

RESULTS

- Empowering small and marginal farmers to grow millet varieties that they prefer, superior and are suitable to their landscape through participatory action research and setting up of community-managed seed systems.
- This is a successful case study of how agrobiodiversity can be conserved by local communities by facilitating cultivation and consumption of a wide variety of landraces – by financial assistance by government.
- Community Managed Seed Centers are playing key role in conservation, multiplication and making the seed available to the farmers on time at present – CMSCs are having the linkages with DoA&FE to limited extent.
- Access to good quality seed with changed agronomic practices – helped in increase in the yields and incomes
- Bringing the appropriate seed systems for landraces which is managed by community – linked with govt and research institutions.
- SoPs talks about mapping of traditional varieties exists locally, bring them into PVTs to identify farmers preferred and superior varieties in the farmers fields; evaluate in MLTs which are conducting in farmers' fields to identify the superior varieties in different agro-climatic zones which are having similar weather, soils, rainfall etc. Submission of proposal to mainstream the traditional varieties as per process mentioned in the SoPs.

A WAY FORWARD

With these efforts, four traditional varieties which are performing better than state & on par equal to national checks are ready to go through the process laid out in approved SoPs to get released and notified.

DoA&FE, Government of Odisha has extended this kind of work to pulses, oil seeds and other millets – bringing them into this system by firming up all the procedures.

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- Members of Working Group of Seed Systems, RRA Network

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SUCCESSES OR OPPORTUNITIES / CHALLENGES IN SCALING UP OR INSTITUTIONALIZING THIS INITIATIVE

Government of Odisha under OMM has shown the way of how agrobiodiversity can be promoted through participation of local communities. Constituted the Working Group on Seeds, Odisha and issued guidelines for standard operating protocols for Alternate seed systems for landraces to mainstream them. This system need not be a replica of existing institutional framework but it has to be done systematically and scientifically. The discussion started with finger millet and now extended to other crops too- in Kharif 2022, there are 33 crop diversity blocks, 17 multi-location trails, 41 participatory varietal trails and 16 seed production plots are there in different locations of Odisha. There is a small pilot is going on mapping the landraces in 11 Districts and 254 village and understand quality parameters of non-raji millets, pulses, oil seeds, paddy from farmer's and scientific community perception. All these will bring them into one umbrella i.e. alternate seed systems for landraces/ traditional varieties.



How Odisha Millets Mission Revived Seed System for Landraces

BACKGROUND

A state level multi stakeholder consultation was organized by Planning & Convergence (P&C) Department, Government of Odisha along with RRA Network, WASSAN and ASHA Network to evolve strategy for revival of millets in Odisha on January 27th, 2016. This consultation was participated by Department of Agriculture and Farmers Empowerment (DoA&FE) officials, Farmers, Women groups, Community leaders, NGOs, Panchayati raj institution members and technical experts from other states such as Karnataka. Thorough review was done to understand several challenges faced by farmers in millet production systems

Emphasis was also given on reviewing different successful approaches led by civil society organizations in collaboration with farmers within and outside Odisha. This was followed by another 4 rounds of brainstorming workshops from February to April 2016 to develop the implementation procedures and develop a comprehensive plan of action. Accordingly, consensus emerged to revive millets through promotion of consumption, production, marketing and enterprise support. It was decided to work in collaboration with the community-based institution by involving the NGOs and promote farmer-to-farmer learning approach. Focus was also given on adopting agroecological approaches as per local situation

DoA&FE allowed to use local traditional varieties seeds as released varieties seeds were not available in enough quantities; it was observed that landraces are performing better and communities are preferring them. It triggered OMM to take up

Participatory Varietal trails from 2018-19. Realizing the need to strengthen seed system for local landraces, the DoA&FE, Government of Odisha formed a Working Group on Seeds under Odisha Millets Mission in 2020. The aim is to create enabling framework for landraces to mainstream -managed by community-based institutions. In this context, Working Group on Seeds (WGoSeeds) under Odisha Millets Mission (OMM) evolved the Standard operating procedures (SoPs) for seed system for traditional varieties/landraces.

