Eastern India Regional Workshop on Sustainable Agriculture and Management of Natural Resources

Hatnada, Seraikela-Kharsawan District, Jharkhand

24th and 25th April 2025

Dulari Hansda and other Participants preparing Seed Balls

With the monsoons and the commencement of the Rainfed Agriculture season less than 2 months away, Keystone Foundation's Eastern India initiative organised a 2-day workshop cum planning meeting in Hatnada village, Seraikela Block, Seraikela-Kharsawan District, Jharkhand. Despite the heat at noon, it was an excellent time to visit the area. In the forests of the area, *Kurchi* was abloom with its delicate white flowers, the Mahua trees, which had recently flowered, were now in leaf with most of the leaves having transitioned from a spectacular range of red hues to fresh green. Tend trees were still in fruit, Char had just begun to fruit and the Mango trees were heavy with hundreds of raw fruits ideal for sumptuous chutneys and refreshing juices.

Kurchi in bloom behind Budheswar's house

This workshop was a part of our sustained efforts to promote Agroecology approaches for sustainable agriculture, alongside gender-just community enterprises, conservation and management for forests, water sources and natural resources in Eastern India and Jharkhand in particular. The event was hosted by CRP Budheswar Mahato and his family and facilitated by Jagabandhu Sanda (Consultant, Eastern India), and Rohan Mukerjee (Programme Coordinator, Eastern India). It involved 19 CRPs and farmers from Musabani and Gurabanda Block of East Singhbhum District, Manoharpur Block of West Singhbhum District, Seraikela and Chandil Blocks of Seraikela-Kharsawan District and Sundar Pahari Block of Godda District, Jharkhand came together in Hatnada village.

The program commenced with a round of introductions–instead of sharing their own names, participants renamed themselves with the name of their favourite fruit. *Aam /* Mango was the most popular fruit with most participants choosing cultivated fruits. Sohon Singh Sardar, a farmer from Sardabera chose *Bhurru*, a wild fruit found in their forests. When asked to name one fruit which is plentiful in their forests and one that has reduced, Sohon shared that *Kendu*, which is currently still in fruit, is plentiful while *Bhurru,* his favourite fruit has reduced in availability. One of the main drivers for the reduction in availability of *Bhurru* was felt to be the fact that *Bhurru* leaves are used as fodder for goats and livestock which has led to their overexploitation. *Bhurru* fruits are also much desired by Bears and Monkeys.

Bhurru

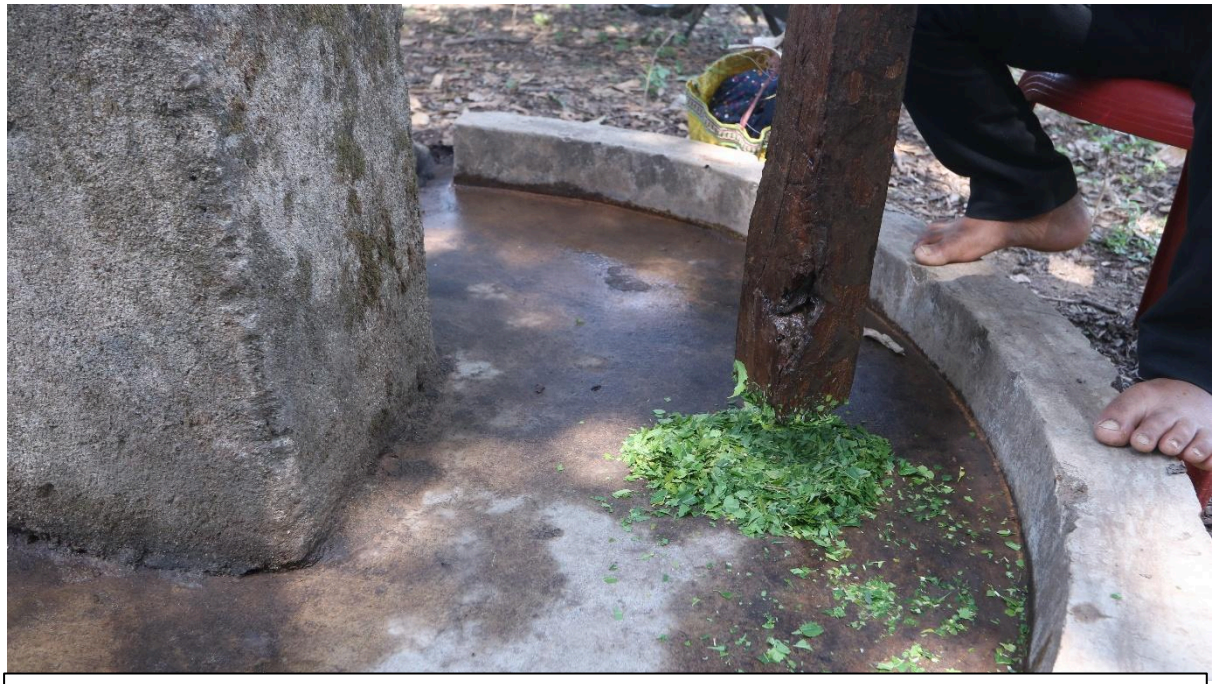
As forest dwelling communities shift from subsistence-oriented livelihood systems to more market-dependent commercial systems, their traditional food systems are being eroded and the fragile socio-ecological ecosystems they inhabit are under threat. These communities have traditionally depended on a mix of Rainfed Agriculture and collection, consumption and sale of a variety of forest produce for their survival. An increase in market dependence and the associated need for cash income has led to increased exploitation of forests and natural resources. Commercial collection and sale of firewood is one of the major drivers of forest

