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LEISA INDIA

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Agroecology
The future of farming

LEISA INDIA

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Aanandaa Permaculture Farm, near Chandigarh was developed with passion and dedication by Manisha and Agam.

(Photo: Manisha Lath Gupta)

The AgriCultures Network

LEISA India is a member of the global Agricultures Network. Seven organisations that provide information on small-scale, sustainable agriculture worldwide, and that publish:

Farming Matters *(in English)*

LEISA revista de agroecología *(Latin America)*

LEISA India *(in English, Kannada, Tamil, Hindi, Telugu, Oriya, Marathi and Punjabi)*

AGRIDAPE *(West Africa, in French)*

Agriculturas Experiências em Agroecologia *(Brazil).*

www.leisaindia.org

Dear Readers

For small farmers who constitute farming majority, farming is a way of life. For them, agriculture is not a technical activity of application of Science for food production alone. For them, farming is necessary to meet their multiple needs – food, fuel, income, fodder, nutrition.

It is not just the farmer's responsibility to keep our planet safe. By promoting unsustainable, chemical intensive farming practices, we are destroying our natural resources, which form the basis on which the present and future generations have to live.

There is no shortage of inspiring models. These models demonstrate that sustainable agroecology based farming models are the answer to meet challenges of food security, climate change, income security, ecological safety and balances, health for all living beings. We have tried to put together such examples to inspire you.

We are extremely thankful to all those who have responded to our Readers Survey. We continue to look forward to your unstinted support, commitment and encouragement to continue our efforts to share knowledge for the benefit of everyone as well as sustainable futures.

The Editors

LEISA is about Low-External-Input and Sustainable Agriculture. It is about the technical and social options open to farmers who seek to improve productivity and income in an ecologically sound way. LEISA is about the optimal use of local resources and natural processes and, if necessary, the safe and efficient use of external inputs. It is about the empowerment of male and female farmers and the communities who seek to build their future on the bases of their own knowledge, skills, values, culture and institutions. LEISA is also about participatory methodologies to strengthen the capacity of farmers and other actors, to improve agriculture and adapt it to changing needs and conditions. LEISA seeks to combine indigenous and scientific knowledge and to influence policy formulation to create a conducive environment for its further development. LEISA is a concept, an approach and a political message.

AMEF is a member of AgriCultures Network, which is involved in co-creation and sharing of knowledge on family farming and agro ecology. The network is **locally rooted and globally connected**. Besides magazines, the network is involved in multi stake holders' engagement and policy advocacy for promotion of small holder family farming and agroecology. The network consists of members from Brazil, Ethiopia, India, Netherlands, Peru and Senegal. The secretariat of the network is located in IED Afrique, Dakar, Senegal.

MISEREOR founded in 1958 is the German Catholic Bishops' Organisation for Development Cooperation. For over 50 years MISEREOR has been committed to fighting poverty in Africa, Asia and Latin America. MISEREOR's support is available to any human being in need – regardless of their religion, ethnicity or gender. MISEREOR believes in supporting initiatives driven and owned by the poor and the disadvantaged. It prefers to work in partnership with its local partners. Together with the beneficiaries, the partners involved help shape local development processes and implement the projects. This is how MISEREOR, together with its partners, responds to constantly changing challenges. (www.misereor.de; www.misereor.org)

AME Foundation promotes sustainable livelihoods through combining indigenous knowledge and innovative technologies for Low-External-Input natural resource management. Towards this objective, AME Foundation works with small and marginal farmers in the Deccan Plateau region by generating farming alternatives, enriching the knowledge base, training, linking development agencies and sharing experience.

AMEF is working closely with interested groups of farmers in clusters of villages, to enable them to generate and adopt alternative farming practices. These locations with enhanced visibility are utilised as learning situations for practitioners and promoters of eco-farming systems, which includes NGOs and NGO networks. **www.amefound.org**

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Agroecology
The future of farming

About 80 percent of the world's food is produced by small farmers or family farmers, for whom farming is a way of life. Traditionally, farming was localized, meeting several needs of the household providing food, fodder, fuel, besides employment and small incomes. In its effort to meet the food security of the growing population through increased food production, the government through subsidies and incentives, pushed farmers to shift to high input intensive, monocropping agricultural systems. The severe negative consequences are already being felt across many facets of life on this planet – social, cultural, economic and ecological.

Solutions to environmentally and socially damaging human practices today require re-establishing connection with agriculture and other earth caring practices. Agriculture is not a technical activity of application of science for food production but rather a socio-cultural practice, rich with deep rooted meaning for the people involved (C F John, p.11). We have travelled away from this philosophy too far. It is therefore necessary that we pause, reflect and revive our natural ways of farming which is sustainable and protects our ecology.

