



# IMPROVING PULSE & OILSEEDS BIODIVERSITY

in rice fallow areas of tribal belts of Central and East Indian states to bring resilience in the farming practice, provide livelihood support and enhance nutritional level of the tribal population

## What are we doing?

- Enhance the availability and on-farm conservation of resilient varieties of pulses specially traditional varieties, underutilized species of pulses and oil seeds for cultivation during the rice fallow season; the project has helped reintroducing varieties of Pigeon pea, Black gram, Groundnut, Green gram, Kudrum, Cow pea, Ghagra, Horseshoe gram, Gram, Little Pea, Red lentil and oil seeds: White sesame, Black sesame, Red sesame, Niger, Mustard, Linseed and Sunflower successfully seeds back to the farms.
- Diversify the local agricultural systems and enhance farmer's resilience through farm trials of pulse varieties collected from seed banks and farmers' fields, in order to select farmers preferred varieties based on climate resilient traits.
- Establishment of 5 community level seed banks.
- Farmer's capacity building such as trainings and field schools on conservation and sustainable use of crop biodiversity, seed quality control and multiplication of quality seed.
- Documentation of indigenous knowledge on local varieties and seed systems, as well as knowledge produced through project activities.
- Seed Diversity Fair organized in five states. about 850 tribal farmers including 295 women farmers participated actively in the seed diversity fairs and benefitted from it.
- Community Seed bank, distributed 403 seed saving passbooks, farmers have received direct benefits while 754 have been benefitted indirectly.
- Farmers are trained on pulse and oil seeds cultivation, crops management, pest managements etc.
- Access to government facilities/ schemes by establishing linkage building and convergence between project farmers and government departments.

Soyabean and cotton are the major crop of Dhar district of Madhya Pradesh in Monsoon season. Farmers are growing single crop in monsoon season and the no crop in winter season. Many small- scale farmers are worried of gaining nothing in spite of fighting with major seasonal variations in the weather in India like very hot summer, the cold winter, excessive rainfalls, lack of rainfall etc. The downfall in the agriculture, the suicide of farmers and low selling of crops are discouraging the small-scale farmers now a days. The situation was same for the many farmers of tribal village Bahadara in Dhar District of Madhya Pradesh. They were growing BT cotton in his lands a few years ago. But in spite of the major investments, he was not satisfied with the result and decided to leave agriculture for the rest of his life. Now they made their farms into multicropping site including pulses, oilseed and millet in which they uses organic compost on the crops. By doing this, he is able to produce more by making less investment. One farmer from them Mr. Mohan Alawa has grown different crops like Urad (Black gram), Moong (Green gram), Chola (Lobia), Onions and Garlic by adopting mixed cropping practices.

Subodhi Soren, a simple and marginal farmer woman from the tribal community of the village Tulsitad, district-Deoghar in the state of Jharkhand. She was a labour earlier and it was her only of earning for living on daily basis. But later, She used to do farming partially at her home along with the labour work. She was grown vegetables and paddy. After initiation of project Subodhi started the introduction of pulses. She collected the different varieties pulses and oilseed from tribal community and store them. The farmers in these areas eat rice with pulse like moong (mung bean), kulthi (horse gram), arhar (pigeon pea) and they have to purchase pulses from market for INR 80 to 160 per kg. Due to high price they are mostly time eat rice with curry of different vegetables and sometime with water only. For kharif crop moong, and urad 6.5 kg pulses and oil seed deposited first time in community seed bank in October 2020. For kharif crop kulthi, white till, black till, red till and niger seeds deposited 16.7 kg in community seed bank in October/ November 2020. For rabi season crops masoor, mustard, linseed, pea, barley and chana deposited 32.2 kg in community seed bank.

Successfully revival of traditional varieties - Lotani (variety of black mustard), Kudrum (Hibiscus cannabinus v.), Ghaghra (Vigna sinensis) in Bihar. Lotani variety was completely lost in the area. Mr. Hareram Yadav and Mr. Jiva Soren both were interested to introduce 1 kg lotani seed and produce 20 kg along with they were first time introduce local variety of groundnut and production was good. Now Mr. Hareram and Jiva Soren are continuously growing local variety of mustard and groundnut and multiplying the seeds. 65 kg seeds deposited in community seed bank from harvesting of winter season crops in April 2021 and 27 kg deposited from harvesting of July season crops in October 2020. 75 farmers in directly and 200 farmers indirectly benefitted in Bihar till 1 April 2021. Benefitted farmers are cultivating pulses in an average 1.5 to 2 bigha area. They are not selling but it reduced the dependency on market around 4 to 6 kg pulses/family/ season.

There are 12 million hectares of rice fallows in India, 82% of which lie in the Central and East Indian states, where Protein-Energy-Malnutrition (PEM) is extremely widespread. Pulses used to be the preferred choice for cultivation after rice is harvested. Over recent years, however, farmers have lost a considerable amount of pulse genetic diversity due to a variety of pressures. Nontraditional legumes (tribal pulses) also remain underutilized due to the absence of robust seed systems in the area. Over the last 60 years, the per capita availability of pulses in India has reduced from 60g to 41.7g per person per day contributing to serious malnutrition.

## What has been achieved to date?

The project will facilitate access to germplasm of resilient varieties of pulses and build skills for sustainable and effective use of these genetic resources, thereby empowering farmers, the majority of whom are women. In this way, the project will have a sustained impact on the health and nutrition of the community.

