attempt has been made to analyse household consumption pattern of millets on the basis of household survey data obtained from 2325 households in all of the programme districts. 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 on the basis of 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 observed that during pre-project situation maximum proportion of households about 85.8 percent were consuming millets during summer season. During winter season about 64.3 percent of households were consuming millets and 66.9 percent during rainy season. Compared to pre project situation, proportion households consuming millets during post project situation has substantially improved in all seasons.

Overall 98.5 percent of millet farmers households are found consuming millets during summers season. Similarly, 79.9 percent were consuming millets during winter season and 72.6 percent in rainy seasons. A good majority of households during pre-project and post project situation are consuming millets during summer season. During post project period, more than 95 percent of millets households in all district consume millets during summer season. In



²¹ OMM Guidelines, 25.11.2016.

Rayagada district, all of the millet households consume millets in all seasons. Similar is the case of Gajapati district. More than 99 percent of the households consume millets in all seasons.

Table-5.1: No. of households reporting millet consumption

Sl.	Districts	No. of households consume millet by seasons			% Of households consume millet by seasons		
		Winter season	Rainy season	Summer season	Winter season	Rainy season	Summer season
		Pre-project Period					
1	Malkangiri	168	170	318	52.5	53.1	99.4
2	Gajapati	318	318	318	99.4	99.4	99.4
3	Kalahandi	208	242	284	65.0	75.6	88.8
4	Kandhamal	8	27	43	2.5	8.3	13.2
5	Koraput	437	438	551	78.2	78.4	98.6
6	Nuapada	117	120	241	48.5	49.8	100.0
7	Rayagada	240	240	239	100.0	100.0	99.6
	All districts	1496	1555	1994	64.3	66.9	85.8
Sl.	Districts	Post-project Period					
		Winter season	Rainy season	Summer season	Winter season	Rainy season	Summer season
		Post-project Period					
1	Malkangiri	171	176	313	53.4	55.0	97.8
2	Gajapati	318	318	318	99.4	99.4	99.4
3	Kalahandi	270	234	316	84.4	73.1	98.8
4	Kandhamal	299	159	316	92	48.9	97.2
5	Koraput	438	439	551	78.4	78.5	98.6
6	Nuapada	121	122	236	50.2	50.6	97.9
7	Rayagada	240	240	239	100	100.0	99.6
	All districts	1857	1688	2289	79.9	72.6	98.5

5.2 Mean Consumption Pattern

The mean consumption pattern is analysed taking into account two indicators like mean household consumption of millets per day and per capita per day consumption (PCPDC) pattern of millets among the household members. Further these two indicators are 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 during post project period remains unaltered compared to pre project period. Considering all seasons, overall, 0.5 Kg. of millet is daily consumed per household. During pre-project period, the mean daily household consumption of millets during winter, rainy and summer season is calculated at 0.7 Kg., 0.4 Kg., and 0.5 Kg. respectively. During post project period, the mean daily household consumption of millets during winter, rainy and summer season is found at 0.5 Kg., 0.5 Kg. and 0.4 Kg. respectively.

Considering all seasons, PCPDC of millets during post project situation has remained same as that of during pre-project situation. Considering all seasons together, the district wise variation in PCPDC for both the time periods as pre project and post project period is depicted in the following chart. PCPDC during post project period has increased in Gajapati and Rayagada districts. This is to note that all of the households are millet consuming households during pre-project as well as post project period. Consequent upon higher millet production at household level and favourable access to millets, PCPDC of millets during post project period has tended to increase in these two districts.

It remains same in Kalhandi district and in the remaining four project district PCPDC has declined during post project period compared to that of the pre project period. As it can be observed from the chart given below, PCPDC of millets during post project period has declined in Malkangiri, Kandhamal, Koraput and Nuapada districts. In these districts due to consumption improvement and acceptability of millet as food habit among a greater number of family members, there is spread of given quantity of millet among a greater number of family members. During field study, it was elicited by the respondents that a smaller number of members per family were consuming millet during pre-project period. However, during post project period, as a greater number of members per family are consuming millets, so, PCPDC of millet has declined. Besides food diversification is also believed to contribute to the declining PCPDC of millet consumption. The analysis suggests that in some of the districts like Malkangiri, Kandhamal, and Nuapada district there is lower PCPDC of millet consumption 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.

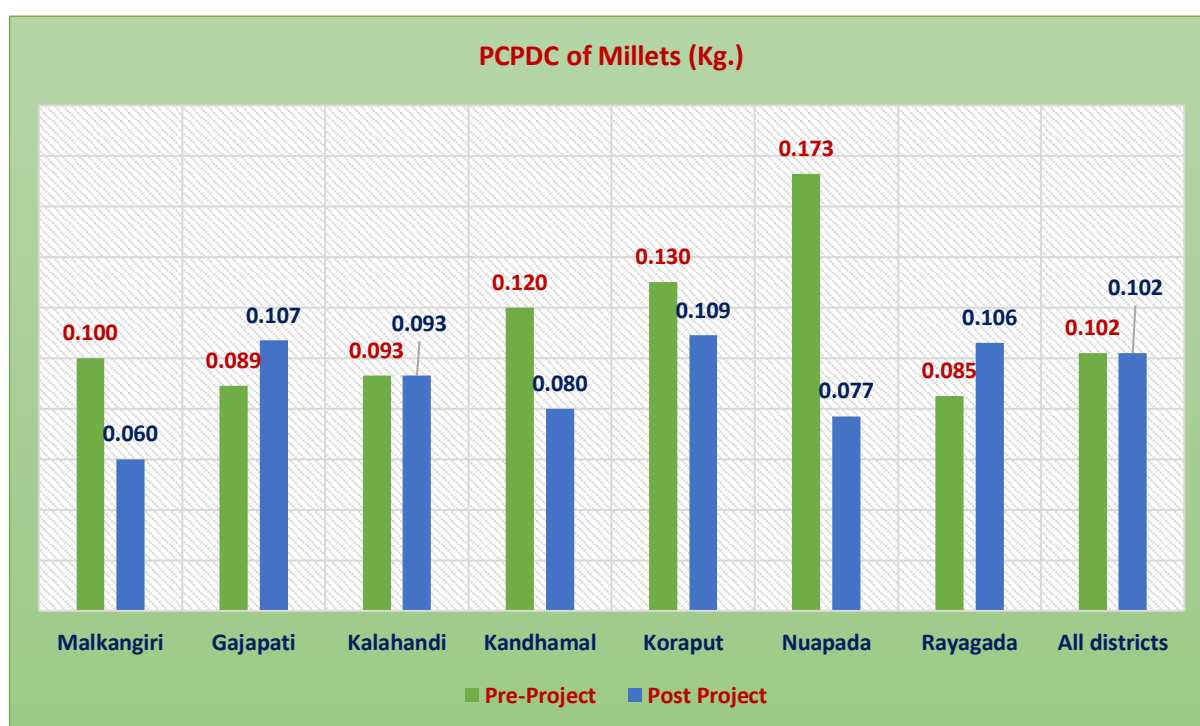


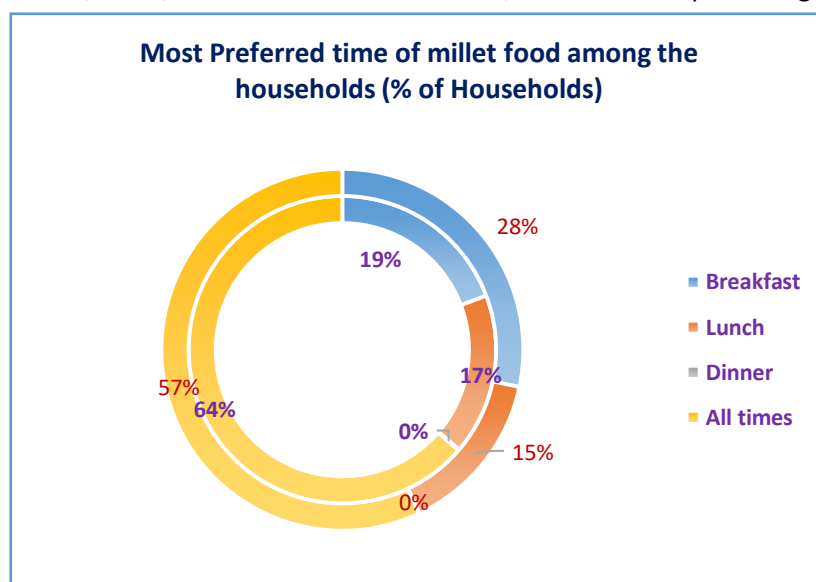
Table-5.2: Seasonality in average household consumption of millets