Inspiring Examples

Inspite of the ever increasing challenges that farming faces, we still find several motivated and passionate individuals who are striving to make our lives on the planet, better. These are the individuals who have the courage to practice something unconventional, building islands or models of sustainable farming. The various agro-ecological practices follow the principles of agroecology, take different names, for example Low External Input sustainable Agriculture (LEISA), Integrated Farming, Permaculture, Agroforestry etc., and are directed primarily at enhancing soil organic matter, enhancing biodiversity and better water conservation. Following are some of the inspiring models, whose experiences are included in this issue.

Nothing goes out of the farm of Sri. Malleshappa Hakkalada, a small farmer residing at Kamplikoppa village, Dharwad district. He has adopted tree based farming and is cultivating fodder on bunds. All the crop residues are converted into compost and applied back to farm. Leaf litters of fruit trees are mulched back into the basins.(M N Kulkarni, p.23)

Anand Dhwaj Negi, popularly known as the 'desert healer', by his tireless efforts turned 90 hectares of desert land into lush green vegetation. Negi has resisted pressure from agricultural experts to use chemical fertilizers in his farm and thinks that the compost produced at the farm from animal waste is enough to add nutrients to the soil. Negi achieved what was once thought to be impossible (Dipankar Dasgupta, p.33).

Disillusioned with corporate life, a couple from Mumbai, with great passion and lots of hard work, developed a food forest on 10 acres of land called Aanandaa Permaculture Farm, near Chandigarh. It includes a combination of trees, shrubs, bushes and beds, with a great diversity of plants and animals. The food forest not only produces food devoid of chemicals, but is also a source of beauty and serenity for the soul. (Manisha Lath Gupta and Radha Lath Gupta, p.6). Similarly, a young IIT-IIM alumini, Sandeep Saxena working in the United States, started experimenting with his own 100 acres land at Sohagpur in Madhya Pradesh. Within four years, the trees created a vibrant food forest, pleasant even in the summers. (Dipankar Dasgupta, p.33).

Savita Uday with her passion on farming made a shift to natural cultivation on 4 acres of land, using lots of organic manure incorporated into the soil. Working on the farm all through the year, she has generated a lot of employment for the local communities. A number of festivals are organized on the farm during different seasons, revolving around the diversity of food, emphasising the importance of slow cooked food, the forgotten foods, the uncultivated greens and much more. (Lakshmi Unnithan, p.15)

Challenges in Upscaling

There is growing evidence that agroecological farming systems are superior to high external input chemical agriculture. However, pockets of agroecological excellence are not sufficient to revert the damage that we have done to our planet. These sustainable farming systems have to be adopted by majority farmers to make a difference to our farming, to our lives and to our planet. While the agroecological farmers experiences are so inspiring, what are the factors that constrain wide spread upscaling? Some points to ponder.

Experience shows that in many areas, farmers while growing food for the household do so using organic methods and indiscriminately use chemicals while growing for the market. This clearly indicates that farmers do see clear links between the way the food is grown and the health of those who consume it. At the same time, lack of awareness on the links between way the food is grown and the ecology in which they live, probably encourages them to use chemicals which is easy to access. This ecological illiteracy is not just limited to farmers but is widespread among the various stakeholders like government department staff, researchers, policy makers etc, which limits their ability to look at agriculture holistically. A study conducted across the tribal communities in Odisha found that wider adoption of agroecological practices are limited by certain constraints which are highly region and community specific (Siva Muthuprakash and Shashank Deora, p.19).

Despite increasing evidences on agroecology, the curriculum and research in the Universities do not change and lean towards chemical agriculture only. Their focus continues to be on increasing single commodity yields with extensive chemical application. Concepts like biodiversity, inter connectedness etc., are still alien to the conventional systems of education and research.

While support from the government is negligible for pursuing agroecological practices, its support to conventional farming system in terms of subsidies to fertilisers and pesticides acts as a deterrant to follow organic farming practices. Also, agroecology is knowledge intensive. Farmers knowledge and innovative spirit is key to its success. Farmers knowledge has hardly been recognized by the conventional agriculture proponents, to such an extent that farmers are no more confident that they can contribute to the development of farming. There is a need to bring back the focus onto the farmer, recognize his efforts as central to farming and build the required capacities to adopt agroecological practices.

Opportunities and way forward

Agroecological practices already exist. They have been proved too through various models. An enabling environment and necessary support are necessary for farmers to be able to transition towards agroecological systems.

There is a need for greater integration among sectors, disciplines and actors to achieve multiple objectives. Sector-specific policy-making will not help in encouraging agroecological transitions, as a holistic approach is necessary. The piece-meal approach by various agencies which are generally period specific and project tied do no good in promoting sustainable food systems.

Growing demand for healthy diets especially from the urban areas is a great opportunity to move towards healthy food production systems. Agroecological systems can address this demand, while simultaneously promoting soil health and reducing environmental degradation.

