

**Success Story**  
**Rashtriya Krishi Vikas Yojna**  
**(RKVY)**

**Project: “Enhancing Production and Productivity of Millets and Pulses in Odisha through an Alternative Seed System Model for Production and Supply of Improved Seed Varieties.”**

**Project Period:** 2018-2021

**Category:** Agriculture

**Project Implementing Agency:** M.S. Swaminathan Research Foundation

**Background:**

**Issues:**

- Dry land smallholder farms do not usually use quality seeds of high-yield, pest-resistant and climate smart varieties available through formal seed systems.
- Yields are low and the risk of losing crops and seed due to natural calamities are high.
- The traditional varieties yield have been gradually decreasing owing to various reasons - non-availability of pure seed, loss of genetic vigor in the available seed.
- The lower seed replacement rate (SRR) in rainfed crops is usually due to high logistic costs in seed production and distribution in the remote villages with low infrastructure and lack of farmer’s ability to pay for high priced seed.
- Growing crops in uncertain agro-climatic conditions is challenging because of many dry land stress and access to quality inputs, especially seed, and other technologies.

**Challenges**

Due to the very poor irrigation facilities available.

Change amongst indigenous community has remained as winning their trust and confidence for adoption of new technology and improved variety .

Quality seed production and enhancing of production.

Formation of FPO and marketing of quality seed.

## **Pre- Implementation Issues**

- According to baseline survey 97 percent farmers were using own traditional variety of finger millet.
- The traditional variety provides very less production.
- Seed treatment was not being followed by the farmers for which pest attack was taken place for both finger millet and green gram crops.

## **RKVY Initiative:**

The following integrated crop management technologies were demonstrated in the farmer's field.

- a. Seed treatment with *Trichoderma viride* 4 g/kg for finger millet and green gram crop. *Pseudomonas fluorescens* @ 10 g/kg of seed in green gram crop. Also, rhizobium culture is used for seed treatment.
- b. Land plough and 2 – 3 irrigation to green gram seed production was promoted.
- c. Foliar application of DAP @ 5 kg/ha at the time of 50% flowering Recommended dose of fertilizer @25:50:25 kg NPK/ha for green gram, Integrated pest and disease management with special
- d. The Community Seed Banks which have been proved successful under the MSSRF's Alternative Seed System Model was promoted for kept safe seed storage and easy access to farming communities.

## **Technology/Tools Development**

The innovativeness/novelty of the project is to transfer /replicate some of the new/adapted/modified technologies from the proven technologies in the farming system such as SMI (System of Millet Intensification), LT (Line transplanting), cycle weeder in finger millet crop and 2% DAP spray in green gram crop.

## **Outcomes**

- Alternative seed production and delivery system enhance production and productivity by 40-45%. Supply of good quality improved variety seed at reasonable price and on time.
- Availability of quality seeds at household (at least 60% of targeted households) and at community level through Community Seed Banks.
- Reduction in drudgery (particularly for women) & seasonal migration, improved health and better livelihood status.
- Produced of 350 quintals of certified seed of finger millet and 750 quintals of green gram during the project duration (3 years).
- Well trained 56 lead farmers in the project area earn asset to serve as para extension workers in the district.

## **Impact:**

Farmers of Koraput tribal farmer get pure quality seed at affordable price in own village.

About 750 farmers started SMI Cultivation, after seeing this plot by adjacent farmers and surrounding Village Farmers

Farmers getting higher yields and more returns in the SMI method in finger millet cultivation system than the traditional cultivation by providing an alternate livelihoods and food security.

The implementation of this model among the 2000 HHs in Koraput (finger millet) and Ganjam (green gram) districts of Odisha resulted in 45 % increase in the production of finger millet and 40% green gram with minimum cultivation cost and improved agronomic practices.

Further, the farmer of Machhra village in Koraput district who adopted this model harvested 51.3 quintals/ha of finger millet which is the highest yield in the state. Annual income of inhabitants of the area will be increased.