Sl.	Districts	Mean Family Size	Quantity consumed per household per day (Kg.)				Per Capita Per Day Consumption (PCPDC) of Millets (Kg.)			
			Winter season	Rainy season	Summer season	All Seasons	Winter season	Rainy season	Summer season	All Seasons
			pre-project period							
1	Malkangiri	5.0	0.9	0.3	0.4	0.5	0.180	0.060	0.080	0.100
2	Gajapati	5.6	0.5	0.5	0.6	0.5	0.089	0.089	0.107	0.089
3	Kalahandi	4.3	0.4	0.3	0.4	0.4	0.093	0.070	0.093	0.093
4	Kandhamal	5.0	0.6	0.4	0.7	0.6	0.120	0.080	0.140	0.120
5	Koraput	4.6	0.7	0.5	0.6	0.6	0.152	0.109	0.130	0.130
6	Nuapada	5.2	1.9	0.5	0.4	0.9	0.365	0.096	0.077	0.173
7	Rayagada	4.7	0.4	0.4	0.5	0.4	0.085	0.085	0.106	0.085
	All districts	4.9	0.7	0.4	0.5	0.5	0.143	0.082	0.102	0.102
			post-project period							
1	Malkangiri	5.0	0.3	0.6	0.1	0.3	0.060	0.120	0.020	0.060
2	Gajapati	5.6	0.6	0.5	0.6	0.6	0.107	0.089	0.107	0.107
3	Kalahandi	4.3	0.4	0.4	0.3	0.4	0.093	0.093	0.070	0.093
4	Kandhamal	5.0	0.6	0.5	0.1	0.4	0.120	0.100	0.020	0.080
5	Koraput	4.6	0.5	0.6	0.5	0.5	0.109	0.130	0.109	0.109
6	Nuapada	5.2	0.4	0.6	0.1	0.4	0.077	0.115	0.019	0.077
7	Rayagada	4.7	0.5	0.5	0.5	0.5	0.106	0.106	0.106	0.106
	All districts	4.9	0.5	0.5	0.4	0.5	0.102	0.102	0.082	0.102

5.3 Popular Timing of the day for millet consumption

In order to understand the preferred time of millets consumption respondents were asked to elicit their opinion on the most preferred time of consuming millets by majority of their household members. Accordingly, as shown in the following table 5.3, the most preferred time of their millet consumption are classified as breakfast, lunch, dinner and all times. Overall, it is found that percentage

share of households consuming millet as breakfast food has increased from 19.3 percent during pre-project period to 28.3 percent during post project period. Millet as dinner food is least preferred option among the households. Similarly, people opting millet as all-time food has decreased from 63.7 percent during pre-project period to 57.0 percent. The inter district differences in the most preferred time for millet food can be glanced



from the table given below. Compared to any other time of the time of the day, millet consumption time during post project period is maximum reported for breakfast time for which it may be stated that millets have emerged as the most preferred breakfast cereal in the project area.

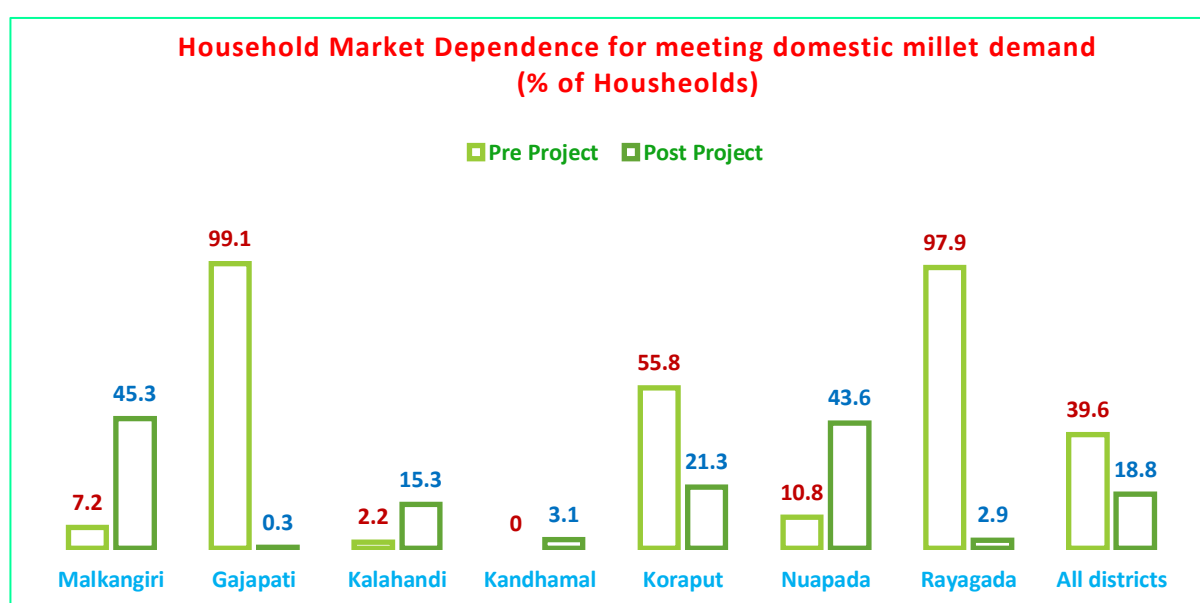


Table-5.3: Most Popular time of the day for Millet consumption

Sl.	Most popular time	No. of households during pre-project period							
		Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
1	Breakfast	22	2	207	43	19	89	1	383
2	Lunch	141	0	13	0	104	80	0	338
3	Dinner	0	0	1	0	0	0	0	1
4	All times	154	316	58	0	428	72	239	1267
5	Total	317	318	279	43	551	241	240	1989
No. of households during post-project period									
1	Breakfast	37	4	180	296	23	87	20	647
2	Lunch	142	0	13	0	106	76	0	337
3	Dinner								
4	All times	136	314	115	19	422	77	219	1302
	Total	315	318	308	315	551	240	239	2286
% of households during Pre-project Period									
1	Breakfast	6.9	0.6	74.2	100.0	3.4	36.9	0.4	19.3
2	Lunch	44.5	0.0	4.7	0.0	18.9	33.2	0.0	17.0
3	Dinner	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1
4	All times	48.6	99.4	20.8	0.0	77.7	29.9	99.6	63.7
5	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% of households during Post-project Period									
1	Breakfast	11.7	1.3	58.4	94.0	4.2	36.3	8.4	28.3
2	Lunch	45.1	0.0	4.2	0.0	19.2	31.7	0.0	14.7
3	Dinner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	All times	43.2	98.7	37.3	6.0	76.6	32.1	91.6	57.0
5	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5.4 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 during pre-project situation, overall, about 39.6 percent of millet producers were purchasing millets from the market, which has been reduced 18.8 percent in the post project situation. This implies that additionally about 20 percent of millet farmers have become self-sufficient by producing their household millet requirements. A case in point is Rayagada district, where households owing to their traditional millet consumption habits, about 97.9 percent were market dependent during pre-project period. Now, only 2.9 percent of millet farmers are market dependent. This has become possible due to boost up production of ragi in the project area. Similarly, Gajapati district also. The tribal families were exclusively market dependent for procuring millet during pre-project period. Now a negligible portion of millet producing households, i.e., less than 1 percent of households are found as market dependent for household millet demand. In Koraput district also, market dependence for domestic consumption has tended to decrease. However, except these three districts, there is increased market dependence even compared to pre project situation. This may be stated that as a result OMM intervention, there has been positive shifts in favour of millet consumption, which was not there previously during pre-project period. Due to this changed preferences for millet consumption, and proportionately millet production has not taken place, the extent of market dependence seems to be higher in Malkangiri, Kalahandi, Kandhamal, and Nuapada. The other minor millets added to ragi millet are most often practiced by the millet farmers in these four districts. From the previous analysis, it is observed that OMM has sufficiently mainstreamed ragi production by introducing package of practices in ragi cultivation, however, it is yet to take place in other millets like kangu, suan, janha and kodo millets. These minor millets are also having high nutritious value. It is in this background, the study is of the opinion that if these minor millets are also promoted at par with ragi by the OMM, there can be quantum jump in the millet productivity in the project area. Household dependence on market for domestic millet demand is depicted in the chart given below.