degradation. In addition to the direct benefits that they provide, forests also make invaluable contributions to Agriculture practices. Forests are often sources of several streams and rivers which are a source of water for agriculture and forests, primarily as a result of leaf litter and associated biomass ensure fertility and overall health of soils which is essential for agriculture. In view of the multiple benefits provided by forests, as well as the threats they are facing, Keystone-supported villages are actively supportive of their conservation and protection. In most of these areas, active Van Suraksha Samitis carry out patrolling and protection of forests. One of the steps most villages have taken is the banning of commercial sale of firewood. But since in many areas this has been the one stable source of income there is a need to promote and strengthen alternate sources of sustainable livelihoods. While Agriculture has tremendous potential to meet both subsistence and livelihood needs it is under threat and in many areas farmers have been moving away from Agriculture. Farmers have been increasingly adopting modern chemical and water intensive agriculture practices using hybrid seeds which are often not in tune with these fragile environments. Increased reliance on hybrid seeds has led to the erosion and often disappearance of more resilient local seed varieties. Climate change, which includes erratic rainfall patterns, increased occurrence of fog, hail, storms and droughts, has been posing serious threats to the viability of Agriculture practices. Modern practices have often been found to be more susceptible to climate variability and associated pest attacks. Modern practices like excessive use of chemical fertilisers, pesticides and herbicides are resulting in reduced soil fertility and threatening local biodiversity like useful insects and plants. Keystone Foundation has been working with village communities and farmers to promote conservation and management of forests alongside sustainable livelihoods of which Agriculture is a vital component. In this regard staff, consultants, CRPs and communities themselves have been championing sustainable agriculture practices. In preparation for the upcoming Agriculture season this workshop involved several sessions on tools and strategies for natural farming and sustainable agriculture as well as open forums and discussions on issues relating to the management and conservation of forests, water sources and other natural resources. Elements of Gender Justice were an integral part of all sessions as well as strategies and plans that were being developed.

Participants shredding leaves to prepare 5 Leaf Mix Pesticide

The first half of Day 1 involved training on making 2 pest control preparations using natural ingredients, and methods of cultivating root crops like turmeric and taro. The first preparation

was *Paanch Patta Mishran Keetnashak /* 5 Leaf Mix Pesticide. The core ingredients were 5 different kinds of locally available green leaves which are either avoided by or not preferred by livestock. The leaves used for the demonstration were Neem, Karanj, Begna, Akond, Podasi. Around 500 gms of each leaf was used. Other ingredients and items needed were 250 gm of *Neem Khol* (oilseed residue, here Neem khol was used but any other oil seed residue can be used), 250 gms of *Dahi /* Curd, 1 and a half kg fresh cow dung, 500 ml Cow urine, an earthen pitcher, a wooden Pestle, a leaf lid and rope. Men and women participants all enthusiastically carried out the different tasks involved in making the preparation. This involved shredding of all the leaves, which can be done by hand tearing the leaves into small pieces or by using a knife of *boti* (Traditional vegetable chopper).



Crushing leaves using a wooden Pestle.

