

# Community food sovereignty<sup>1</sup> through re-establishing millet based mix cropping systems



## Background and Overview

**T**rócaire has had specific programmes on community food sovereignty through re-establishing a millet based mix cropping system in 10 villages in Rayagada district of Odisha through its partner Living Farms since 2010. The major tribal community in the operational villages are the Kondha. The district has the second highest concentration of dalit<sup>2</sup> and tribal population in Odisha, with a dominant tribal population (56%) and 14% dalit population.

In 2010, in cooperation with partner organisation Living farms, Trócaire started an innovative 5 year livelihood programme. The programme includes a specific component to promote agro ecological balance in the area and community level conservation of cereal varieties of locally appropriate food crops. The core component of the programme is to revive the traditional millet based mix crop practices that have enabled families to have additional food.

The core component of the programme is to revive the traditional sustainable food and farming systems that

### BOX 1:

Kondha are the largest tribal in Odisha. They have a great cultural heritage and values which respect nature. They grow their food mostly through exchange of labour, seeds, skills, services and consulting one another regarding farm-related decisions. Traditionally they grew more than 60 varieties of crops (millets, maize, sorghum, lentils, sesame, flax seed, roots, tubers, spices, beans and vegetables) through mixed-cropping practices in land and/or along hill slopes. This practice helped them in improving soil health and soil fertility. They used several local plants that are used as insect repellants such as sago palm. They also used to cultivate a few folk varieties of paddy and collect hundreds of uncultivated foods from the forests (edible flowers, fruits, tubers, leaves, stems, seeds, wild mushrooms, tamarind, bamboo shoots and edible insects).

<sup>1</sup> Food Sovereignty is "the right of peoples, communities, and countries to define their own agricultural, pastoral, labour, fishing, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances. It includes the true right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food-producing resources and the ability to sustain themselves and their societies." [From: Food Sovereignty: A Right For All, Political Statement of the NGO/CSO Forum for Food Sovereignty. Rome, June 2002; <http://www.grain.org/seedling/?id=329>

<sup>2</sup> Dalit: A Dalit is the term used for a section of Indian society traditionally considered 'Untouchable'. The Constitution of India recognises them as 'Scheduled Caste'.

optimise and stabilise yields to meet household food and nutrition security needs.

The millet based foods with varied crops have improved nutritional intake. Tribal women have been encouraged to focus on their traditional crops not only to avoid increasing market prices but they are part of their food culture as well.

The families who have taken up this millet based mix cropping have also realised that this cropping practice also helps them in the event of long dry spells and heavy rain falls destroying the rice fields as almost all of them have managed to harvest few crops (as the mix crop fields take up crops ranging between a minimum of 8 varieties to maximum 53 varieties).



▲ Tribal village in the midst of forest

## Strategies adopted for promoting food security through reviving traditional agriculture:

### Reintroducing and increasing crop diversity:

Villagers started building horizontal networks amongst and between them for the revival of traditional seeds, agri-culture and food systems involving farmers from more than 300 villages to counter the external effects – as one of the strategies to assert their food sovereignty especially when external input intensive agriculture is being pushed.



▼ The seed yatries moving on

This momentum inspired and reached out to neighbouring villages, through structured and unstructured forums mostly led by local communities. It involved a **bihana yatra (seed tour)** to neighbouring villages and reaching to their fellow farmers in other districts to collect their lost seed varieties. Farmers from 30 villages decided to resume mixed cropping in 2012 with 8 varieties of crops. A number of **seed exchanges** amongst and between farmers were organised to facilitate sharing of seeds and knowledge on agro-ecological principles and practices. Increasing the crop diversity was given importance so that the nutritional needs of small and marginal farmers were addressed. For instance by growing millets, pulses, oilseeds and tubers in the same patch of land, the households would get cereals, pulses and oilseeds from the same field.

Experience shows that increasing the diversity of crops at species and varieties level increases the farm resilience to climate and thereby enables the farmers to harvest one or the other crop as opposed to complete crop loss. The increased crop diversity has played an important part in this as (a) farmers could select the varieties suitable to the local climatic condition and (b) did not face total crop loss due to 'Hudhud', the severe cyclonic storm and following incessant rain in October 2014. The diversity of crops grown by farmers in the programme villages in 2013-14 rainy season crop cycle included 9 types (23 varieties) of millets, 9 types (16 varieties) of pulses, 4 types (7 varieties) of oilseeds and 5 types (6 varieties) of tubers on 765 acres (306ha) of land.

