

Sustainable Farming: A Collective Learning Approach

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Bringing to life the dying land, ravaged by years of chemical use, farmers in Bhandaro village choose to risk going back to organic methods of crop cultivation, controlling diseases and pests through indigenous ways. The results were theirs to experience... better yield, richer soil, and rejuvenated natural resources

“Dada hum logon ko har saal khet mein zyada kar ke khaad dalna padta hai aur humara khet ka pani bhi jaldi sukh jata hai (Dada, every year we have to use more and more fertilizers in our fields. Our fields also dry up very quickly),” grumbled Sushila Hembrom, as she showed me her dry paddy fields in despair.

Another SHG member said, “Humlog apna khet mein chemical wala khad dalna Bengal jane ke baad sikhe the. Lagbhag 20–25 saalo se humlog urea khad khet mein dalte aa rahe hai (We learned to use chemical-based fertilizers after our exposure to Bengal farmers. We have been applying urea for almost 20–25 years now).”

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The story of these SHG women from Bhandaro village is no different from that of many other farmers of Kathikund block in Jharkhand. The effects of using chemical-based fertilizers have begun to show up in the land and were taking a toll on the farmers.

SHG members shared with me that earlier when they were not using chemicals, they did not have enough produce to feed their family. Many people from the village migrated then in search of wages to Bengal, where they worked as agricultural labourers. They learned about new techniques, about hybrid seeds and fertilizers, which helped increase the yield considerably.

When the migrant labourers came back to their village, they adopted the same techniques in their fields. They started using chemical fertilizers such as DAP, urea and potash. Initially, the results were significant and the production increased considerably. However, over the years, there was stagnation in production. When the SHG members shared their stories with me, I heard hopelessness and fear in their voices. Year by

year, their fields were asking for more and more chemicals. The farmers had no option but to invest more in their fields or to give up agriculture and migrate again.

Most of the land in the village was undulated, of poor soil quality and had no irrigation facilities. The village had huge scope for chemical-free agriculture farming because of the abundance of cattle population. All the households in the village had livestock such as cattle, goat and backyard poultry, that was used by them to mitigate their immediate money needs. Also, because many of the SHG members were involved in broiler poultry farming, there was bird-excreta available in abundance. Convinced that this huge untapped resource could solve the issue that the SHG members were facing, I asked if we could have a meeting of the entire village to discuss this issue.

Exploring Non-chemical-based Practices

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In the village-level meeting, the villagers reiterated that their current farming practices

necessitated high input costs in terms of hybrid seeds, chemical fertilizers and pesticides. There was low retention of moisture in the land, and the quality of the land was getting degraded every year due to excessive application of chemical fertilizers. Soil erosion was high too owing to the undulating topography of the area.

When I shared with the community the possibility of non-chemical-based practices, there were mixed responses. Many said that it was impossible to have a good yield without the use of chemical fertilizers and pesticides. People also assumed that organic farming would be very costly and cumbersome. Some, on the other hand, supported the idea. One dada said “Dada, agar humlog jaivik tarika nahi apnayenge toh aane wala samay mein humara khet banjar ho jayega aur hamara bal bacha uspe kheti nahi kar payega. (Dada, if we do not adopt organic methods of farming, our lands will become barren in time and our coming generations will not be able to do any cultivation.)” Even though the villagers were not very sure, they were interested in knowing more about the non-chemical-

A video show called 'Toxic Foods—Poison on Our Plate,' from the popular television show 'Satyamev Jayate,' was shown in the workshop. The villagers were dumfounded after seeing the show and almost everyone in the village wanted to switch to organic practices

based agriculture. A three-day workshop was organized for them, in which the people from Bhandaro village and the nearby Jitpur village participated.

The workshop focused on existing farming practices vis-a-vis traditional farming practices. The purpose was to build a common understanding among farmers so that they could make a choice as to which approach they wanted to follow. A discussion was held about the challenges and the drawbacks of both the practices. Some of the questions that surfaced were: What were the crops that their ancestors used to grow on their land? Had they witnessed any kind of diseases in their village in the past 10 to 15 years? How would they protect their plants in case of pest and disease attacks? How many farmers were still using the traditional variety of seeds and why?

The farmers said that they used to cultivate different varieties of crops on their agriculture land. They had never used chemicals in their crops. One such crop, which the people, nowadays have stopped cultivating, was millet. It was now limited to only a few families in the village.