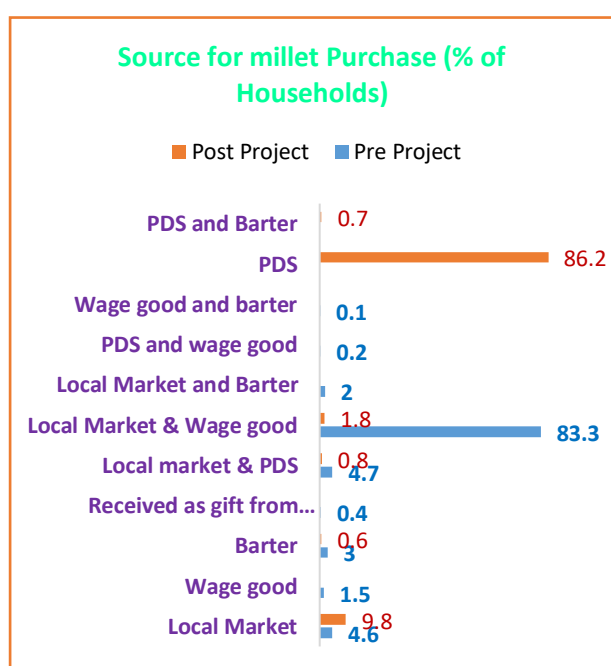


Market demand for millet per household during post project period compared to pre project situation reveals that overall, there is 555.6 percent positive increase in market demand among the millet producing households despite their increased production. This is attributed to growing popularity of millet food among the households. The objective behind OMM is not only increase the production level of households but also motivating all households including millet producing households for increased consumption of millets by substituting mainstreamed cereals like rice, which is said to be staple food item in all parts of Odisha. The average quantity of millet purchased per annum per millet purchasing household during pre-project and post-project period is calculated at 0.28 and 1.86 quintal respectively. Percentage deviation in Market Demand for Millet per Household for all the project districts as shown in the following table also indicates that it is the highest in Kalahandi district and lowest in Rayagada district.

Table-5.4: No of households purchasing millets from outside despite own production

Sl.	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
1	Malkangiri	23	7.2	145	45.3	320	0.23	2.00	772.1
2	Gajapati	317	99.1	1	0.3	320	0.27	2.00	635.3
3	Kalahandi	7	2.2	49	15.3	320	0.18	1.98	980.9
4	Kandhamal		0.0	10	3.1	325		2.00	-
5	Koraput	312	55.8	119	21.3	559	0.28	1.93	581.0
6	Nuapada	26	10.8	105	43.6	241	0.22	1.82	715.7
7	Rayagada	235	97.9	7	2.9	240	0.32	1.03	224.6
	All districts	920	39.6	436	18.8	2325	0.28	1.86	555.6

5.6 Source for purchasing millets



As per table 5.5, It is found that during pre-project period, as high as 83.3 percent of the household requiring purchase of millet for household consumption were purchasing local market as well as receiving wage good. However, during post project situation has brought about a breakthrough in the system of household millet purchase. During post project situation, as high as 86.2 percent of needy households are purchasing millet from PDS. The study views that it is a significant impact of OMM for promoting a vibrant PDS system to bolster household millet consumption in the project area. Distribution of millets through PDS mechanism was one of the strongest objectives of OMM and in this front OMM has achieved good deal of success.

Table-5.5: Source for purchasing (procuring) by households

Sl.	Source for millet purchase	% of households purchasing millets							
		Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All districts
		Pre-project period							
1	Local Market	42.3	0	54.5		0.3	40.7	5.8	4.6
2	Wage good	0	0	0		0	0	5.8	1.5
3	Barter	34.6	0	36.4	0	0.3	48.1	0.4	3
4	Received as gift from fellow relatives	11.5	0	0		0	3.7	0	0.4
5	Local market & PDS	3.8	8	9.1		3.2	3.7	2.5	4.7
6	Local Market & Wage good	0	91.4	0	0	95.2	0	79.6	83.3
7	Local Market and Barter	3.8	0.6	0	0	0.6	3.7	5.4	2
8	PDS and wage good	3.8	0	0		0.3	0	0	0.2
9	Wage good and barter	0	0	0		0	0	0.4	0.1
	Total	Total	100	100	0	100	100	100	100
		Post Project period							
1	Local Market	3.8	0	49.4	0	3.9	8.6	14.3	9.8
2	PDS	95.5	50.0	44.7	100	91.7	87.1	0	86.2
3	Barter	0.7	0	0	0	0	1	14.3	0.6
4	Local market & PDS	0	0	2.4	0	0.4	1.9	0	0.8
5	Local Market & Wage good	0	50.0	0	0	3.9	0	71.4	1.8
6	PDS & Barter	0	0	3.5	0	0	1.4	0	0.7
	Total	100	100	100	100	100	100	100	100

Concluding Remarks

During pre-project situation maximum proportion of households about 85.8 percent were consuming millets during summer season. During winter season about 64.3 percent of households were consuming millets and 66.9 percent during rainy season. Compared to pre project situation, proportion households consuming millets during post project situation has substantially improved in all seasons. Overall 98.5 percent of millet farmers households are found consuming millets during summers season. Similarly, 79.9 percent were consuming millets during winter season and 72.6 percent in rainy seasons. A good majority of households during pre-project and post project situation are consuming millets during summer season. During post project period, more than 95 percent of millets households in all district consume millets during summer season.

During pre-project period, the mean daily household consumption of millets during winter, rainy and summer season is calculated at 0.7 Kg., 0.4 Kg., and 0.5 Kg. respectively. During post project period, the mean daily household consumption of millets during winter, rainy and summer season is found at 0.5 Kg., 0.5 Kg. and 0.4 Kg. respectively. Compared to any other time of the time of the day, millet consumption time during post project period is maximum reported for breakfast time for which it may be stated that millets have emerged as the most preferred breakfast cereal in the project area. During pre-project situation, overall, about 39.6 percent of millet producers were purchasing millets from the market, which has been reduced 18.8 percent in the post project situation. This implies that additionally about 20 percent of millet farmers have become self-sufficient by producing their household millet requirements. The average quantity of millet purchased per annum per millet purchasing household during pre-project and post-project period is calculated at 0.28 and 1.86 quintal respectively. During pre-project period, as high as 83.3 percent of the household requiring purchase of millet for household consumption were purchasing local market as well as receiving wage good. However, during post project situation has brought about a breakthrough in the system of household millet purchase. During post project situation, as high as 86.2 percent of needy households are purchasing millet from PDS. The study views that it is a significant impact of OMM for promoting a vibrant PDS system to bolster household millet consumption in the project area.

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 district. 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 20 Kms. So, it can be stated that, on an average, households cover an average distance of 11 Kms. to undertake the primary processing of millets. 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 use locally available traditional instruments like “dhinki”, made up of wooden logs, and “chakki”, made up of two round stone plates. Dhinki is used for dehussing and chakki is used for grinding. Both these instruments are operated manually.

Table-6.1: Processing of millets for Self-Consumption

Sl.	Districts	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	Malkangiri	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
		Suan	Khira, Upma, khicdi, pan cake	De-husking for saun rice	All HHs do debussing manually through traditional	Nil distance

					means like dhenki .	
2	Gajapati	Ragi	Porridge, thick porridge, ladu, Pakoda, Pan cake	Ragi to ragi flour	About 40 percent of HHs doing ragi flour manually at home	Those 60 percent cover a distance of 2 -15 kms to access mills
		Suan	Upma	De-husking for saun rice	All HHs do debussing manually through traditional means like dhenki .	Nil distance
		Kangu	khichdi	De-husking for kangu rice		
3	Kalahandi	Ragi	Soup, Porridge, pan cake, mixture, Khir, Pakodi, ladu, sarabat, halwa	Ragi to ragi flour	About 20 percent of HHs doing ragi flour manually at home	Those 80 percent cover a distance of 2 -12 kms to access mills
		Suan (also called gurji)	Khira, Upma	De-husking for saun rice	All HHs do debussing manually through traditional means like dhenki .	Nil distance
		Kangu	khichdi	De-husking for kangu rice		
		Janha	Muan (Ladu of puffed Janha)	Dehusking and roasting		
		Kodo (also called Kosla)	khira	De-husking for kodo rice		
4	Kandhamal	Ragi	Soup, Porridge, pan cake, deep fried cake, Vada, Khir, Khichdi, Ladu, Halwa	Ragi to ragi flour	About 40 percent of HHs doing ragi flour manually at home	Those 60 percent cover a distance of 5 -20 kms to access mills
		Suan (also called Kueri)	Khira, Muan (Ladu of puffed suan), Khichdi, upma	De-husking for saun rice	All HHs do debussing manually through traditional means like dhenki .	Nil distance
		Kangu	Khira, Pakhala	De-husking for kangu rice		
		Janha	Muan (Ladu of puffed Janha)	Dehusking and roasting		
5	Koraput	Ragi	Pan cake, rice added porridge, Khira,	Ragi to ragi flour	About 30 percent of HHs doing ragi flour	Those 70 percent cover a distance of 5-20 kms to access mills

					manually at home	
		Suan	khir	De-husking for saun rice	All HHs do debussing manually through traditional means like dhenki .	Nil distance
		Janha	Muan (Ladu of puffed suan),			
6	Nuapada	Ragi	Pan cake, rice added porridge, Khir, Vada, Chappati, fried cake	Ragi to ragi flour	About 25 percent of HHs doing ragi flour manually at home	Those 75 percent cover a distance of 5 -10 kms to access mills
		Suan	Khichidi, Khir	De-husking for saun rice	All HHs do debussing manually through traditional means like dhenki .	Nil distance
		Kangu	Khichidi	De-husking for kangu rice		
		Janha	Muan (Ladu of puffed suan)	Dehusking and roasting		
		Kodo	Khichidi	De-husking for kodo rice		
7	Rayagada	Ragi	Soup, porridge, ladu, idli, pan cake, Pakoda	Ragi to ragi flour	About 10 percent of HHs doing ragi flour manually at home	Those 90 percent cover a distance of 2 -15 kms to access mills
		Suan	Upma, khicdi,	De-husking for saun rice	All HHs do debussing manually through traditional means like dhenki.	Nil distance
		Kangu	Khichidi	De-husking for kangu rice		
		Janha	Muan (Ladu of puffed suan)	Dehusking and roasting		

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 sorting 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 79.8 percent of surplus ragi surplus were sold through middlemen and now, during post project period, as maxim as 81 percent of surplus ragi are sold through Mandis. This is a remarkable achievement of OMM. Selling of surplus ragi at local haat was also a solid channel during pre-project period which is found negligible during post project period.