## Citation of farmers

### Hari Sukia:

It is my first experience of cultivating finger millet foundation seed. I am a small farmer of the area. I started my farmer life last 28 years. I cultivated traditional methods in previous years. I did not get good price from agriculture field. Last years I adopted SMI method from MSSRF staffs in finger millet seed production. I used small cycle weeder for inter cultural activities. I am very happy and surprised to see the crop performance of the foundation KMR-204 improved variety in comparison to my own traditional variety. I got yield 3.4 quintals/ acre from traditional variety of bati mandia following traditional practices and 20.55 quintals/ acre from the improved variety i.e. KMR-204 following SMI method and improved cultivation practices



### Laichan Sukia:

In year 2019 I cultivated 1 acres of land for finger millet certified seed production programme with foundation KMR 204 variety along with SMI method. I adopted SMI method from MSSRF staffs in ragi cultivation. In my field I seen 14 to 22 tillers one plant and 10 to 15 nos. of finger in a panicle. I got good yield from the new technology the yield up to I got 13.78 q/ac which were sold 10 qts. to Odisha



State Seed & Organic Products Certification Agency (OSSOPCA) Jeypore @ Rs.4065/- per quintal for seed purposes and 3.5 qts. to Mandi @ Rs. 3150/- for grain. Total earned Rs. 51675 /- against the cost of cultivation Rs.13615/- per acre. The farmers of nearby villages and other districts like Denkanal, Ganjam, Sundargard and Malkangiri also apart farm near by state like Chhattisgarh and Maharashtra farmers visited to my field. In 2020 kharif I was cultivated KMR 204 finger millet variety 2 acres for seed production out of three acre of upland. I got total 27.45 qtls. I sold 15 qtls. of seeds to OSSOPCA remaining 12.45 qtls. to Mandi @ Rs 3295/- per qtls. .

Now I am open a small tea and Tiffin hotel the invest of earned from the seed production money.

## Ramanath Panigrahi

Ramanath says, they know about the improve varieties of seeds but not cultivated ever as he thought its need extra care and the high yielding varieties need more fertilizer and pesticides etc. so they have use own seeds for cultivation of green gram. in the year 2019 he interact with the staff of MSSRF and also got seed support along with various inputs like technical knowledge, training, field inputs etc



under RKVY supported ASSM project (Alternative seed System Model) for Production and supply of improved seed varieties. such as high yielding seeds with cultivation and practices through training and demonstration. So we are innovate and wants to cultivate improve varieties both for consumption and sales. So we are very happy and cultivated IPM 02-14 and IPM-02-03 Green gram seed such as high yielding seed varieties in our field for livelihood development. for collective marketing of green gram seed we formed "Bahuda Farmer Producer Company Ltd". (FPO) which brings us in a single umbrella.

I have used the bio-fertilizers and bio-pesticides which is recommended in the FFS in one acre green gram cultivation. The plant population and vigor is increased and root rot disease incidence is very much reduced compared to my previous cultivation. Through this process personally I got Rs. 29630/- (Twenty nine thousand six hundred thirty rupees from 2 acre in 2019. I am happy to continue the new process for green gram cultivation in future and those are interested to learn the process of seed production I will help them. The yield enhancement compare to previous cultivation is more than 170 percent.



**Inter culture with cycle weeder**



**RKVY state evaluation team visited finger millet seed production field at Machhra**



**RKVY state evaluation team visited finger millet seed production field at Machhra**



**Finger millet quality seed winnowing and cleaning**



**Finger millet seed packaging for sell to OSSOPCA**



**2% DAP spray at vegetative stage of green gram**





**Irrigation with sprinkle water**



**MSSRF – Director visiting the green gram field at Barabaranga, Ganjam**

## Magical Hands of a Tribal Farmer Set a Milestone in Finger Millet Cultivation-A Case from Koraput, Odisha, India

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### Abstract

The nutritious millets traditionally occupied substantial part of the diets and cropping systems in tribal areas of Odisha. Millets require less water and are more resilient to climate vulnerability. They can also be cultivated on the undulating terrain. Reduction in millets resulted in nutrition deficiency. In order to address growing crop failures and nutritional issues, millets need to be revived. Majority of the farmers in Koraput district of Odisha are tribal, resources poor and mostly dependent on onset of monsoon for agriculture. The rainfall in this region is erratic and prolonged drought conditions are common occurrences. Numbers of rainy days were decreased over the period of time. Millets being climate resilient crops systems, revival of millets will enhance resilience of the farming systems and household food security against Climate Change. Finger millet is the second staple food after rice. Area under millets is drastically declining resulting in narrowing of the food diversity in consumption at household level. Increasing urban demand, improvements in processing machinery, availability of improved cultivars, better agronomic practices and possibility of accessing support irrigation has increased the potential of realizing higher productivity in millets thereby improving nutrition security, resilience and economic security of tribal households. The farmers were cultivating many traditional varieties in the past, but now have changed to improved varieties because the traditional varieties continuously perform low in terms of productivity due to mixture of seeds, loss of purity and long duration. This paper analyses how a tribal family set a milestone in finger millet by adopting improved agronomic and good agricultural practices (Figure 1).