The increasing recognition at the global level for nutritious food and family farming serve as a great opportunity to push sustainable farming systems. United Nations Decade of Family Farming (2019-2028) and United Nations Decade of Action on Nutrition (2016-2025) offers an important opportunity to raise awareness of, and support for, the inter-linkages between agroecology and family farming and contribution of agroecology for improved nutrition.

Policy support and political will are crucial to promote large scale upscaling of agroecological systems. Sikkim in India, began reducing the subsidy on chemical pesticides and fertilisers by 10 per cent every year in 2003 and banned them completely in 2014, exhibiting commendable political will. If more States follow suit, transitioning to agroecology can become a reality.

Harvesting every drop of rainwater

Aanandaa Permaculture Farm

Manisha Lath Gupta and Radha Lath Gupta

With great passion and lots of hard work, a couple from Mumbai developed a food forest, an ecosystem which includes a combination of trees, shrubs, bushes and beds, with a great diversity of plants and animals. The food forest not only produces food devoid of chemicals, but is also a source of beauty and serenity for the soul.

We, Manisha and Agam, associated with the corporate world for more than two decades, took a bold step and ventured into a new and unknown world of farming in 2010. Located at the foothills of Morni Hills near Chandigarh, Aanandaa Permaculture Farm is an outcome of our passion and hardwork.

In 2010, we bought 6 acres of land. The depth of the underground water was quite low almost 350 feet or so - quite different from land on Punjab side where water was barely 50 feet away. The soil quality was very poor. It was completely barren and full of stones. There was uncontrollable flooding during the monsoon, as the runoff from the hills would come gushing down. There was no vegetation and nothing to slow the flowing water.

The farm was designed on the principles of Permaculture. With permaculture, we felt it was an easy way to restore a piece of land that had been totally degraded and

Box 1: "Zoning" in Permaculture

Zone 0 -	wherever there is a physical structure
Zone I -	The kitchen garden/ lawn/ flower garden surrounding the structure (ideally kitchen garden should be at the opening of the kitchen door)
Zone II -	Orchard (the food forest)
Zone III -	Some plots for farming cereal
Zone IV -	The Forest (providing windbreak and protection on all sides of the farm)

destroyed. It struck us, both at a scientific level and at an instinctive or intuitive level that, we can actually grow our own food and harvest our own water, with much less effort than required in conventional agriculture. It seemed like the right thing to do. We read some informative books and watched videos and trained ourselves. Permaculture was a pretty new term to us as well as to anybody we knew, so we taught ourselves everything and set off on this mission to become self-sustainable.

'Zoning' was one of the initial principles that we applied to the land (See Box 1). So the first step was to cordon off our land, get it fenced to avoid grazing by animals. This itself helped with the regeneration of the vegetation.

We decided to go with our instinct, and started the plantation from the forest. We invited our friends and family to join in the celebration, and every visitor got to plant at least one tree, if not more. Given the high amount of termite infestation in the soil, we were advised to dip each sapling into a solution of Ibidachlorpid before planting it. While we are totally averse to the idea of using chemicals, we did this procedure for fear of losing 1000 trees to termites, and an entire year of progress.

The windbreak was easier to plant, as it was 4 rows of trees - of Casuarina and Silver Oak. This did not require as much supervision and hand holding and was managed by the farm help independently!

For the first two to three years, the forest took up reasonable effort, trying to save the trees from neelgai and wild boar attacks, protecting them from termite, and keeping them watered, fertilized and mulched. Doing this for a 1000+ trees was indeed a full time job!

Expanding the farm

In the summer of 2013, we got the opportunity to add two more acres to our land holding. The land was not adjoining Aanandaa - in fact it was about 400 m down the road, much closer to the village Bunga. We liked the land, as it had a *kaimi* or water channel on either side.

We decided to design the farm based on Mandalas - the circles of life. Thereby, the farm got its name as Mandala too. We created 4 rows of windbreak on the north side, and two rows on the south side. We measured out 6 circular fields in the rest of the property, each one having an entrance for access. We chose to plant native forest trees in the outermost circle of each mandala, with fruit

Mandala way of planting

trees in the inner circle and the flowering shrubs in the inner most circle. Accordingly we planted a total of about 1000 trees in two acres of land, still leaving a lot of space for the crop fields. A customary windbreak was planted at the North and South boundaries - rows of Casuarina and Silver Oak trees. The East and West boundaries have a water channel, so we planted bamboos and native trees there.

In the summer of 2014, we got the opportunity to extend our farm by another two acres, taking the total up to ten acres. Along the pathway we planted Ashoka trees, but on the entire periphery of the land, we did a double row of Casuarina and Silver Oak as a windbreak, and bougainvillea on the fence, which has become a signature of Aanandaa.

Today we have about 5,500 trees at the farm.

