

Rapporteur's Report on Odisha's Tryst with Millets and Integrated Farming: Inclusive, Sustainable and Going Global

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I

INTRODUCTION

Odisha's tryst with millets and integrated farming or their recent revival can be traced to the budget speech of 18 March 2016 by the Finance Minister of Odisha where para 28 points to the State's intent to launch a "Special Programme for Millet in Tribal Areas" and another programme on "Support to Integrated Farming System in Tribal Districts," Government of Odisha (2016b). What is commendable, is that the intent was followed-up with the framing up of the guidelines in November 2016 (Government of Odisha, 2016c, 2016d).

A reading of the call for papers for this theme, as one reiterates here, suggests that "the millets initiative of Odisha, now popularly known as the Odisha Millets Mission (or, OMM) has expanded from 30 blocks spread across seven districts in 2017-18 ... to 177 blocks spread across all the 30 districts of the state as Odisha is leading to showcase to the world the revival of the nutritionally beneficial and climate-resilient crops in our celebration of the International Year of Millets in 2023." And, "the integrated farming initiative has spread from 40 gram panchayats in four clusters of one district in 2018-19 to 300 gram panchayats in 30 clusters of nine districts in 2022-23." Besides, Odisha also had integrated farming initiatives in non-tribal areas. The call for papers for this theme had asked scholars to examine the spread of the programme or to bring in a comparative perspective.

Given that OMM has been the toast in academic and policy circles, there has been a greater response on this aspect and as a result the papers and abstracts selected cater to various facets of the millets initiative. We look to further delve into this. However, before that I will briefly touch upon the programmes being inclusive and sustainable.

II

INCLUSIVE AND SUSTAINABLE¹

The inclusiveness of the two programmes comes from three perspectives. The first being that the programmes, to being with, have been for the tribal areas. These are hilly and forest areas with cultivation being largely rainfed. In that sense, it is about regions and lands that have been left out. Technically speaking, as per the Fifth Schedule of the Constitution, in Odisha, six districts are fully covered and another

seven districts are partially covered with areas designated as Scheduled Areas. The programmes, as it has progressed, is not necessarily limited to these scheduled areas, but, to other blocks and districts with a focus on rainfed on marginal lands that have been left out.

Second, these areas, particularly the Scheduled Areas, also have a preponderance of tribal population or Scheduled Tribes. The programme is not limited to tribals alone and has been open to other social groups, including an emphasis on women farmers, particularly targeting marginal (less than 1 hectare) and small (between 1-2 hectares) farmers that together constitute 92 per cent of operational holdings of Odisha as per 2015-16 Agricultural Census. Further, in Odisha, as per 2011 Census, 23 per cent are Scheduled Tribes and 17 per cent are Scheduled Castes, and, as per a 2023 estimate (Barik, 2023), 39 per cent are Other Backward Classes. In other words, the programmes call in being inclusive are to social groups that have been left out, gender that have been left out, and among farmers with farm-sizes where sustenance is difficult.

Last, but not the least, compared to other cereals like rice and wheat, millets are a crop group that have been robust to biotic (weed and pest) and abiotic (weather-related like long dry or intense wet spells) stress. They also have nutritional advantages over other cereals. In fact, prior to the budget speech of 2016, a background exercise started with a consultation meeting under the aegis of the Planning Coordination department at the Nabakrushna Choudhury Centre for Development Studies (NCDS), an Indian Council of Social Science Research (ICSSR) institute established in collaboration with the Government of Odisha, and the concept note therein had articulated out the need for revival of millets, a neglected crop group, on account of two advantages, namely, climatic resilience and nutritional properties (Government of Odisha, 2016a). Similarly, integrated farming is knowledge-intensive cropping system based on agro-ecology that can be contrasted with the now dominant mono-cropping identified with input-intensive industrial agriculture (Mishra *et al.*, 2013). It is about crops or cropping system that have been left out.

On sustainability, it is pertinent to note that both the initiatives of Odisha follow the agro-ecological approach. In this context, a recent futures exercise comparing industrial agriculture with agro-ecological approach, AgroEco 2050 for Andhra Pradesh, which shows that the agro-ecological approach would revive the degraded lands, provide more employment, reduce inequalities between farmers and non-farmers, and have greater availability of nutritionally rich food for the population (Dorin *et al.*, 2023). Or, as they say, the sustainability part comes from their advantage to the planet. It is an added advantage that it is also good for the producer and the consumer. A win-win for all.

Getting back, the millets initiative in Odisha has interventions in four verticals, viz., production, processing, marketing and consumption, first articulated through a proposal submitted by NCDS (2016) that came out of the earlier-mentioned

consultation meeting and also indicated in the guidelines (Government of Odisha, 2016d). Some of the papers selected for presentation as full papers or abstracts are on these themes, some bring out a comparative perspective and there is one on integrated farming. Let us elaborate on these.