This SoPs was developed by WGoS, Odisha under the chairmanship of Dr. K.S. Varaprasad, Former Director, Indian Council of Agriculture Research-Indian Institute of Oilseeds Research in consultation with scientists from ICAR-IIMR, Odisha University of Agriculture and Technology (OUAT).



INTERVENTIONS

DoA&FE in collaboration with farmers, participatory varietal trials (PVTs) were conducted at block level to identify preferred and superior varieties. Majority of the farmers preferred local varieties over the improved ones. Community managed Seed centers managed by Farmers producer organisations played a lead role in seed multiplication of preferred traditional. Multilocation trials with women and men farmers' preferred landraces were also conducted bringing selected suitable finger millet varieties for mainstreaming in the public domain. Odisha Millets Mission has been instrumental in assessing the performance of recommended cultivars and popularize; involvement District and below District officials from DoA&FE is there. So far Farmers were able to access to these landraces on cost basis through community-managed seed centres established under Odisha Millets. The formal seed systems only cater to notified varieties and is not suitable for landraces. Seeds notified varieties are not allowed for sale in labelled packaging.

Odisha Millet Mission has explored the landraces of millets which are still grown in few pockets in the state of Odisha. These varieties are conserved both in field gene bank established in the block attached to Community Management Seed System (CMSS) programme of OMM and also in the State Seed Testing Laboratories (SSTL) in Bhubaneswar. Till now, there were 97 traditional millet varieties stored in SSTL. The farmers can access the conserved landraces from SSTL if there is a loss of landrace due to any natural calamities. Traditional millet varieties are collected from primary conservers from different districts with a prescribed format. The conservation activities are conducted in the agro-ecological zones involving farmers in various stages – twice in a crop cycle, late vegetative stage and physiological maturity stage for collecting seed materials from the conservation plot.

It is important to recognize the preferred varietal characteristics highlighted by conservers based on their contextual, multi-functional and cultural knowledge. Under the Odisha Millets Mission, there is great emphasis on identifying, selecting, removing the admixtures some extent and promoting the best local varieties. Some farmers are designated by the mission as 'Seed Farmers', and they play leading roles in conservation and exchange among farmers in their respective regions. Farmers were trained on millet seed multiplication. The seed multiplication plot is treated with organic inputs such as *ghanajeevamruta*, *jeevamaruta*, *beejaamruta* and *handikhata* - *Ghanajeeamruta* and *Jeevamruta* are used as microbial inoculants.

- **Ghanajeevamruta** is prepared with fresh cow dung and urine, jaggery and flour of chickpea – farmers make them in powder form from solid form applies as manure as basal application and top dressing.
- **Jeevamaruta** is prepared with fresh cow dung and urine, jaggery, bengalgram flour/powder, handful of fertile soil and water.
- **Beejaamruta** is prepared with fresh cow dung and urine, surface soil, lime powder and water. It is used to do seed treatment to protect seed borne.
- **Handikhata** is prepared with fresh cow dung and urine, jaggery, Bengal gram flour, handful of fertile soil, leaves of neem (*Azadirachta indica*), leaves of *karanj* (*Pongamia pinnata*) and leaves of *arakha* (*Calotropis gigantea*).

Rationale

Landraces are ecotypes cultivated for a long time in their pristine habitats. Farmers have selected them for traits based on their ecological suitability, traditional cooking and consumption habits.

For local adaptation and resilience in the changing climate era, it is important to promote cultivation of landraces by the farmers.

In the participatory varietal trials (PVTs) and Multi Location Trials (MLTs) - maintained proper documentation of seed characteristics, yield, nutrition value and its resilience to diseases and pest infestation.

