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

## Gajapati District




**Submitted to-**

**Submitted By-**

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

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**Green India**

## Abbreviations

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

# Chapter-I: Introduction

## 1.1 Background

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

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

## 1.2 Increased Relevance of Millet Production and Consumption

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

[1] ICRISAT Official website
[2] https://foodprint.org/real-food/millet/
[3] Jones, Martin (2016): " Food Globalisation in prehistory: The agrarian foundations of an interconnected continent", Journal of the British Acdemy, Vol-4, PP 73-87
[4] M.I. Gomez, S.C. Gupta, in Encyclopedia of Food Sciences and Nutrition (Second Edition), 2003
[5] https://themillet.org/a-brief-history-of-millets/

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

### 1.3 Emphasis towards Millet Production in India

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

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

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

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

'Nutrient Management', 'Agricultural insurance', 'Credit support', 'Markets', 'Access to Information' and 'Livelihood diversification'.[9]

### 1.3.1 Intensive Millet Promotion (INSIMP)

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

### 1.3.2 National Mission for Sustainable Agriculture (NMSA)

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

### 1.3.3 Rainfed Area Development Programme (RADP)

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

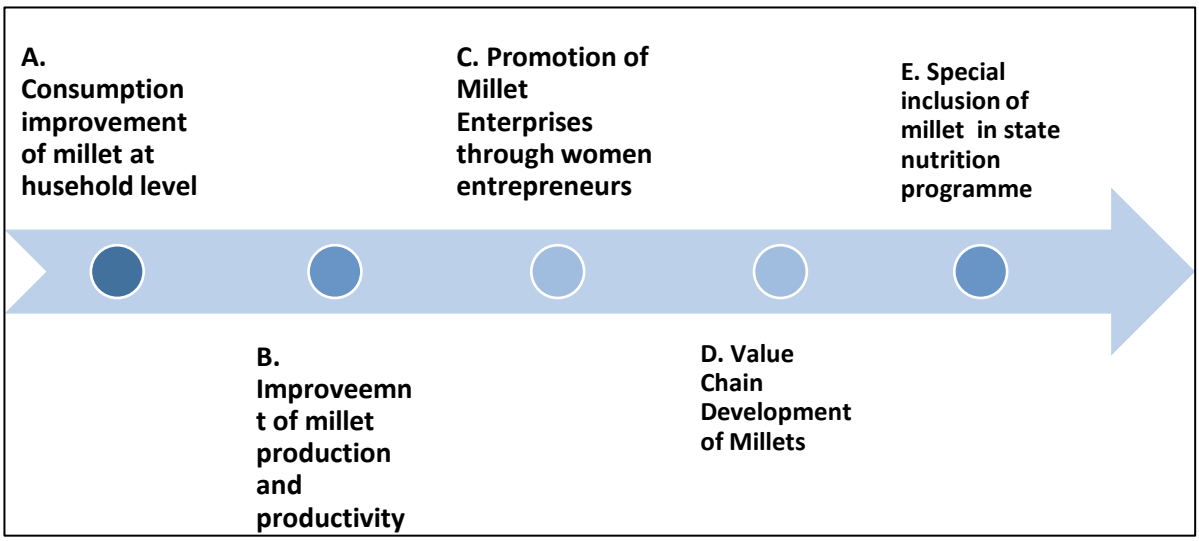
[9] Department of Agriculture & Cooperation, (2014), "National Mission for Sustainable Agriculture (NMSA): Operational Guidelines", Ministry of Agriculture, Government of India

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

### 1.4 Special Programme for Millets in Tribal Areas of Odisha

Special Programme for millets in tribal areas otherwise called Odisha Millet Mission (OMM) evolved in 2017, after a state level consultation organized by Planning and Convergence Department, Govt. of Odisha on the subject "Comprehensive Revival of Millets in Tribal areas of Odisha" to secure Nutrition Security and mitigate drought in South Odisha held at Nabakrushna Choudhury Centre for Development Studies on 27th January 2016. This led to a series of interactions and a memorandum of understanding (MoU) was signed on 27 February 2017 between the Directorate of Agriculture and Food Production (DAFP) as the state level nodal agency that would monitor and implement the programme, NCDS as the state secretariat that would also anchor the research secretariat, and Watershed Support Services and Activities Network (WASSAN) that would anchor the programme secretariat as part of the state secretariat. The date of signing of the contract was treated retrospectively as the start date of progrmme 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[10], 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

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

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

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.[12] Following this principle, Initially the programme was started in 29 blocks under seven tribal districts, Kalhandi, 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.[13] 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.[14]

**Programme Outreach of OMM**

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

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

[12] 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.

[13] 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.

[14] OMM official website

## 1.5 Coverage of Millet Farmers in Gajapati District

The first phase implementation of OMM in Odisha had covered 22075.8 hectares of land in all of the seven programme districts and about 2937.49 hectares of land. Gajapati district accounts about 14.9 percent of the overall OMM outreach in the state. In Gajapati district, during the first phase of OMM, maximum outreach in terms of land area covered for millet cultivation was 31.3 percent in Gumma block followed by R Udayagairi (25.0 %), Mohana (23.5 %) and Gudari (20.1%).

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

| Sl. | Blocks | Land area taken up for ragi cultivation by Districts, blocks and crop years (in Hectares) | | | | % Share of the block in district total | % share of the district in state total |
|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | All Years | | |
| 1 | Gumma | 174.2 | 350.2 | 508.2 | 1032.6 | 31.3 | 14.9 |
| 2 | Mohana | 134 | 253.6 | 388.6 | 776.2 | 23.5 | |
| 3 | R.Udayagiri | 202.4 | 284 | 338.3 | 824.7 | 25.0 | |
| 4 | Rayagada | 118.2 | 215 | 331.2 | 664.4 | 20.1 | |
| 5 | **Sub total** | **628.8** | **1102.8** | **.3** | **3297.9** | 100.0 | |
| | **All districts** | **3161.03** | **7625.93** | **11288.8** | **22075.8** | | **100.0** |

Source: Computed from WASSAN Official data

OMM implementation In Gajapati district was started in the year 2018-19. Out of the total non ragi millet area taken up by the registered millet farmers during the first phase implementation in the state, percentage share of non-ragi millet cultivated lands in Gajapati district was about 17.0 percent. Similarly, out of the non-ragi millet cultivated lands in the district, percentage share of Rayagada block stands at 36.57 percent followed by R Udayagiri block at 33.01 percent. Remaining 30 percent are with Gumma and Mohana blocks.

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

| Sl. | Blocks | Land area taken up for non-ragi millet cultivation by Districts, blocks and crop years (in Hectares) | | | | % Share of the block in district total | % share of the district in state total |
|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | All Years | | |
| 1 | Gumma | 0 | 88.6 | 31.6 | 120.2 | 18.32 | 17.0 |
| 2 | Mohana | 0 | 57.8 | 21.6 | 79.4 | 12.10 | |
| 3 | R.Udayagiri | 0 | 150 | 66.6 | 216.6 | 33.01 | |
| 4 | Rayagada | 0 | 95.4 | 144.6 | 240 | 36.57 | |
| | **Sub total** | **0** | **391.8** | **264.4** | **656.2** | 100.00 | |

Source: Computed from WASSAN Official data

Out of the total 63002 millet farmers covered under first phase OMM intervention in the state, about 18.5 percent of millet farmers were covered in Gajapati district. Percentage share of millet farmers in Gumma, Mohana, R udayagiri and Rayagada blocks stand at 33.7, 22.5, 20.6 and 23.1 percent respectively.

