



Millet Production, Challenges & Opportunities-A Case Study Of Koraput District

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Abstract: Millets have been integral to the traditional farming systems of Koraput district, Odisha, particularly among tribal communities reliant on rain-fed agriculture. This study examines the present status of millet cultivation, emphasizing its ecological benefits and role in food security. Despite their adaptability and low input needs, millets face challenges such as weak market linkages, low yields, and limited institutional backing. Through field research and stakeholder engagement, the paper outlines these constraints while exploring new opportunities, including government revival initiatives, organic farming potential, and rising consumer interest. It concludes with actionable strategies to enhance millet production through policy integration, value chain strengthening, and community participation.

I. INTRODUCTION :

Koraput district, located in the southern part of Odisha, is a tribal-dominated region known for its rich biodiversity, hilly terrain, rain fed agriculture, and traditional agricultural practices. Among its key crops, Finger millets hold a significant place, cultivated for generations as both a food and cultural staple. Besides Finger millet there are little millet, foxtail millet & Pearl millet are count as major millet cultivating crops. However, in recent decades, millet production has seen a decline due to the shift towards commercial cash crops, limited market access, and changing dietary preferences, millet farming is seeing a strong revival—thanks to government initiatives like the Odisha Millets Mission (OMM). This program promotes sustainable millet production, improves processing infrastructure, and encourages the consumption of millets for better nutrition.

Despite this, Today, Koraput stands out as a model district for millet revival in India, driven by their nutritional benefits and climate resilience, presents an opportunity for revival, with thousands of small and marginal farmers adopting improved techniques and receiving direct support from the state. The focus on eco-friendly, climate-resilient farming and inclusion of millets in public nutrition programs has transformed millet farming from a subsistence activity to a livelihood opportunity in the region.

II. STUDY AREA :

Koraput is one of the top millet-producing districts in Odisha. Among these, Koraput ranks in the top 2-3 districts in terms of area under millet cultivation and production volume. While districts like Nabarangpur and Malkangiri also have substantial millet cultivation, Koraput's diversified millet varieties and higher yield make it stand out.

Koraput District lies along the Eastern Ghats bounded by Rayagada and Kalahandi district in the North, Nabarangpur and Bastar District of Chhattisgarh in the West and Malkangiri district in the South. It is the 3rd district in terms of size and also 15th in terms of population. Koraput is the seventh urbanized district in the state, with only 16.39% of its population residing in urban areas, compared to 16.69% of the state's population living in urban regions. More than 50% of the population is tribal belonging to various communities like Paraja, Gadaba, Kandha etc. There are 101 uninhabited villages in the district whereas 7 villages are having a population of more than 5000 each.

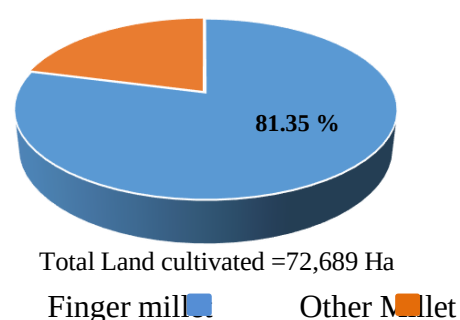
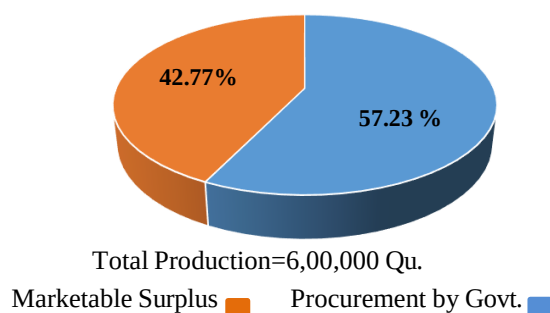


III. MILLET PRODUCTION SCENARIO

The FAO projected that global millet production would amount to 28.33 million metric tonnes in 2019 and increase to 30.08 million metric tonnes in 2021. As of 2021, India stands as the leading producer of millet, contributing to 41% of the total global production.. As well as, In Koraput district the production was also increased in **2023-2024** as compare to 2018-19.

The current scenario of millet production =

- Total millets production in Koraput district = **Approx. 6 lakh 10 thousand quintal**
- Total millets cultivated land = **72,689 ha. Of land**
- Finger millet cultivated land = **59,139 ha. Of land = (81.35%)**
- Other millets = **12,815 ha. Of land**
- From total production of millet,
- **3 lakh 72 thousand quintal** = marketable surplus
- **2 lakh 38 thousand quintal** = procurement by govt., Basically the production was occur 2 times in a year, i.e in Kharif season from July-November & in Rabi season from November to March