The chopped leaves were crushed and ground using makeshift wood pestles. The crushed leaves were then arranged in mounds on Sal leaf plates along with *Neem Khol, Kaccha Gobar* / Fresh Cow dung, and a bowl of curd. All the ingredients were then put into an earthen pitcher in stages and mixed. Participants took around 2 handfuls of each of the crushed leaves and put them in the pitcher along with Neem khol and Gobar and mixed them all together. This process was repeated till all the crushed leaves were in the pitcher. The curd was added, and the contents of the pitcher were mixed again. Finally, after adding around 500 ml of cow urine and mixing the earthen pitcher was sealed with a Sal leaf lid and rope and kept in a dark and cool room. The mixture will be left to sit for 15 days, after which the pitcher can be opened and the mixture stirred and strained with a large strainer. The resulting liquid should be stored in a non-plastic container, like a glass bottle. Even aluminium containers should be avoided. This liquid should be mixed with water (1 litre solution with 10 litres of water) and can be sprayed to mitigate pests and disease and also to strengthen the plants. It is good for paddy and vegetable crops. It is best to spray the crops early in the morning. The undiluted mixture can last for 3 years.

Preparation of *Teen Patta aur Tel Mishrann Keet Nashak*

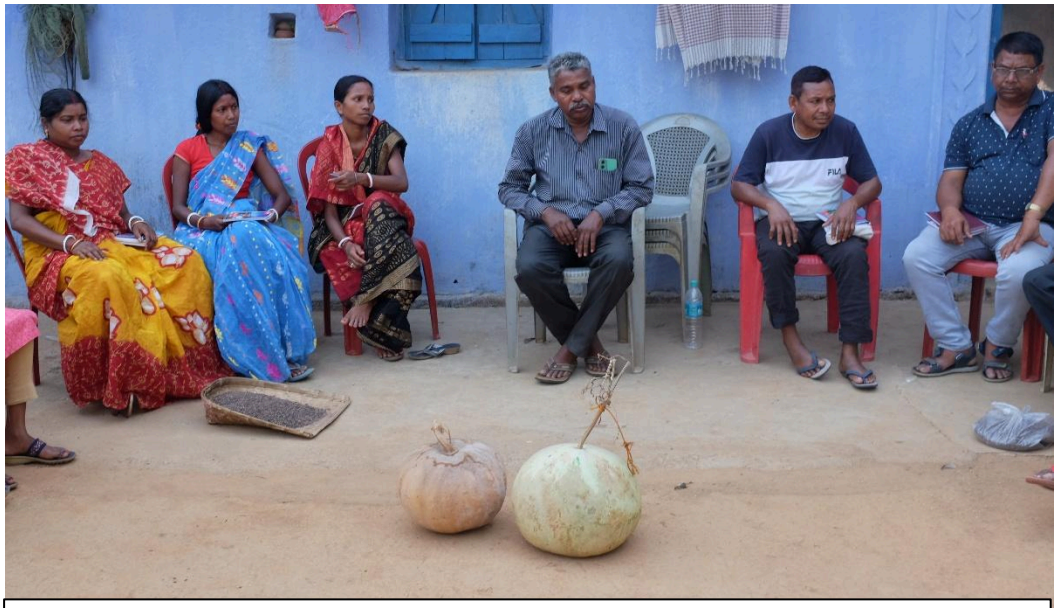
The second pest control preparation was known as *Teen Patta aur Tel Mishran Keet Nashak* (3 Leaves and Oil mixture pesticide). Ingredients and items needed – 5 Mango leaves, 10 Guava leaves, 3 Papita leaves, 100 ml each of 3 to 5 kinds of natural oils like *Mahua / Dori, Karanj, Neem, Kusum,* 1 and a half kilograms of *Gobar,* 250 grams of *Neem Khol* (Neem seed residue after oil extraction), 3 litres of water and an earthen pitcher. All ingredients are put in the earthen pitcher and mixed using a wooden stick, stirring 5 times in clockwise direction and 5 times in anticlockwise direction. The pitcher is then covered with a leaf lid and tied with rope and left in a dark and cool place. Daily for 10 to 12 days the pitcher needs to be opened and the mixture stirred 5 times in clockwise direction and 5 times in anticlockwise direction after which the pitcher is resealed. After 12 days the mixture is ready and can be mixed with water (1 l mixture and 10 l water) for spraying. In order to ward off insects and pests the mixture should be sprayed in the evening.

The participants then made their way to Budheswar's *Badi* / Habitation plot in front of his house where Jagabandhu Sanda demonstrated techniques for cultivating tuber crops on a large scale. The demonstration was carried out using Turmeric and Taro / Alti but any other tuber crops could be used like *Kham Aloo, Oll, Sakarkand, Piyaj, Lasun, Aada.* Lines need to be prepared using *Kodal* keeping 1 foot distance between lines and the planting material is sown in 2 inch holes and covered with mud at a distance of 8 inches between each hole. After this soil is turned using kodal and mud is layered twice.

