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## **Odisha's Tryst with Millets and Integrated Farming: Inclusive, Sustainable and Going Global\***

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### ABSTRACT

This state of Odisha has an innovative approach to sustainable agriculture by promoting millets and integrated farming systems, addressing climate resilience and nutritional security. With agriculture contributing significantly to greenhouse gas emissions, Odisha has prioritized crops like millet, which have a lower environmental impact. The Odisha Millets Mission, launched in 2017-18, aims to revive millets in farming and dietary practices through end-to-end value chain interventions, targeting nutritional security for vulnerable communities. The mission emphasizes millet diversity conservation, household consumption enhancement, and millets' inclusion in public distribution and nutrition programs. Furthermore, the Special Programme for Promotion of Integrated Farming is designed to optimize natural resources and improve livelihoods through a sustainable food system approach. Both initiatives demonstrate Odisha's commitment to climate-resilient, sustainable agriculture, earning recognition for their comprehensive, community-focused strategies.

**Keywords:** Sustainable agriculture, Odisha Millets Mission, climate-resilient technologies, nutritional security, Odisha

**JEL classification:** O33, O38, Q11, Q16, Q55, Q58

Global carbon project estimates that agriculture contributes to 45 per cent to 53 per cent of greenhouse gases (GHGs) in the food supply/value chain and contributes to overall 24 per cent of all GHGs. Synthetic fertilisers and pesticide usage, deforestation, excessive irrigation, ploughing, solarisation due to fallow lands, etc are the main concerns. The per capita emission of the state (2015-20) is 2.35 metric tonnes and is 11.4 per cent more than in 2010-15 (1.88MT). This shows that we need to immediately focus on reducing carbon footprints by moving crops with less GHGs and less fertiliser and pesticide use. This is especially true in the uplands of Odisha, where fertiliser application efficiency is very less due to high rainfall and high slopes.

Climate change in terms of erratic rainfall, prolonged dry spells and flash floods has affected crop production, especially in the rainfed areas of the state. Rainfed regions play a critical role in India's landscape, with approximately 55 per cent of farmers relying on natural precipitation. These areas exhibit diverse topologies, undulating terrains, and varied agro-climatic conditions. Apart from this, they often feature marginal soils and are particularly vulnerable to dry spells. When the country's rainfed regions and areas with high poverty rates are mapped, a significant overlap becomes evident. Furthermore, climate change projections from ICAR-CRIDA indicate an anticipated rise in the frequency of dry spells in many states including Odisha in the years to come.

The vulnerability of agriculture to climate change has adverse effects on production and risk to nutrition and food security. Similarly, malnutrition continues to

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be a daunting challenge for a significant population of the state. A qualitative emerging category of adaptations can be broadly divided into incremental, intermediate, and transformational. Adjustment of agronomic practice with current crop types and cultivars and current crop types with more tolerant cultivars fall under incremental criterion. Early warning and decision support systems and agricultural insurance systems fall under the intermediate criterion. Switching to different crop types and shifts in cropping areas are seen as adaptations with transformative potential.

Food and Agriculture Organization (FAO) has developed a sustainable food systems framework which focuses on community participation, land and resource governance, connectivity, recycling, input reduction, soil health, animal health, biodiversity, economic diversification, social values and food transitions with a focus on the co-creation of knowledge and synergies. This can lead to agro-ecological and food system transformation. We aim to relook at different programmes to include food systems transformation in our climate-resilient agriculture approaches. Guided by such approaches, Odisha has launched two key initiatives, the Odisha Millets Mission and the Special Programme for Promotion of Integrated Farming in tribal areas.

#### ODISHA MILLETS MISSION

##### *Heritage of Millets*

Known as one of the heritage crops owing to their cultivation and use as a staple food since ancient times, evidence of millets has been discovered in earthen pots used for storing grains and seeds at archaeological sites in India, China, Europe and different parts of Africa. Foxtail, barnyard and finger millets have been mentioned in *Yajurveda*, one of the ancient Vedic texts in India. This indicates that millet consumption was common, pre-dating to the Indian Bronze Age, 4,500 BC. In Odisha too, millets have been cultivated in the tribal regions of the state since time immemorial and are often termed as *Adi-anna* (ancient grains).