IV. RAGI PROCUREMENT DETAILS FOR YEAR 2021 TO 2025 FOR KORAPUT DISTRICT

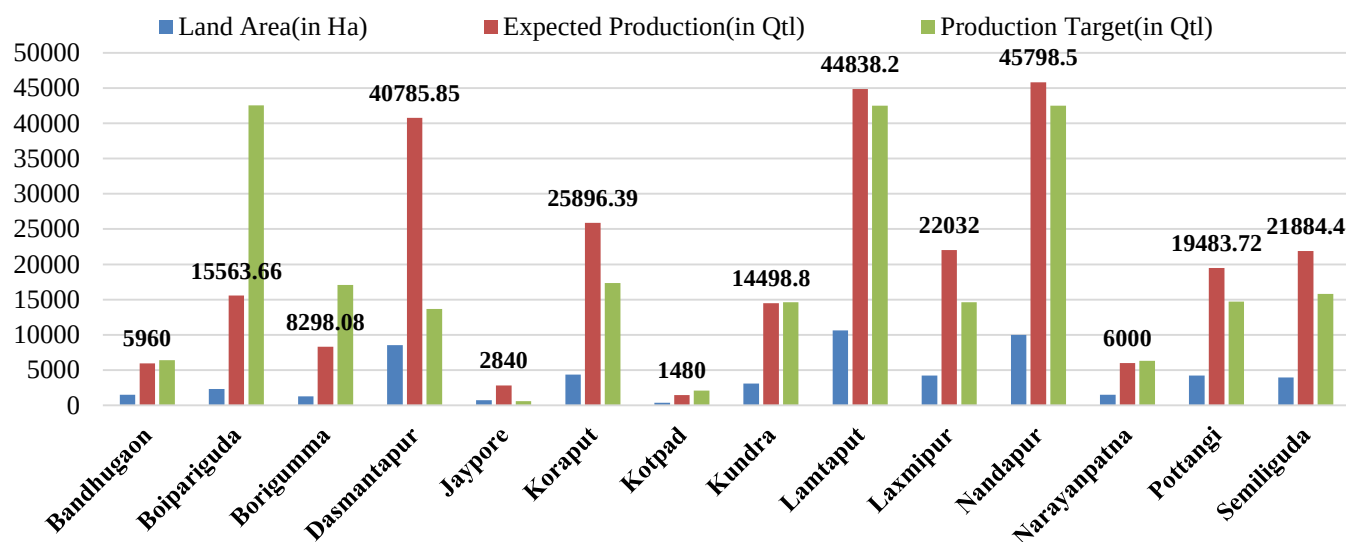


Fig-01.1 Showing procurement details of year 2021-2022.

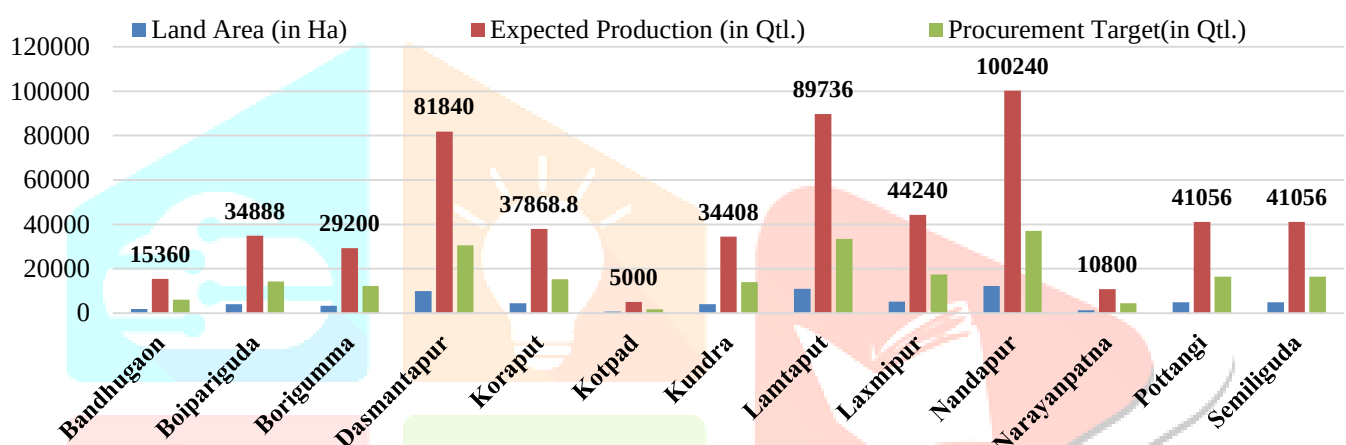


Fig- 01.2 Showing Finger Millet procurement details of year 2022-2023.