The post lunch session involved sharing of updates, and experiences by CRPs from different areas and an open discussion on different topics. The CRPs shared their experiences working with women's groups and promoting women's role in decision making. Baby Patar who has been working with Keystone Foundation since 2018 shared how when she first

started working, women never came for meetings and trainings due to household responsibilities and difficulties in getting permission from Male household heads. Since then, despite the challenges she has conducted several meetings and training programs and involved women in various initiatives with their participation gradually increasing. Currently women have become more independent. They take their issues and concerns to the Block office, are active members of Shiksha Samitis (Village Education Committees) and are sending their children for coaching Navodaya Vidyalaya entrance exams. There is also an active woman Sarpanch in one of the Panchayats in which she works and she has ensured active participation of women in village level decision making. Kapra Mahali shared that women participate in the Gram Sabha and are particularly active in Katsakra and Bakra panchayats where they raise their voices on a variety of issues like issues being faced with regards to Pension schemes and Awas Yojna. With regards to promoting enterprises several women centric enterprises have been established. While some are doing well Kapra pointed out that the process has not been without its challenges. She has been working with a women's enterprise around Mahua flowers and seeds. While initially they were very enthusiastic and active their interest is currently on the wane however she continues to engage regularly with them and Jagabandhu shared that we would explore means to enable them to strengthen, broaden and scale up their enterprise.

Jomi Paharin, a woman CRP from Sundar Pahari, Godda District, Jharkhand shared that in the last year she had regular meetings with Paharia women regarding the importance of *Jara-Kurwa* the Paharia people's traditional shifting cultivation-based agriculture practice. Several women came forward to cultivate a diverse variety of local crops on their Kurwa lands last year and in the coming season more women have committed to work together to revive and strengthen the agriculture practices of the Paharia people. Surja Paharia (Field Assistant) provided a brief overview of *Jara-Kurwa* which is one of the last remaining forms of shifting cultivation still actively practiced in Jharkhand. Gurba Sardar, CRP from Reyarda village, Chandil Block Jharkhand shared that they also practice 2 forms of Jara cultivation one which involves the removal of *Puru* / Eupatorium for the cultivation of *Kurthi* / horse gram and another which is similar to that practiced by the Paharia and involves broadcasting of *Romha /* Cowpea and *Sutri* / Rice bean after which Putus / Lantana is felled and left in the plot for the crops to climb on.