**Table-1.4: Farmer Outreach under first phase intervention OMM in Gajapati district**

| Sl. | Blocks | Number of farmers covered under first phase OMM by districts, blocks and crop years (No. of farmers) | | | | % Share of the block in district total | % Share of the district in state total |
|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | All Years | | |
| 1 | Gumma | 610 | 1405 | 1918 | 3933 | 33.7 | 18.5 |
| 2 | Mohana | 386 | 955 | 1280 | 2621 | 22.5 | |
| 3 | R.Udayagiri | 546 | 941 | 916 | 2403 | 20.6 | |
| 4 | Rayagada | 232 | 739 | 1727 | 2698 | 23.1 | |
| | **Sub total** | **1774** | **4040** | **5841** | **11655** | 100.0 | |
| | **All districts** | **8636** | **21972** | **32394** | **63002** | | 100.0 |

## 1.6 About the Study

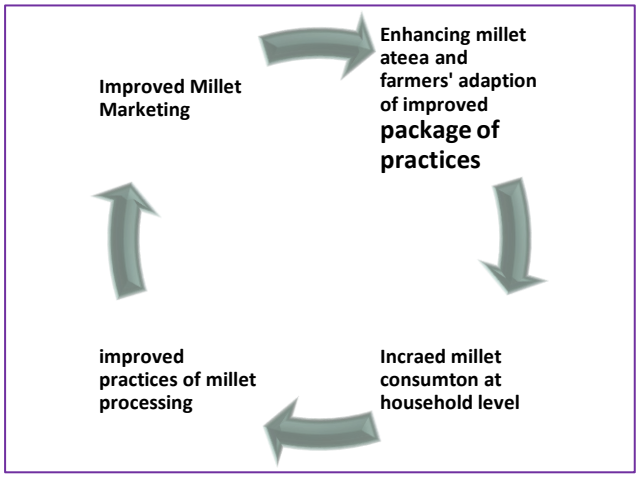
Present study is aimed at the mid-term evaluation of OMM I Gajapati district taking into account the stipulated parameters for production, consumption, millet marketing and processing by the registered millet farmers of Gajapati district in Odisha.

## 1.7 Objectives of the Study

- → 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 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 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. 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.

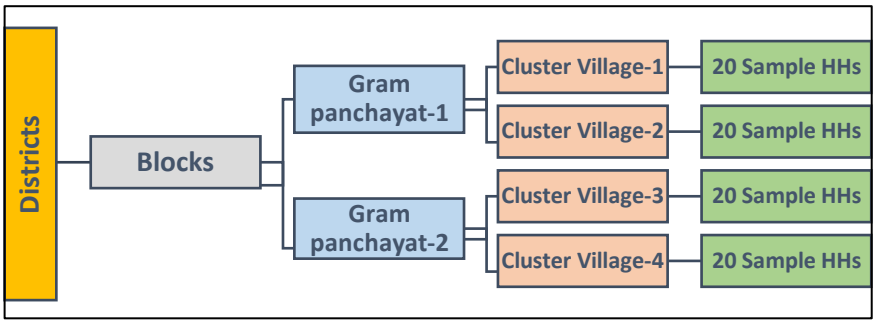



**Table-1.5: Sample Design**

| Sl. | Blocks | Gram Panchayats | Villages | No. of households covered in the study |
|---|---|---|---|---|
| 1 | Gumma | Bhubani, Tarbha | Ameisingi & Tidasingi, Buruding & Tarava | 80 |
| 2 | Mohana | Baghamari, Chandiput | Andiragada & Baghamari, Kaliapata & Taramal | 80 |
| 3 | R Udayagiri | Mangarajapur, Sabarapali | Balidi & Sargisahi Anukampa & Tikemal | 80 |
| 4 | Rayagada | Ameda, Laxmipur | Gatida & Titli, Gayabaljuba & Raiguma | 80 |
| | | | **Sub total** | **320** |

### 1.8.3 Statistical Instruments

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

### 1.8.4 Study Period

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

# Chapter-2: Brief Profile of Gajapati District in Odisha

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 Gajapati district is outlined in this chapter. The pattern of millet production is discussed in the light of changes taking place over time. 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.


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: *Distric*t 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 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

## 2.2. 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

## Concluding Remarks

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 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. 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 situations. In the small millets, the yield rate in Gajapati district stands lower compared to all Odisha situation in both the decades. 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 situations. On the other hand, there is much better improvement in the annual production of small millets in Gajapati district in 2010s compared to 2000s.

# Chapter-III: Socio Economic Characteristics of Millet Farmers of Gajapati District

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

## 3.1 Social Category

The farmers covered under OMM are predominantly ST farmers and overall ST farmers constitute around 93.1 percent followed by SC farmers 5.6 percent and other category of farmers at 1.3 percent. Except R Udayagiri block, coverage of ST farmers is more than 90 percent in all other blocks. All of the registered millet farmers of Rayagada block are ST farmers.

**Table-3.1: Social Category of farmers**

| Sl. | Blocks | No. of millet farmers | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | SC | % Share | ST | % Share | OC | % Share | Total | % Share |
| 1 | Gumma | 1 | 1.3 | 78 | 97.5 | 1 | 1.3 | 80 | 100 |
| 2 | Mohana | 8 | 10.0 | 72 | 90.0 | | 0.0 | 80 | 100 |
| 3 | R. Udayagiri | 9 | 11.3 | 68 | 85.0 | 3 | 3.8 | 80 | 100 |
| 4 | Rayagada | | 0.0 | 80 | 100.0 | | 0.0 | 80 | 100 |
| | All blocks | **18** | 5.6 | **298** | 93.1 | **4** | 1.3 | **320** | 100 |

## 3.2 Age Structure

The age structure is defined in terms of average age of millet farmers which overall found at 46.2 years. The average aga of millet farmers in all of the reporting blocks ranges between 43-48 years which can be said millet farmers are within the better part of their productive age.

**Table-3.2: Mean Age of farmers by social Category**

| Sl. | Blocks | Mean age of farmers | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | SC | S.D. | ST | S.D. | OC | S.D. | Total | S.D. |
| 1 | Gumma | 61.0 | | 47.8 | 11.4 | 41.0 | | 47.9 | 11.4 |
| 2 | Mohana | 47.6 | 4.7 | 45.3 | 10.8 | | | 45.5 | 10.3 |
| 3 | R. Udayagiri | 48.9 | 8.5 | 47.3 | 11.3 | 48.3 | 17.2 | 47.5 | 11.1 |
| 4 | Rayagada | | | 43.8 | 12.2 | | | 43.8 | 12.2 |
| | All blocks | **49.0** | 7.3 | **46.0** | 11.5 | **46.5** | **14.5** | **46.2** | **11.3** |

N: B: S.D. means standard deviation around the mean

## 3.3 Sex Category

Millet farmers classified on the basis of sex category as male and millet farmers reveals that majority of registered millet farmers are male farmers. Overall, about male and female millet registered under OMM stands at 80 and 20 percent respectively. Highest proportion of female millet farmers are found at Gumma block relative to other blocks. In other blocks incidence of millet farmers is more than 80 percent.

**Table – 3.3 No. of Farmers by sex Category**

| Sl. | Blocks | No. of farmers by sex category | | | | | |
|---|---|---|---|---|---|---|---|
| | | Male | % Share | Female | % Share | Total | % Share |
| 1 | Gumma | 58 | 72.5 | 22 | 27.5 | 80 | 100.0 |
| 2 | Mohana | 64 | 80.0 | 16 | 20.0 | 80 | 100.0 |
| 3 | R. Udayagiri | 68 | 85.0 | 12 | 15.0 | 80 | 100.0 |
| 4 | Rayagada | 66 | 82.5 | 14 | 17.5 | 80 | 100.0 |
| | All blocks | **256** | 80.0 | **64** | 20.0 | **320** | 100.0 |

## 3.4 Educational Background

The educational background of millet farmers as indicated in table 3.4 reveals that majority of millet farmers of Gajapati district are illiterates followed primary level of education. In percentage terms, out of the total registered millet farmers, majority of millet farmers are illiterates followed by primary standard (13.1%) and about 5.6 percent of them have above HSC level educational background.

**Table-3.4: Framers' Educational Background**

| Sl. | Blocks | Number of farmers | | | | | |
|---|---|---|---|---|---|---|---|
| | | Illiterate | Primary | Upper Primary | Upto HSC | Above HSC | Total |
| 1 | Gumma | 75 | 1 | 1 | 2 | 1 | 80 |
| 2 | Mohana | 61 | 13 | 1 | 1 | 4 | 80 |
| 3 | R. Udayagiri | 46 | 16 | 4 | 6 | 8 | 80 |
| 4 | Rayagada | 57 | 12 | 3 | 3 | 5 | 80 |
| | All blocks | **239** | **42** | **9** | **12** | **18** | **320** |
| | | % of framers | | | | | |
| 1 | Gumma | 93.8 | 1.3 | 1.3 | 2.5 | 1.3 | 100.0 |
| 2 | Mohana | 76.3 | 16.3 | 1.3 | 1.3 | 5.0 | 100.0 |
| 3 | R. Udayagiri | 57.5 | 20.0 | 5.0 | 7.5 | 10.0 | 100.0 |
| 4 | Rayagada | 71.3 | 15.0 | 3.8 | 3.8 | 6.3 | 100.0 |
| | All blocks | 74.7 | 13.1 | 2.8 | 3.8 | 5.6 | 100.0 |

## 3.5 Religion

All of the registered millet farmers of the district are either Hindus or Christians by religion. Overall, 74.4 percent of millet farmers are Hindus by religion followed by Christianity at 25.6 percent. Majority of millet farmers of Gumma block to the extent of 92.5 percent are Christians with respect to their religious faith.