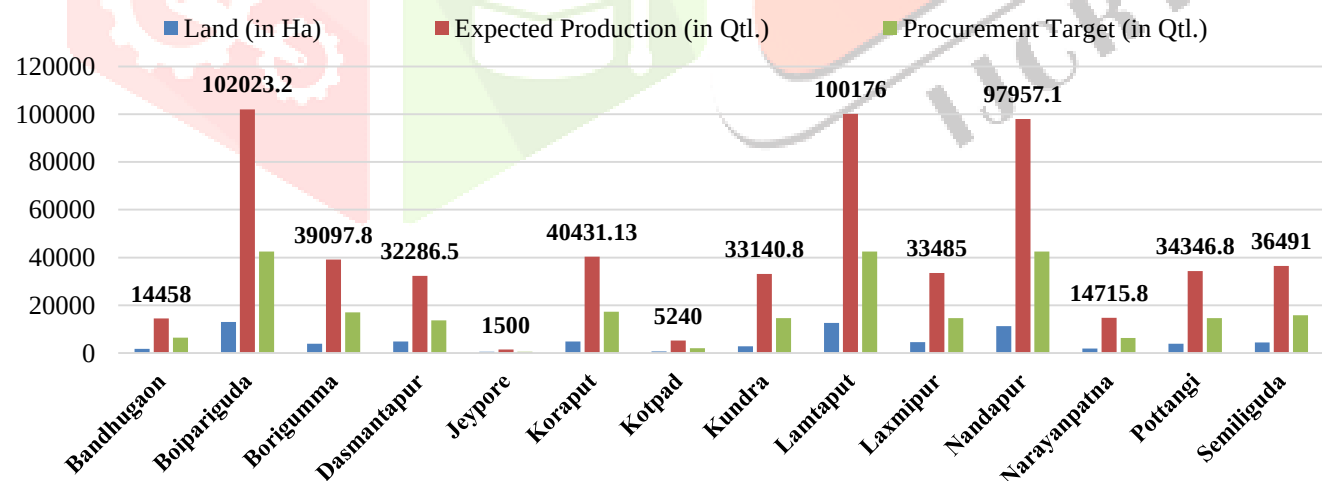


Fig-01.3 Showing Finger Millet Procurement Status of KMS 2023-24.

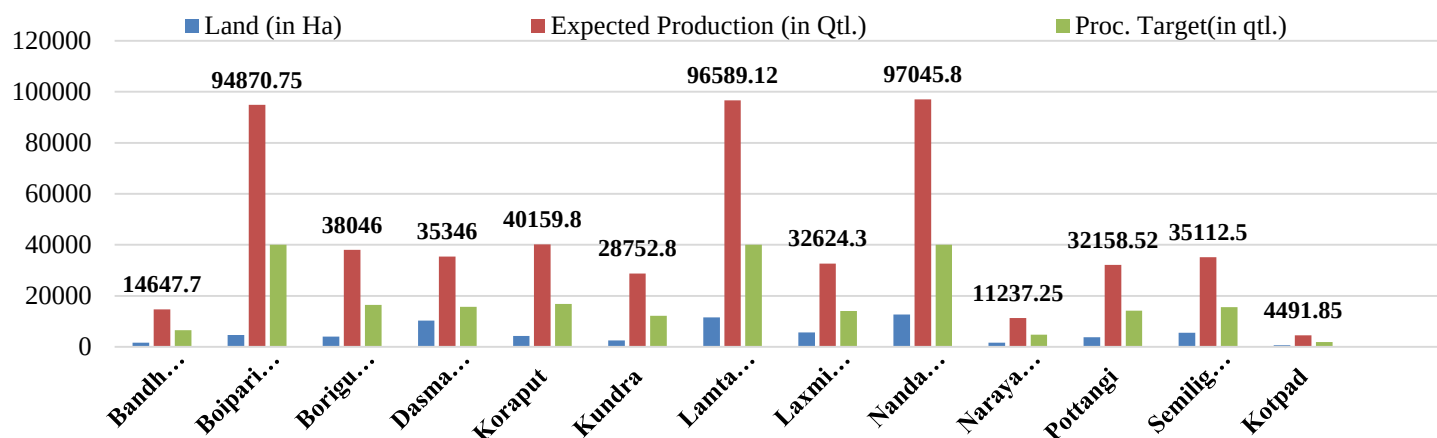


Fig 01.4 Showing Finger Millet Procurement Status of KMS 2024-25.

OBSERVATION:

- The expected production is gradually increased during 2021 to 2024 but in 2024-25 the production is comparatively less than in 2023 year.
- Land area is also gradually increased during 2021 to 2024 but in 2025, its decrease of about 2600 ha. as compare to previous year.
- The procurement behaviour of current year has decreased up to 13,000 qtl. as compared to 2023-24 due to Un favourable climatic conditions, leading to reduced sowing area & Market saturation or delayed payments from procurement agencies reduced farmer enthusiasm, resulting in lower targets being set.