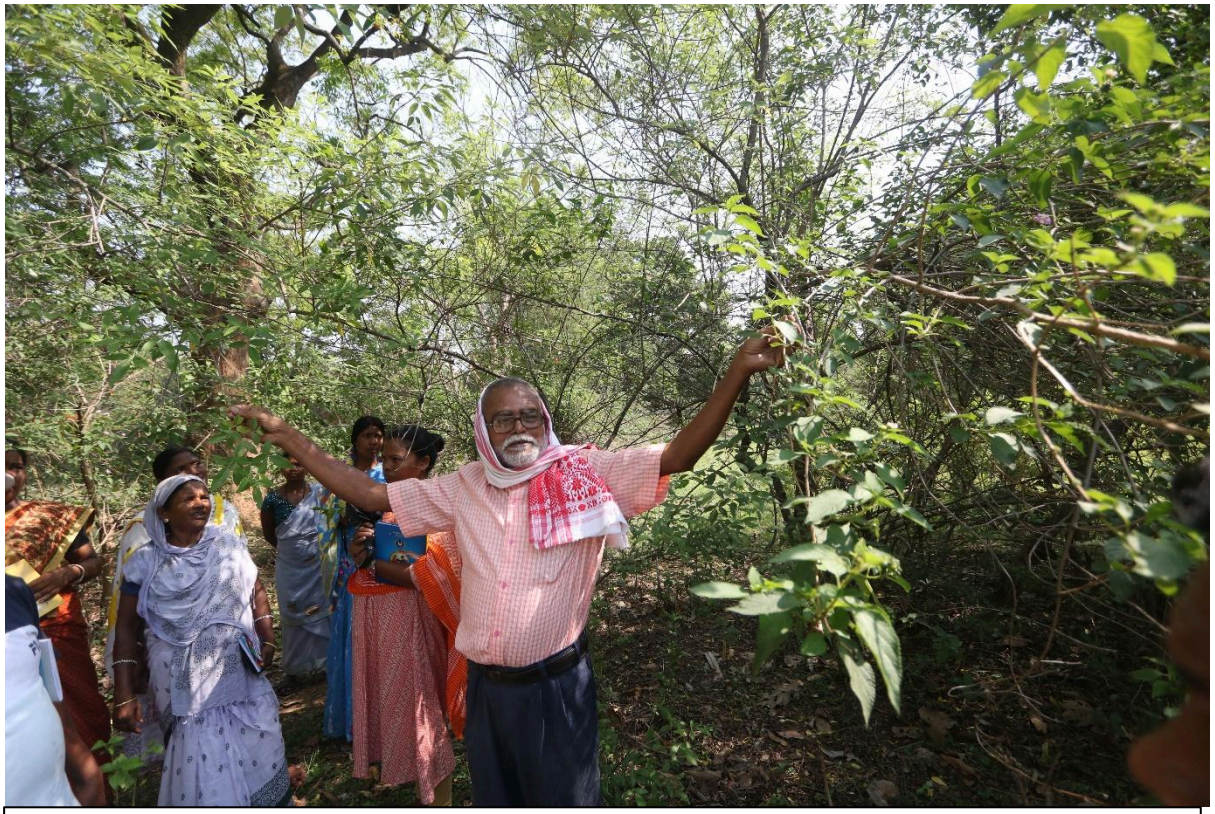


Open Forum and seed exchange

The participants also talked about the different seeds that they could exchange with one another. Baby Patar displayed and shared the Black Rice seeds she had brought. Buheswar displayed *Lauki* / Bottle Gourd and *Kohonda* / Pumpkin which he had kept for seeds and was happy to share with other participants. Sohan Singh Sardar brought *Jhinga /* Ridge gourd seeds and shared sweet potato tubers for planting with the Paharia participants. Inda was very impressed with one of Budheswar's chickens and shared that he did not have that variety, so Budheswar gave him a chick when he was leaving.

The session ended with a discussion on the possibility of expanding community enterprises in the region. Rohan shared the experiences of Aadhimalai Pazhanagudiyinar Producer Company Limited (APPCL) and the participants discussed the possibility of establishing an FPO along similar lines in Eastern India.

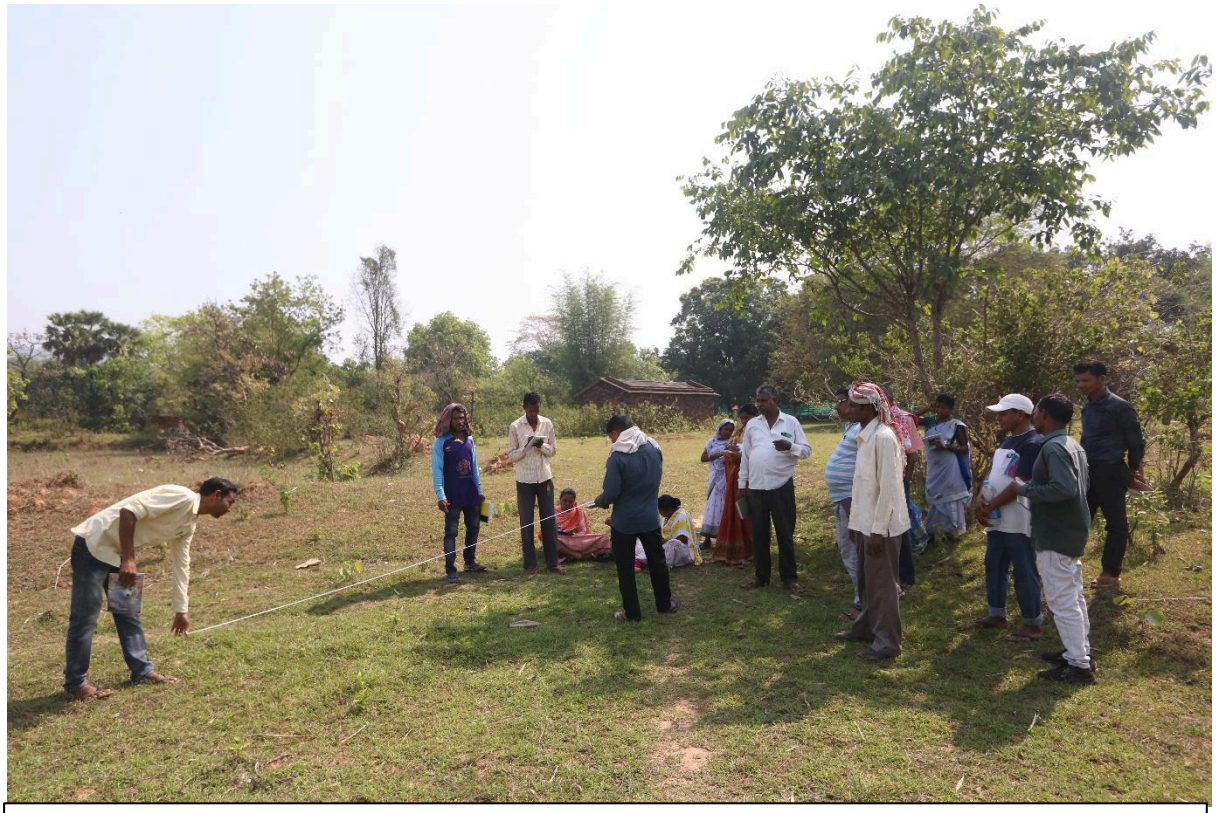
The team from Sundar Pahari shared that they were overjoyed to come to Hatnada for this year's workshop. The area is similar to where they come from, so they feel at home the main difference being that the forests here are better than in Sundar Pahari. An optional forest trail was organized before the 2nd day's sessions began. Inda Jamuda, CRP from Saranda, led the forest trail which involved Surja Paharia, Krisna Paharia, Ruben Malto and Rohan Mukerjee. Inda shared common and Ho names of the different trees we came across while the Paharia participants shared Paharia names. While most trees in Hatnada's forests were also found in Sundar Pahari, *Bhurru* whose fruits are a favorite among children and adults alike, was one of the trees the Paharia participants were seeing for the first time.