##### *Significance of Millets as Climate-smart and Nutritious Crops*

Millets are resilient cereals that can grow in both low and high altitudes and across a wide latitudinal range, on arid lands, under non-irrigated conditions, in very low rainfall regimes, and have a low water footprint. They require less water than rice and wheat, and are very tolerant of heat, drought, and flood, making them an obvious choice for farmers in an era of climate change and depleting natural resources. Millets are also a rich source of minerals, vitamins and protein and can help address many lifestyle diseases.

##### *How Odisha is Reviving Millets*

In recent years, Odisha has emerged as the forerunner in comprehensively promoting the millet ecosystem. The Department of Agriculture and Farmers' Empowerment launched the Odisha Millets Mission (OMM) in 2017-18 to revive millets on farms and food plates through end-to-end value chain interventions. The

programme is a uniquely designed multi-stakeholder government-led sustainable food system intervention with a focus on millets to ensure nutritional security to at least 5 million households of vulnerable and indigenous communities in Odisha. The state government procures finger millet from the farmers, many of whom are women, at the minimum support price and distributes it among the people under public distribution entitlements. In the initial year of 2017-18, the Odisha Millets Mission was successfully implemented in 30 blocks of 7 districts. Subsequently, in the year 2022-23, OMM was extended to 142 blocks in 19 districts for implementation of the programme. Currently, the programme is being implemented in 177 blocks in all 30 districts of Odisha.

#### *Objectives of Odisha Millets Mission*

The objectives of the programme aim to significantly improve various aspects of millet production and consumption in Odisha. A key goal is to increase household consumption of millets by 25 per cent from baseline levels (2016)<sup>1</sup> by revalorising millet food cultures in both urban and rural communities. Another focus is on the conservation and promotion of landraces through community-based seed systems to preserve millet diversity. The objectives also include the promotion of post-harvest and primary processing enterprises involving millets to improve the productivity of millet-based cropping systems. The objectives seek to encourage millet value-addition businesses in rural and urban areas alike. An additional target is facilitating the inclusion of millets in public distribution systems, nutrition programmes, midday meals, welfare hostels and other schemes. Also, the programme aims to facilitate millet markets and exports of millet-based products from Odisha to expand opportunities for farmers and entrepreneurs. This programme has an additional objective of promoting equity alongside its central goal that aims to provide substantial incentives to farmers in tribal areas, as many other schemes lack this component in supporting tribal communities. The incentives aim to help address the inequality often faced by tribal area farmers.

#### *Inclusivity, Equity and Justice in OMM*

The inclusive, equitable, and justice in the Odisha Millets Mission (OMM) underscores the importance of supporting upland/rainfed farmers, particularly those who have been historically neglected. Over five years, the incentive for millet cultivation has seen a significant increase from 10,000/ha to 26,500/ha, delivered through the innovative Direct Benefit Transfer (DBT) mechanism. Assured Ragi procurement through WSHGs and FPOs is facilitated, with payments guaranteed within 72 hours through the Millet Procurement Automation System (M-PAS). Furthermore, the integration of ragi into the Public Distribution System (PDS) and Integrated Child Development Services (ICDS) serves as an additional layer of support, enhancing the nutrition security of tribal communities. Under the banner of Mission Shakti, WSHG members are not merely participants but leaders in post-harvest activities, processing, and millet value-addition enterprises. The establishment

of Millet Shakti enterprises, such as Millet Tiffin Centres, kiosks, outlets, and cafes, signifies a shift towards women-led entrepreneurship on millets.

#### *Conservation of Landraces*

The Odisha Millets Mission has undertaken systematic efforts to identify and promote the cultivation of indigenous ragi landraces. Extensive participatory varietal trials have been conducted across tribal districts to evaluate diverse landraces. Further purification and multi-location trials have helped identify climate-resilient landraces like *Kundra Bati*, *Laxmipur Kalia*, *Malyabant Mami* and *Gupteswar Bharati* suited to local conditions. These landraces have been released for cultivation in Koraput and Malkangiri, marking a historic first in India. Meticulous documentation, community participation and scientific validation have enabled the conservation of precious millet diversity. Mainstreaming landraces enhances farmers' access to resilient traditional varieties while preserving agrobiodiversity. OMM is focusing on the conservation and promotion of seed systems for landraces which will significantly contribute to ecology, economy, and equity together.