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	Gajapati	-	0	66.7	33.3	0.0	0.0
3	Kalahandi	-	44.9	52.0	1.1	0.0	2.0
4	Kandhamal	-	1.3	77.4	0.0	0.0	21.3
5	Koraput	-	95.8	4.2	0.0	0.0	0.0
6	Nuapada	-	96.5	3.6	0.0	0.0	0.0
7	Rayagada	-	0	0.0	100.0	0.0	0.0
	All districts	-	79.8	18.3	0.7	0.0	1.1
Sl.	Districts	Marketing of Ragi by farmers in different market channels (% of overall quantity) during post-project period					
		Govt. procurement	Middlemen	Local Haat	local Money Lender	Input supplier	Barter
1	Malkangiri	73.1	26.9	0.0	0.0	0.0	0.0
2	Gajapati	99.8	0.2	0.0	0.0	0.0	0.0
3	Kalahandi	96.3	3.6	0.2	0.0	0.0	0.0
4	Kandhamal	98.8	0.0	1.2	0.0	0.0	0.0
5	Koraput	76.0	15.3	3.0	2.1	3.7	0.0
6	Nuapada	41.8	55.3	3.0	0.0	0.0	0.0
7	Rayagada	98.9	0.0	1.1	0.0	0.0	0.0
	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 around 83.6 percent of surplus suan were sold to middlemen and now, during post project period also, about 83.7 percent are sold through this channel. Like middlemen, the importance of local haat to offload surplus suan still continues in the project area. About 15.5 percent of surplus suan are sold through local haats during pre-project as well as post project period.

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	Gajapati	-	0				
3	Kalahandi	-	44.6	51.8	3.5	0.0	0.0
4	Kandhamal	-	76.2	23.8	0.0	0.0	0.0
5	Koraput	-	99.3	0.7	0.0	0.0	0.0
6	Nuapada	-	91.9	8.1	0.0	0.0	0.0
7	Rayagada	-	0				
	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					
1	Malkangiri	-	100	0.0	0.0	0.0	0.0
2	Gajapati	-	100	0.0	0.0	0.0	0.0
3	Kalahandi	-	55.4	44.7	0.0	0.0	0.0
4	Kandhamal	-	14.7	75.3	10.0	0.0	0.0
5	Koraput	-	97	2.8	0.1	0.0	0.0
6	Nuapada	-	100	0.0	0.0	0.0	0.0
7	Rayagada	-	0				
	All districts	-	83.7	15.7	0.7	0.0	0.0

6.2.3 Marketing Channels for Kangu

As it can be seen from the following table 6.4, during pre-project period local middlemen was the predominant channel and as high as 97.5 percent of surplus kangu was sold through this channel and only about 2.5 percent were sold through local haats. However, during post project period, there is a declining share of local middlemen and consequently selling through local haats and input suppliers has become prominent.

Table-6.4: Marketing of Kangu by different Marketing Channels

Sl.	Districts	Marketing of Kangu 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	-					
2	Gajapati	-					
3	Kalahandi	-	100.0	0.0	0.0	0.0	0.0
4	Kandhamal	-	0.0	100.0	0.0	0.0	0.0
5	Koraput	-					
6	Nuapada	-	100.0	0.0	0.0	0.0	0.0
7	Rayagada	-					
	All districts	-	97.5	2.5	0.0	0.0	0.0
		Marketing of Kangu by farmers in different market channels (% of overall quantity) during post-project period					
1	Malkangiri	-					
2	Gajapati	-					

3	Kalahandi	-	100.0	0.0	0.0	0.0	0.0
4	Kandhamal	-	0.0	36.5	63.5	0.0	0.0
5	Koraput	-					
6	Nuapada	-					
7	Rayagada	-					
	All districts	-	39.4	22.1	38.5	0.0	0.0

6.2.4 Marketing Channels for Janha

As it can be seen from the following table 6.5, during pre-project period local middlemen and local haat were the predominant channels for selling surplus janha by the farmers. These two channels absorbed jointly absorbed the entire marketable surplus of janha in the project area. Proportionately about 62.1 percent of the surplus were sold through middlemen and the remaining surplus through local haat. However, during post project period, there is a declining share of local middlemen and local haat. consequently, selling through local money lender has emerged as a prominent channel. As high as 75.3 percent of surplus janha is sold through local money lenders during post project period.

Table-6.5: Marketing of Janha by different Marketing Channels

Sl.	Districts	Marketing of Janha 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	-					
2	Gajapati	-					
3	Kalahandi	-	39.0	61.0	0.0	0.0	0.0
4	Kandhamal	-					
5	Koraput	-	100.0	0.0	0.0	0.0	0.0
6	Nuapada	-					
7	Rayagada	-					
	All districts	-	62.1	37.9	0.0	0.0	0.0
		Marketing of Janha by farmers in different market channels (% of overall quantity) during post-project period					
1	Malkangiri	-	0				
2	Gajapati	-	0				
3	Kalahandi	-	53.4	46.6	0.0	0.0	0.0
4	Kandhamal	-	1.4	1.1	97.4	0.0	0.0
5	Koraput	-	0	100.0	0.0	0.0	0.0
6	Nuapada	-	100	0.0	0.0	0.0	0.0
7	Rayagada	-	100	0.0	0.0	0.0	0.0
	All districts	-	16.5	8.2	75.3	0.0	0.0

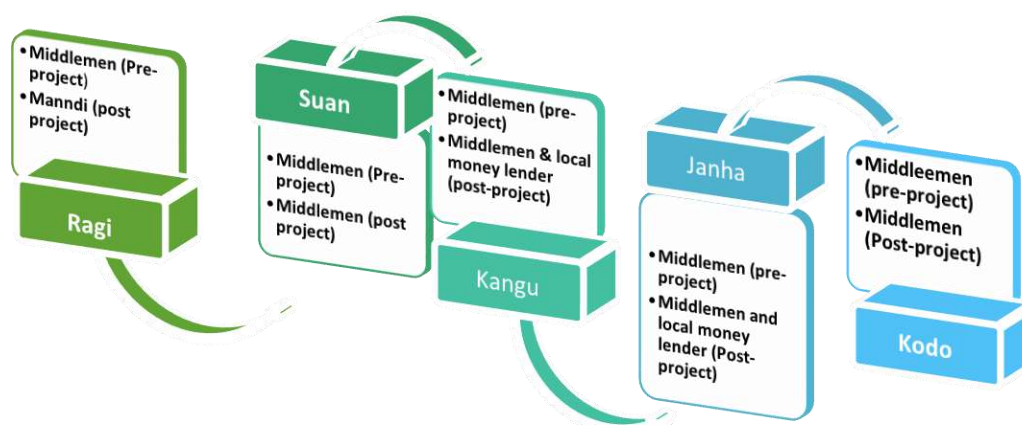
6.2.5 Marketing Channels for Kodo

As it can be seen from the following table 6.6, during pre-project period local middlemen followed by local haat and barter were the most prominent channels for selling surplus kodo millets by the farmers. However, the predominant channel was the local middlemen and about 759 percent of the surplus millets were sold through this channel only. The importance of local middlemen still continues as a predominant channel even during post project period. It is further evident that the importance of barter is slightly lowered in favour of local haats during post project situation.