**Keywords:** Cropping System; Nutrition Deficiency; Climate Resilient Crop; Koraput; Seeds

### Introduction

Odisha is predominantly an agricultural state with a cultivated area of 90.54 lakh ha and average production of 25.44 million tons. Koraput district comes under Eastern Ghats high land type agro-ecological zone. The district enjoys tropical climate characterized by hot summer (20.5°C to 38°C), cold winters (12°C to 29°C) and rainy seasons (19°C to 28°C). The winter season generally commences from late November and continues up to the end of February. The summer season commences from March and continues till middle of June. It is observed that about 80% of the total annual rainfall takes place due to south-west monsoon between the middle of June and mid-October. The north east monsoon gives erratic and insufficient rainfall. The average annual rainfall varies between 1320-1520mm (Figure 2 & 3). Although the district is having high rainfall, the number of rainy days is restricted to 70-80 days/annum. The district is drought prone because of the erratic and uneven pattern of rainfall. The entire Koraput district has a unique physiographic set up. Except the north western and west-west

central part, the rest of the district is occupied by dense forest with highly rugged mountains, interspersed with intermundane valleys. The total geographical area is 8,807 Sq. Km. The population of Koraput district as per 2011 census 1,379,647 of which male and female were 678,809 and 700,838 respectively with the schedule caste population is 196540 (14.2%) and schedule tribe population 697583 (50.6%). The literacy percentage of the district is 49.29 as against 72.9 of the state. Population density is 157/km<sup>2</sup>. The proportion of district population to the Odisha state population is 3.29%, Sex Ratio (Per 1000) 1032: 999. The total cropped area is about 3.56 lakh ha out of which 1.53 lakh ha (43.0% of TCA) is irrigated and 2.03 lakh ha (57.0% of TCA) is under rain fed area. The main sources of irrigation are canals, rivers, farm ponds, dug wells to net sown area of the district. Among the different crops, cereals accounts for 54.5% of the irrigated area followed by other crops (34.6%), coarse cereals (4.7%), horticulture & plantation (2.9%), pulses (2.5%) and oil seed crops (0.7%). The primary

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source of income is from Agriculture whereas secondary source from agriculture labourer and daily wages. *Kharif* is the major cropping season where farmers cultivate cereals, millets and pulses. In *Rabi* season few pulses crops, oil seed crops and vegetables are being cultivated and majority of the farmers migrated in search of wage labourer both within the district and outside the district. The majority of farmers hold less than one hectare of land in the district and generally practice subsistence farming. Rice is the major crop cultivated in the district in *Kharif* and also in *Rabi* where irrigation

facilities available. Traditional farm practices are followed in upland resulting in low level of production. In the non-agriculture season NTFP like *kendu leaf*, tamarind, *Mohua* and *Sal* seeds are the source of income. Koraput was recognized as a Globally Important Agricultural Heritage Systems (GIAHS) by FAO in 2012 for the efforts of the community in biodiversity conservation, food security, preserving the traditional wisdom and cultural diversity of the region for the benefit of the present and future generations (Figures 4-6).



1. Prashant K Parida, Neeranjan Gauda, R. Jeeva, Kartik Charan Lenka, Production of Certified Seeds of finger millet through Alternative Seed System Model (Odia), 2020, 10.55 minutes length, published by Biju Patnaik Tribal Agro-biodiversity Centre, M.S. Swaminathan Research Foundation, Jeyapore, <https://youtu.be/Ey74tP-dhp4>



## [Alternative Seed System Model of Finger Millet](#)

Title of the video: Alternative Seed System Model of Finger Millet  
Supported by: RKVY, Govt. of India and Department of Agriculture and Food Production, Gov...

youtu.be

2. P.K.Parida, Niranjan Gouda, R. Jeeva and Kartik Charan Lenka : 2020 Magical hands of a tribal farmers set a milestone in finger millet cultivation - A case from Koraput, Odisha India, *Scholarly Journal of Food and Nutrition* DOI: 10:32474/SJFN-2020.02.000144  
Lupine Publishers ISSN: 2638-6070

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