### Cultivation of traditional varieties of paddy:



▲ Harvesting Paddy

Similarly farmers have revived cultivation of traditional varieties of paddy, which has have been helping them to adapt to the changes in the climate, have more net yield per unit of land and food at home for more weeks and months. The yield per acre has increased to 4.52 quintal in upland, 17.27 quintal for medium land and 15.89 quintal for low land in 2014-15. (3.23 quintals-upland, 12.92 quintals - medium land and 11.62 quintals - low land as per baseline-2012 and 4.12 quintals-upland, 16.58 quintals-medium land and 15.21 quintals- low land as per data collected in 2013-14).

### Vegetables from homestead nutrition gardens:

More than 50% of the farmers families now grow vegetable cultivation in two seasons a year i.e. rainy and winter, which was not a practice earlier. They are growing about 12-18 varieties of vegetables in their homestead garden which provides 6-7 months supply of vegetables for a year. There has been an increase in the total dietary diversity at household level between 2013 and 2014 in three different seasons as shown in the illustration below. An improvement in dietary diversity contributes to having a more balanced diet.

### Traditional mixed cropping:

A mixed cropping system of 43 non paddy crops (cereals, pulses, oilseed, tubers) with a staggered sowing and harvesting is being worked out. These crops are an integral part of the local food culture and more nutritious than the polished rice being distributed under the public distribution system. These crops do not need synthetic chemical inputs;



▲ Mix cropping

the seed are renewable, need relatively less water, can withstand water stress, help to strengthen farm resilience, improve soil health, reduces per unit production costs and gradually moves towards making a positive net yield. The women gradually convinced their children to accompany

**Loknath Nauri, a farmer from Kerandiguda village had shared his view point of farming system in the context of food security and sovereignty of small and marginal farmers in the 2nd national Rice Congress which was held at Bhubaneswar in October 2012. He had told that ‘in the changing climatic scenario, we prefer mixed cropping, as that gives us food security, which we feel is most important for our family.’ So they cultivate varieties of crops – millets, pigeon pea, sorghum, maize along with paddy in the upland land.**

them to millets fields and the woods to recognise the diversity of food. This helped to increase knowledge of how the mixed cropping and forest foods can help them to be self-sufficient, work as a natural insurance against natural disasters, while also cementing a bond between the present generation and the ancestors, represented by the land and forest.

### Seed and Food Festivals:



▲ Seeds exhibition being inaugurated by Assistant Block Development Officer, Bissamcuttack Block.

Another method was the revival of food and seed festivals involving all villages in the project area. These festivals are as much about worshipping and expressing gratitude to the land, forest, water and village deity for being kind to them, as about sharing knowledge and seeds amongst each other and celebrating food and seeds diversity. While these festivals offered chances to the children and youth from the neighbouring villages to physically witness the diversity of their food, the adults would discuss the threats to their food producing habitats- the land and forest. In February 2014, in one such Food Festival at Bissam Cuttack in the Niyamgiri



▲ Tribal food festival

foothills of Odisha over 600 tribal villagers, about 80% women, gathered from over 200 tribal villages – to celebrate the rich diversity of their traditional foods. More than 1500 food varieties – cultivated and uncultivated, raw and cooked – were on display; over 900 were uncultivated forest foods! Included too were 400 ready-to-eat recipes for sampling.

With the realisation of the inherent strengths of their traditional agricultural practices, village elders have begun to involve the youth in re-establishing their socio-cultural linkages with food, forest and agriculture. Community dialogues between elders and youth on land, forest and food were organised which provided space for critical reflection and strengthening solidarity amongst them. In one such dialogue, they said:

**“We shall protect our independence and self reliance for our food needs. Besides what we collect from our forests, we want to cultivate our own diverse organic, poison free crops from our own traditional seeds. We want to live together as a community, and not be fragmented. We know what trees we must preserve, and what we can cut. Our environment – air, water and forests – are sacred to us. They must remain pure and unpolluted. We will keep the business companies and traders out of our forests, hills and villages!”**

**Community Based Adaptation Practices:**

As one of the locally appropriate strategies to strengthen community based adaptation practices, Living Farms has been making efforts to improve the resilience of the agro system, promote forest / or uncultivated food and have begun work on sustainable management of forest and other commons.