Making a raised-bed vegetable garden

In 2017, we decided to make a raised bed vegetable garden. We marked out concentric circles, keeping the beds about 4.5 feet wide, and the walking paths in between about 2 feet wide. Once we had marked out the entire design, we started work on one bed at a time. We dug the bed about 8-10 inches deep and removed the earth into the walking path area. We then put a layer of thick newspaper at the bottom of the bed. This will prevent weeds from growing out in the bed.

Next we put thin branches from peach and mango trees at the bottom of this bed. This will decompose over time providing a rich source of nutrients, and will also keep the bed well aerated as it breaks down. We also added some leafy matter to the bed. And then finally put back the soil we had removed back into the bed. Along with the soil we mixed farm yard manure as well. We then took large stones we found on the property and fitted them into the edges of the dug out bed, keeping most of the stone above the ground. The soil was piled up higher than the walking path, and kept in place with the help of the stones. The stones will ensure that excess water leaves the raised bed through its gaps.

We added a whole lot of compost, leafy matter and farm yard manure to the top of this bed, and it was now ready for sowing the seeds. We planted all our winter vegetables here, towards the end of September/ early October - radish, carrots, turnip, tomatoes, beans, peas, spinach, mustard, fenugreek, amaranth, lettuce, garlic, broccoli, cauliflower and many more. A couple of weeks into the winter, we also sowed some herbs like oregano, rosemary and thyme. Not just that, we also sowed seeds of winter flowers as we believed that the vegetable garden will look perfect with some colourful flowers in between!

Harvesting redgram is laborious and time consuming

Conserving water

During the monsoons, the water comes down Morni hills and takes some time to get into the farm. As it flows into our farm, it follows the path laid out for it through the channels we built. This meandering path slows down the water, allowing the soil to absorb, before it makes it's way to the pond for storage. The pebbles in the channel, the plantation on it's edges and the meandering path it was designed to take, all play out just as imagined in design phase.

The trees, bamboos and grasses lining the path of the water ensures that the soil does not erode, and the water gets filtered on its way to the pond. It's been 6 years since

> With better water conservation, the water get's slower and cleaner. Also, each year the eco system gets stronger.

we built this entire infrastructure, and each year the eco system gets stronger. The water get's slower, cleaner; the trees get bigger, greener; the bamboos grow taller, denser; and the grasses grow thicker, bushier!

Jaivik kheti

Till we discovered Jeevamrut and Agnihastra we were meeting with mixed success in growing pulses and vegetables. Grains were hardy and less prone to disease. But with leafy plants like those of pulses and vegetables, we had big losses, or no luck from the start.

Permaculture does not talk about cow based farming - I think this is mostly because all permaculture texts are western in origin. And given that they do not have desi cows in the west, cow based farming has not been discovered yet. We heard about cow based farming from the inspirational farm in Noida called Beejom. And then we went on to read more through Subhash Palekar, the father of Zero Budget Natural Farming, or Jaivik Kheti. We realised that we were now ready to take the productivity of Aanandaa to the next level with the help of cow products.

We already had two cows. So we decided to start practicing javik kheti at Aanandaa. We also made Agnihastra - a naturally made insecticide with ingredients like urine, garlic, chillies, tobacco and neem. Jeevamrut and Agnihastra have now become our standard fertiliser and insecticide for all purposes - crops, begetables, fruits - everything. It is safe to say, our farm now runs on these two ingredients.

Saving Seeds

It has been a few years now that we have rarely bought seeds for our vegetables and crops. We have been diligently saving seeds to sow back in the following season. With cereals, pulses, legumes, oilseeds it is simple, because the seed is the crop. But for vegetables, we have to keep aside some plants, to over-ripen and produce seeds.

Winter vegetables like radish, carrots, turnip, cauliflower, broccoli, spinach, fenugreek, brassica, are simply left in the beds to over grow and fruit. This does mean that we have to leave those beds undisturbed till April end, when

Sesame is one of the three crops grown for oil production, besides mustard and sunflower.

the weather turns warm and the fruits on these plants dry up. We then cut the entire plant, and let it dry even more in a corner. Finally, we beat the dried plants with a stick to thresh out the seeds.

Summer vegetables are mostly squashes like bottle gourd, cucumber, bitter gourd, snake gourd, melons, pumpkin and apple gourd. Usually, we simply leave a few fruits on the vines to over ripen and dry out. Most of the times, we simply forget to pick them from the vine because they went unnoticed! Other vegetables like brinjal and tomato have a slightly more complex process of seed saving. This is because the seeds have a gelatinous covering on it, which has to be removed before drying the seed. If you do not do that, the seeds tend to catch fungus and lose their vitality.