**Table-3.5: Millet Farmers by Religion**

| Sl. | Blocks | No. of millet farmers by religion | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hindu | % | Christian | % | Total | % |
| 1 | Gumma | 6 | 7.5 | 74 | 92.5 | 80 | 100.0 |
| 2 | Mohana | 75 | 93.8 | 5 | 6.3 | 80 | 100.0 |
| 3 | R. Udayagiri | 78 | 97.5 | 2 | 2.5 | 80 | 100.0 |
| 4 | Rayagada | 79 | 98.8 | 1 | 1.3 | 80 | 100.0 |
| | All Blocks | **238** | 74.4 | **82** | 25.6 | **320** | 100.0 |

### 3.6 Farmer Category

On the basis of amount of land holdings farmers are categorised under marginal farmers (MFs), small farmers (SFs), medium farmers and large farmers. As per table 3.4, it is found that majority of millet farmers of the district are marginal farmers followed by small farmers. Proportionate share of marginal and small farmers in the total registered millet farmers under OMM stands at 52.5 and 27.2 percent respectively. These two categories of farmers jointly constitute around 80 percent of the total millet farmers. Conversely, proportionate share of medium and large farmers stands at 16.6 and 3.8 percent respectively.

**Table-3.6: No. of farmers by Farmer Category**

| Sl. | Blocks | No. of millet farmers by Farmer category | | | | |
|---|---|---|---|---|---|---|
| | | MF | SF | Medium Farmers | Large Farmers | Total |
| 1 | Gumma | 49 | 13 | 15 | 3 | 80 |
| 2 | Mohana | 38 | 25 | 13 | 4 | 80 |
| 3 | R. Udayagiri | 30 | 38 | 8 | 4 | 80 |
| 4 | Rayagada | 51 | 11 | 17 | 1 | 80 |
| | All blocks | **168** | **87** | **53** | **12** | **320** |
| | | **% of millet farmers** | | | | |
| 1 | Gumma | 61.3 | 16.3 | 18.8 | 3.8 | 100.0 |
| 2 | Mohana | 47.5 | 31.3 | 16.3 | 5.0 | 100.0 |
| 3 | R. Udayagiri | 37.5 | 47.5 | 10.0 | 5.0 | 100.0 |
| 4 | Rayagada | 63.8 | 13.8 | 21.3 | 1.3 | 100.0 |
| | All blocks | 52.5 | 27.2 | 16.6 | 3.8 | 100.0 |

### 3.7 House Structure

The housing structure of millet farmers as analysed in table 3.5 reveals that overall, higher proportion of millet farmers of the district have semi pucca houses followed by pucca houses. About 89 percent of millet farmers of the district have semi pucca and pucca houses. Relatively higher proportion of millet farmers of Raygada block have Kutcha houses.

**Table-3.7 : Housing Structure of millet farmers**

| Sl. | Blocks | No. of millet farmers by house type | | | |
|---|---|---|---|---|---|
| | | Pucca | Semi Pucca | Kutcha | Total |
| 1 | Gumma | 18 | 61 | 1 | 80 |
| 2 | Mohana | 25 | 51 | 4 | 80 |
| 3 | R. Udayagiri | 22 | 54 | 4 | 80 |
| 4 | Rayagada | 24 | 29 | 27 | 80 |
| | All Blocks | **89** | **195** | **36** | **320** |
| | | **% Share** | | | |
| 1 | Gumma | 22.5 | 76.3 | 1.3 | 100.0 |
| 2 | Mohana | 31.3 | 63.8 | 5.0 | 100.0 |
| 3 | R. Udayagiri | 27.5 | 67.5 | 5.0 | 100.0 |
| 4 | Rayagada | 30.0 | 36.3 | 33.8 | 100.0 |
| | All Blocks | 27.8 | 60.9 | 11.3 | 100.0 |

## 3.8 Household Structure

A household structure comprises of male as well as female members. As it can be seen from table 3.8, overall, there are 2.9 male and 2.8 female members per each millet farmers' household in the district. The average family size is found at 5.7 persons. There is intra district variations in the average family size of millet farmers' households.

**Table-3.8: Household Size**

| Sl. | Blocks | No. of household members/ Household among the millet farmers | | | Number of females per 1000 males |
|---|---|---|---|---|---|
| | | Males | Females | Total | |
| 1 | Gumma | 3.1 | 3.1 | 6.0 | 1000 |
| 2 | Mohana | 3.1 | 2.8 | 5.8 | 903 |
| 3 | R. Udayagiri | 2.8 | 2.3 | 5.1 | 821 |
| 4 | Rayagada | 2.6 | 2.8 | 5.4 | 1077 |
| | All Blocks | **2.9** | **2.8** | **5.6** | 966 |

## 3.9 Year of joining into OMM

In order to avail the benefits of OMM project intervention, the farmers in the programme area are required to register themselves with OMM. The sampled-out farmers covered in the study have joined into OMM since 2017-18. As it is evident from table 3.9, almost all of the farmers have joined into OMM in 2017-18 year only. Out of 320 registered millet farmers, 308 farmers have joined in 2017.18 and only twelve farmer have joined in the subsequent years 2018-19 and 2019-20.

**Table-3.9: Year of joining into OMM**

| Sl. | Blocks | No. of farmers | | | |
|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | Total |
| 1 | Gumma | 78.0 | 2.0 | | 80.0 |
| 2 | Mohana | 79.0 | | 1.0 | 80.0 |
| 3 | R. Udayagiri | 73.0 | 7.0 | | 80.0 |
| 4 | Rayagada | 78.0 | 2.0 | | 80.0 |
| | All Blocks | **308.0** | **11.0** | **1.0** | **320.0** |

## Concluding Remarks

Almost all the farmers have joined into OMM in 2017-18 year only. Out of 320 registered millet farmers, 308 farmers have joined in 2017.18 The farmers covered under OMM are predominantly ST farmers and overall ST farmers constitute around 93.1 percent followed by SC farmers 5.6 percent and other category of farmers at 1.3 percent. The age structure is defined in terms of average age of millet farmers which overall found at 46.2 years. Overall, about male and female millet registered under OMM stands at 80 and 20 percent respectively. Highest proportion of female millet farmers are found at Gumma block relative to other blocks. Majority of millet farmers of Gajapati district are illiterates followed primary level of education. Overall, 74.4 percent of millet farmers are Hindus by religion followed by Christianity at 25.6 percent. Majority of millet farmers of the district are marginal farmers followed by small farmers. Proportionate share of marginal and small farmers in the total registered millet farmers under OMM stands at 52.5 and 27.2 percent respectively. Overall, higher proportion of millet farmers of the district have semi pucca houses followed by pucca houses. About 89 percent of millet farmers of the district have semi pucca and pucca houses. Overall, there are 2.9 male and 2.8 female members per each millet farmers' household in the district. The average family size is found at 5.7 persons.

# 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 Operational Land holding

The farmers' operational land holding as shown in table 4.1 comprises of own land, encroached land and shared in land. The overall operation landholding among the millet farmers of Gajapati district is found to be ay 3.8 acres of which own land is 1.2 acres and 1.3 acres is shared in land. Own land per farmer is calculated to be at 1.2 acres.

**Table-4.1: Millet Framers' Operational Landholding**

| Sl. | Blocks | Land owned (Acres) | Other encroached land, if any (Acres) | Shared in Land (Acres) | Total Operational Land holding (Acres) |
|---|---|---|---|---|---|
| 1 | Gumma | 1.6 | 1.3 | 0.8 | 3.7 |
| 2 | Mohana | 2.5 | 1.2 | 1.3 | 5 |
| 3 | R. Udayagiri | 2.8 | 1.6 | 1.6 | 6 |
| 4 | Rayagada | 1.2 | 1.3 | 1.3 | 3.8 |
| | All Blocks | 1.2 | 1.3 | 1.3 | 3.8 |

## 4.2 Cropping Pattern

Cropping of pattern of the millet farmers in the project area is analysed in terms of crop mix, which is combinations different crops grown by them. The millet farmers not only produce millet. In addition to millet, they cultivate paddy, pulses, vegetables, oil seeds, and cash crops. Ragi, suan, Kangu, Janha and kodo are different types of millets cultivated by the farmers. A comparative picture about number farmers cultivating different crops during post project situation compared to pre project situation is presented in the following table 4.2. It is evident that there is very much nominal decline in the number of farmers cultivating paddy, and cash crops during post project period in relation to pre project period. However, with respect to pulses and vegetables, there has not been any change in the number of farmers cultivating these crops during both time periods. Ragi is the major millet in the district and number of farmers cultivating ragi has increased by 1.6 percent during post project period.