Table-6.6: Marketing of Other millets (Kodo) by different Marketing Channels

Sl.	Districts	Marketing of other millets (Kodo) 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	-	0				
2	Gajapati	-	0				
3	Kalahandi	-	58.5	24.2	0.0	0.0	17.3
4	Kandhamal	-	0				
5	Koraput	-	0				
6	Nuapada	-	93.2	1.9	0.0	0.0	5.0
7	Rayagada	-	55.6	0.0	0.0	0.0	44.4
	All districts	-	75.9	12.6	0.0	0.0	11.4
		Marketing of other millets (Kodo) by farmers in different market channels (% of overall quantity) during post-project period					
1	Malkangiri	-					
2	Gajapati	-					
3	Kalahandi	-	49.1	36.7	0.0	0.0	14.2
4	Kandhamal	-	0.0	100.0	0.0	0.0	0.0
5	Koraput	-					
6	Nuapada	-	100.0	0.0	0.0	0.0	0.0
7	Rayagada	-					
	All districts	-	74.4	19.1	0.0	0.0	6.5

6.3 Principal Marketing Channels for Reported Millets



Concluding Remarks:

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 20 Kms. So, it can be stated that, on an average, households cover an average distance of 11 Kms. to undertake the primary processing of millets. 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 use locally available traditional instruments like "dhinki", made up of wooden logs, and "chakki", made up of two round stone plates. 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. Local middlemen, local haat, local money lender, input supplier and barter are different market channels through which surplus millet is sold by the farmers. 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 79.8 percent of surplus ragi surplus were sold through middlemen and now, during post project period, as maxim as 81 percent of surplus ragi are sold through Mandis.

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.



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 resistant capacity and lower water intake. 	<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. → Due to diversification of food, people have increased preference for millets. 	<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 contributed to millet processing. 	<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. procurement of millets through

		→ Tribals are historically linked with millet cultivation. So, they are naturally advantageous to undertake millet cultivation.	→ Govt has systematically emphasized the relevance and utility of millet consumption, for which more people are attracted for millet consumption.		mandi, there is better scope for farmers to get authentic value for their produced millets.
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>	→ Locally availability of quality processing, there is time saving by covering reduced distance for millet processing.	→ 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.
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>→ Modern method of cultivation as provided under OMM is expected for further increase</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 millet consumption helps to boost immunity.</p> <p>→ The food festivals and exhibitions have showcased</p>	→ Easy processing has contributed to value addition of millets.	→ Gradation of millets as introduced by the FAs in the OMM project areas have enabled farmers to get differential prices for different qualities of millets

		<p>in millet productivity in the project area.</p> <p>→ Govt incentive scheme has encouraged more number of farmers with increased area of millet cultivation in the project area.</p>	<p>millet based food and recipes at different district, block and state level . This has contributed to increased millet consumption.</p>		<p>produced by them.</p>
5	CBOs	<p>→ 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.</p> <p>→ 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.</p> <p>→ The management skills and other skill development programmes as provided to millet farmers have strengthened millet farmer's'</p>	<p>→ 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.</p> <p>→ 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</p>	<p>→ 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.</p>	<p>→ 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>

		confidence for millet production.			
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 of millet farmers might have adopted non ragi millets.</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>

		→ 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.	→ Millet recipes although introduced under ICDS and PDS, still it is optional, so consumption improvement is not getting broad-based.		
4	Facilitating Agencies	→ 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.	→ Since decades, there is social discouragement that millet recipes are poor man's food, which stands on the way of increasing millet consumption.	→ Age old food habits may take time to get changed in favour of millet consumption drastically.	→ There is imperative need to promote export of millets from India.
5	CBOs	→ 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. → 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.	→ 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.	→ 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. → Resultingly, even if millet processing units are found, it becomes very difficult to make regular functioning of millet processing machineries.	→ Farmers complain that there is payment delay by the Govt, when they sell their millets through mandis.
6	CRPs	→ Use of certified seeds is practiced by limited number of millets. This is attributed to non-	→ Most of the rural people consume ragi millet as porridge (Jau) only,	→ Trained manpower to operate millet processing machines is	→ Owing to higher cost of cultivation, the MSP of millets are still

		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.	which is not tasty. Sufficient training and awareness on the preparation of alternative recipes would further increase millet consumption.	also limiting factor for machine-based processing of millets in the project villages.	considered lower by the millet farmers. → Besides, there are delays in the procurement of millets under Mandi system. Framers say that soon after harvest, Mandi system should become effective, so that, there will quick cash inflow to the farmers bank A/Cs.
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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	→ 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	→ Millet procurement with MSP support is gradually mainstreamed and there is also systematic

		lands, millet crops can be grown.		cultivation and processing. This is due to the sincere efforts of OMM.	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.
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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 paddy lands for millet cultivation in Odisha.	→ 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 flour. From marketing point of view, it is to some extent difficult.	→ 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.
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	→ 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

		the commercial viability of millet farming.			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 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 Non-Ragi millets.	
6	CRPs	→ Most often the millet farming is considered inferior compared to the prestige value attached to other crops	→ Large scale adoption of millet as staple food may lead to scarcity of millets and consequently higher price which may confuse		

		cultivation particularly paddy cultivation.	households to consume millets.		
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Chapter-VIII: Mapping of Outcome Indicators of OMM

The outcome indicators of OMM are analysed on the basis of production, income, consumption, income, marketing and process related factors. Further, each factor is influenced by a set of indicators. The performance of these indicators was mapped in the baseline study of the report. Present study determines the corresponding values which are called midline performance of the same set of indicators. By comparing the midline performance indicators with that of the baseline indicators provides a detailed insight about the progress of OMM intervention in the project area. The details of mapping of the outcome indicators are comparatively analysed in the following tables 8.1 to 8.4. The indicator-based performance is provided for ragi millet as the study finds that ragi is the dominant form of millet and sufficiently taken care of by OMM intervention. The details of other types of millets although separately analysed throughout the report, however for indicator mapping exercise, ragi millet is only considered.



Table-8.1: Performance of Outcome indicators in the baseline study compared to midline study (Ragi)

Sl.	Factors/ Indicators	Outcome	Baseline values							Midline values							Ref in the report		
			Malka ngiri	Gajap ati	Kalah andi	Kandha mal	Kora put	Nuap ada	Raya gada	All Odisha	Malk angiri	Gaja pati	Kalaha ndi	Kandha mal	Korap ut	Nua pada		Raya gada	All Odisha
	No. of sampled millet farmers covered in the study									320	320	320	325	559	241	240	2325		
I	Production																		
1	% of millet Farmers involved in ragi production		91.9	97.5	80.0	13.8	97.1	88.0	97.5	81.5	100.0	99.1	89.4	94.2	98.0	97.9	99.6	96.9	Section 4.2
2	Crop area as % of total holding of millet farmer (%)		1.0	0.97	0.87	0.72	0.95	0.57	0.99	0.91	1.20	0.97	0.97	0.67	0.98	0.62	0.97	0.93	Section 4.2
3	Crop production/ farmer (Quintal)		1.5	1.4	2.1	3.9	1.4	1.5	2	1.7	4.7	5.6	5.6	7.9	5.5	4.0	5.6	5.6	Section 4.4.1
4	Crop production/ Hectare (Quintal)		6.2	5.2	12.2	11.4	6.7	6.4	4.7	6.4	9.7	14.1	14.1	14.5	13.6	15.6	14.1	14.9	Section 4.4.1
5	Production Cost/ Hectare (Rs.)		3264	6619	4613	4468	5945	3524	6029	5191	10560	13883	7884	10453	13226	7894	13729	11532	Section 4.6
6	% of farmers using organic manure (%)		8.1	93.8	21.3	11.4	71.2	0.8	99.6	46.0	39.1	93.8	30.0	98.5	79.8	5.8	99.6	66.2	Section 4.7
7	% of farmers using chemical fertilizer (%)		2.8	15.0	0.0	0.3	9.5	0.0	2.5	5.0	62.2	9.1	2.5	3.4	30.2	19.1	9.2	20.8	Section 4.7
8	% of farmers doing mono crop		57.7	99.0	66.7	87.8	66.7	40.2	94.1	71.4	99.4	94.3	97.6	88.0	100.0	100.0	96.2	96.8	Section 4.3
9	% of farmers doing mixed crop		42.0	1.0	31.8	12.2	33.2	59.3	5.9	28.3	0.3	5.7	2.4	12.0	0.0	0.0	3.8	3.1	Section 4.3
10	% of framers doing inter cropping		0.3	0.0	1.6	0.0	0.2	0.5	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Section 4.3
11	% of farmers doing SMI		0.0	0.0	0.4	0.0	0.2	1.0	0.8	0.3	9.8	99.0	72.0	45.4	72.9	38.6	100.0	62.9	Section 4.3
12	% of farmers doing LT		3.4	0.0	6.2	2.4	0.4	10.0	0.0	2.6	79.8	1.5	20.6	52.6	23.2	55.5	0.0	33.1	Section 4.3