For pulses, cereals, legumes, oil seeds and other spices like fennel, ajwain, dill, we simply keep aside a part of the harvest to sow the following year. To prevent these seeds from getting spoiled, it is important to dry them out completely in the sun before storing them in a water tight container or sealed plastic bag. For added protection, we sometimes add layers of neem leaves, or mix in some cow dung ash to keep away insects and fungus.

Selling Organic Produce

At Aanandaa, we have some surplus produce like onions, potatoes and dals. Being non perishable, we do not have

Regular trimming and cutting back of mango trees allows better aeration and sunlight.

a problem storing them, and are beginning to sell this produce in the Chandigarh Organic Farmer's market that takes place every Saturday. We also sell some produce in Gurgaon, where we live most of the time.

As an organic farmer, one may find it challenging to find a market for the produce. That is why, often farmers choose to continue on the path of conventional, chemical assisted mechanised farming - as it is easy to get higher productivity, and an easy market, even if prices are low. However, as an organic farmer, one gets fair value for its produce, along with respect from the local community. For example, conventional potatoes may be selling for Rs 1-5/kg in the mandi. In the same market organic potatoes could fetch Rs 30-40/kg. In the long run, even with lower yields (which will never be the case), you end up making good returns by getting higher value for the produce.

Reaping rich benefits

With permaculture, there has been increasing crop productivity. Productivity is not just measured by the output of a farm, it is the ratio of the inputs versus the outputs. We have found that every day our inputs are decreasing, but our outputs are actually increasing. Working with nature, we build our soil quality and quantity rapidly and are able to store and harvest water much more efficiently.

While we continue to farm in small clearings and grow vegetables and crops the conventional way, we continue to remain interested and invested in the forest we have grown. The forest is doing wonders in improving the soil quality. The top soil is getting mulched with the leaves and twigs falling from the trees. Coupled with that, we have big animals like cows and goats trampling over this mulch, and also mixing their dung and urine with it. Over time, we are seeing a significant improvement in the soil quality.

Secondly, water run off has reduced remarkably. In fact, with vegetation and trees in place, we hardly have any muddy water run off from Aanandaa. Most of the water seeps into the mulched soil, and then finds its way to the pools and ponds through the surface of the soil, leaving clear filtered water behind. And thirdly, the trees have provided shelter for so many different birds. Aanandaa has become a bird watchers delight - one can spot many species here, along with the famous peacocks from Morni HIlls!

As we walk through our forest, see the trees reaching for the sky, look at all the bio diversity of bees, birds, butterflies, rodents that live in this eco system, we feel blessed. We had planted about a 100 different species of trees and each has given back to the eco system something unique - either a huge canopy, or beautiful flowers, or home to some birds.

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Farmers as custodians of Earth

C F John

At a time when no limits are set for our thoughts and success, both farmers and seeds stay within limits and blossom a boundless world of Life - an abundance blossomed from limits. All what we seek lies dormant as a treasure in this dynamically embedded body - our body and body of earth. What farmers nurture and uphold in this soil, is a world of care, attention, resistance, survival, custodianship, togetherness and sanctity.

Farmers exchange enables local seed conservation

Solutions to environmentally and socially damaging human practices today require re-establishing connection with agriculture and other earth caring practices. Agriculture is not a technical activity of application of science for food production but rather a socio-cultural practice, rich with deep rooted meaning for the people involved. Agriculture is farming and farming is responsible keeping, breeding and rearing. It is soil, seed, moisture, warmth, air, vulnerability, and also pests, weeds, and infestation. It is observation and staying alert, it is people and relationships. Industrial agriculture is the antonym of it.

It is in this context that we, a small group of creative minds, decided to spend time with a farmer's collective, FTAK, and work towards a cross disciplinary art project focusing on culture of agriculture, situating our larger ecological and social context today. This article holds fragments that we stumbled upon when we walked with them during the last three years. With me in this inquiry, apart from number of well wishers, are visual artist - Azis T.M, poet - V.T.Jayadevan, theatre artist - Shivdas Poikavu and poet - M.P Pratheesh.

Changing values

Not long ago in this county most people were either doing farming or in some way were connected or had acquaintance with farmers. Today, this connection is lost and its implications on our culture, ecology, consumption, understanding of food, and wasting are grave. And it is important to re-establish the connection between agriculture and the general public.

When people were connected with agriculture it had a bearing on our cultural sensibilities too. For eg., it helped sustain an empathy for food, which is a deeper connection with food. Not long ago, in our houses, children were taught to respect every grain that earth produced. When a grain of rice falls on the ground, we would pick it with hands. Sweeping it with broom was considered as showing disrespect to food and earth. Even when we had in abundance, we practiced the same. The food that we held in our hands was not regarded from the light of money spent but as something mother earth gifted. In certain conditions, each grain is a seed and as food it comes to sustain our life. Today, the food we waste is taking us to a level of insanity.