The participatory approach under participatory varietal trials has two major objectives as follows:

- **First**, map and document the traditional varieties of ragi which are with farmers
- **Second**, to provide suitable farmers preferred and superior variety from the pool of finger millet landraces for a micro-agroecology (block) by conducting the PVTs in farmer's field.
- **Third**, take them into MLTs – conducting them in farmer's field to see the performance and are preferred by farmers - Research Institutions, Community Based Organizations DoA&FE and NGOs are involved in the process

Process:

- In each administrative block, a meeting was conducted with farmers and partner NGOs staff and WASSAN staff in identifying local finger millet varieties, selecting the plot and farmers, irrigation source, designing the layout.
- The PVT trials, used Randomized Block Design (RBD) in three replications with State recommended and popular varieties as checks. some of the traditional varieties got mixed up with others in several years – plant type of landrace was identified based on the traditional knowledge of farmers. Selected plant type of ear heads was sown as a row to restore the original landraces plant type.
- The minimum plot size per traditional variety per replication was 25sq.m.
- Distance between replication to replication was kept 100cm and variety to variety in the replication was 60cm.
- The farmers and grass root workers regularly visited the PVT plots and recorded the date of sowing, planting, weeding and flowering.
- During maturity stage, farmers' field day was organized.

- Groups of farmers along with Community Resource Person, identified suitable varieties after discussion and put the colored tags. The Community Resource person collected information on the basis for their ranking as well as the characteristics they prefer. Research team collected the Agronomic data which included visual and measurement characters of the varieties during vegetative stage with a prescribed format from each replication and score it;
- Data of selected varieties from farmers and research team is compiled to come out with the best two varieties for the block and finally planning for seed production of those varieties in next year. *Bati mandia*, *Bharati Mandia*, *Ladu mandia*, *Sargi mandia*, *Bada mandia*, *Kalaganthi* and *Mami mandia* were some of the selected landraces. These traditional varieties went into MLTs .

Engaging Farmers Producer Organisations and Women Self-Help Groups:

- To ensure farmers' accessibility to superior quality of seed varieties, around 4-5 numbers of community managed seed centers (CMSCs) were set up in each block under Odisha Millets Mission. These CMSCs are managed by Farmer Producer Organizations (FPOs) at the block level and sub-centres of CMSCs are managed by women self-help groups (WSHG) at the community level.
- Training programmes were organized for Farmers Producers Organisations (FPO) and Women Self-help Groups (WSHG) on seed production protocols and the effective process of preserving quality seeds
- DoA&FE strengthened the seed centers work by providing the required infrastructure like tarpaulin sheets, weighing machines, bins and moisture meters. Apart from this, FPOs are also supported with a working capital for acquiring seeds and overseeing the operational costs.
- Agreements were made between FPOs of the concerned block and the selected farmers who showed interest for seed multiplication. This agreement defined the mutually agreed terms and conditions of seed production and the agreeable

price at which seed is to be purchased along with quality and quantity parameters. With this seed centers are able to supply limited quantity seed

- Agricultural officials/workers at block and village level provide the necessary guidance and support for this process. The seed multiplication plot is treated with organic inputs such as cow urine, *FYM*, *Jeevamruta*, *Handikhata*, *Neemastra*, etc. as per the guideline of organic farming along with a compulsory 3 times weeding done with spraying of *Jeevamrutha*. Guidance and support are given by Block Agriculture Officer, AAO and Village Agriculture Worker.

Impact:

- Entire process is creating example of using the scientific knowledge and Building on farmers' wisdom and experience in PVTs and MLTs. It has given opportunity to map and document the landraces exists and developing the social capital who are knowledgeable to do mapping exercises and conducting PVTs. ICAR-IIMR has done nutrition profiling.
- These traditional varieties are performing better in System of Ragi intensification with agro ecological practice than released varieties.
- Seed centers' managed by Farmers producers organisations are taking up the seed multiplication and making the good quality seed in limited way to farmers on cost basis. There is a pool of seed producers who learned the seed production protocol.
- Triggered the discussion to have Alternate seed systems for landraces/ traditional varieties- Govt of Odisha has approved the SoPs. In near future, it will be functional – useful to all pulses, oil seeds, paddy and other crops than ragi too.

Multi Location Trails:

Further Multilocation trials were also conducted during Kharif 2021-22, in 4 different Mini Agro-Ecological Zones from Odisha, bringing selected suitable finger millet varieties that identified from Participatory Varietal Selection for mainstreaming in the public domain. Generated required data from MLTs and PVTs to present it to Government.