There were some farmers in the village, who were still cultivating the traditional variety of paddy called the Baihad Dhaan. But it was on a limited patch of land and only for their own household consumption. They could use this paddy for a long time because they did not use any fertilizers and pesticides for it; moreover, it was tastier than the hybrid paddy variety, that is, Swarna.

The farmers also said that, earlier, people never had health problems. Now, however, people were beginning to suffer from illnesses such as blood pressure, diabetes and gastric problems. People's attitudes too have changed. They do not want to do the hard work that is needed for traditional farming. The young generation tires very soon. One SHG didi said, "Dada aaj kal kodo jo ugata hai gaon mein use garib parivaar samjha jata hai (Dada, nowadays, those who cultivate millet are considered poor farmers)."

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in the village wanted to switch to organic practices. Some were also disturbed to see the effect of chemicals on their health and on their land.

Anita Murmu said, "Pehle ke admi zyada mehnat ka kaam kar lete the aur zyada din zinda rehte the. Abhi bhi gaon mein 4 se 5 log hai jinka umar 80 se zyada hai (Earlier, people would work very hard and lived much longer. Even today, there are 4 or 5 people in the villages who are more than 80 years old)."

The villagers showed enthusiasm about trying out non-pesticide management (NPM) farming although they did fear that production would decrease if they did not use inorganic fertilizers such as DAP and urea. Also, they were not sure about the cost-effectiveness of organic farming and believed that it would require a lot of physical labour. They, however, were willing to try it on some portion of their land.

Piloting in Bhandaro and Jitpur villages

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To begin with, two experienced change animators, Pushpa

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Devi and Bimla Devi, from an organization called PRAN (Preservation and Proliferation of Rural Natural Resources and Nature), with extensive experience in organic interventions, were engaged to support the villagers in Bhandaro and Jitpur. Their role was to hand-hold the farmers in adopting organic practices and identify and train some Resource Persons within the village on NPM farming. These Resource Persons would then perform the role of change agents for the rest of the block. For Bhandaro and Jitpur, however, these two change animators were the Resource Persons; they created a base for modern farming practices such as the System of Root Intensification (SRI), provided on-field technical support in preparing organic products and demonstrated its use to farmers. The animators supported the community for almost a year, helping bring about a shift in the practices and enhancing the skills and the knowledge of the farmers about NPM farming. In this process, six SHG didis emerged as Resource Persons for the rest of the village and for the block.

Platform to Experiment and Share

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During this period of engagement with the villages, many of the problems they faced when adopting the practices came to light. Some said that it was difficult to collect cow's urine whereas others who had prepared the organic formulation said it smelt very foul. Some farmers observed that practising organic cultivation required a large amount of animal waste and that the process was very time-consuming. They were not willing to devote so much time and hard work. They wanted quick results and expressed a wish to use the readymade products such as urea and DAP, easily available in the market.

Clearly, going full steam into organic farming would be counter effective; instead, a gradual transition from one practice to the other would be a better alternative. Earlier, we were focused on adhering to a model Package of Practices (PoP). Therefore, for SRI paddy, we shifted the focus to improved practices, rather than insisting the farmers adopt all the SRI principles. Training was provided

to farmers through audio-visual aids. IEC (Information, Education and Communication) material was provided to farmers in the form of booklets and leaflets so that they had the option of choosing or dropping the organic practices, based on the availability of resources and on their convenience.

A farm-field school, an informal set-up, was created for farmers to support each other, to enable a group-based learning process, enhance their skills and knowledge and help them make informed decisions. For example, the farmers collected different types of insects and disease-affected plants from the field and brought them to a common place for further discussion. They discussed the types of insects (both sucking and chewing). They learned whether an insect was harmful or beneficial for their plants. They were shown how the presence of harmful pests could be minimized naturally and how the presence of beneficial pests could be increased.

Sushila Hembrom from Bhandaro village said, "Pehle to

The farmers took measures to protect the health of their crops and the ecology from the ill-effects of chemical pesticides

hum to sabhi keedo ko kharab samajh kar uspe dawa daal dete the (Earlier, we thought that all the insects were harmful and we would apply pesticides on all the insects).”

Sarita Murmu added. “Hum ne jab jaiwik khad daalne ke baad dekha ki mitti mein keede ho rahe hai to hum ko laga ki kharab ho gayi lekin training mein pata chala ki wo keede mitti ke liye phaydemand hai (When we applied organic manure, we found that there were insects in the soil; we thought it was bad

for the soil. In the trainings, we understood however that those insects were beneficial for the soil).”