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

| Sl. | Districts | Time Period | Overall agricultural practices of sample farmers (No. of farmers) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Gumma | Mohana | R. Udayagiri | Rayagada | All blocks |
| 1 | Paddy | Before Project | 68 | 69 | 73 | 67 | 277 |
| | | After Project | 67 | 69 | 73 | 67 | 276 |
| | | % Variation | -1.5 | 0.0 | 0.0 | 0.0 | -0.4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | Pulses | Before Project | 37 | 10 | 28 | 16 | 91 |
| | | After Project | 37 | 11 | 27 | 16 | 91 |
| | | % Variation | 0.0 | 10.0 | -3.6 | 0.0 | 0.0 |
| 3 | Vegetables | Before Project | 33 | 17 | 22 | 18 | 90 |
| | | After Project | 33 | 17 | 22 | 18 | 90 |
| | | % Variation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4 | Oil seeds | Before Project | 3 | | | | 3 |
| | | After Project | 3 | | | | 3 |
| | | % Variation | 0.0 | | | | 0.0 |
| 5 | Cash Crops | Before Project | 31 | 63 | 69 | 21 | 184 |
| | | After Project | 31 | 64 | 67 | 21 | 183 |
| | | % Variation | 0.0 | 1.6 | -2.9 | 0.0 | -0.5 |
| 6 | Ragi | Before Project | 79 | 78 | 79 | 76 | 312 |
| | | After Project | 80 | 79 | 80 | 78 | 317 |
| | | % Variation | 1.3 | 1.3 | 1.3 | 2.6 | 1.6 |
| 7 | Suan | Before Project | | 1 | 1 | 3 | 5 |
| | | After Project | | | | 3 | 3 |
| | | % Variation | | -100.0 | -100.0 | 0.0 | -40.0 |
| 9 | Kangu | Before Project | | | | 1 | 1 |
| | | After Project | | | | 0 | 0 |
| | | % Variation | | | | -100.0 | -100.0 |

## 4.3 Crop Area

Crop wise land area among the sample farmers during pre-project period compared to post project period is separately shown for all the project blocks in the following table 4.3. It is observed that area under paddy and cash crops has marginally decreased by 0.8 and 2.2 percent during post project period in comparison to pre project period. During the same period, there has not been change in the land area utilised for pulses, vegetables and oil seeds. Area used for ragi has increased by around 4.5 percent. Sizable fall in land area used for suan cultivation is noticed during post project period. Compared to pre project situation, suan and kangu crops cultivated by very limited number of farmers at Rayagada block of the district has tended to further diminish.

**Table-4.3: Area under crop in post project period compared to pre project period among the sample farmers (Land area in Acres)**

| | | | Area under Crops in OMM Blocks of Gajapati district (Acres) | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Districts** | **Time Period** | **Gumma** | **Mohana** | **R. Udayagiri** | **Rayagada** | **All blocks** |
| 1 | Paddy | Before Project | 55.41 | 98.5 | 92 | 57 | 302.91 |
| | | After Project | 54.41 | 98.50 | 90.50 | 57.00 | 300.41 |
| | | % Variation | -1.8 | 0.0 | -1.6 | 0.0 | -0.8 |
| 2 | Pulses | Before Project | 33.65 | 5.5 | 25.5 | 13.5 | 78.15 |
| | | After Project | 33.65 | 6.5 | 24.5 | 13.5 | 78.15 |
| | | % Variation | 0.0 | 18.2 | -3.9 | 0.0 | 0.0 |
| 3 | Vegetables | Before Project | 20.03 | 15.00 | 15.00 | 13.50 | 63.53 |
| | | After Project | 20.02 | 14.50 | 15.00 | 14.00 | 63.52 |
| | | % Variation | 0.0 | -3.3 | 0.0 | 3.7 | 0.0 |
| 4 | Oil seeds | Before Project | 2.5 | | | | 2.5 |
| | | After Project | 2.5 | | | | 2.5 |
| | | % Variation | 0.0 | | | | 0.0 |
| 5 | Cash Crops | Before Project | 4.15 | 5.5 | 44.5 | 15 | 69.15 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | After Project | 4.15 | 5.5 | 43 | 15 | 67.65 |
| | | % Variation | 0.0 | 0.0 | -3.4 | 0.0 | -2.2 |
| 6 | Ragi | Before Project | 67.83 | 70.5 | 88 | 75.5 | 301.83 |
| | | After Project | 68.95 | 70.5 | 88 | 76 | 303.45 |
| | | % Variation | 1.7 | 0.0 | 0.0 | 0.7 | 0.5 |
| 7 | Suan | Before Project | | 1 | 1.5 | 2 | 4.5 |
| | | After Project | | | | 1.5 | 1.5 |
| | | % Variation | | -100.0 | -100.0 | -25.0 | -66.7 |
| 8 | Kangu | Before Project | | | | 0.5 | |
| | | After Project | | | | 0 | |
| | | % Variation | | | | -100.0 | |

## 4.4 Package of Practices for Millet Production

### 4.4.1 Method of Cultivation

With the objective of increasing the productivity of millets improved agronomic practices among the farmers have been popularized by the OMM project. This includes Introducing System of Crop Intensification based on suitability, Promotion of Line transplanting/Line sowing/Inter cropping of millets, Improved manure/ composting / in-situ practices for better crop nutrition Pest and disease management practices in the lines of NPM and other organic/agro ecological practices as deemed necessary as per local needs. In this direction, method of cultivation of millets assumes significance. As it is indicated in table 4.4, 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. From previous analysis it is noted that argi is the major millet cultivated by the millet farmers of the district. Ragi farmers mainly undertaking monocropping method of cultivation. As high as 99 percent of ragi farmers adapted monocropping method of cultivation during pre-project period, which has slightly come down to 94.3 percent during post project period. As per the following table it is clearly indicated that the farmers who do not practice monocropping method of cultivation, they have shifted for mixed cropping method of ragi cultivation during post project period.

**Table-4.4: Method of cultivation adopted by millet farmers for ragi (Mono crop, mixed crop and inter crop)**

| Sl. | Blocks | Pre-Project (No. of farmers) | | | | Post-Project (No. of farmers) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mono Crop | Mixed Crop | Inter crop | Total | Mono Crop | Mixed Crop | Inter crop | Total |
| 1 | Gumma | 58 | 2 | | 60 | 59 | 1 | | 60 |
| 2 | Mohana | 79 | | | 79 | 75 | 4 | | 79 |
| 3 | R. Udayagiri | 79 | 1 | | 80 | 72 | 8 | | 80 |
| 4 | Rayagada | 79 | | | 79 | 75 | 4 | | 79 |
| 5 | All blocks | 295 | 3 | 0 | 298 | **281** | **17** | **0** | 298 |
| | | **Pre-Project (% of farmers)** | | | | **Post-Project (% of farmers)** | | | |
| 1 | Gumma | 96.7 | 3.3 | | 100.0 | 98.3 | 1.7 | 0.0 | 100.0 |
| 2 | Mohana | 100.0 | 0.0 | | 100.0 | 94.9 | 5.1 | 0.0 | 100.0 |
| 3 | R. Udayagiri | 98.8 | 1.3 | | 100.0 | 90.0 | 10.0 | 0.0 | 100.0 |
| 4 | Rayagada | 100.0 | 0.0 | | 100.0 | 94.9 | 5.1 | 0.0 | 100.0 |
| 5 | All blocks | 99.0 | 1.0 | | 100.0 | 94.3 | 5.7 | 0.0 | 100.0 |

### 4.4.2 Agronomic Practices

Comparative analysis of the agronomic practices of millet farmers during post period compared to pre project period suggests that, there is declining importance of broadcasting and increasing importance of other type of agronomic practices like SMI, LT and LS methods. As per the following table 4.5, it is evident that for all types of millets almost in all of the project blocks of the district, 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 LT method particularly for argi and kodo millets, which are found to be the two major millets of the district. During interaction with Community Resource Persons (CRPs)[15] 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 for adopting modern methods of cultivation. This has encouraged farmers for better adoption of SMI cultivation. From the following table, it is evident that during pre-project period, the agronomic practice of ragi cultivation was based on broadcasting methods. However, due to OMM project intervention, broadcasting method is completely bandoned by the ragi farmers and now during post project period, the farmers are mainly using SMI and LT based ragi cultivation.