A living soil is basic to the planet's life

While the nation's dream development projects burned many along with their land, still some continued to persist like a chopped tree puts forth new branches from its remains. They tried to keep the light of farm alive, as a sacred duty keeping a covenant between the seed and us. When the country's law is to protect and foster market and capital economy, the law farmers honor is the law of

FTAK is born at the peak of the agrarian crisis in Kerala, formed in 2005 by Tomy Mathew of Kerala's oldest organic store, Elements in Kozhikod. The 300 families from Waynad who were its first members initially were looking to increase market access for their farm produce and to negotiate better prices to ensure trade justice, keeping the dignity of farmers at the center of the collective. Now under its umbrella over 5000 families, have made a mark in the hilly tracts of Malabar by its pioneering efforts at fair market access for the hill produces of Kerala.

The organization initially focused on remunerative prices and fair market access. Today the organization has managed to build on this and become a force in sustainable and organic farming practices, rejecting mono-cropping for biodiversity. It is thumping a finger at terminator technology. They are recapturing seeds for the public good. At another level, it is bringing the focus back on food sovereignty. By collectively adopting sensitive farming practices, 4500 member farmers of FTAK have turned more than 15000 acres of farmland in the Western Ghats into climate resilient homesteads. The aim is to make each member's farm a miniature rain forest with a multitude of fauna and flora, typical for the Western Ghats region, now a declared protected biosphere.

A farmers market

life and health. Farmer's law is founded on interconnectedness and interdependence of life, and honoring its responsibility and obligation. Hence we have witnessed in the past many peoples movements in the country, be it farmers, tribals or fish workers, who have fought certain developmental projects and market to preserve the law of the soil and a life sustained by it.

Many kinds of profit that we make in the country today is like poisoning the pond to catch fish. It is to make short term profit without caring about ecological and social consequences. A good farmer is in another kind of relationship and bondage. They are also the custodians of the soil in which they dwell. Only if he cared about the health of the soil, his children can continue to dwell in that soil. Their notion of justice, sense of responsibility, and embeddedness they preserve has its meaning beyond their family, generation and community.

But farmers today are pushed to the corner to earn more just to meet their basic needs and education needs of children etc. They take heavy loans to teach their children, and the children learn to fit to a world that disregard agriculture. What could we speak of a country that cannot protect people who showed a way of living in accordance with the law of preservation and sustenance of life. We animate them to do what should not be done, and cause a situation where there is no other choice. An insanity of our times.

Nurturing has given way to a different kind of efficiency that market demands. A farmer says, *"today we are losing control on our taste. What market is doing today is taking away our own taste. Until now the taste was defined by what was grown in our fields. Today the market takes our produces and brings back their taste to us. For eg., jackfruit burger, rolls, etc. Our kitchen was not just a place to cook but also a place to preserve both food and seeds. Today, the works we do on the land and its taste have less place in our house, in our kitchen. What we do in our land is for an abstract market and the life in our homes is defined by that world outside"*. A connection lost its symbiotic nature

Changing perceptions

Today, what is written is considered as knowledge. But the knowledge that farmers hold is not in books or in the library but dwell among the living. Farmers are the sanctuaries of knowledge and wisdom. It would be worthwhile to do an integrated auditing on the contributions, gains and wastage both farmers and other professionals make in our times today. It should include contributions that sustain our life, larger ecological issues, efficient use of energy and wastage created, among many other things. If one does not know the integral nature of things he cannot engage with the work of nurturing. By default due to the nature of engagement farmers are conditioned to do, nurturing coexistence and sustenance become integral part of their consciousness.

Due to the nature of engagement farmers are conditioned to do, nurturing coexistence and sustenance become integral part of their consciousness.

Today's knowledge by and large is abstract. Knowledge serves its purpose only when it serves life. We have gained much knowledge today. But it has blinded us from recognising the tenets of life. The desire for success and higher profit has grown to become like a killer weed, which has enwrapped most thoughts, actions and forms we encounter today. You ban one product in the market, it will resurface in another form. Similarly, every solution that we find for a problem, itself would become another problem for which we need to find another solution. This alienated approach to life, as we all know, has caused many problems. Both physical as well as emotional and mental issues are growing in alarming ways in the country.

Fifty years ago, we did not have anything that we could call as waste. It was an alien thought. Everything helped nourish something else. Today we do not have anything as pervasive as waste. We are enwrapped with waste. In India every day we dump 25,940 tons of plastic alone as waste. We believe every problem paves way to another business. And also we believe that there is a system in place to find solutions for all the problems that we face. Even when we lose everything, we push our dreams forth. How long we can go on playing this game?

Learning to reconnect with life

For us, who have become a part of a machine for the market and is running to meet targets, and in the process losing ourselves, farmers show a different way of living. They live in a different time and speed. The ways of the soil, seeds, sprouts and yield are different. It is about a different kind of alertness, waiting, slowness and letting go. How do we understand slow money and slow food? And what is the meaning of being slow for our times.