The farmers learned to identify different pests and learned curative measures. For sucking pests, they used Neemastra, an organic pesticide; and for chewing pests, they used Agniastra. Farmers from both the villages used these pesticides and the results were very effective. The best time for farmers to review their fields was early mornings when they could

clearly see the pests in their plots.

To retain soil moisture, farmers were encouraged to use Jeevamrit. In case of less vegetative growth, they used organic fertilizers such as Pranamrit and Bakramrit. In case of viral diseases, farmers isolated the affected plant from the others, identified the vectors responsible for the diseases, and checked their growth by using a coloured sticky plate over their crop fields. This process was repeated fortnightly or monthly,

Table 1: Organic Products Used by Farmers

Product	Use	Material
<i>Jeevamrit</i>	Fertilizer (increased bio-agent in soil)	Cow dung, cow urine, jaggery, gram flour, fertile soil, water
<i>Ghan-jeevamrit</i>	Fertilizer (increased bio-agent in soil)	Cow dung, cow urine, jaggery, gram flour, fertile soil
<i>Pranamrit</i>	Organic fertilizer	Poultry waste, oil cake, ash, water
<i>Bakramrit</i>	Organic fertilizer	Goat excreta, oil cake, ash, water
<i>Beejamrit</i>	Seed treatment	Water, cow dung, cow urine, lime, handful of soil
<i>Beeja Raksha</i>	Seed treatment	Soil from under a big tree, ash, asafoetida, turmeric powder, cow urine.
<i>Mahuastra</i>	Fungal disease	Mahua, jaggery, cow urine
<i>Agniastra</i>	Chewing pests	Cow urine, dry tobacco leaf, chilli, garlic, neem leaf
<i>Lohastra</i>	Pest control	Rusted iron scraps, cow urine
<i>Mathastra</i>	Fungal disease	Fermented curd and water
<i>Amrit</i>	Tonic/Hormone	Moong dal seed, chick pea, wheat, cow pea, arhar dal, til seed, etc.

Farmers found visible changes in their fields after using organic practices. Soil health improved as was evident from the change in the colour of the soil from reddish to black. The farmers also said that diseases and pest attacks were fewer because of better soil health

by all the farmers, who had similar kinds of crops in close proximity.

The farmers took measures to protect the health of their crops and the ecology from the ill-effects of chemical pesticides. Some of these measures were: building bird perches, laying pheromone traps, using yellow sticky plates, using border crops such as red gram, marigold and coriander, to reduce pest attacks and applying Neemastra and Agniastra, in case the crop was attacked by pests. The farmers also shifted to improved agricultural practices, using SRI, making a collective nursery, sorting the seeds, treating the plants with Beejamrit and managing water correctly.

The farmers monitored the texture of the soil, the growth of plants and any attacks by pests in their fields and countered these with the application of organic preparations. They also used these preparations in the patches where they had used chemical-based methods. Subsequently, they did an impact analysis in the organic and the inorganic patches, and discussed the results in their SHG meetings for further course

of action. They took decisions, collectively, on some crops and monitored them commonly. Accordingly, they also prepared a crop-wise pest and disease calendar. The whole idea was that the community gets engaged in the learning process, doing active experimentation and taking informed decisions.

Some remarkable changes that the farmers of Bhandaro and Jitpur villages adopted, while doing non-chemical based interventions last year were: the adoption of SRI practices, resulting in increased yield of paddy and vegetables during the kharif and the rabi seasons; improved water and animal waste management; preparation of organic pesticides and fertilizers; inculcating NPM interventions in farming practices; creation of awareness about the side-effects of chemical pesticides on human health as well as the ecology; identifying pests and learning how to eliminate them; taking a community approach in learning and making decisions; creating a knowledge nucleus around NPM by building expert resources; demonstrating clear differences between current practices and NPM-based

agriculture interventions with the community; and to be able to bring the community on the same platform.

Bitiya Marandi of Bhandaro village said, “Jo didi jaivik khad aur dawa khet mein nahi dali hai uska paudha accha nahi hua hai (Those who did not use organic methods in their fields did not have good plants).”

Evident Changes

In both the villages, farmers found visible changes in their fields after using organic practices. Soil health improved as was evident from the change in the colour of the soil from reddish to black. The farmers also said that diseases and pest attacks were fewer because of better soil health, seed treatment and preventive measures taken such as sticky traps and plantation of marigold.