**Promotion of uncultivated food / forest food:**

Recognising the contribution of forest food of both plant and animals on the diet of the locals, a series of steps have been taken to understand the diversity, availability, accessibility as well as perception of people about these foods. In this connection, a systematic documentation of these foods collected from farm and forest has been initiated in the project villages with prior consent and participation of all the villagers. From the dietary diversity score collected for three seasons a year – summer, rainy and winter, it has been observed that uncultivated food makes around 33.33%, 26.82% and 29.17 % in summer, rainy and winter season respectively. They avail many of the raw and ripe fruits of different colours in summer, the rainy season is the season for mushrooms, shoots and greens, winter being the season for varieties of roots and tubers. Foods collected from water bodies include varieties of small and medium fish, shells, snails, crabs, turtles and greens.

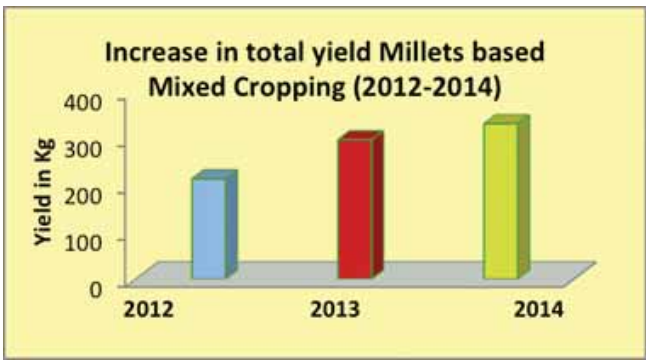
**Impact:**

The programme has been working with 726 tribal households out of total population of 894 household (753 tribal + 141 dalit) in 10 villages in Rayagada district, Odisha. All these 726 farmers have been involved in millets based mixed cropping on 656 hectares of land.

**Increased crop diversity:**

The below graph - 1 illustrated, increased millets based mix crop diversity has provided a buffer for the target families against food insecurity. Even though there was crop loss/less yield in a few crops due to the erratic climatic condition and the cyclone, villagers were able to harvest the remaining crops like minor millets.

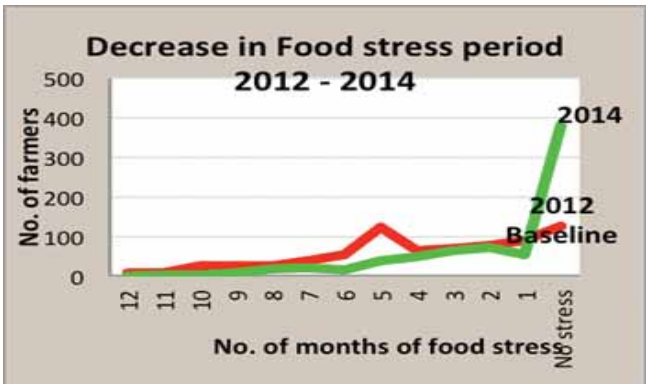
▼ Graph – 1: Increased in total Yield Millets based Mix Cropping



**“I am able to provide good meals to my children along with dal (pulses) and oil through this mixed cropping, which I had never thought of. And it does not demand more of my labor than what I was doing earlier!”**  
 – Palai Huika, a single woman farmer.

**Reduction in food stress period**

Out of 726 farmers, 381 (52%) families have got sufficient food for a whole year and for another 317 (44%) farmers it has been reduced by varied number of months as shown in the graph - 2 illustration. However, unfortunately 24 farmers have faced crop loss as a result of the cyclonic storm in 2014. As per the data, the output per acre of land has increased from 213 kg in 2012 to 296 kg in 2013 to 330 kg in 2014, i.e. an increase by 38% over baseline. Assuming that all these harvests have been consumed at home, this increase has contributed to the availability of food at household level for 3-3.5 months for a standard family of five.





Parbati Pusika, of Tadingipai village, previously grew just three varieties of cereal on her 3 acres of rainfed upland. The food produced was insufficient for her 6 member family, and during some months she had to borrow money from the local money-lender to buy food. She said ‘Our intake of rice is relatively more, but we prefer millets,

as they are more satiating than rice.’ She continues, ‘we need only 500 gm of finger millet powder for breakfast and lunch. However, if we have to have rice, 2 kg is needed’. She was one of 11 farmers who were the first to take part in a trial of reviving mixed cropping to increase the farm productivity. Parbati followed organic farming practices and mixed cropping using diverse and traditional seeds. She doubled her yield, during a time when many of the farmers in her area had lost crops because of the drought. She also shared her experiences with others and saved traditional seeds in the neighbouring villages. She now has a large variety of crops (11 types of millets, 6 rice, 4 pulses, 6 tubers and 3 oilseeds) that cover all her and her family’s needs. The land is producing more, at less cost, and in a sustainable way. She is now a respected resource person and mobiliser for other farmers. She says: “My childhood foods – kangu, kodo, suan – were gradually lost and I never thought I would ever be able to feed my family any of those millets!”