Jagabandhu pointing out different plant species that are suitable for live fences

Day 2 started with a visit to an area behind Budheswar's Badi where Jagabandhuda conducted an onsite discussion on live fencing for agriculture fields. In the past most farmers used different kinds of live fences which helped keep livestock and wild animals away from their fields and also were a source of other benefits. These are also a cost-efficient method

of safeguarding crops. Jagabandhu showed the participants 3 different kinds of plants that are suitable for live fencing – Begna, Putus / Lantana, and Ankol/Ankura/ Dhela/Ansha – which also has medicinal uses, people use *Datun* (Chew sticks) of this plant to combat fever. If the stalk or branches are cut and sown, then they will grow, and they are guided using bamboo and wooden fencing materials. Other live fences discussed included Sia Kul, Kaanta Baans, Cactus. Live fences will be promoted across all project areas in the upcoming Agricultural season.

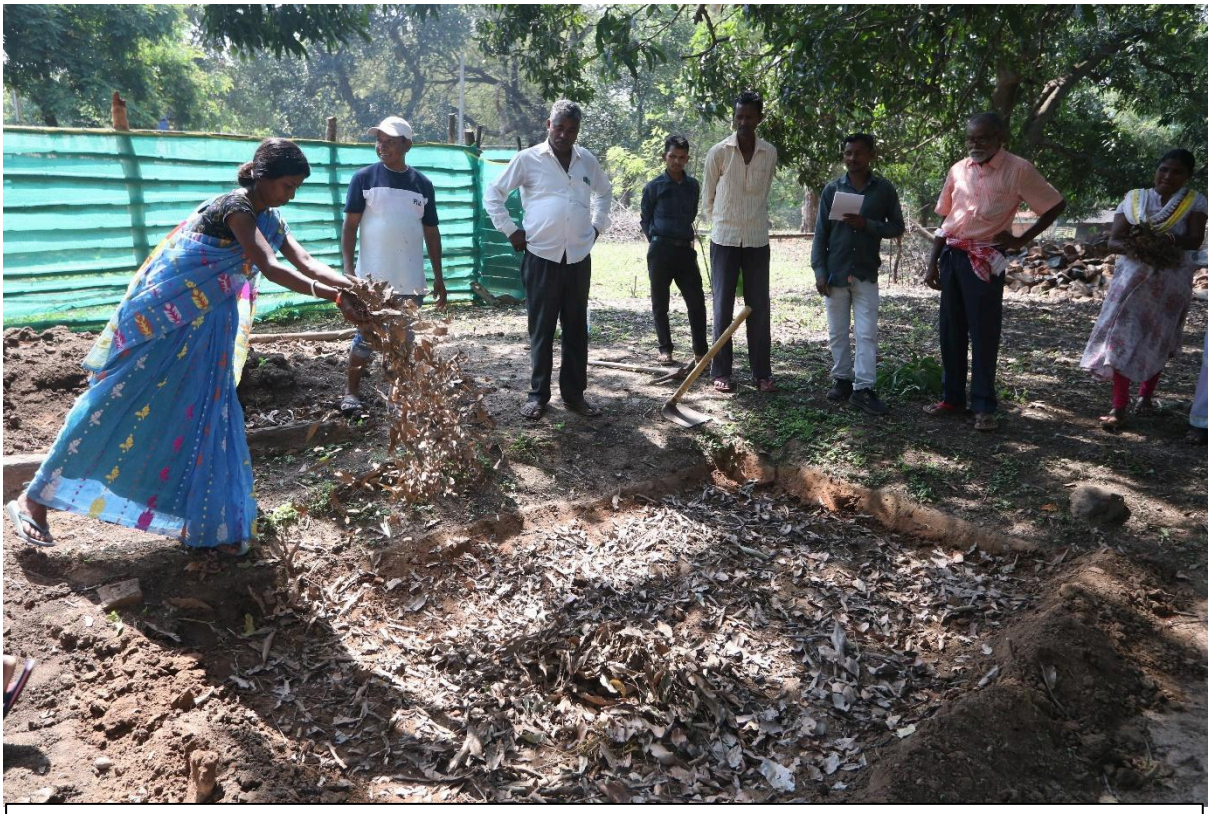


Carrying out measurements for a sample Seed Conservation plot

Next, equipped with measuring tape, we visited an open plot to discuss and plan setting up seed production plots. We can use these plots for producing local varieties in different areas to address the shortage of local seed varieties and reduce dependence on hybrid seeds, especially of vegetables. Based on a discussion involving all CRPs and farmers, we determined that ideally, land availability permitting, the Seed Production site would be a 50 feet square. The land can be divided into 4 plots each for a different category of crops namely – plants, creepers / climbers, greens