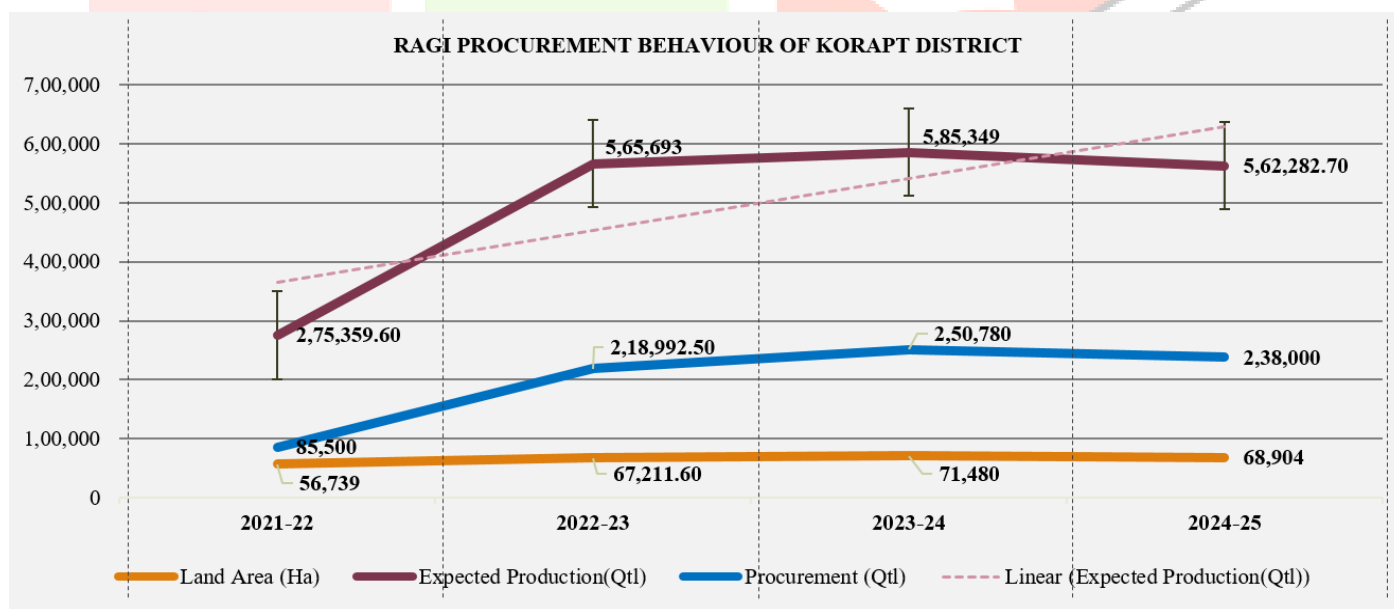
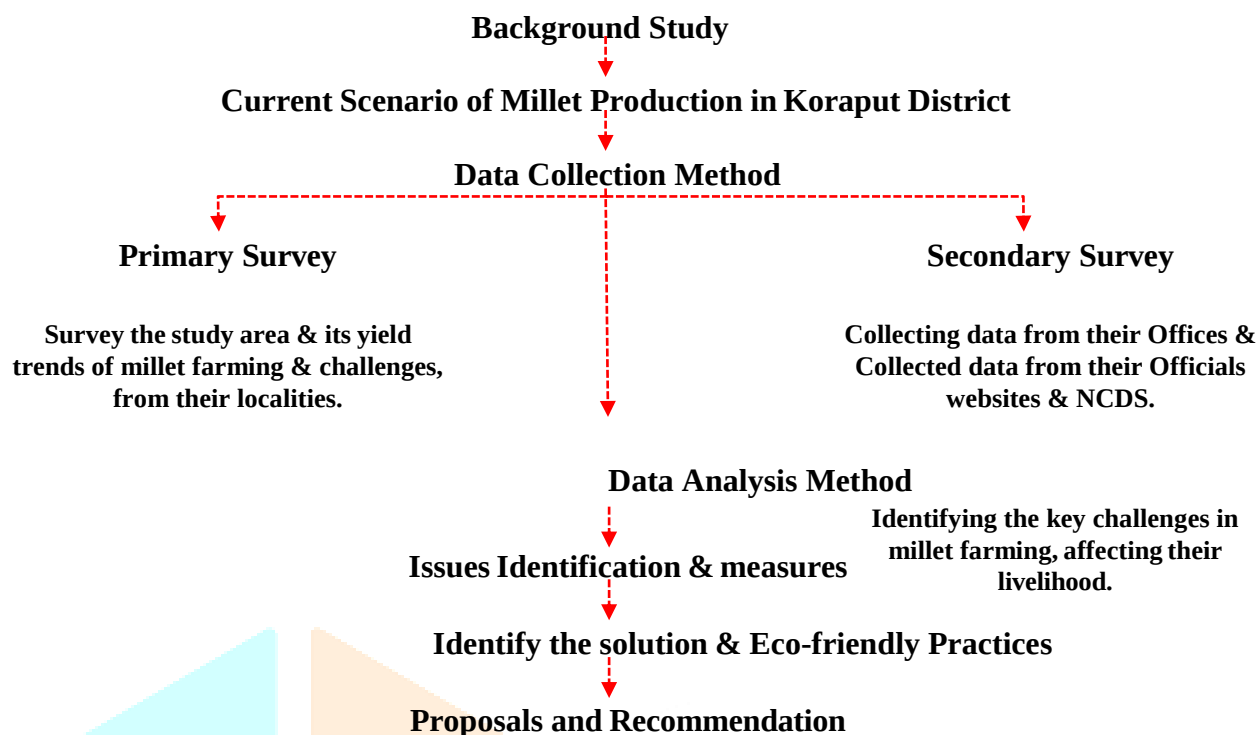


Fig 01.5 Showing Overall Year wise Ragi Procurement Status of KMS. Of Koraput District.

