



## Participatory Varietal Selection: A Case Study on Small Millets (Little millet) in Tribal Dominated Areas of Odisha

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### Abstract

Modern Plant breeding has catered more to the needs of rich farmers who could afford high management under irrigated situations. In contrast, subsistence farmers growing millets in unfavorable environments use low levels of inputs and have not been benefited by high yielding variety (HYV) technology. In present study, the usefulness of participatory approach for identifying cultivars for harsh environments and acceptable to resource poor farmers has been demonstrated. In Little millet one released variety OLM -208 was tested along with nine local landraces in farmers field. Trials were conducted during kharif-2022 at Golereguda village of Kundura block, koraput district and Agroecology center, chitrakonda block of Malkangiri district of odisha. In Pre - and Post-harvest Focus group discussion (FGDs) revealed that the variety "Bada suan" in Little millet at Golereguda village of Kundura block, koraput district meet the criteria of farmers. Also like this the variety "Bada suan -Ranga" in Little millet at Agroecology center, chitrakonda block of Malkangiri district meet the criteria of farmers requirement. Farmers also opined that these local landraces has good yield potential, lodging and disease, pest resistance and they would adopt them in future agro ecosystem.

**Keywords:** *Little millet, Participatory selection.*

### Introduction

Among rainfed crops, small millets play an important role for food and nutritional security for the farmers who are mostly depending on rainfed farming. India is the largest producer of small millets which are often referred to as coarse cereals. Realizing the nutritional security of these grains they are now consider as "nutri-cereals" (Smart grains). Small millets grown in India are Finger millet, Kodo millet, Foxtail millet, Little millet, proso millet, Barnyard millet are account for about 2.7 million ha and their cultivation extending in variable agro ecological conditions. The crops are grown in diverse soils, varying rainfall regims and in area widely differing in thermo -and photo periods. The resilience exhibited by these crops in helpful in their adjustment to different kinds of ecological niches and have

made them quite indispensable to rainfed and hilly agriculture, where crop situation is very difficult. That is why it is important to enhance production, productivity of these crops to ensure food and nutritional security.

In odisha this grain (Little millet) is most important is used for sailing purpose and very less quantity is used as food for human consumption in some occasion. The usage of straw for bovines is not being highly accepted, due to soft straw of paddy is easily available, free green grazing in the forest areas are the basic factors for straw usages of Little millet. It has been observed that the maximum quantity of straw used for making Farmyard manure or, making fire of Little millet straw which alternatively gives some nutrients to soil.

The grain is processed and consumed in traditional process at village level in traditional recipes like rice and some traditional beverage. In spite of superior nutritional value of grains, their use is conformed very less to rural areas due to various factors .all the Un processed grains are transported to other places like Maharashtra, Gujarat .The promotion of this crop can lead to efficient natural resource management and holistic approach in sustaining precious agro -biodiversity.

Although many varieties have been released for cultivation in this crop and its adoption by farmers is minimal due to non-availability of the improved released varieties by different agencies. In vast dry land areas where this crop is grown in associated with local landraces, practice adopted is sole cropping method. The improved varieties for little millet those were tested in different research station were found superior than the local landraces, but these improved varieties may not perform well up to expectation in farmer's field (Thiele, *et al.*, 1997; Baidu -Forson, 1997; Sthapit, *et al.*, 1996).This situation has lead to

farmers not showing performance to new varieties having lower genetic potential as a consequence the grain yield productivity is low.

Keeping these things in view, the study was placed by providing cultivars acceptable to farmers through participatory varietal selection.

This gives closer to farmer's involvement from the initial stages of varietal evaluation and selection which helps in identification of better varieties for suitable for a given situation preferable to specific agroecological condition. This paper discusses the result of case studies on farmers participatory varietal selection of little millet crop in both koraput and Malkangiri districts of odisha.

### Materials and Methods

The trials were consisted at Kundura block of Koraput district and chitrakonda block of Malkangiri district of odisha during kharif - 2022 cropping season. The demographic details where the experiments were initiated are given below.

**Table 1:** Study areas for participatory varietal selection in little millet

Crop	Year	Season	Project area
Little millet	2022	Kharif	Village -Golereguda ,Block -Kundura ,District -koraput ,Odisha
Little millet	2022	Kharif	Village - Rajelkonda ,Center for Agroecology ,Block -Chitrakonda ,District -Malkangiri ,Odisha

**Table 2:** Varieties Selected for the Study in Little millet

Crop	Name of the variety	Special features / Silent features
Little millet	Tuma suan	Local landrace , Tall Plant type ,Compact Panicle
	Dhala suan	Local landrace ,Semi Dwarf ,Erect & Open Panicle
	Ranga suan -1	Local landrace , Tall Plant type Erect & Long Coloured Panicle
	Dangar suan	Local landrace , Semi dwarf ,Erect & Open Panicle
	Bada suan -Ranga	Local landrace ,Tall Plant type ,Open & Semi compact Panicle
	Mami suan	Local landrace ,Dwarf ,Semi erect & Small Panicle
	Kajerikanhara suan	Local landrace ,Tall Plant type ,Long & Semi compact Panicle
	Bada suan	Local landrace ,Tall Plant type , Long & Droopy Panicle
	Jetrimundi suan	Local landrace ,Tall Plant type , Long & Droopy Panicle
	OLM -208	Released , Tall Plant type , Erect & Open Panicle

PRA (Participatory Rural Appraisal) was part of the study to understand the needs and performance of farmers in varietal choice .This was done by individual farmer survey

using preform developed for this purpose. Survey was conducted in project villages during kharif 2022. Participatory Rural Appraisal showed that the millet growing

farmers 'grain and grain yield were the main consideration .But in case of other millets like finger millet ,they also wanted big size and compact panicle ,blast resistance varieties. Based on the farmers requirement from the pool of varieties available, nine varieties of local landraces were identified for testing in Randomized Block design plot in farmers field with comparison with one released variety.