**Table-4.5: Cultivation Practices of Ragi**

| Sl. | Blocks | Pre-Project (No. of Farmers) | | | | | Post-Project (No. of farmers) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SMI | LT | LS | Broad casting | Total | SMI | LT | LS | Broad casting | Total |
| 1 | Gumma | | | | 60 | 60 | 59 | 1 | | | 60 |
| 2 | Mohana | | | | 79 | 79 | 79 | | | | 79 |
| 3 | R. Udayagiri | | | | 80 | 80 | 79 | 1 | | | 80 |
| 4 | Rayagada | | | | 79 | 79 | 78 | 1 | | | 79 |
| | All blocks | | | | 298 | 298 | **295** | **3** | | | 298 |

### 4.4.3 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 4.6, it is evident that during pre-project period, all of the reported ragi farmers were undertaking two time weeding and now, being conscious of the impacts of weeding on better crop productivity, significant majority of farmers have adopted more than two times of weeding for ragi crops.

**Table-4.6: Weeding practices followed for cultivating ragi millet in the project area**

| Sl. | Blocks | Pre-Project (No. of farmers) | | | | Post-Project (No. of farmers) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | One time | Two times | More than two times | Total | One time | Two times | More than two times | Total |
| 1 | Gumma | - | 60 | - | 60 | - | - | 60 | 60 |
| 2 | Mohana | - | 79 | - | 79 | - | 1 | 78 | 79 |
| 3 | R. Udayagiri | - | 80 | - | 80 | - | 2 | 78 | 80 |
| 4 | Rayagada | - | 79 | - | 79 | - | 3 | 76 | 79 |
| | All blocks | - | 298 | - | 298 | - | **6** | **292** | 298 |

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

## 4.5 Production Behaviour of Ragi in the district

Ragi is found to be the major millet reported in the district. For other types of millets, there are only a few farmers involved during pre-project and post project period. So, taking note of the importance of ragi, the economics ragi production in the district compared to all Odisha situation (All OMM districts) is analysed in this section. It is found that production per farmer and production per acre of ragi in Gajapati district is found at 1.4 and 2.1 quintals which is marginally lower compared to all Odisha situations.

**Table-4.7: Behaviour of millet production in Gajapati District (Pre-project period)**

| Sl. | Particulars | Ragi | Suan/Gurji | Kangu | Janha | Kodo | All millets |
|---|---|---|---|---|---|---|---|
| 1 | No. of farmer involved in millet cultivation | 312 | 5 | 1 | | | 318 |
| 2 | Area under millet cultivation (Acres) | 303 | 5 | 1 | | | 308 |
| 3 | Production /Farmer (Quintal) | 1.4 | 0.6 | 0.3 | | | 1.4 |
| 4 | Production /Acre (Quintal) | 2.1 | 0.9 | 0.8 | | | 1.4 |
| 5 | Total Sales Proceeds/Framer (Rs.) | 140 | | | | | 138 |
| 6 | Total Sales Proceeds/ Acre (Rs.) | 144 | 0 | 0 | | | 142 |
| 7 | Total Sales Proceeds/ Quintal of marketable surplus (Rs.) | 1550 | 0 | 0 | | | 877 |
| 8 | Total Cost /Farmer (Rs.) | 2595 | 2102 | 2186 | | | 2294 |
| 9 | Total Cost / Acre (Rs.) | 2669 | 2162 | 2248 | | | 2360 |
| 10 | Total Cost / Quintal of marketable surplus (Rs.) | 3128 | 1295 | 3855 | | | 2514 |
| 11 | Net Income/ Farmer (Rs.) | -2455 | -2102 | -2186 | | | -2156 |
| 12 | Net Income/ Acre (Rs.) | -2525 | -2162 | -2248 | | | -2218 |
| 13 | Net Income / Quintal of marketable surplus (Rs.) | -1578 | -1295 | -3855 | | | -1637 |

**Table- 4.8: Behaviour of millet production in Gajapati district (post-project period)**

| Sl. | Particulars | Ragi | Suan/Gurji | Kangu | Janha | Kodo | All millets |
|---|---|---|---|---|---|---|---|
| 1 | No. of farmer involved in millet cultivation | 317 | 3 | | | | 320 |
| 2 | Area under millet cultivation (Acres) | 309 | 2 | | | | 310 |
| 3 | Production /Farmer (Quintal) | 5.6 | 2.3 | | | | 5.5 |
| 4 | Production /Acre (Quintal) | 5.7 | 2.8 | | | | 5.7 |
| 5 | Total Sales Proceeds/Framer (Rs.) | 16510 | 2256 | | | | 16355 |
| 6 | Total Sales Proceeds/ Acre (Rs.) | 16967 | 3886 | | | | 16883 |
| 7 | Total Sales Proceeds/ Quintal of marketable surplus (Rs.) | 2960 | 4646 | | | | 3247 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | Total Cost /Farmer (Rs.) | 5447 | 4412 | | | | 4930 |
| 9 | Total Cost / Acre (Rs.) | 5598 | 4534 | | | | 5066 |
| 10 | Total Cost / Quintal of marketable surplus (Rs.) | 1165 | 2537 | | | | 1109 |
| 11 | Net Income/ Farmer (Rs.) | 11063 | -2156 | | | | 11425 |
| 12 | Net Income/ Acre (Rs.) | 11369 | -648 | | | | 11817 |
| 13 | Net Income / Quintal of marketable surplus (Rs.) | 1795 | 2109 | | | | 2138 |

**Table- 4.9: Behaviour of millet production in the State (First Phase 29 blocks under OMM Intervention) during Pre Project period**

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

**Table- 4.10: Behaviour of millet production in the State (First Phase 29 blocks under OMM Intervention) during Post Project period**

| Sl. | Particulars | Ragi | Suan/Gurji | Kangu | Janha | Kodo | All millets |
|---|---|---|---|---|---|---|---|
| 1 | No. of farmer involved in millet cultivation | 2252 | 213 | 29 | 28 | 116 | 2638 |
| 2 | Area under millet cultivation | 2102 | 178 | 10 | 16 | 115 | 2422 |
| 3 | Production /Farmer (Quintal) | 5.6 | 2.1 | 0.83 | 1.45 | 1.2 | 5.0 |
| 4 | Production /Acre (Quintal) | 6.0 | 2.5 | 2.35 | 2.54 | 1.2 | 5.5 |
| 5 | Total Sales Proceeds/Framer (Rs.) | 16515 | 2256 | 5290 | 3671 | 3601 | 14700 |
| 6 | Total Sales Proceeds/ Acre (Rs.) | 17692 | 3886 | 2178 | 4296 | 4955 | 16012 |
| 7 | Total Sales Proceeds/ Quintal of marketable surplus (Rs.) | 2960 | 4646 | 6132 | 7541 | 4990 | 3294 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | Total Cost /Farmer (Rs.) | 4341 | 4081 | 3591 | 3699 | 3995 | 3941 |
| 9 | Total Cost / Acre (Rs.) | 4650 | 4371 | 3847 | 3962 | 4279 | 4222 |
| 10 | Total Cost / Quintal of marketable surplus (Rs.) | 987 | 2537 | 9342 | 3386 | 3109 | 1030 |
| 11 | Net Income/ Farmer (Rs.) | 12174 | -1825 | 1699 | -28 | -394 | 10759 |
| 12 | Net Income/ Acre (Rs.) | 13042 | -485 | -1669 | 334 | 676 | 11790 |
| 13 | Net Income / Quintal of marketable surplus (Rs.) | 1973 | 2109 | -3210 | 4155 | 1881 | 2264 |

## 4.6 Varieties of Ragi Cultivated

Varieties of ragi cultivated in the OMM project area is highlighted in the following table 4.12. 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. Improved "Arjuna", Chilika and Bhairavi varieties of ragi is introduced by some of the farmers in Gajapati district.