13	% of farmers doing LS	0.0	0.0	0.4	0.0	0.0	1.4	0.0	0.2	0.0	0.0	3.7	1.3	0.2	0.4	0.0	0.8	Section 4.3
14	% of farmers doing broadcasting	96.6	100.0	93.0	97.6	99.5	87.6	99.2	96.8	10.4	0.0	1.7	0.7	3.8	5.5	0.0	3.3	Section 4.3
15	% of farmers using own seeds	99.6	100.0	98.1	97.4	99.9	99.2	100.0	99.6	96.3	51.7	34.3	93.1	76.6	92.4	13.4	67.7	Section 4.9
16	% of farmers using certified seeds	0.4	0.0	1.9	2.6	0.1	0.8	0.0	0.4	3.8	48.3	65.7	6.9	23.4	7.6	86.6	32.3	Section 4.9
17	% of farmers undertaking seed treatment	2.4	0.3	3.5	13.3	0.4	0.9	7.3	2.3	9.4	93.8	69.4	97.2	61.7	2.9	99.6	62.8	Section 4.9
18	% of farmers undertaking germination test of seeds before use	0.0	0.0	0.0	15.6	0.0	0.0	0.4	0.4	1.6	94.6	64.7	99.0	58.6	0.4	100.0	60.1	Section 4.9
II	Consumption																	
19	% of millet farmers households consuming millet in winter season (%)	52.5	99.4	65.4	2.5	78.2	48.5	100.0	64.3	97.8	99.4	98.8	97.2	98.6	97.9	99.6	98.5	Section 5.1
20	% of millet farmers households consuming millet in rainy season (%)	53.1	99.4	75.6	8.3	78.4	49.8	100.0	66.9	55.0	99.4	73.1	48.9	78.5	50.6	100.0	72.6	Section 5.1
21	% of millet farmers households consuming millet in summer season (%)	99.4	99.4	88.8	13.2	98.6	100.0	99.6	85.8	53.4	99.4	84.4	92.0	78.4	50.2	100.0	79.9	Section 5.1
22	% of production used for self-consumption	11.2	25.7	4.9	11.9	17.7	12.2	59.8	16.2	12.2	6.8	8.9	5.0	9.0	10.1	7.0	8.1	Section 4.4.1
23	% of millet farmers purchase millet from market	7.2	99.1	2.2	0.0	55.8	10.8	97.9	39.6	45.3	0.3	15.3	3.1	21.3	43.6	2.9	18.8	Section 5.4
III	Marketing																	
24	Quantity of marketable surplus/ farmer (Quintal)	4.0	2.4	7.6	5.2	3.6	2.3	0.2	3.5	3.7	4.8	4.6	7.0	4.5	3.3	4.8	4.7	Section 4.4.1
25	Quantity sold through mandi per farmer (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.1	99.8	96.3	98.8	76.0	91.8	98.9	81.0	Section 6.2

	share of marketable surplus)																	
26	Quantity sold through informal channels like middlemen and others (% share of marketable surplus)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	26.9	0.2	3.7	1.2	24.0	58.2	1.1	19.0	Section 6.2
IV	Processing																	
27	Type of recipes witnessed	Porridge, pan cake								Soup, Porridge, pan cake, deep fried cake, Vada, Khir, Khichdi, Ladu, Halwa								Section 6.1
28	% of households consuming millets in breakfast	6.9	0.6	74.2	100.0	3.4	36.9	0.4	19.3	11.7	1.3	58.4	94.0	4.2	36.3	8.4	28.3	Section 5.3
29	% of households consuming millets during lunch	44.5	0.0	4.7	0.0	18.9	33.2	0.0	17.0	45.1	0.0	4.2	0.0	19.2	31.7	0.0	14.7	Section 5.3
30	% of households consuming millets during dinner	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Section 5.3
31	% of households undertaking manual processing of millets	-	-	-	-	-	-	-	-	30.0	40.0	20.0	40.0	30.0	25.0	10.0	27.9	Section 6.1
32	% of households undertaking machine processing of millets	-	-	-	-	-	-	-	-	70.0	60.0	80.0	60.0	70.0	75.0	90.0	72.1	Section 6.1
33	Average distance covered for machine processing of millets	-	-	-	-	-	-	-	-	6.0	8.5	7.0	12.5	12.5	7.5	8.5	8.9	Section 6.1

Table-8.2: Performance of Outcome indicators in the baseline study compared to midline study (Suan)

Sl.	Factors/ Outcome Indicators	Baseline values								Midline values								Ref in the report
		Malkan giri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	
	No. of sampled millet farmers covered in the study									320	320	320	325	559	241	240	2325	
I	Production																	
1	% of millet farmers involved in suan production	3.8	1.6	18.1	1.8	10.6	0.8	2.5	6.4	5.6	0.9	19.4	19.7	11.3	0.4	0.8	9.2	Section 4.1
2	Crop area as % of total holding of millet farmer (%)	12.1	13.5	13.6	8.8	15.1	7.9	17.2	14.3	12.9	8.0	10.1	6.2	15.2	1.1	10.0	9.5	Section 4.2
3	Crop production/ farmer (Quintal)	1.9	0.0	1.7	0.6	2.2	0.2	0.0	1.7	2.7	0.0	2.4	1.4	2.6	0.8	0.0	2.1	Section 4.4
4	Crop production/ Hectare (Quintal)	5.2	0.0	4.1	3.1	5.1	0.9	0.0	4.2	7.1	0.0	6.0	9.2	5.7	9.8	0.0	6.3	Section 4.4
5	Production Cost/ Hectare (Rs.)	1315.9	2668.9	1860.0	592.0	2397.1	1421.2	2431.1	2093.1	4258	5598	3179	4215	5333	3183	5536	4650	Section 4.6
6	% of farmers using organic manure (%)	8.1	93.8	21.3	11.4	71.2	0.8	99.6	46.0	39.1	93.8	30.0	98.5	79.8	5.8	99.6	66.2	Section 4.7
7	% of farmers using chemical fertilizer (%)	2.8	15.0	0.0	0.3	9.5	0.0	2.5	5.0	62.2	9.1	2.5	3.4	30.2	19.1	9.2	20.8	Section 4.7
8	% of farmers doing mono crop	100.0		63.0	0.0	63.6	100.0		64.3	100.0		94.6	59.7	93.3	100.0		82.5	Section 4.3
9	% of farmers doing mixed crop	0.0		35.2	100.0	34.1	0.0		33.9	0.0		3.6	40.3	6.7	0.0		16.9	Section 4.3
10	% of framers doing inter cropping	0.0		1.9	0.0	2.3	0.0		1.7	0.0		1.8	0.0	0.0	0.0		0.6	Section 4.3
11	% of farmers doing SMI	0.0		3.6	0.0	0.0	0.0		1.7	14.3		8.9	4.8	2.2	0.0		6.2	Section 4.3

12	% of farmers doing LT	0.0		1.8	0.0	0.0	0.0		0.9	0.0		21.4	33.9	4.4	0.0		19.7	Section 4.3
13	% of farmers doing LS	0.0		1.8	0.0	0.0	0.0		0.9	0.0		28.6	1.6	0.0	0.0		9.6	Section 4.3
14	% of farmers using own seeds	58.3	0.0	87.9	83.3	79.7	50.0	0.0	75.0	44.4	0.0	82.3	93.8	77.8	100.0	0.0	79.3	Section 4.9
15	% of farmers using certified seeds	41.7	100.0	12.1	16.7	20.3	50.0	100.0	25.0	55.6	100.0	17.7	6.3	22.2	0.0	100.0	20.7	Section 4.9
16	% of farmers undertaking seed treatment	0.0	0.0	6.9	0.0	0.0	0.0	0.0	2.7	5.6	0.0	50.0	96.9	1.6	0.0	0.0	44.6	Section 4.9
17	% of farmers undertaking germination test of seeds before use	0.0	0.0	3.4	0.0	0.0	0.0	0.0	1.4	0.0	0.0	43.5	96.9	0.0	0.0	0.0	41.8	Section 4.9
II	Consumption																	
18	% of production used for self-consumption	5.4		4.0	0.0	0.8	0.0		2.4	6.7		9.9	24.2	3.3	50.0		10.0	Section 4.1
III	Marketing																	
19	Quantity of marketable surplus/ farmer (Quintal)	1.6	0.0	1.4	0.5	2.0	0.1	0.0	1.5	2.3	0.0	1.9	0.9	2.3	0.3	0.0	1.7	Section 4.1
IV	Processing																	
20	% of households undertaking manual processing of millets	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	Section 6.1
21	% of households undertaking machine processing of millets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Section 6.1
22	Average distance covered for machine processing of millets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Section 6.1

Table-8.3: Performance of Outcome indicators in the baseline study compared to midline study (Kangu)