III

PRODUCTION AND PRODUCTIVITY

One of the objectives under millets revival has been to increase production and productivity. In this context, the paper titled “A Study on the Adoption and Impact of Improved Finger Millet Varietal Technology (*Bada Mandia*) in Odisha” by Sarba Narayan Mishra *et al.* compares the use of an improved finger millet variety with traditional varieties and observes greater yield, increased income and reduced incidence of poverty in the former sample. This is a useful result and has policy implications. However, there could be selection bias in the sampling design, and hence, there needs to be more pilots before taking up such suggestion. Besides, as Odisha after following standard operating procedures has released four open pollinated farmer varieties or indigenous landraces through participatory varietal trials (Government of Odisha, 2022, 2023), the improved varieties need to be compared and contrasted against the approved farmer varieties using standard operating procedures in varietal trials.

Given that Odisha’s millets initiative that started in 30 blocks across seven districts in 2017-18 has now spread to 177 (of its 314) blocks across all the 30 districts of the state in 2023-24 and this has garnered interest among scholars to compare performance of Odisha with other states. There are two papers that attempt that. The paper by Mukesh Kumar is titled “Comparative Progress of Odisha in Millets Farming: An Inter-State Analysis through Agricultural Efficiency Index.” One would expect the agricultural efficiency index on millet production for Odisha to have increased between 2016-17 and 2020-21 if share of Odisha’s area in all India and its yield in proportion to all India average yield would have both increased. The study observes that while Odisha’s rank has increased, but the index has decreased. Well, this is so because Odisha’s levels in terms of share of area under millets as also yield has been lower. The low yield is because Odisha largely grows finger millet (ragi or mandia) and some minor millets while the states that grow bajra and jowar will have relatively greater yields. This comparison should have been limited to specific millet crops or ragi and in these also the index can still go down if other states have been doing relatively better.

The second paper comparing Odisha with other states by Deepak Shah is titled “Millet Economy of Odisha: How Far it is Viable and Sustainable?” The comparison across five states is limited to finger millets on cost of cultivation, profitability based on minimum support prices and income shows that it is not viable. The study shows that costs are relatively lower in Odisha, but net returns are negative for all the four years in all the states for which analysis has been done. A legitimate concern that this

paper raises is on sustenance of farmers (a large question of concern) and for this either the yield or prices need to further increase. The paper also shows changes in cropping pattern and changes in area production and yield by comparing 2019-20 with data points in previous decades, which may not be proper because area and production under millets have been declining since green revolution (Jena and Mishra, 2022a,b) and the revival has been at a nascent stage in 2019-20 with yield increases because of intervention in agronomic practices (Jena, 2022; Mishra, 2020). In fact, in 2019-20, from the 1.6 lakh hectares area under millets in Odisha less than 14 per cent were interventions under OMM using suggested agronomic practices.

The paper titled "Comparative Performance of Millets in Odisha, Madhya Pradesh and India" by Ankita Rajput and G.K. Vani uses data for recent twenty years (2000-01 to 2020-21) and looks into relative and absolute changes to point out decrease in area and increase in output for India and for Madhya Pradesh where there has been an increase in area and output for bajra. It also shows that there has been a decline in both area and output for all millet crops in Odisha, as also observed in Jena (2022).

The paper titled "An Analysis of Growth and Instability in Area Production and Productivity of Finger Millets in Odisha" by Rupa Basu *et al.* has used data for the recent forty years (1981-82 to 2020-21) and divides them into two sub-periods of twenty years each and, as in other studies, observes decline in area and increase in yield at the aggregate level. The study also points to district level variations with relatively larger area under millets in Koraput district. In fact, in 2020-21, from the total area under millets in the state 44 per cent was in Koraput.

Another paper titled "Growth and Instability in Area, Production, and Productivity of Millets in India: A District Level Analysis of Odisha" by Vinod Kumar looks into the trends and patterns with decadal analysis for India and Odisha and also observes that the area, production and productivity of all millet crop groups were negative, as in other papers. Further, it shows that four-fifths of the total millets production of the state in the year 2020-21 were from five districts, namely, Koraput (49 per cent), Rayagada (10 per cent), Ganjam (9 per cent), Gajapati (7 per cent) and Malkangiri (4 per cent). These five, along with Kandhamal and Nupada were the seven districts where revival of millets started in Odisha in 2017-18.

IV

CONSUMPTION AND CONSUMER AWARENESS

Another objective of the millets revival was to increase consumption. A paper by Hulas Pathak *et al.* titled "Consumer Awareness and Consumption Pattern of Millets and Millet-Based Products in Raipur City, Chhattisgarh." The paper looks into cross tabulation of consumption with other features and then uses chi-square test to reject independence and suggests that a greater frequency of consumption of millets may be associated with better education, higher income, government employee or business, better awareness, obtained awareness information through

personal research or professional guidance, increased availability or lower prices, and with specific type of millets such as foxtail millet or finger millet. It would be worthwhile to see if the results would be robust to additional econometric exercise and also the reasons for the absence of independence with certain features and how to do away with that.