INFERENCE:

- **Mismatch Between Production and Procurement:** While expected production rose substantially, procurement did not grow at the same rate. In fact, in 2024-25, procurement dropped even though expected production was still high.
- **Efficiency Gap:** The procurement-to-production ratio shows inefficiency or market absorption issues.
- **Policy Implication:** There may be a need to strengthen procurement mechanisms or storage/market infrastructure to absorb the increasing production.

2. RESEARCH METHODOLOGY :



3. ANALYSIS :

The data are taken from the respondent of 80 nos., A year wise comparison chart of yield trend during crop cutting experiments in Koraput District.

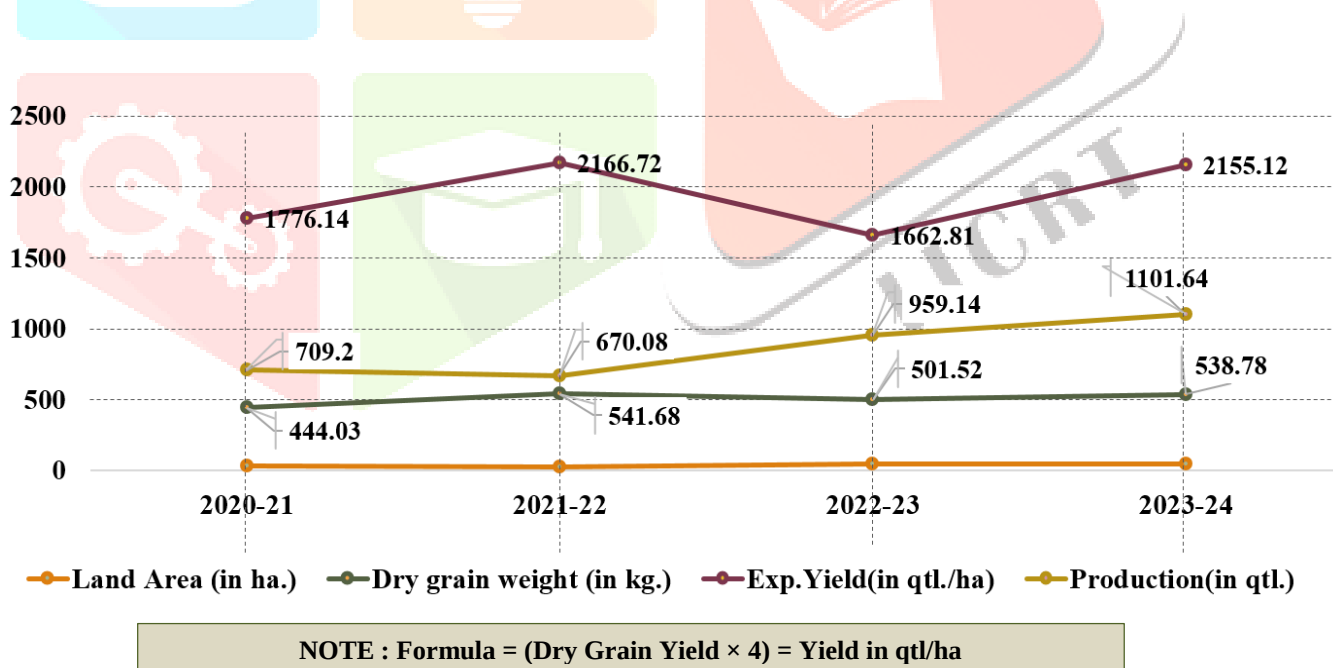


Fig-3.1 Showing Comparison chart of year wise yield trend during crop cutting experiment of 25sq.m. of land area.

OBSERVATION:**01. Nandapur Block – Significant and Consistent Growth**

- Yield improved sharply from 709.20 kg/ha (2020–21) to 1101.64 kg/ha (2023–24).
- This is the highest yield recorded among all blocks across all years.
- Indicates adoption of best agronomic practices, effective millet promotion, or favorable agro-climatic conditions.

02. Dasantpur Block – Positive Upward Trend

- Yield increased from 670.08 kg/ha (2021–22) to 959.14 kg/ha (2022–23).
- Indicates ongoing improvement in productivity, possibly due to better extension support or improved input usage.

03. Lamtaput Block – Improving But Fluctuating

- Shows moderate yield performance, from 444.03 kg/ha to 538.78 kg/ha over the years.
- The trend is positive, but the pace is slow. This block may benefit from targeted capacity building.