Seeds and the soil that the farmers care hold up the truth of life. Farming is alertness and observation. You can see what is going on. The hand and feet that works through it, with or without knowing, preserve the truth of coexistence. For us, the people who have developed a taste for studio aesthetics, corporate funded exhibitions and other entertainments, entering the beauty of seed and soil may become a journey of pilgrimage. To re-establish this connection between agriculture and the general public, I feel, every citizen before s/he is thirty should spend a minimum of two years in an integrated agricultural land.

Agriculture holds great spiritual meaning too for seeds and soil. A walk through the soil is walk into a different light and bodily relation. As of a spiritual act, separating seeds, keeping, caring, planting and exchanging, the hands feet eyes and heart of a farmer overcome darkness. With the sacred act of placing the seeds into the soil, farm lands become 'silent prayers'.

While we celebrate the personalities of different professions and hold them as our common pride, we have to recognize that in our midst are people who walk the land and work without names, address and honors, work day and night making not only what we eat but also help protect the earth. Still they remain outside our consciousness.

If our wounds are to be healed, we need to enter their wounds. In their life of interdependence with nature, we shall find healing. Let our wounds, sorrows, joy, togetherness and blossom, be rooted in the truth of Life.

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Conserving local culture and enhancing local livelihoods

Lakshmi Unnithan

Meeting the demands of future food needs, while conserving natural resources, improving nutrition and improving farm livelihoods are the main challenges of 21st century. New approaches of problem solving, new ways of thinking and new partnerships have to be explored and adopted to meet these challenges.

Friends from urban areas participate in farm activities.

There is an urgent need to promote metamorphic changes in how food is cultivated, processed, transported, stored, distributed and consumed. Agroecology is recognised as critical to ensure to offer many benefits including food security, resilience, boosting livelihoods and local economies, diversifying food production and diets, promoting health and nutrition, safeguarding natural resources, biodiversity and ecosystem functions. It is critical to ensure the active participation of family farmers, in particular small-scale food producers, women and youth, in order to catalyse dialogue and cooperation to scale-up agroecology.

In this context, it becomes very important to be acquainted with individuals having new approaches of problem solving, new ways of thinking which tries to inculcate the ideas of boosting livelihoods, economies, improving diets, improving nutrition and diversifying food production. It's indeed inspiring to track the journey of Savita Uday the teacher, folklorist and the founder of the Buda Folklore Museum, a Cultural Heritage Centre. A multifaceted woman, who inspires and empowers many on her way, her story reveals ingenuity and passion in boosting livelihoods and local economies, diversifying food production and diets, promoting health and nutrition, safeguarding natural resources, biodiversity and ecosystem.

Savita Uday, after her PhD, taught in a few schools. However, she soon discovered the restrictions of the classroom and decided to venture into teaching in different schools from Ahmedabad to Bangalore to Muscat in various conventional schools to alternative schools like Prakriya School, Bangalore and Valley School, Bangalore. As Savita taught geography in school, she found that majority of the children lacked experiences with land, forest and rivers and she realized the importance of taking classes within the school to being one with the Mother Nature. She quit the job and designed a program for the schools because she believed children learn better in a natural environment.

The unique Buda study tour programme by Savita Uday allowed students from schools, colleges and universities to choose from a River, Sea or Forest routes to experience the rich ecological diversity in the landscape, meeting members of tribal communities that inhabit these spaces and learning about them in close quarters. Students spend one week to a month along rivers, the sea, and the deep forest lands and learn from experts –the tribal people (Halakki and Siddi) (See Box 1). A very unique way where in she introduced the tribals in these programs to take classes and teach folklores to the children in those schools, which was appreciated way beyond.

Box 1: *BuDa* programme

BuDa in Kannada stands for the beginning – the ground and the base. Everything is built upon that. *BuDa* folklore presently operates out of two locations: Honnavar and Angadibail (Ankola). Her programs were initially from her parents place in Honnavar. Her parents Dr. Shanthi Nayak and Dr. N.R Nayak, both Kannada professors, worked tirelessly for 40 years to conserve the folklore of the Uttarakannada region. They have authored over 80 books and documented the folklore through literature, arts, crafts, dance, food, drinks, songs, games, medicinal plants and costumes. The *BuDa* programs are conducted at either of these locations to experience the life and the culture of the community and to understand the interrelationship between people and nature in each place. *BuDa* folklore believes in the experiential learning philosophy and has designed the following programs for schools and colleges, whereby they can experience the rich natural and cultural heritage of the Uttara Kannada coastal belt.

Study tour programme

River Route

They trace the entire route of the Sharavathi River from the origin till it meets the Arabian sea. We cover this through a combination of treks, boat rides and short stretches of road. In this journey, students explore beautiful historical islands, the course of the river, various land forms created by the river- The craft, art, food, folk gods and the people and their way of life.