**Table-4.12: Reported varieties of ragi seeds used in the OMM area**

| Blocks | Varieties of seeds used by ragi farmers | |
|---|---|---|
| | Traditional Varieties | Improved varieties |
| Gumma | Sana Mandia, Bada Mandia, Kartika, Dushara | Arjuna |
| Mohana | Sana Tara, Bada Tara, Dhala Mandia, Pata Mandia, Bagada, Budha, Kala guduli, Hata Bhanga, Kanta Mera, | Chilika, Bhairavi, Arjuna |
| R Udayagiri | Bada Mandia, Tara, Mojala, | Arjuna |

## Concluding Remarks

The overall operation landholding among the millet farmers of Gajapati district is found to be ay 3.8 acres of which own land is 1.2 acres and 1.3 acres is shared in land. There is very much nominal decline in the number of farmers cultivating paddy, and cash crops during post project period in relation to pre project period. However, with respect to pulses and vegetables, there has not been any change in the number of farmers cultivating these crops during both time periods. Ragi is the major millet in the district and number of farmers cultivating ragi has increased by 1.6 percent during post project period. area under paddy and cash crops has marginally decreased by 0.8 and 2.2 percent during post project period in comparison to pre project period. During the same period, there has not been change in the land area utilised for pulses, vegetables, and oil seeds. Area used for ragi has increased by around 4.5 percent. Sizable fall in land area used for suan cultivation is noticed during post project period. 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. From previous analysis it is noted that argi is the major millet cultivated by the millet farmers of the district. Ragi farmers mainly undertaking monocropping method of cultivation. As high as 99 percent of ragi farmers adapted monocropping method of cultivation during pre-project period, which has slightly come down to 94.3 percent during post project period. for all types of millets almost in all of the project blocks of the district, 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 LT method particularly for argi and kodo millets, which are found to be the two major millets of the district. During pre-project period, the agronomic practice of ragi cultivation was based on broadcasting methods. However, due to OMM project intervention, broadcasting method is completely bandoned by the ragi farmers and now during post

project period, the farmers are mainly using SMI and LT based ragi cultivation. During pre-project period, all of the reported ragi farmers were undertaking two time weeding and now, being conscious of the impacts of weeding on better crop productivity, significant majority of farmers have adopted more than two times of weeding for ragi crops. Production per farmer and production per acre of ragi in Gajapati district is found at 1.4 and 2.1 quintals which is marginally lower compared to all Odisha situations. Despite continuance of traditional varieties, ragi farmers in selected areas also undertake ragi cultivation by introducing improved varieties. Improved “Arjuna”, Chilika and Bhairavi varieties of ragi is introduced by some of the farmers in Gajapati district.

# 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.[16] In this chapter, an attempt has been made to analyse household consumption pattern of millets on the basis of household survey data obtained from 320 households in all of the programme blocks. The consumption pattern examines seasonality of mean household consumption pattern, preferred timing of the day for the consumption of millets, extent of dependence of millet households on market for purchasing millets, average quantity of millet purchased per millet household and source of purchase of millets.

## 5.1 Seasonality of Household Millet Consumption

The seasonality of household millet consumption pattern is analysed based on proportion of households in the project area consume millets during different seasons in a year. The different seasons are categorized as Winter seasons, Rainy seasons, and summer seasons. As per table 5.1, it is found that in the district as well as intervention blocks, ragi was consumed by almost all households during pre-project period which has remained same during the post project period also.

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

| Blocks | No. of households consuming Millets | | | | | |
|---|---|---|---|---|---|---|
| | Pre- project period | | | Post-project period | | |
| | Winter season | Rainy season | Summer season | Winter season | Rainy season | Summer season |
| Gumma | 79 | 79 | 79 | 79 | 79 | 79 |
| Mohana | 80 | 80 | 80 | 80 | 80 | 80 |
| R. Udayagiri | 80 | 80 | 80 | 80 | 80 | 80 |
| Rayagada | 79 | 79 | 79 | 79 | 79 | 79 |
| All blocks | **318** | **318** | **318** | **318** | **318** | **318** |

## 5.2 Mean Consumption Pattern

The mean consumption pattern is analysed considering mean household consumption of millets per day and further it is analysed by winter, rainy and summer seasons. As per the analysis made in table 5.2, it is revealed ed that per household millet consumption in summer season has remained constant during pre-project as well as post project period. However, the same has marginally increased for winter and rainy seasons during post project period.

**Table-5.2: Seasonality in average household consumption of millets**

| Sl. | Blocks | Millet Consumption per household (Kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pre- project period | | | Post-project period | | |
| | | Summer season | Winter season | Rainy season | Summer season | Winter season | Rainy season |
| | Gumma | 0.589 | 0.516 | 0.523 | 0.554 | 0.515 | 0.516 |
| | Mohana | 0.653 | 0.520 | 0.586 | 0.661 | 0.549 | 0.604 |
| | R. Udayagiri | 0.589 | 0.449 | 0.510 | 0.599 | 0.499 | 0.538 |
| | Rayagada | 0.606 | 0.448 | 0.535 | 0.623 | 0.484 | 0.542 |
| | All blocks | **0.609** | **0.483** | **0.539** | **0.609** | **0.512** | **0.550** |

[16] OMM Guidelines, 25.11.2016.

## 5.3 Household Dependence on Market for Millets

Despite own production of millets, most often millet farmer households depend on market to meet the household consumption requirement. This implies their own production is insufficient to meet their domestic requirements or self-consumption for which they purchase millets from the market. As per table 5.4, it is observed that for meeting domestic consumption requirements about 99.1 percent of the households were purchasing millets from market. OMM has brought about drastic changes in this front. Now during post project period almost all of the households have become self-sufficient, and they no longer depend on market for purchasing millets. This has become possible due to rising production of millets among the millet farmer households.

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

| Districts | No. of households' purchase millet for household use | | | | | Average quantity of millet purchased for household use (Quintal) | |
|---|---|---|---|---|---|---|---|
| | Pre-project period | % of HHs | Post-Project period | % of HHs | Total Households surveyed | Pre- project period | Post- Project period |
| Gumma | 79 | 98.8 | 1 | 1.3 | 80 | 0.28 | 2 |
| Mohana | 80 | 100.0 | 0 | 0.0 | 80 | 0.28 | |
| R. Udayagiri | 80 | 100.0 | 0 | 0.0 | 80 | 0.27 | |
| Rayagada | 78 | 97.5 | 0 | 0.0 | 80 | 0.26 | |
| All blocks | 317 | 99.1 | 1 | 0.3 | 320 | 0.27 | |

## 5.5 Source for purchasing millets

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

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

| Sl. | Source for millet purchase | % of households purchasing millets from different sources during pre-project period | |
|---|---|---|---|
| | | Gajapati | All districts |
| 1 | Local Market | 0 | 4.6 |
| 2 | Wage good | 0 | 1.5 |
| 3 | Barter | 0 | 3 |
| 4 | Received as gift from fellow relatives | 0 | 0.4 |
| 5 | Local market & PDS | 8 | 4.7 |
| 6 | Local Market & Wage good | 91.4 | 83.3 |
| 7 | Local Market and Barter | 0.6 | 2 |
| 8 | PDS and wage good | 0 | 0.2 |
| 9 | Wage good and barter | 0 | 0.1 |
| | Total | 100 | 100 |
| | | % of households purchasing millets from different sources during post project period | |
| 1 | Local Market | 0 | 9.8 |
| 2 | PDS | 50.0 | 86.2 |
| 3 | Barter | 0 | 0.6 |
| 4 | Local market & PDS | 0 | 0.8 |
| 5 | Local Market & Wage good | 50.0 | 1.8 |
| 6 | PDS & Barter | 0 | 0.7 |
| | Total | 100.0 | 100 |

## Concluding Remarks

Ragi is consumed by almost all households during pre-project period which has remained same during the post project period also. Per household millet consumption in summer season has remained constant during pre-project as well as post project period. However, the same has marginally increased for winter and rainy seasons during post project period. It is observed that for meeting domestic consumption requirements about 99.1 percent of the households were purchasing millets from market. OMM has brought about drastic changes in this front. Now during post project period almost all of the households have become self-sufficient, and they no longer depend on market for purchasing millets. This has become possible due to rising production of millets among the millet farmer households. During pre-project period, major source of purchasing millets were local market and wage good. However, during post project period owing to mainstreaming of PDS, households are found purchasing millets from PDS.

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

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

## 6.1 Primary Processing of Millets

The type of first-hand processing of the produced millets by the farmers' themselves is conceptually known as primary processing. From the previous analysis it is well known that millet farmers ultimately use their produced millet for the purpose of self-consumption and sales of marketable surplus. Thus, broadly there are two types of processing activities separately carried out by the millet farmers. This implies for self-consumption; they do undertake one type of processing and for marketing purposes they do undertake different types of processing. Table 6.1 analyses the processing activities undertaken by the households for self-consumption of millets. The different food items prepared for millets are also discussed separately for all the districts. The processing activities mainly comprise of converting ragi to flour and de-husking in the case of other millets. With respect to ragi flour making, majority of households depend on machine for which they cover a minimum distance of 2 Kms. and maximum distance of 15 Kms. On the other hand, for other types of millets, de-husking of millet is required which is done through traditional means by all households. However, the household's dependent on traditional processing uses locally available traditional instruments like "dhinki", made up of wooden logs, and "chakki", made up of two round stone plates. Dhinki is used for dehusking and chakki is used for grinding. Both these instruments are operated manually.