04. Bandhugaon Block – Stagnant Yield

- Yield is relatively constant, ranging from around 275–295 kg/ha. No substantial improvement observed, indicating possible production constraints, such as low input use or traditional practices.

05. Semiliguda Block – Consistently Lowest Yield

- Yield remains very low and flat across the four years, under 200 kg/ha. Signals urgent need for intervention, such as access to quality seeds, training, or irrigation support.

4. FARMING PRACTICES:

Millet farming in **Koraput district of Odisha** is a blend of traditional knowledge and modern innovations, largely shaped by the agro ecological diversity and tribal communities of the region.

Basically there are 3 major type of methods or practices adopted for millet cultivation in Koraput district. The package of practices is vital for a millets farmer; in this section the different agronomic practices being followed by the Households have been discussed below.



4.1 COMPARISION IN BETWEEN THE METHOD OF SMI, LT/LS & BROADCASTING:

Feature / Parameter	SMI (System of Millet Intensification)	LT / LS (Line Transplanting / Sowing)	Broadcasting (Traditional Method)
Seed Rate	2–3 kg/acre	4–5 kg/acre	8–10 kg/acre
Spacing	Wide (25×25 cm)	Medium (20×10 cm or 30×10 cm)	No spacing, random
Planting Method	Transplanting 15–20-day seedlings	Sowing or transplanting in rows	Scattering seeds manually
Weeding	Easy with cycle weeder	Moderate effort needed	Difficult and labor-intensive
Yield Potential	High (10–15 quintals/acre)	Moderate (6–9 quintals/acre)	Low (2–4 quintals/acre)
Seedling Survival	High due to young, healthy transplants	Medium	Low due to competition and stress
Soil Health	Improved (organic, aerated)	Moderate	Degrades over time
Labor Requirement	High (nursery, transplanting, weeding)	Moderate	Low
Input Cost	Low to moderate (organic, labor-driven)	Moderate	Low
Climate Resilience	High (deep roots, less water stress)	Moderate	Low
Suitability in Koraput	✓ Best suited for productivity + resilience	Suitable for moderate resources	Traditional, but least efficient

*Fig-4.1 Showing Comparison in between practices.***OBSERVATION:**

The System of Millet Intensification (SMI) is the most effective and sustainable cultivation method for millets in Koraput. It combines high yield potential, better soil health, improved climate resilience, and efficient resource use, though it demands more labor and initial planning. While line transplanting/sowing offers a balanced approach for farmers with moderate resources, traditional broadcasting is clearly inefficient, leading to lower yields, poor soil health, and minimal resilience. Thus, transitioning to SMI or improved line sowing practices is strongly recommended to enhance productivity, profitability, and sustainability in Koraput's millet farming systems.

04.3 YIELD RATE AS PER THE PACKAGE OF PRACTICES

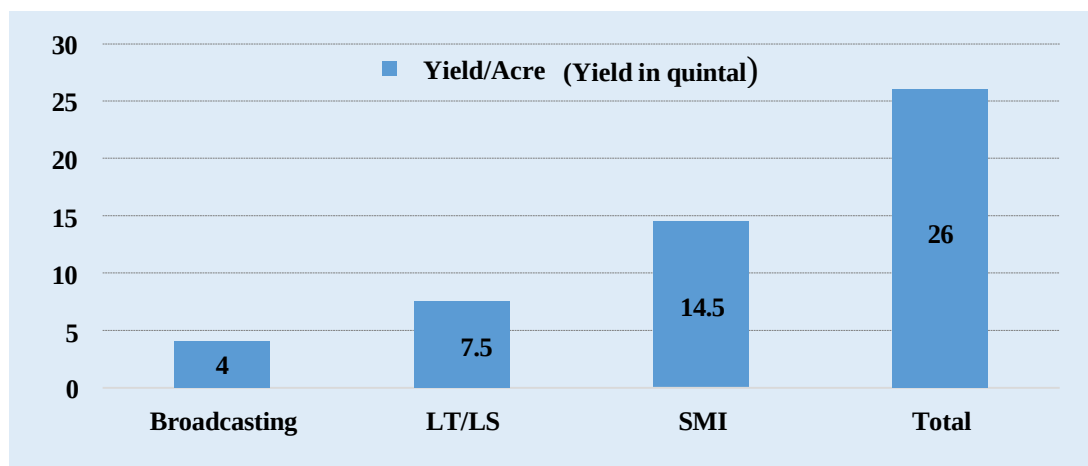


Chart 4.3. Showing the Yields rate of millet according the Package of practices.

OBSERVATION:

The highest amount of yields are served by SMI method of farming = 12-17 quintal/Acre as compare to other practices, which is necessary to adopt more & more nos. of farmers for sustainable millet production in Koraput district.