Bitiya Marandi, who did organic and inorganic paddy in two patches of her land, had a yield difference of seven quintals per acre with a mix of organic practices and improved practice of cultivation than through chemical-based farming.

I would often question, why we were working here? Why am I here? What change will I bring here, where things are already in a certain stage of development? Is there a real need for us to work here?

Sonamati Tudu cultivated tomatoes through organic practices as well as the chemical-based method in two patches of 10 decimals each. She had a produce of 20 quintals in the organic field, where she used Pranamrit as fertilizer and sticky trap and Neemastra to control pest attacks. The yield from the field in which she used DAP was 14 quintals. The water-holding capacity of the farmlands treated with organic fertilizers such as Jeevamrit, Bakramrit and Pranamrit has also increased,

with some farmers claiming that it had occasionally saved them from having to irrigate their lands one or two times.

Bitiya Marandi irrigated her potato crop in 10 decimals of land twice; she also applied Pranamrit, Jeevamrit, Ghanjeevamrit and got a yield of 4.2 quintals. On the other hand, she irrigated the other patch of land of 10 decimals three times, used DAP and got a yield of three quintals.

The SHG members also said that the cost of cultivation had decreased, contrary to the thinking of the people that organic practices would be costlier and more time-consuming. Table 2 shows the difference in the cost of cultivation between organic practice and inorganic practice in Anita Murmu's field. She had cultivated paddy both organically and inorganically in two separate fields of one bigha (33 decimals) each. The cost incurred through organic methods was low when

Table 2: Cost Analysis of Chemical-based and Organic Paddy Cultivation in 1 Bigha Land

Chemical-based Farming		Organic Farming	
Material and labour days used	Cost (in Rupees)	Material and labour days used	Cost (in Rupees)
Seeds: 3 kg	330	Seeds: 3 kg	330
Total man-days for the preparation of the nursery field: 2 days	340	Total man-days for the preparation of the nursery field: 2 days	340
Total man-days for the preparation of the main field: 9 days	1530	Total man-days for the preparation of the main field: 9 days	1530
DAP: 30 kg	900	<i>Pranamrit</i> : (1 time)	220
Urea: 20 kg	200	<i>Jeevamrit/Ghan-Jeevamrit</i> : (4 times)	250
Total man-days for weeding: 6 days	1,020	Total man-days for weeding: 6 days	1,020
Total man-days for harvesting: 16 days	2,720	Total man-days for harvesting: 16 days	2,720
Total cost	7,040	Total cost	6,410
Yield	6 quintals/ <i>bigha</i>		6.5 quintals/ <i>bigha</i>

At present, more than 1,000 farmers are venturing into non-chemical-based farming. Some have shifted entirely while the others have made a partial shift

compared to the chemical-based methods, using the same number of labour days. Significantly, the yield through organic methods was also more.

The yield will improve over the years, with the use of organic practices, because of improvement in soil quality. The most visible change observed was in the quality and the taste of the produce. SHG members said that the vegetables produced were much tastier. This also helped them fetch better prices in the market. Their produce was in high demand in the haat (local market). SHG members now, regularly, discuss their experience in the SHG and Village Organization (VO) meetings, and extend their support to other farmers. As part of the farmer field school, they regularly visit the organic and inorganic patches separately, and

work on preparing an action plan to scale up healthy and efficient practices.

Making the Idea Viral

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Bhandaro and Jitpur villages, in two years, have become the nucleus for the rest of the block for non-chemical-based agriculture. Exposure visits were conducted for the farmers of other villages during the kharif and rabi seasons. SHG members of Bhandaro and Jitpur created awareness around non-chemical-based agriculture in their Cluster and in the panchayat. They sang songs and performed plays to create awareness and had focused group interactions with SHG members of other villages in the block.

Six women from Bhandaro and Jitpur were trained as master

trainers, to develop new cadres in other villages in Kathikund block, who in turn would support farmers. At present, more than 1,000 farmers are venturing into non-chemical-based farming. Some have shifted entirely while the others have made a partial shift.

Although very gradual, the transition process is natural and is without external coercion. The community has taken its own time to explore, understand and improvise on practices. Convinced, they are now taking it upon themselves to reach out to the other farmers and are inviting them to explore, creating a learning environment that helps them make informed choices.

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