About 41.3 Acre farms are under the cultivation of these pulses and oil seeds now. This will increase further as the varieties are reintroduced in the coming season. The initial plan was to introduce the pulses and oil seeds in the post monsoon (rice fallow) season. But in all the project sites on farm screening has been conducted for 3 seasons – monsoon, late monsoon and post monsoon (rice fallow).

All the project sites are in the places where pulse and oil seeds cultivation have either fully left by the farmers or where only a handful scattered farmers were cultivating these crops. Seed banks have been proved crucial in providing necessary support and training to the farmers for sustainably using these resources and off farm and in -situ conservation of these PGRFA. A very important step in this regard has been setting up active collaboration between farmers and scientists from agriculture universities and Krishi Vikas Kendra. The project activities have resulted in the return of in -situ cultivation (and therefore conservation) of 27 varieties of 14 crops in Jharkhand, 46 varieties of 17 crops in Bihar, 11 varieties of 7 crops in West Bengal and 10 varieties of 4 crops of pulses and oil seeds in Chhattisgarh so far. In the project site in Jalpaiguri, West Bengal communities have started cultivating pulses after more than two decades.



## Who has benefited?

The direct beneficiaries of this project will be 1,250 vulnerable farmers, mostly women, from indigenous and tribal communities in Central and East Indian States. Tribal communities will be the beneficiaries of the project as the enhanced area under pulse production will provide them an additional crop, nutritional support and bring back crop biodiversity and therefore develop climatic resilience. It is anticipated that the number of beneficiaries receiving seeds from seed banks will number 250, while a further 1,000 farmers will benefit from technical capacity building through workshops, farmer's field school, knowledge exchange, information materials and exposure visits.

- Seed Diversity Fair organized in five states. about 850 tribal farmers including 295 women farmers participated actively in the seed diversity fairs and benefitted from it.
- Community Seed bank, distributed 403 seed saving passbooks, 403 farmers have received direct benefits while 754 have been benefitted indirectly till 1 April 2021.
- ~78 tribal farmers became part of the participatory trails, and received extensive hands-on training on-farm seed conservation, cultivation and multiplication.

Farmers of the tribal rich project area have long left cultivating pulses and oil seeds. They used to get only one crop a year during monsoon season. Strengthening informal seed system via setting community level 5 seed banks for pulse and oil seeds, capacity building of farmers on conservation and sustainable use of plant genetic resources, participatory on-farm trials & variety selection and seed exchange via seed fairs in the tribal villages have successfully initiated diversification of cropping system of the project villages. A major success has been that the results have inspired the farmers from outside the project area especially in Bihar and West Bengal to cultivate pulses and oilseeds. In near future it is expected to open a new source of earnings for them.

Capacity of the tribal communities have been developed in 5 project sites to conserve and manage seed varieties in the community seed banks and run these seed banks smoothly.

The strong participatory approach deployed for conservation and sustainable utilization of plant genetic resources for food and agriculture has strengthened the collaboration between tribal farmers especially women farmers, scientists & researchers and field coordinators. Various local actors and practitioners observing the impacts of the project are becoming increasingly aware of the usefulness and urgency to conserve and sustainably utilize the locally available genetic biodiversity for sustainable farming, diversifying livelihood options and nutritional support. About 850 farmers including 295 women farmers participated in the seed fairs. Seed fairs proved important in building a relationship among the project team, farming community, officials from local governing bodies (Panchayati Raj Institutions) and agriculture department.

## Best practices and success stories

Most of these are marginal farmers growing only one crops (rice during rainy season) in a year (which is hardly sufficient to sustain their households through the year. Majority of them supplement their income from farming with earning daily wages from brick kilns or working as manual labour in construction where they typically earn INR 70-100 besides having some marginal income from livestock. Promotion to pulses will not only increase their earnings but also nutritional intake. Therefore, project objectives are highly consistent with local needs. Women eat last in the family and have hardly any nutritious food; pulses can be significant addition in their nutrition and also enhance household income as they would do not have to buy pulses from the market.

In West Bengal Most of the farmers are cultivating single crop – monsoon paddy. the farmers are migrating as daily labour to other states. Dhupjhora-Batabari villages of Matiali block of Jalpaiguri district, West Bengal is selected as project location in January 2020. Based on evolving action plan, there are 12 farmers who are cultivating black gram, green gram and kulthi trial plots in the monsoon season after 20 to 25 years. There are 9 farmers who cultivated black gram by using traditional knowledge and rest 3 farmers used scientific knowledge to cultivate black gram, green gram and kulthi. Winter crops Khesari, Mustard and Red Lentil seeds received 21 kg in community seed bank in April 2021. As Kharif crop Green gram, Kulthi, Black gram and niger seed deposited in 2.5 kg in community seed bank in October 2020. The project is just initiating to explore the land and human resources towards pulse cultivation after 20/25 years. There are just 1% farmers who cultivated pulses sporadically in last 25 years in the project location. The reasons behind this long gap are unavailability of pulses seeds, loss of traditional knowledge, lack of trainings, lack of technologies etc. though farmers knew pulse is more profitable than other crops. In West Bengal 75 Farmers directly and 104 indirectly benefitted till April 2021. The individual farmer was cultivating the pulses in an average half to one biga area till April 2021. It reduced dependency on market around 3 to 4 kg pulses/ family/season.