### Promotion of strategic foods/crop:

Forest food play an important role in the everyday diet of villagers in the project area. These foods help mitigate against food scarcity in cases of natural calamities like drought or flood (as shown in the illustration below table 1 - Food harvested and collected from agriculture fields and forests during different seasons), also endows them with a wide range of protective vitamins and minerals and hence

consumption of these food have been encouraged. To ensure the availability of these foods, these villagers are using forest conservation with natural biodiversity techniques. Recognising the importance of the role of food from commons, around 6000 multipurpose trees as enlisted by the villagers have been planted on fallow land, road sides and close to village ponds. There has been an increase in the diversity of forest food in their everyday diet and there is increase in the total dietary diversity too as shown in illustration below table -1.

Source	Rainy July ~ October	Winter November ~ February	Summer March ~ June
Mixed Crop fields	2 varieties of Finger millet, 1 variety each of Maize, Foxtail millet, Kodo millet, Barnyard millet and Cow pea	2 varieties each of Sorghum, Little millets, and Pigeon pea, 1 variety each of Finger and Pearl millet, Horse gram, Black gram, Green gram, Sesame, Mustard, Niger, Castor, Yam, Tapioca, and Elephant foot yam etc.	
Rice Field	120 varieties of Paddy	12 varieties of Paddy	
Forest	12 varieties of Fruits, Nuts, and Vegetables, 16 varieties of Fish & Crabs, 29 varieties of Mushrooms, 24 varieties of Green leaves, 17 varieties of Birds, 14 varieties of edible Insects, Honey from 5 sources, 2 varieties of Roots/Tubers, 1 variety of Oilseeds	17 varieties of Fruits, Nuts, and Vegetables, 15 varieties of Green leaves, 21 varieties of Roots/Tubers, 3 varieties of Fish & Crabs, Honey from 3 sources, 13 varieties of Wild animals and Insects, 17 varieties of Birds and 1 variety of Oilseeds	43 varieties of Fruits, Nuts and Vegetables, 15 varieties of Green leaves, 2 varieties of Roots/Tubers, 21 varieties of Wild animals and Insects, Honey from 7 sources, 9 varieties of Oilseeds, 6 varieties of Fish and 6 varieties of Birds

▲ Table 1 Food harvested and collected from agriculture fields and forests during different seasons.

## Addressing climate change effects:

The rich pool of farmers' seeds varieties which includes 120 varieties of paddy alone along with varieties of millets, pulses and oilseeds, has contributed towards mitigating against erratic climatic conditions in different years. For example, in 2011 there was a drought in the area, in 2013 and 2014, there were severe cyclonic storms (Phailin and Hudhud) and there was late monsoon rains in 2014. Nonetheless, farmers have experienced an increase in their net yield unlike their counterparts who have been using industrial farming techniques and had to face crop losses in these conditions. On the other hand, forest foods like roots and tubers, greens, fruits and nuts have been a critical complement to combat food stress arising due to changing climatic conditions.

## Impact on Women

Tribal women are the primary actors in agriculture, collection of forest produce and in livestock management. Living Farm's baseline study showed that women had greater control over food and seed systems. They used to nurture biodiversity in their farming as part of their cultural heritage. In designing the programme intervention, Living Farms focused on the work of women in the area. They were supported in increasing the crop varieties grown in the area, in seed management and in developing home gardens and nurseries.

In the process of the search for the seeds, women travelled to nearby villages on Seed Tours. The women groups in the villages were involved in multiplying and conserving the seeds and the Community Seeds Banks are now being managed by them. Women have come to the forefront in safeguarding the forests, the Bejuni (the woman Priest of village) stated, *"It has become necessary to protect our village forests because we cannot live without it. The forest is like a mother to us who feeds us every day. When we (mostly women – young and adults) go to the forest we never come back empty handed. We bring back green leaves for our curry, fruits, mushrooms and yams."* The communities, with the leadership of women, have been making plans for sustainable management of their forests. They have been holding



▲ Invoking Mother Earth

dialogues with the Department of Forest to promote bio diverse forests and not to replace it with industrial monocultures. Women have been more articulate during the Uncultivated Food Festivals, Traditional Recipe festivals expressing their concerns over the changing food habits of the future as a threat to their 'samaj' (caste society) and disseminating their knowledge and skills about how to manage and use their traditional food.