04.4 ECO FRIENDLY & RESOURCE EFFECTIVE FARMING METHOD :

04.4.1 Integrated pest management (IPM)

Monitoring & Identification	01. Regular observation of pest levels to decide when and if control is needed. 02. Correctly identifying pests to avoid unnecessary treatments.
Cultural Control	01. Practices like crop rotation, intercropping, & early sowing to prevent pest build-up. 02. Using pest-resistant millet varieties.
Mechanical & Physical Control	Hand-picking of pests & Use of traps, light barriers, and ash dusting.
Biological Control	Encouraging natural predators like ladybugs, birds, and Use of bio pesticides like neem extract and Bacillus Thu-Ringiensis .
Chemical Control	Use of low-toxicity, target-specific pesticides only when absolutely necessary.

04.4.2 CROP ROTATION :

Crop rotation is, growing different crops in a planned, seasonal sequence on the same plot of land over different seasons or years. In millet farming, this means alternating millets with legumes, oilseeds, or vegetables to enhance soil health & reduce pest buildup.

- ☐ **Finger Millets rotated with legumes** (e.g., pigeon pea, horse gram, black gram).
- ☐ **Little Millet rotation with oilseeds** (e.g., Niger seed)
- ☐ Sometimes interspersed with short-duration vegetables or pulses in home gardens.

BENEFIT: It reduces pest and disease build-up, breaking cycles that affect millet. Enhances soil fertility, especially when legumes fix nitrogen. Reduces weed growth & increases yield & crop stability.

04.4.3 CHALLENGES & OPPORTUNITIES:

In the current landscape, the millet industry is encountering numerous challenges related to millet production, processing, value addition, marketing, and consumption. Concurrently, there exist significant opportunities for entrepreneurs within the millet sector. These challenges can be alleviated by making additional efforts to address the issues encountered in the millet value chain.

SL.NO	CONSTRAINT	EXPLANATION	SOLUTION
01	Low productivity of millets:	I have identified that the primary challenges are weeds, and the majority of farmers are growing millets using traditional methods. They typically scatter the seeds at the beginning of the monsoon season and harvest the crop after a period of 75 to 90 days. Just because of this practices and poor agronomic knowledge lead to low yields.	Training farmers on improved agronomic practices and use of high-yielding varieties (HYVs).
02	Area under millet is declining:	It has been observed that the area cultivated with millet is experiencing a significant decline in both India and Koraput. When comparing the area dedicated to millets from the 1960s to the current situation, there has been a reduction of over 50%.	If the uncultivated and barren lands are converted to millet farming, the production can significantly increase. Additionally, it is essential to provide incentives to millet farmers to motivate them to cultivate millets.
03	Rainfed Dependency:	Erratic rainfall affects crop success.	Promote drought-resistant millet varieties and rainwater harvesting systems.
04	Poor Quality Seeds:	Currently, 40-50% of farmers are encountering difficulties in obtaining quality millet seeds. Farmers rely on saved, low-vigor seeds. While there are no problems with Sorghum and Pearl Millet, as private companies have entered this market and made it accessible to farmers, finger millet farmers may encounter challenges.	To bring quality seeds of minor millets and this can be done by establishing seed hubs for breeding and producing seeds & also, Establish community seed banks and promote certified seed distribution.
05	Soil Fertility Decline:	Continuous cropping without replenishment leads to poor soils.	Promote the use of organic fertilizers, implement green manuring practices, and adopt crop rotation involving legumes.
06	Challenges in lack of storage & millet processing:	The millet processing machinery offered in India achieves a low grain recovery rate of 70-80%, presenting a significant challenge for millet processors. As a result of this inefficiency, the final output contains a higher proportion of un-hulled and broken grains.	Depending upon one DE huller for DE husking all types of millets is not suitable rather it requires two types of DE huller. It is widely recognized that millet grains vary in size, shape, and husk content, which makes them challenging to manage.

Chart 04.4.1 Showing the Challenges in millet production.

The millet industry presents numerous opportunities, fueled by a growing consumer interest in nutritious and sustainable food choices. Below are some of the opportunities available in the millet sector.

04.4.4 EXPANSION OF MILLET-BASED ENTERPRISES :

Opportunity: Establishing micro and small enterprises focused on millet processing, packaging, and product development.

Evidence: The Odisha Millet Mission has facilitated the creation of local processing units, enabling farmers to produce value-added products like Ragi malt and millet snacks.

Impact: Enhances income for farmers and creates employment opportunities, especially for women and youth in rural areas.

04.4.5 DEVELOPMENT OF MILLET-BASED CAFÉS :

Initiative: Under OMM, 12 'Millet Shakti' tiffin centers operated by women's Self-Help Groups (SHGs) have been established, offering millet-based meals and snacks.

Opportunity: Expanding these centers into urban areas can tap into health-conscious consumer bases, creating sustainable income sources for SHGs and promoting millet consumption.

04.4.6 PROMOTION OF MILLET EXPORT:

Opportunity: Tapping into international markets where demand for gluten-free and health foods is rising.

Evidence: India's millet exports have seen fluctuations, but there is potential for growth with proper quality control and certification.

Impact: Diversifies income sources for farmers and contributes to the district's economy through foreign exchange earnings.