**Table-6.1: Processing of millets for Self-Consumption**

| Sl. | Type of millets reported | Type of food items prepared by millet households | Reported Primary Processing activities | Access to Primary Processing Methods | Average distance covered for machine processing |
|---|---|---|---|---|---|
| 2 | Ragi | Porridge, thick prridge, 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 |
| 2 | Suan | Upma | De-husking for saun rice | All HHs do debussing manually through traditional means like dhenki . | Nil distance |
| | | khir | De-husking for saun rice | All HHs do debussing manually through traditional means like dhenki . | Nil distance |
| | | | | | |

So far as processing of marketable surplus is concerned, traditionally millets farmers were categorising millets particularly ragi under two categories as with and without husk. Accordingly, there was price differentiation and obviously they were selling with husked millets at lower price and without husked millets at a higher price. Soon after the introduction of Mandies under OMM, millet farmers are processing their millets as per Mandi standards. They are sun-drying dehusked millets for maintaining required moisture. Very commonly, they sell millets with husk at a lower price. The middlemen undertake value addition activities by making millets husk free. Further middlemen also do 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 66.7 percent of surplus ragi surplus were sold through local haat and now, during post project period, as maxim as 99.8 percent of surplus ragi are sold through Mandis in Gajapati district. This is a remarkable achievement of OMM. Selling of surplus ragi at local moneylender was also a solid channel during pre-project period which is not found of any relevance during post project period.

**Table-6.2: Marketing of Ragi by different Marketing Channels**

| **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** |
| Gajapati | - | 0 | 66.7 | 33.3 | 0.0 | 0.0 |
| **All districts** | **-** | 79.8 | 18.3 | 0.7 | 0.0 | 1.1 |
| | **Marketing of Ragi by farmers in different market channels (% of overall quantity) during post-project period** | | | | | |
| Gajapati | 99.8 | 0.2 | 0.0 | 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**

| 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** |
| Gajapati | - | 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** | | | | | |
| Gajapati | - | 100 | 0.0 | 0.0 | 0.0 | 0.0 |
| **All districts** | **-** | 83.7 | 15.7 | 0.7 | 0.0 | 0.0 |

## 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 15 Kms. On the other hand, for other types of millets, de-husking of millet is required which is done through traditional means by all households. However, the household's dependent on traditional processing uses locally available traditional instruments. 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. During pre-project situation, around 66.7 percent of surplus ragi surplus were sold through local haat and now, during post project period, as maxim as 99.8 percent of surplus ragi are sold through Mandis in Gajapati district. This is a remarkable achievement of OMM. Selling of surplus ragi at local moneylender was also a solid channel during pre-project period which is not found of any relevance 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.

# 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 | | | |
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| **Sl.** | **Stakeholders** | **Stakeholder' Opinions on the Strength of OMM in the district** | | | |
| | | **Production** | **Consumption** | **Processing** | **Marketing** |
| 1 | District level Agricultural Officers | → OMM has been instrumental in bringing more areas under millet cultivation.<br>→ More numbers farmers are also mobilised for millet cultivation.<br>→ Framer are provided with due training and hand holding support for better and scientific cultivation of millets.<br>→ Framers' training on Best possible agronomic practices is promoted under OMM.<br>→ Organic cultivation of millet is promoted. | → 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.<br>→ 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. | → Millet de-huskers, flour mills provided at local level have reduced the drudgery of women for processing of millets. | → Due to MSP for millets, farmers are quite encouraged for millet cultivation. |
| 2 | Block level Agricultural Officers | → Millet is a low investment crop for which tribal farmers with low investment capacity can better adapt to millet cultivation.<br>→ 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. | → 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.<br>→ Due to diversification of food, people have increased preference for millets.<br>→ Govt has systematically emphasized the relevance | → 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. | → Previously, farmers were mainly selling millets to local middlemen, whereby they were exploited by price front. Now due to Govt. procurement of millets through mandi, there is |

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| | | → Tribals are historically linked with millet cultivation. So, they are naturally advantageous to undertake millet cultivation. | and utility of millet consumption, for which more people are attracted for millet consumption. | | better scope for farmers to get authentic value for their produced millets. |
| 3 | District level WASSAN Officials | → Due to OMM intervention, farmers have accepted millets as one of the best crops to be cultivated by them in their own lands.<br>→ Most suitable crop in the rainfed areas.<br>→ It is very much cost effective compared to paddy. | → Millet is a cheap source of nutrition at household level. OMM promoted awareness programmes have influenced millet consumption in the project area.<br>→ Now, millets are distributed through PDS network for which millet consumption has increased.<br>→ 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. | → 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 | → Adequate training and handholding support are instrumental in bringing about proactive attitude of millet farmers towards continuance of millet cultivation.<br>→ Modern method of cultivation as provided under OMM is expected for further increase in millet productivity in the project area. | → 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.<br>→ The food festivals and exhibitions have showcased millet based food and recipes at different district, block and | → 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 produced by them. |

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| | | → Govt incentive scheme has encouraged more number of farmers with increased area of millet cultivation in the project area. | state level . This has contributed to increased millet consumption. | | |
| 5 | CBOs | → 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.<br>→ 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.<br>→ The management skills and other skill development programmes as provided to millet farmers have strengthened millet farmer's' confidence for millet production. | → 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.<br>→ 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 | → 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. | → 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. |

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| 6 | CRPs | → 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.<br>→ 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. | → CRPs are also engaged in promoting diversified millet recipes at household level which is augmenting household millet consumption in the project area. | → There are local level evidences that millets powders are found as essential ingredients of "Chhatua Powder". | → Due to the upsurge of millet consumption even among the non-millet producing households has significantly contributed to the upward market demand for millets. |

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 | → Change in the mindset of farmers is a time-consuming process. They are taking their own time from diverting to millets from other crops.<br>→ Further continuance of the OMM supported awareness programme would leverage the adoption of millets as an important dry land crop in the project area. | → There is still lack of awareness among the masses regarding the health benefits of millet consumption.<br>→ Millet should be included in the Food Security Act, of the Govt. of India, so that millet consumption | → 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. | → 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. |

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| | | | would be further increased. | | |
| 2 | Block level Agricultural Officers | → Millet farming is a traditional farming practice. Adoption of modern methods of cultivation is yet to be full-fledged. | → By nature, millets are light foods, so, most often people engaged in hard manual works, accord priority to heavy foods rather than millets. | → Most of the people are yet to be trained on the required specialised processing of millets. | → Govt. procurement of ragi is still limited and yet to be strengthened. |
| 3 | District level WASSAN Officials | → 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.<br>→ 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. | → 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.<br>→ Millet recipes although introduced under ICDS and PDS, still it is optional, so consumption improvement is not getting broad-based. | → Govt. through OMM project intervention is yet to promote access and usage of millet processing units at every village. | → Besides, non ragi millets are yet to be included in the ambit of Govt. procurement through the fixation of MSP. |
| 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 | → 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. |

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| | | | increasing millet consumption. | | |
| 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.<br>→ 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.<br>→ 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-availability of required certified seeds in timely manner. Perhaps use of certified seeds by the millets farmers can enhance millet production in the project area. | → Most of the rural people consume ragi millet as porridge (Jau) only, which is not tasty. Sufficient training and awareness on the preparation of alternative recipes would further increase millet consumption. | → Trained manpower to operate millet processing machines is also limiting factor for machine-based processing of millets in the project villages. | → Owing to higher cost of cultivation, the MSP of millets are still considered lower by the millet farmers.<br>→ 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 |

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| | | | | | cash inflow to the farmers bank A/Cs. |