Sl.	Factors/ Outcome Indicators	Baseline values								Midline values								Ref in the report
		Malkan giri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	
	No. of sampled millet farmers covered in the study									320	320	320	325	559	241	240	2325	
I	Production																	
1	% of millet farmers involved in crop production		0.3	2.5	0.3		0.4		0.5		0.0	2.2	6.5		0.4		1.2	Section 4.1
2	Crop area as % of total holding of millet farmer (%)		6.7	8.1	6.7		6.9		7.8		0.0	7.5	3.2		6.6		3.5	Section 4.2
3	Crop production/ farmer (Quintal)		0.0	0.9	0.3		0.8		0.7			1.7	0.6		0.9		0.8	Section 4.4
4	Crop production/ Hectare (Quintal)		0.0	4.1	1.5		4.0		3.4		0.0	8.7	4.6		4.5		5.8	Section 4.4
5	Production Cost/ Hectare (Rs.)		6619	4613	1468		3525		5191		13883	7884	10453		7894		11532	Section 4.6
6	% of farmers using organic manure (%)		93.8	21.3	11.4		0.8		46.0		93.8	30.0	98.5		5.8		66.2	Section 4.7
7	% of farmers using chemical fertilizer (%)		15.0	0.0	0.3		0.0		5.0		9.1	2.5	3.4		19.1		20.8	Section 4.7
8	% of farmers doing mono crop		100.0	50.0	0.0		100.0		54.5			14.3	47.6		100.0		41.4	Section 4.3
9	% of farmers doing mixed crop		0.0	0.0	0.0		0.0		0.0			14.3	23.8		0.0		20.7	Section 4.3
10	% of framers doing inter cropping		0.0	50.0	100.0		0.0		45.5			71.4	28.6		0.0		37.9	Section 4.3
11	% of farmers doing SMI		0.0	0.0	0.0		100.0		9.1			14.3	4.8		0.0		6.9	Section 4.3

12	% of farmers doing LT		0.0	0.0	0.0		0.0		0.0			14.3	9.5		0.0		10.3	Section 4.3
13	% of farmers doing LS		0.0	0.0	0.0		0.0		0.0			0.0	71.4		0.0		51.7	Section 4.3
14	% of farmers using own seeds		100.0	100.0	100.0		100.0		100.0			100.0	81.0		100.0		86.2	Section 4.9
15	% of farmers using certified seeds		-	-	-		-		-			0.0	19.0		0.0		13.8	Section 4.9
16	% of farmers undertaking seed treatment		0.0	12.5	100.0		100.0		27.3			100.0	95.2		0.0		93.1	Section 4.9
17	% of farmers undertaking germination test of seeds before use			0.0	0.0		0.0		0.0			100.0	90.5		0.0		75.9	Section 4.9
II	Consumption																	
18	% of production used for self-consumption			19.4	0.0		62.5		23.8			20.7	46.3		55.6		35.1	Section 4.4
III	Marketing																	
19	Quantity of marketable surplus/ farmer (Quintal)		0.0	0.6	0.3		0.1		0.4			1.1	0.2		0.2		0.4	Section 4.4
IV	Processing																	
20	% of households undertaking manual processing of millets		100.0	100.0	100.0		100.0		100.0			100.0	100.0	100.0	100.0		100.0	Section 6.1
21	% of households undertaking machine processing of millets		0.0	0.0	0.0		0.0		0.0			0.0	0.0	0.0	0.0		0.0	Section 6.1
22	Average distance covered for machine processing of millets		0.0	0.0	0.0		0.0		0.0			0.0	0.0	0.0	0.0		0.0	Section 6.1

Table-8.4: Performance of Outcome indicators in the baseline study compared to midline study (Janha)

Sl.	Factors/ Outcome Indicators	Baseline values								Midline values								Ref in the report
		Malkan giri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	
	No. of sampled millet farmers covered in the study									320	320	320	325	559	241	240	2325	
I	Production																	
1	% of millet farmers involved in crop production			4.1	0.3	0.4	0.4	0.4	0.8			4.7	2.5	0.4	0.8	0.4	1.2	Section 4.1
2	Crop area as % of total holding of millet farmer (%)			7.6	9.6	4.1	14.4	7.4	7.8			6.7	6.2	4.0	11.2	5.0	6.5	Section 4.2
3	Crop production/ farmer (Quintal)			1.3	1.6	0.8	1.3	2.0	1.3			1.8	0.7	2.3	0.8	1.5	1.5	Section 4.4
4	Crop production/ Hectare (Quintal)			5.7	8.1	6.2	3.1	9.9	5.8			6.9	4.4	18.6	2.0	7.4	6.3	Section 4.4
5	Production Cost/ Hectare (Rs.)			4613	1468	5945	3525	6029	5191			7884	10453	13226	7894	13729	11532	Section 4.6
6	% of farmers using organic manure (%)			21.3	11.4	71.2	0.8	99.6	46.0			30.0	98.5	79.8	5.8	99.6	66.2	Section 4.7
7	% of farmers using chemical fertilizer (%)			0.0	0.3	9.5	0.0	2.5	5.0			2.5	3.4	30.2	19.1	9.2	20.8	Section 4.7
8	% of farmers doing mono crop			92.3	100.0	100.0	100.0	100.0	94.4			86.7	62.5	50.0	50.0	100.0	75.0	Section 4.3
9	% of farmers doing mixed crop			7.7	0.0	0.0	0.0	0.0	5.6			13.3	37.5	50.0	50.0	0.0	25.0	Section 4.3
10	% of framers doing inter cropping			0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	Section 4.3
11	% of farmers doing SMI			0.0	0.0	50.0	0.0	0.0	5.6			6.7	37.5	100.0	0.0	0.0	21.4	Section 4.3

12	% of farmers doing LT			0.0	0.0	50.0	0.0	0.0	5.6			26.7	12.5	0.0	0.0	0.0	17.9	Section 4.3
13	% of farmers doing LS			7.7	0.0	0.0	0.0	0.0	5.6			66.7	12.5	0.0	0.0	100.0	42.9	Section 4.3
II	Consumption																	
18	% of production used for self-consumption			18.5	6.2	6.7	40.0	75.0	22.9			13.0	40.9	2.2	12.3	13.3	15.6	Section 4.4
III	Marketing																	
19	Quantity of marketable surplus/ farmer (Quintal)			1.0	1.5	0.7	0.7	0.3	0.9			1.5	0.4	2.2	0.7	1.3	1.2	Section 4.4
IV	Processing																	
20	% of households undertaking manual processing of millets			100.0	100.0	100.0	100.0	100.0	100.0			100.0	100.0	100.0	100.0	100.0	100.0	Section 6.1
21	% of households undertaking machine processing of millets			0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	Section 6.1
22	Average distance covered for machine processing of millets			0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	Section 6.1

Table-7.5: Performance of Outcome indicators in the baseline study compared to midline study (Kodo)

Sl.	Factors/ Outcome Indicators	Baseline values								Midline values								Ref in the report
		Malkan giri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	Malkangiri	Gajapati	Kalahandi	Kandhamal	Koraput	Nuapada	Rayagada	All Odisha	
	No. of sampled millet farmers covered in the study									320	320	320	325	559	241	240	2325	
I	Production																	
1	% of millet farmers involved in crop production			12.5	0.3		26.6	0.4	4.6			12.5	0.6		30.3	0.4	5.0	Section 4.1
2	Crop area as % of total holding of millet farmer (%)			14.0	4.8		13.8	44.3	14.2			11.1	4.1		10.3	29.9	11.3	Section 4.2
3	Crop production/ farmer (Quintal)			0.9	0.3		0.8		0.7			1.7	0.6		0.9		0.8	Section 4.4
4	Crop production/ Hectare (Quintal)			4.1	1.5		4.0	0.0	3.4			8.7	4.6		4.5	0.0	5.8	Section 4.4
5	Production Cost/ Hectare (Rs.)			4613	1468		3525	6029	5191			7884	10453		7894	13729	11532	Section 4.6
6	% of farmers using organic manure (%)			21.3	11.4		0.8	99.6	46.0			30.0	98.5		5.8	99.6	66.2	Section 4.7
7	% of farmers using chemical fertilizer (%)			0.0	0.3		0.0	2.5	5.0			2.5	3.4		19.1	9.2	20.8	Section 4.7
8	% of farmers doing mono crop			70.0	0.0		43.8	0.0	52.8			100.0	0.0		75.3	0.0	81.9	Section 4.3
9	% of farmers doing mixed crop			30.0	100.0		56.3	100.0	47.2			0.0	100.0		21.9	100.0	16.4	Section 4.3
10	% of framers doing inter cropping			0.0	0.0		0.0	0.0	0.0			0.0	0.0		2.7	0.0	1.7	Section 4.3
11	% of farmers doing SMI			0.0	0.0		1.6	0.0	0.9			5.0	0.0		16.4	0.0	12.1	Section 4.3