04.4.7 DEVELOPMENT OF MILLET-BASED TOURISM AND CULINARY EXPERIENCES:

Opportunity: Creating agro-tourism initiatives that offer millet-based culinary experiences, promoting local culture and cuisine.

Evidence: Events like the 'Millet Shakti' stalls have showcased millet recipes, attracting tourists and increasing awareness.

Impact: Boosts local businesses, preserves culinary heritage, and provides additional income streams for communities.

5. DISCUSSION & RESULT:

The study reveals that millet cultivation in Koraput district, particularly ragi, has shown significant revival due to government initiatives like the Odisha Millets Mission. While expected production has steadily increased from 2021 to 2024, procurement has not kept pace, highlighting inefficiencies in the market linkage and procurement mechanisms. The drop in procurement in 2024–25, despite high production, reflects challenges such as climatic stress, market saturation, and delayed payments.

Yield analysis across blocks shows that areas like Nandapur and Dasmantpur have made strong gains through better farming practices (like SMI), whereas others like Semiliguda continue to lag. There is a clear opportunity to scale successful methods and strengthen institutional support.

The results stress the need for:

- Better procurement infrastructure and timely payments,
- Wider adoption of high-yield methods (e.g., SMI),
- Capacity building in low-performing blocks,
- Enhanced market access and value-chain integration,
- Leveraging eco-friendly and sustainable practices.
- Overall, millet farming in Koraput is evolving from a subsistence activity to a viable livelihood option, with strong potential for economic and nutritional impact.

6. RECOMMENDATION:

01. Strengthen farmer awareness about omm project training - Organize capacity building programs for farmers on millet farming techniques, especially the system of millet intensification (SMI/SRI) by Conduct community level demonstrations, workshops, seminars and information sessions

02. Provide hands-on training in improved millet cultivation methods & adopt modern agricultural technologies - Expand the System of Millet Intensification (SMI) & Provide subsidized inputs like roller weeders, seeders, and harvesters and promote early transplanting, spacing, and organic pest/nutrient management. Introduce advanced tools and machinery such as precision seeding equipment, automated irrigation systems & improved storage units etc.

03. Promote local production and distribution of quality seeds - Train local farmers (especially SHGS & FPOS) in quality seed production, processing, and storage.

04. Establish millet market hubs and value chain ecosystems with strategic branding – by includes setting up dedicated millet marketing hubs, linking tribal farmers to national and international value chains, and institutionalizing branding through GI tags and organic certification. Encouraging millet-based enterprises through targeted incubation and financial incentives will create a self-sustaining value chain.

7. CONCLUSION:

Millet cultivation in Koraput district has transitioned from being a traditional subsistence activity to an emerging livelihood opportunity, supported by ecological suitability and proactive policy interventions as Odisha Millets Mission. The district's communities, agro-climatic diversity, and adoption of high-yield methods like SMI, have contributed to notable gains in productivity, particularly in blocks like Nandapur and Dasmantpur. However, the sector continues to face key challenges, including inconsistent procurement, limited market infrastructure, and climate-related uncertainties. Addressing these gaps requires a multi-pronged approach involving enhanced institutional support, improved procurement mechanisms, timely payments, & better value chain integration.

With rising demand for nutritious and climate-resilient crops, Koraput has the potential to become a model for sustainable millet-based rural development. Strengthening community participation, supporting millet-based enterprises, and integrating traditional knowledge with modern techniques will be crucial to ensuring long-term growth and food security in the region.

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REFERENCES:

1. A review on problem and prospects of millets production in India.
2. Unlocking the potential: small millet cultivation in Semiliguda, Koraput district, Odisha
3. Millet production, challenges & opportunities –A case study of India specific region.
4. Intervention for sustainable millet production in Sudan.
5. Lopamudra Patnaik Saxena, 2020. "Community Self-Organisation from a Social-Ecological Perspective: 'Burlang Yatra' and Revival of Millets in Odisha (India)," Sustainability, MDPI, vol. 12(5), pages 1-27, March.
6. Taylor JRN., Duodu KG. Effects of processing Sorghum and millets on their phenolic phytochemicals and antioxidant properties. In: Taylor J, Prasad RK, A M Gomez (Eds.) Climate change and multi-dimensional sustainability in African agriculture: proceedings of the third Africa rice congress. Academic Press: Cambridge. 2015. pp. 307–316.
7. Mohamed BA, Elamin EM, Abd Elaziz AH. Economic consideration and model development spatial trade for Sorghum and millet staple food in Sudan. Agri Res & Tech. 2018;14(4):555929. Mohamed BA, Elamin EM, Abd Elaziz AH, Hashim Alobied A. Assessment of sustainable production of stable food crops in Southern Darfur State, Sudan. Curr Investig Agric Curr Res Short Commun. 2018b. <https://doi.org/10.2474/CIACR.2018.05.000211>.
8. United Nations Development Programme (UNDP). Sudan: human development indicators. 2019. <http://hdr.undp.org/en/countries/profiles/SD>