and root and tuber crops. Each of these plots would further be divided into sub plots for the different seeds being raised. This initiative is aimed at ensuring self sufficiency in production of local seed varieties. Participants helped mark out a 50 feet square plot which helped visualise what a seed production site would look like. It was also decided that each site would have 2 fences, one outer live fence and an inner fence made from bamboo, wood and associated materials.

After this there were a series of demonstrations on making organic fertilisers. Firstly, there was a demonstration of preparing a Compost pit. A few participants marked out and dug out a sample pit. Ideally the dimensions of a compost pit should be 10 feet in length, 6 feet width and 4 to 6 feet deep. Since the sample pit was only for demonstration purposes the depth was only around 2 feet. Once the pit is dug it can be filled, with several layers being created. Each layer would comprise of dry leaves at the bottom, followed by paddy straw, which is

then covered with the different manure available (cow, goat, chickens etc.) along with household green waste, after which once again dry leaves are applied, and the next layer is made in a similar manner. Subsequent layers are added till the entire pit is filled with a gap of around 6 inches from the top. The compost in such a pit takes around 4 months to get ready for use. Every 2 months the contents of the pit should be mixed and some water can be added to the mixture. After 4 months the compost is ready for application to the fields.



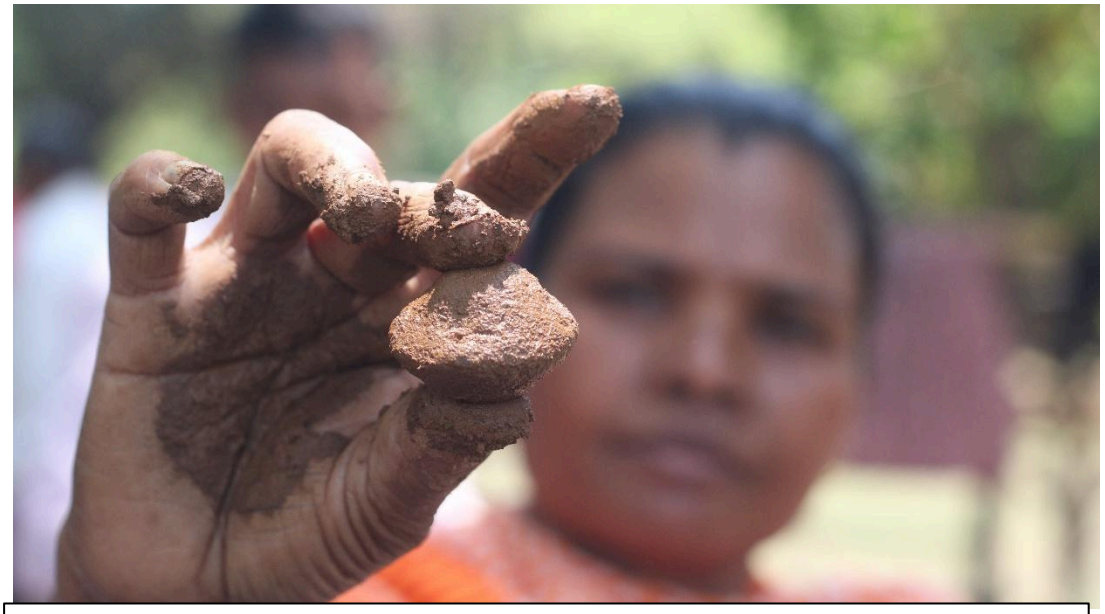
Participants filling dried leaves in the compost pit