7.3 Opportunities of OMM

| Sl. | Stakeholders | Stakeholder' Opinions on the Opportunities of OMM in the district | | | |
|---|---|---|---|---|---|
| | | **Production** | **Consumption** | **Processing** | **Marketing** |
| 1 | District level Agricultural Officers | → The net income from millet cultivation per acre of land is higher relative to other crops. So, there is good prospect of undertaking millet cultivation and substituting other crops by millets. | → Millet is very much nutritious and hygienic food. | → Ragi threshers and peelers supplied to SHGs will strengthen millet processing.<br>→ Pulverisers are likely to be provided through OMM will strengthen processing activities. | → There is increased scope of marketing of millets domestically as well as internationally. |
| 2 | Block level Agricultural Officers | → It requires less water and drought resistant. Even in the very unfavourable marginal lands, millet crops can be grown. | → It can be easily accessed in any type of marketing places starting village Haats upto supermarkets. | → Millet farmers to some extent have adopted modern methods of millet cultivation and processing. This is due to the sincere efforts of OMM. | → Millet procurement with MSP support is gradually mainstreamed and there is also systematic attempts to cover all millets under MSP. |
| 3 | District level WASSAN Officials | → It is climate resilient and having solid promise in rainfed agricultural scenarios. | → Multiple millet-based recipes are possible and households have slowly learned the preparation of multiple | → Millet farmers are gradually acquiring good deal of knowledge on millet | → Few of the Food retailers have already started branding of millets, so as to cater to |

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| | | | millet-based recipes owing to systematic intervention of OMM in providing demonstrations of different millet-based recipes. | processing and further value addition. | 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. | → Millet can be consumed along with many other foods.<br>→ It can be a wholesome meal even without combining with other foods.<br>→ Its consumption can be any meal of the day or all the meals of the day.<br>→ Millet is very much a flexible food. | → Millet processing units although not established in all of the villages, but, there is good access to the processing units at least at the GP level. | → Govt. has started millet-based tiffin centres with the support of SHGs, and there is good demand for the items supplied through this millet cafes. |
| 5 | CBOs | → Millet crops can be grown even in the sloppy terrains and hilly areas. | → Millet is proven immunity booster food and during the time of ongoing Covid-19 pandemic, millet consumption has increased relevance. | → Millet processing and value addition can enhance the value chain activity of millets and even the supply chain can be increased to the export market. | → There is good chance of promoting skills for millet-based value addition activities as well as strengthening the supply chain management of millet activities. |
| 6 | CRPs | → All categories of farmers can easily adopt millet cultivation, because of the simplicity of its cultivation process without entailing much of the sophisticated knowledge. | → The outreach of millet consumption could be further reinforced by further promoting millets in the MDMs and AWCS. | → There is plan to undertake systematic intervention for the promotion of millet processing in all of the OMM intervention villages. | → Considering that more number of households and household members are adopting millets as staple foods, there is good chance of marketing of millets in the immediate future. |

7.4 Threat of OMM

| Sl. | Stakeholders | Stakeholder' Opinions on the **Threats** of OMM in the district | | | |
|---|---|---|---|---|---|
| | | **Production** | **Consumption** | **Processing** | **Marketing** |
| 1 | District level Agricultural Officers | → Farmers will adopt to millet cultivation only in high land areas where paddy and cultivation of other crops are risky. In that way, there can't be any major diversion of 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 the commercial viability of millet farming. | → As millet are light foods and quickly digests, the hard-working rural people may find it costlier and inconvenient to substitute rice like heavy food for millet. | → There is large scale wastage in the processing of millets. | → Although, there is govt. procurement for ragi, for non ragi millets, such mechanism is yet to be established which is a limitation for millet farmers for proper marketing of their produce. |
| 3 | District level WASSAN Officials | → Millet cultivation can't be possible in all land categories, which is very | → Although quality wise millets are very good, but, most often people are | → There is absence of processing facilities at village level. | → Marketing of millets is viewed to be a constraint owing to |

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| | | much a limiting factor for aggressive outreach of millet cultivation. | detached from millet as taste wise, millets are not very good. | | limited processing facilities of millets. |
| 4 | Facilitating Agencies | → Farmers feel it difficult to consider millet cultivation as principal cultivation of any cropping season. Rather it is supplementary cultivation as perceived by the farmers. | → Despite promotion of so many varieties of millet base recipes, but majority of people consider ragi porridge as the main recipe, which can't be substituted by any other recipe. | → Considering limited demand, private investment in millet processing sector is found limited. | → In the case of non ragi millets, there is very much limited marketable surplus, for which it is becoming difficult to strengthen proper marketing channels for millets. Resultingly, middlemen purchase is found to be the very much established channels for non ragi millets. |
| 5 | CBOs | → Paddy cultivation, over time has influenced the socio, religious and cultural practices of farmers' households, which might hinder the sustained adoption of millet farming. | → Even if there is large scale adoption of millets as staple food, the supply of millet is limited. | → Limited mechanised processing facilities at village level discourage millet processors to go for necessary value addition particularly for millets requiring dehusking. It is the case of suan, kangu and kodo millets. | |
| 6 | CRPs | → Most often the millet farming is considered inferior compared to the prestige value attached to other crops cultivation particularly paddy cultivation. | → Large scale adoption of millet as staple food may lead to scarcity of millets and consequently higher price which may confuse households to consume millets. | | |

# Chapter-VIII: Key Findings and Way Forward

## 8.1 Key Findings

### 8.1.1 Outreach of OMM

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 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. 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 situations. In the small millets, the yield rate in Gajapati district stands lower compared to all Odisha situation in both the decades. 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 situations. On the other hand, there is much better improvement in the annual production of small millets in Gajapati district in 2010s compared to 2000s.

### 8.1.2 Socio Economic Characteristics of Millet Framers

Almost all the farmers have joined into OMM in 2017-18 year only. Out of 320 registered millet farmers, 308 farmers have joined in 2017.18 The farmers covered under OMM are predominantly ST farmers and overall ST farmers constitute around 93.1 percent followed by SC farmers 5.6 percent and other category of farmers at 1.3 percent. The age structure is defined in terms of average age of millet farmers which overall found at 46.2 years. Overall, about male and female millet registered under OMM stands at 80 and 20 percent respectively. Highest proportion of female millet farmers are found at Gumma block relative to other blocks. Majority of millet farmers of Gajapati district are illiterates followed primary level of education. Overall, 74.4 percent of millet farmers are Hindus by religion followed by Christianity at 25.6 percent. Majority of millet farmers of the district are marginal farmers followed by small farmers. Proportionate share of marginal and small farmers in the total registered millet farmers under OMM stands at 52.5 and 27.2 percent respectively. Overall, higher proportion of millet farmers of the district have semi pucca houses followed by pucca houses. About 89 percent of millet farmers of the district have semi pucca and pucca houses. Overall, there are 2.9 male and 2.8 female members per each millet farmers' household in the district. The average family size is found at 5.7 persons.

### 8.1.3 Behaviour of Millet Production

Ragi is consumed by almost all households during pre-project period which has remained same during the post project period also. Per household millet consumption in summer season has remained constant during pre-project as well as post project period. However, the same has marginally increased for winter and rainy seasons during post project period. It is observed that for meeting domestic consumption requirements about 99.1 percent of the households were purchasing millets from market. OMM has brought about drastic changes in this front. Now during post project period almost all of the households have become self-sufficient, and they no longer depend on market for purchasing millets. This has become possible due to rising production of millets among the millet farmer households. During pre-project period, major source of purchasing millets were local market and wage good. However, during post project period owing to mainstreaming of PDS, households are found purchasing millets from PDS.

### 8.1.4 Behaviour of Millet Consumption

Ragi is consumed by almost all households during pre-project period which has remained same during the post project period also. Per household millet consumption in summer season has remained constant during pre-project as well as post project period. However, the same has marginally increased for winter and rainy seasons during post project period. It is observed that for meeting domestic consumption requirements about 99.1 percent of the households were purchasing millets from market. OMM has brought about drastic changes in this front. Now during post project period almost all of the households have become self-sufficient, and they no longer depend on market for purchasing millets. This has become possible due to rising production of millets among the millet farmer households. During pre-project period, major source of purchasing millets were local market and wage good. However, during post project period owing to mainstreaming of PDS, households are found purchasing millets from PDS.

### 8.1.5 Behaviour of Millet Processing and Marketing

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 15 Kms. On the other hand, for other types of millets, de-husking of millet is required which is done through traditional means by all households. However, the household's dependent on traditional processing uses locally available traditional instruments. 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. During pre-project situation, around 66.7 percent of surplus ragi surplus were sold through local haat and now, during post project period, as maxim as 99.8 percent of surplus ragi are sold through Mandis in Gajapati district. This is a remarkable achievement of OMM. Selling of surplus ragi at local moneylender was also a solid channel during pre-project period which is not found of any relevance 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.

## 8.2 Way Forward

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