▲ An woman harvesting peas

Parbati Pusikaka and Loknath Nauri were awarded in the Regional Millets Convention held at Bhubaneswar in May 2012 for sharing their traditional knowledge/ medicinal properties of millets and the importance of millets farming. Our experience on our efforts to revive traditional millets based mixed farming system also helped us to talk with government officials and stop the introduction of hybrids of finger millets and little millets along with synthetic fertilisers and pesticides through the Initiative for Nutritional Security and Intensive Millets Promotion (INSIMP) programme in the state. The experience of farmers of the last two years was shared with the State government. The government supported programme advocates cultivation of four types of millets and the package consists of hybrid seeds along with micronutrients, fungicide and bio-fertiliser, DAP, urea, potash, pesticides, weedicides(2,4-D). We shared our concerns with the government officials. It has resulted into passing an official circular to the concerned district level officials for use of farmers' varieties of seeds of millets and not to use synthetic chemicals and pesticides for millets in three districts - Koraput, Malkangiri & Rayagada.

## Challenges faced:

**Commercial plantations by government and other agencies:** The forest biodiversity is shrinking in Rayagada district due to the plantation of eucalyptus, teak, cashew, and pongamia by industry, Government sponsored projects and mining related activities. This is a major threat to the forest food diversity of the local population.

**Promotion of hybrid seeds and chemical fertilisers under Government Schemes:** The Second Green Revolution to Eastern India programme with an emphasis on promotion of hybrid seeds of paddy, sun flower, maize and synthetic chemical inputs is a major challenge to sustainable agricultural practices. However, with the positive results of sustainable agriculture shown in farmers' fields, more farmers are taking it up. The horizontal networking amongst and between farmers is helping to get this change process institutionalised. Despite this, it is a sustained challenge to confront external input intensive agricultural practices.

**Climate Change:** Climate change has been a critical challenge with erratic monsoon cycles, a reduced raining season and the recent experiences in cyclones which have affected the agriculture activities and traditional cropping systems. Living Farm has been working to address these challenges through the demonstrations in sustainable agriculture through the conservation of forest bio-diversity, seed conservation and organic agriculture. However, it is an ongoing challenge.

## Lessons Learnt:



A location specific strategy which is in sync with the local food culture and ethos has helped in mobilising the community to get involved in the project and take leadership.

Action research and documentation; has helped in sensitisation and reorientation of the community to their traditional cropping systems, crop diversity and forest food diversity.

A horizontal network amongst and between people activates local leadership and they then become the advocates of the approach and strategy.

Revival of traditional agriculture and crop diversity can address food and nutrition security and help mitigate the effects of climate change

Facilitating critical reflection and action amongst farmers helps sustainable change.

▼ community meeting in progress



## Role of Living Farms:

Exchange and exposures for increasing knowledge and confidence

Facilitating the sharing of farmers' varieties of seeds

Technical training and workshops on pest & disease management, soil fertility improvement, water management, seed conservation

Supporting action research in collaboration with scientist to evolve locally appropriate solutions to their food and agriculture related problems.

## Conclusion:

The task is quite challenging though the initiatives have been begun. There is a need to intensify the engagement with the community and especially the youth and women to revive traditional conservation agriculture, conservation of biodiversity and eco-systems for the future food security and sustenance.

## Our seeds , our common property. . .

said by the villagers of Munda

'We are 52 families residing in this village. Many of us cultivate on dongar (hill land). For past 10-15 years we have been growing maize, cow pea pigeon pea and turmeric only as we had lost other seeds of crops. The farmers of neighbouring villages supported by sharing the seeds of foxtail millet, finger millet, kodo millet, paddy etc. with us. It has helped to increase our crop diversity. It has helped us to resume celebrating a few of our traditional festivals which had to be stopped due to loss of the seeds required. The increased crop diversity is also helping us to have more and diverse yield. We consider the revival of our seed diversity is part of our efforts to reclaim our heritage and control over seed.

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