After transplanting of the trial as per the package of practices, regular visits of the trial coordinating staff during the crop growth period were made to keep up the continuous interaction with the farmer's .This enabled proper execution of the trial as well as in gathering of farmers perception on the testing material.

### Results and Discussion

The Performances of these varieties in each trial plot in each block where the trials were tested were judged by visually as well as quantitatively by a group of 30 farmers specially formed for this purpose, so that the final judgment and ranking of varieties were solely made by the farmers themselves. The group visited all the subplots which were grown in different varieties from each other in all replication of the trial plots, scientist, extension officers and key officials, NGO staffs accompanied the group.

The input provided by the group was used for formulating a pre harvest ranking of varieties along with check .by making important characters ,namely crop duration ,panicle type ,and size of panicle ,disease resistance ,drought tolerance ,grain density ( size),and estimated yield potential , grain yield data after harvest were collected from each

subplots of each replication for more critical comparison .

In the trial which has tested in Kundura block of Koraput district mean grain yield data indicated that the local cultivar "Jetrimundi suan" was superior in 3.8 qt. of grain yield per acre to "Bada suan" was performed the grain yield of 3.15 qt. of grain yield per acre, and the third superior was "Ranga suan-1" of grain yield 2.91 qt. per acre in between the all varieties (10 no.) including the check.

In the trial which has tested in Chitrakonda block of Malkangiri district mean grain yield data indicated that the local cultivar "Bada suan -Ranga" was superior in 3.15 qt.of grain yield per acre to the released variety "OLM - 208" of grain yield 3.11 qt .per acre, the third superior was "Kasamjhupa suan "of grain yield 2.91 qt. per acre in between the all varieties (10 no.) respectively.

Participatory rural appraisal showed that the little millet growing farmers has considered on panicle shape, grain yield were the main visualized characters for the varietal selection process .Based on the yield data, the variety "Jetrimundi suan" was found significantly superior to other varieties and the variety was preferred by farmers because of medium duration maturity (134 days), high tillering, non -lodging and drought tolerant at Kundura location.

In chitrakonda location "Bada suan -Ranga "was found significantly superior to other varieties and the variety was preferred by farmers because of long duration maturity (154 days) , high tillering ,long droopy panicle ,non -lodging and tolerant specific characters

**Table 3: Mean Performance of Grain yield**

Mean Performance of Grain yield of Ten entries in Participatory Varietal Trial of Little millet in Kundura location				
Sl.no	Name of variety	Production range		Rank
		In Acre ( qt)	In Hectare (qt)	
1	Tuma suan	2.5	6.17	
2	Dhala suan	2.63	6.49	
3	Ranga suan -1	2.91	7.18	3rd
4	Dangar suan	2.67	6.59	
5	Bada suan -Ranga	2.79	6.89	
6	Mami suan	0.31	0.76	
7	Kajerikanhara suan	2.79	6.89	
8	Bada suan	3.15	7.78	2nd
9	Jetrimundee suan	3.8	9.38	1st
10	OLM -208	1.57	3.87	

The mean grain yield of Kundura location under improved variety OLM -208 was 1.57 qt. per acre in comparison with 3.8 qt. of grain

yield per acre of local variety showed that 2.42 % of grain yield increased in local variety.

**Table 4: Mean Performance of Grain yield**

Mean Performance of Grain yield of Ten entries in Participatory Varietal Trial of Little millet in Chittrakonda location				
Sl.no	Name of variety	Production range		Rank
		In Acre ( qt)	In Hectare (qt)	
1	Tuma suan	2.59	6.39	
2	Dhala suan	2.83	6.99	
3	Ranga suan -1	2.59	6.39	
4	Dangar suan-2	2.87	7.08	
5	Bada suan -Ranga	3.15	7.78	1st
6	Ranga suan-2	2.5	6.17	
7	Kajerikanhara suan	2.71	6.69	
8	Bada suan	2.38	5.87	
9	Kasamjhupa suan	2.91	7.18	3rd
10	OLM -208	3.11	7.68	2nd

The mean grain yield of Chittrakonda location under improved variety OLM -208 was 3.11 qt. per acre in comparison with 3.15 qt. of grain yield per acre of local variety showed that 1.01 % of grain yield increased in local variety.

### Conclusion

The Superior cultivar for large scale cultivation needs to be maintained for its genetic and physical purity in order to exploit its genetic potential in a well-managed crop improvement programme. The farmers who have been involved in conducting Front line

Demonstration were given training for adopting proper procedure for maintaining the genetic architecture of the cultivars .

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**Source of support:** Nil;

**Conflict of interest:** The authors declare no conflict of interests.

**Cite this article as:**

Das, B.S. "Participatory Varietal Selection: A Case Study on Small Millets (Little millet) in Tribal Dominated Areas of Odisha." *Annals of Plant Sciences*.12.06 (2023): pp. 5884-5888.