The second organic fertilizer that was prepared was *Gumbaj Khad* which involves arranging the inputs in a manner that results in a final structure that resembles a *Stupa* or Temple like mound. This method also involves building of several layers, each layer consisting of shredded green leaves of plants that livestock avoid like Neem and Begna at the bottom, followed by fresh cow dung and topped off with paddy straw. The height of the final structure should be around 3 to 3.5 feet. Once ready it is coated with cow dung and covered with Jute sacks which allow air to pass unlike plastic sacks. The structure is left to sit for around 35 to 40 days after which the compost is ready for application to farmers' fields.

The third fertiliser was called *Patta Khad* (Leaf Compost) and the principal ingredients are dried twigs, leaf litter and mud. It is made under the shade of a tree which makes it easy to access dried twigs and leaf litter. An area is cleared under the tree and dried twigs are arranged on the base to form a line and then leaf litter is heaped on top of the twigs to make a mini hill around 2.5 feet high which is then coated with a water and mud mixture after which it is left to sit for around 35 to 40 days.

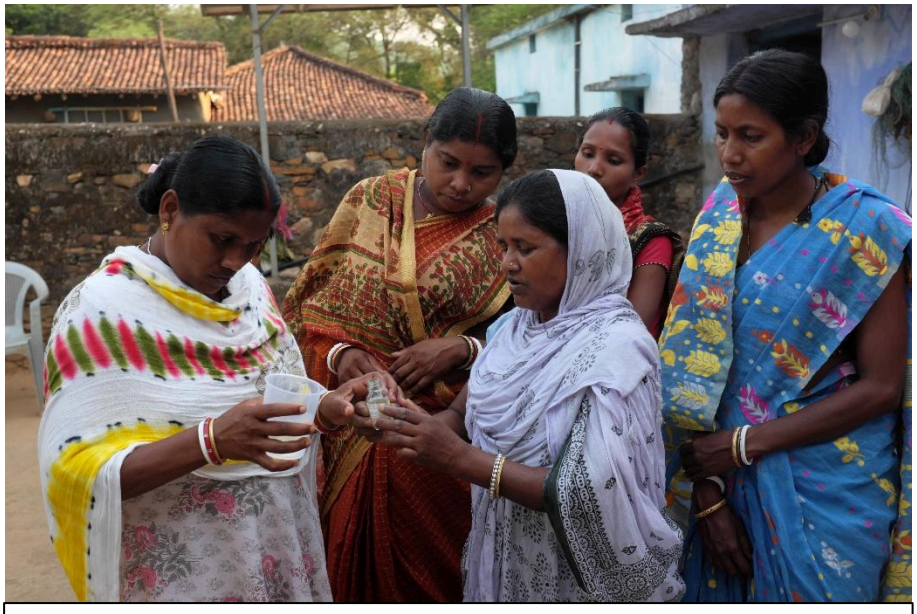
The last exercise prior to lunch involved the preparation of Seed Bombs / Seed Balls. Ramchandra Manjhi, Sohon Singh Sardar and Gurba Sardar had brought a variety of different seeds which included *Karanj, Arjun, Kusum, Kudol, Kendu, Bhela, Imli* and *Char.* The process of preparing Seed Bombs involved collection of termite mud which was mixed

with cow dung and water and made into a dough-like consistency which was used to prepare small balls with a seed inside. These seed balls are then dried and stored. Once the monsoons commence, they can be thrown in degraded and open forest areas for them to germinate. This process can also be carried out with vegetable seeds for which instead of sowing the balls in a line in fields.



Baby Patar displaying a seed ball she just prepared

The post lunch session involved a brief refresher on carrying out water testing for parameters like TDS, EC, Ph and Coliform and a discussion on establishing and developing capacities of water user groups to monitor, manage and conserve their water sources.



Participants carrying out a Coliform test

Tentative plans for the upcoming months were discussed and all CRPs resolved to prepare detailed work plans after returning. Follow up Village level trainings on the Ecological

Farming would be conducted by CRPs once they returned. In addition, a series of trainings would be conducted with farmers in areas where SRI is being promoted. The workshop ended with a vote of thanks with all participants expressing their gratitude to Budheswar and his family for hosting us and pledging to share the lessons they have learned with the communities they work with and work jointly with them towards the goal of a just, equitable and sustainable future.