#### *Marching Ahead with New Initiatives*

As the Odisha Millets Mission moves ahead with innovative measures, the mission is now spearheading an initiative to secure Geographical Indication (GI) tags for indigenous varieties of finger millets, aiming to preserve their unique characteristics. Presently, in collaboration with the Odisha University of Agriculture and Technology (OUAT), the government is actively working to establish a benchmark price for non-ragi millets.

#### *IYoM and ICM*

Odisha became the first state in the country to declare a day for millets called Mandia Dibasa or Millets Day. The hugely successful inaugural Mandia Dibasa on November 10, 2022, led the Chief Minister to declare it an annual event. With the year 2023 declared as the International Year of Millets (IYoM) by the United Nations, Odisha celebrated this in a big way. Its IYoM framework connected millets with sports, tribes, gender, SDGs and events, highlighting tribal communities and empowering women and farmers. The Government of Odisha is working on a policy roadmap for millets for the next 10 years following the International Convention on Millets (ICM) which was organised in Bhubaneswar on 9th and 10th of November 2023.

#### *Recognition for Odisha Millets Mission*

OMM has received several accolades for the tremendous works that have been grounded by functionaries from the state level to the grassroots level. Odisha was awarded as the best-performing millet promotion state (2021) and the best state for

scaling up the millets mission (2022) by the Government of India. The MoA&FW and NITI Aayog identified OMM as one of the best models and advised state governments to adopt the OMM approach. The Government of India has set up a task force to understand the framework of OMM to revise the National Sub-mission on millets. Cambridge University partnered with OMM to explore the possibility of designing the Odisha model as an alternative to the Green Revolution framework. Mint India identified OMM as one of the national best practices across India. Recently, Odisha Millets Mission was awarded for being a “Global Model” at the PoshakAnaj Awards ceremony held by IIMR in Hyderabad.

#### *Promoting Integrated Farming*

Increasing pressure on land has led to fragmentation resulting in the fall of average landholding size in Odisha. This declining farm landholding all over the state has imposed a serious challenge to the sustainability and profitability of farming as well as imposing threats to the food and nutritional security of the state. The Integrated Farming System (IFS) is an interdependent, interrelated, and often interlocking production system based on a few crops, animals, and related subsidiary enterprises in such a way that maximizes the utilization of nutrients to achieve profitable and sustained agricultural production of each component and minimizes the negative effect of these enterprises on the environment. The Special Programme on Promotion of Integrated Farming (SPPIF) is a novel initiative which is designed on the lines of a sustainable food system approach.

The key objectives of SPPIF are the optimum utilisation of available natural resources through reduction, recycling, reuse and recovery; promotion of site-specific and landscape-based farming system integration, diversification, and intensification using a cluster approach; and improvement of tribal farmers' livelihoods and incomes through enterprises, marketing, and value chain interventions by WSHGs/FPOs.

SPPIF has been carrying out various activities across agriculture, horticulture, livestock, and fisheries to promote integrated farming in the state. In agriculture, activities include crop diversification, intercropping, multi-cropping, seed production, the establishment of mini-seed centres, and preparing organic liquid manure. For horticulture, the programme focuses on promoting the use of trellis systems for vegetable cultivation, promoting agroforestry, supplying quality seeds, and maintaining fruit orchards. Livestock activities include establishing goat shelters and poultry night shelters, setting up indigenous chick production units, and conserving native livestock breeds for livelihood development. For fisheries, the programme emphasises supporting quality fish stocking by supplying fingerlings and yearlings, as well as establishing nano fish feed mills.

#### *Recognition for SPPIF*

Swabhiman Farmers Producers Company (FPC) in Malkangiri promoted under SPPIF received a prestigious award for its outstanding efforts in safeguarding crops against dry spells. The Hon'ble Governor of Odisha bestowed an award upon the FPC in the Agriculture Category at the UTKAL SAMMAN 2023 this year. Apart from this,

the “Protective Irrigation” initiative implemented by Swabhiman FPC garnered additional acclaim for its excellence in governance. The Hon'ble Home Minister, Government of India, honoured this initiative during a ceremony in New Delhi this year.

Through all these interventions, Odisha has embarked on a climate-resilient sustainable food system. The multifaceted approach of the Odisha Millets Mission, with its emphasis on indigenous landraces, participatory trials, and conservation efforts, shows a commitment to ecological and agricultural diversity. Simultaneously, the Special Programme on Promotion of Integrated Farming underscores the state's dedication to optimizing natural resources, encouraging farming system integration, and improving the livelihoods of farmers.

#### REFERENCES

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