The paper titled “Food and Nutritional Security among Tribal Communities of Odisha” by Ravinder Ram uses unit level data from the 2011-12 round of National Sample Survey and against the binary dependent variable identified with a household that either satisfies or fails to meet per capita per day calorie, protein and fat requirements together (satisfies all three 1, otherwise fails 0) it rejects absence of relationship or suggests deprivation for those with lower income (monthly per capita expenditure, MPCE), being tribal, and are residing in rural regions. This echoes with recent observations of Samal and Mishra (2022) that people residing in rural and tribal regions are not only nutritionally deficient, but that they also have limited access to nutritionally health food that are grown in the region.

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ECONOMIC CONCERNS AND WELLBEING

The paper titled “Millet Based Enterprises and Sustainability: Evidence from Farmer Producers Company in Kalahandi District, Odisha” by Saswat Kumar Pani and Nibal Dibat uses linear structural relations to indicate that sustainability (as a latent variable) of income and its relationship across four observed variables through a goodness of fit is on account of value addition (0.88) and innovation (0.71), and relatively less for collaboration (0.54) and risk coverage (0.10). In addition, a logit exercise shows that farmers inclination towards entrepreneurship is significant and positive for family support and scale of operations and is negative for age and curiously also for sustainability, which needs further explanation. The author could have dealt on the link between the two exercises.

The paper titled “Economic Feasibility of Millets Residue Conversion” by Pratikshya Mishra *et al.* explores the advantages and challenges that would be possible by using the millet by-products to produce biofuel (this could reduce greenhouse emission), biochar (enhance fertility of soil and aid carbon sequestration), and briquette (reduce indoor air pollution while cooking). The challenges being that the activities could be seasonal and location specific.

B.B. Barik in his paper “Odisha Millets Mission – An Evaluation from Tribal Development Perspective” examines the progress of the mission in the last seven years showing increase in coverage of area and also yield. It also points to involvement of women self-help groups and farmer producer organizations in the millets value chain process. While lauding these initiative, it calls for greater focus on training tribal women farmers to aid in their wellbeing.

The paper titled “Performance of Millets (*Shree Anna*) Production, Consumption, Trade and Government Interventions Initiatives in India” by O. P.

Singh and P.K. Singh shows that at the global level as also in India area under millets production has declined but yields have increased. It also indicates that in India, at a per capita level, consumption of millets has declined. More importantly, India, in 2021, has a larger share of global area (32 per cent) and production (44 per cent) of millets. Further, in the last three decades, as computed through various trade-related indices, India has a comparative advantage in export of millets when compared with overall agricultural exports and that its exports of millets are competitive.

The paper titled "Assessing the Impact of Integrated Farming Systems on Agricultural Productivity and Livelihood of Farmers in Puri District, Odisha" by Subrat Pattnaik *et al.* compares 30 farmers that cultivate crops alone with six types of integrated farming systems that have 3 to 33 farmers and observes that all the six have a benefit cost ratio (gross income as a ratio of total variable cost) to be greater than one and five of them have it greater than two, but the highest is for crop plus livestock plus poultry at 2.87 with crop plus livestock plus resource generation a close second at 2.86. These two are also the integrated farming systems where the relative economic efficiency (difference in net income between integrated farming system and crops only system as a ratio of the net income of crops only system) is greater than 100 at 108 and 123 respectively. All the six integrated farming systems fare better over crop only system in terms of marginal cost benefit ratio (ratio of difference in gross income over difference in total variable cost). The study also points to constraints in taking up integrated farming. These are high wage rate, increasing costs of other inputs, difficulty in managing subsidiary activities, frequent floods, low involvement of youth, lack of remunerative prices, poor access to information and extension services, exploitation by middlemen, and absence of marketing avenues.

VI

CONCLUDING REMARKS

The five full length papers and eight abstracts of the theme cover many facets of Odisha's millets initiative and beyond that. Not surprisingly, on account of access to secondary data, many of these have looked into production and productivity. Some on consumption and particularly on the importance of awareness. Of course, there are other factors that are important to address nutritional deprivation, but they have been beyond the scope of the current theme. The papers focusing on economic concerns and well-being bring out the relevance of value addition and innovation in entrepreneurship, the opportunity in use of residues, the need for training, the advantages in trade and the constraints that the farmers face.

Some facets of the Odisha Millets Mission have been left out such as the evolving triad of the Government with civil society and the academia, the top-down decision making relying on the bottom-up feedback mechanisms, the use of traditional knowledge along with scientific developments and principles, the coming together of different line departments, lessons for policy at the national and

international level and many others. Studies on the integrated farming initiatives of Odisha in line with the natural farming initiative of Andhra Pradesh and its convergence with the millets initiative remain as open questions with policy challenges. These as also the unanswered questions in the papers/abstract presented in the theme that open up may be taken up by scholars in future.

NOTE

1. This draws upon a number of presentations by the rapporteur made elsewhere in different capacities and is part of an ongoing work.

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