12	% of farmers doing LT			0.0	0.0		1.6	0.0	0.9			0.0	100.0		1.4	0.0	2.6	Section 4.3
13	% of farmers doing LS			0.0	0.0		0.0	0.0	0.0			70.0	0.0		1.4	100.0	25.9	Section 4.3
II	Consumption																	
18	% of production used for self-consumption			18.5	6.2		40.0	75.0	22.9			13.0	40.9		12.3	13.3	15.6	Section 4.4
III	Marketing																	
19	Quantity of marketable surplus/ farmer (Quintal)			1.0	1.5		0.7	0.3	0.9			1.5	0.4		0.7	1.3	1.2	Section 4.4
IV	Processing																	
20	% of households undertaking manual processing of millets			100.0	100.0		100.0	100.0	100.0			100.0	100.0		100.0	100.0	100.0	Section 6.1
21	% of households undertaking machine processing of millets			0.0	0.0		0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	Section 6.1
22	Average distance covered for machine processing of millets			0.0	0.0		0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	Section 6.1

Chapter-IX: Conclusion: Key Findings and Way Forward

9.1 Key Findings

9.1.1 Characteristics of Millet Farmers

- Majority of millet farmers covered under OMM are under the age group of 25-50 years followed by more than 50 years age group. Overall coverage of male and female farmers under OMM is at 75.3 and 24.7 percent respectively.
- About 64.9 percent of millet farmers are illiterates, 17.7 percent of farmers have education upto primary standard and another 6.8 percent have education upto upper primary standard.
- Majority of millet farmers, overall, to the extent of 73.8 percent are Scheduled Tribes (STs) followed by other castes (20.5%) and the remaining 5.6 percent are SCs.
- More than 90 percent of millet farmers of Gajapati and Rayagada district are STs by their social category. Majority of farmers, about 84 percent of millet farmers are Hindus by religion followed by Christianity (16.0%).
- A sizable chunk of millet farmers are marginal and small farmers. Proportionate share of marginal and small farmers jointly account around 78.1 percent of the total millets farmers as discussed.
- Overall, for about 60 percent of millet farmers, their residential houses are semi pucca houses followed by kutchha houses and pucca houses. Percentage share of pucca houses in the overall residential housing structures of millet farmers is about 18.2 percent.
- There are 2.5 male and 2.4 female members per millet farmers’ household. More than 90 percent of the sampled-out millet farmers of Gajapati and Rayagada district are oldest registered millet farmers as they have have joined into OMM in the year 2017-18.
- The average land owned by marginal, small, medium and large farmers is found as 1.7 acres, 2.7 acres, 4.3 acres and 8.9 acres respectively. Overall, it is found that the average land holding per millet farmer is found at 2.9 acres.
- The operational land holdings per millet farmer is found at 3.7 acres. Overall sex ratio in the project area is found at 935. About 60 percent of household members are found employed in agricultural activities as their principal occupation.
- A miniscule proportion of the total household members roughly 3 percent are employed in other occupations as principal source of income.
- Main occupation of these 3 percent of people includes daily wage earner, business activities, Govt. and private service, artisan, MFP collection etc.
- Wage earning and agriculture are the two major sources of subsidiary occupation in the project area. The overall annual household income from principal as well as subsidiary occupation is calculated at Rs. 50052.

9.1.2 Behaviour of Millet Production

- 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.
- It is found that paddy area per farmer has marginally declined in all of the project districts except Malkangiri, Koraput and Rayagada. In Koraput district there is no change, however, in Malkangiri and Rayagada district, there is marginal increase in paddy are per farmer.

- Similarly, there is more than 10 percent fall in the pulses areas in Malkangiri district and 5 percent fall of the same in Koraput district.
- Out of seven districts, in five districts, there is falling tendency of vegetable area per farmer. With respect to oil seeds and cash crops there is also falling tendency in the crop area per farmer in three districts. However, with respect to ragi, except two districts, five districts witnessed positive increase in the land area per farmer.
- There is sizable increase in ragi area per farmer in Malkangiri district. Compared to pre project situation, there is about 20 percent increase in ragi area per farmer during post project situation. Overall speaking the Gross Cropped area per farmer, otherwise called average operational land holding per farmer has increased from 7.079 acres during pre-project period to 8.799 during post project period, thereby registering 24.3 percent increase in the average operational area per farmer.
- For ragi crop, it is found that there is about 60 percent increase in monocropping of millets and correspondingly there is sufficient decline mixed and intercropping of millets. During post project period, about more than 85 percent of the ragi farmers have abandoned mixed and intercropping of ragi and have switched over to monocropping of ragi.
- Similarly, the extent of increase of monocropping of Suan, bajara, Janha, and kodo millets during post project period has increased by 97.3, 200, 42.9 and 68.2 percent respectively. for all types of millets almost in all of the project districts farmers have shifted from traditional broadcasting method of cultivation and adopted other scientific methods of cultivation.
- In addition to promoting the outreach of existing millets among a greater number of farmers, the OMM has also successfully promoted new varieties of millets in the project area. Besides, the project has also successfully promoted a set of packages of practices like improved cultivation methods, better agronomic practices and importance of de-weeding on millet fields.
- During pre-project situation Amount of production of ragi per farmer and per acre is found at 1.7 and 2.6 quintals respectively. However, during post project situation, the amount of production per farmer and per acre are found to be at 5.6 and 6.0 Quintal respectively.
- Considering the total production of suan during pre-project and post project situations separately, the production per acre during pre-project situation is found at 1.7 quintal as against the same at 2.5 quintal during post project situation. Similarly total production of suan per farmer during pre-project and post project situations is calculated at 1.7 and 2.1 Quintals respectively.
- It is found that kangu production per farmer and per acre during pre-project situation was at 0.73 and 1.38 quintals respectively. During post project situation, production of kangu per farmers has increased to 0.83 quintals and per acre to 2.35 quintals.
- Janha production per farmer and per acre during pre-project situation was at 1.28 and 2.32 quintals respectively. During post project situation, production of janha per farmer has increased to 1.45 quintals and per acre to 2.54 quintals.
- The total cost of millet cultivation per acre during pre-project period stands at Rs. 2093.1 of which Rs.1301.3 is the operational cost and Rs.791.8 is the labour cost. In per acre analysis also obviously, manure and ploughing charges are found to be the leading costs. Jointly, these tow costs account as high as 84 percent of the total operational cost per acre of ragi cultivation.

- With respect to labour cost per acre of cultivation, it is mainly contributed harvesting time labour cost and transplantation time labour cost. Besides weeding cost is third prominent contributor to labour cost per acre of ragi cultivation.

9.1.3 Behaviour of Millet Consumption

- Compared to pre project situation, proportion households consuming millets during post project situation has substantially improved in winter and rainy seasons. However about six percent of households have reduced millet consumption during summer season. Inter district variation in the seasonality of consumption pattern during post project period indicates that more than 95 percent of millet farming households are consuming millets in Winter season.
- During pre-project period, the mean daily household consumption of millets during winter, rainy and summer season is calculated at 0.7 Kg., 0.4 Kg., and 0.5 Kg. respectively. During post project period, the mean daily household consumption of millets during winter, rainy and summer season is found at 0.5 Kg., 0.5 Kg. and 0.4 Kg. respectively.
- Compared to any other time of the time of the day, millet consumption time during post project period is maximum reported for breakfast time for which it may be stated that millets have emerged as the most preferred breakfast cereal in the project area.
- During pre-project situation, overall, about 39.6 percent of millet producers were purchasing millets from the market, which has been reduced 18.8 percent in the post project situation. This implies that additionally about 20 percent of millet farmers have become self-sufficient by producing their household millet requirements.
- The average quantity of millet purchased per annum per millet purchasing household during pre-project and post-project period is calculated at 0.28 and 1.86 quintal respectively.
- During pre-project period, as high as 83.3 percent of the household requiring purchase of millet for household consumption were purchasing local market as well as receiving wage good. However, during post project situation has brought about a breakthrough in the system of household millet purchase.
- During post project situation, as high as 86.2 percent of needy households are purchasing millet from PDS. The study views that it is a significant impact of OMM for promoting a vibrant PDS system to bolster household millet consumption in the project area.

9.1.4 Behaviour of Millet Marketing and Processing

- 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 20 Kms. So, it can be stated that, on an average, households cover an average distance of 11 Kms. to undertake the primary processing of millets.
- 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 use locally available traditional instruments like "dhinki", made up of wooden logs, and "chakki", made up of two round stone plates.
- 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. Local middlemen, local haat, local money lender, input supplier and barter are different market channels through which surplus millet is sold by the farmers.
- 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 79.8 percent of surplus ragi surplus were sold through middlemen and now, during post project period, as maximum as 81 percent of surplus ragi are sold through Mandis.

9.2 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 undertake cultivation of ragi.
- Besides, there are farmer level suggestions 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 in 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.