Sea Route

Beach trek from Honnavar to Gokarana is along the coast and over the hills and camping along the beaches. This is a very unique kind of trekking which is possible only in this stretch.The people we interact are *Halakki* tribe and fishermen community.

Forest route

Students live in the forest, in the farm house at Angadibail, in the middle of paddy fields, surrounded by mountains, streams and forests in Uttara Kannada district. Students are given exposure to rich folk culture of this region which includes the people of this region (*Halakki, Gamokkalu, Gondas, Siddis and Kare okkalu*). They study their food, art, craft, music, dance, architecture and their way of life.

They trek through the evergreen and moist deciduous forests of the Western Ghats and camp in villages that fall en route on our trek. It includes trekking to Yana Motigudda,the highest peak of this region.They study how the environment/landscape influences the life of this community or how the community adopt their lifestyle according to the surroundings.

Learning on the farm

She just couldn't settle for teaching and her inner call was much beyond that - an inner call which called her back to her land. It all started with volunteering and land care activity at the Valley School, leading her to farming on her land.

Savita wanted to do much more, revive education and spread knowledge in a way that the next generations could benefit from it. Her calling to work on land was so ultimate that she went on to purchase 25 acres of land in the Angadibail village in the evergreen forests of Western Ghats and about thirty kms away from Gokarna, in the Uttara Kannada Region. She keeps reiterating the fact that she didn't know what farming was, and she had never worked on land. Initial two years were a struggle according to her and she even kept thinking to herself that it was the biggest mistake which she did in life. Things weren't falling in place as easily as she believed them to be. As her husband was away working in Tanzania, she also adds that she found a little lost in the initial years.

The cultivable land (4 acres) of the total 25 acres that the Udays owned, was chemically treated. Hybrid rice was the main crop grown which required chemical fertilizers and pesticides. But, gradually over the last 5 years, Savita has made a shift to natural cultivation using lots of organic manure being incorporated into the soil, to improve soil quality.

At present she cultivates desi variety of rice namely *Ratnachooda, Halaga* and *Heggae*. The quantity she produces is enough to sustain them for a whole year and some to be distributed to her friends. Over years, her urban friends who helped her during the planting time, stayed at her place sponsoring their stay and food costs. This helped Savita to take care of the farm activities to an extent. Also, this arrangement paved way for

> Savita has work on the farm throughout the year, giving a regular stable income to the local community who work on her farm.

Kokum Festival

Kokum (*Garcinia indica*), is an ornamental fruit tree native to India. Its tiny fruit turns from red to deep purple as it ripens, tastes sour and also has a faint slight sweet aroma. Kokum has many medicinal properties.

The Kokum festival is a journey of kokum from tree to jar. The fruits are plucked, processed and preserved during this period. It starts with harvesting of Kokums. Participants wander into the nearby forest neighbourhoods in groups and collect kokum fruits in big woven baskets and bring them home.

The next step is to remove the soft fleshy outer part of the fruit Kokum and separate the seeds to be made into butter, an emollient similar to shea or cocoa butter,which is often used in cosmetics such as lipsticks, moisturizing creams, conditioners and soaps. Some of the soft fleshy part is layered with jaggery and made into a jam like consistency which can be further made to squashes, jams and coirdials.

The dried rind of the fruit is used as a culinary and medicinal agent, its colour turns almost black to purple in the sun and has gnarly edges.Some of the ripe fruits are used for making jam,wine,sherbets,kokum rasam etc.

We also experienced making Kokum butter from yesteryears kokum seeds. Kokum seeds were boiled and then grinded in the stone hand grinder and then boiled to separate an emollient similar to shea or cocoa butter.This is often used in cosmetics such as lipsticks, moisturizing creams, conditioners and soaps.

Kokum butter made from kokum fruits is used in cosmetic industry

organizing a two-day planting festival called *Mungaru* in the month of August.

All the varieties of paddy with their long and tasty leaves, serve as a preferred fodder for her livestock - 2 bulls, 4 cows and 3 calves. Also, there is high demand for her fodder these days. She has work on the farm throughout the year, giving a regular stable income to the local helps working on her farm. Thus, she is able to boost livelihoods and economies of the local community.

Savita has constructed a traditional farm house in Angadibail, where people can stay, participate and volunteer in all farm works. *Buda*, in due course has become another study centre in addition to the one in Honnavar, at her parents place. This beautiful experiential learning and farm-stay, takes in about 15 guests at a time, to teach them forgotten tribal ways of making food and crafts. The tribals of Halakki and Siddi community are invited to perform, depict stories, entertain and also assist in various works, which also provides them a stable and regular income.

Kokum is collected from the nearby forestduring the Kokum festival

Reviving forgotten foods

They organise a variety of festivals, in different seasons, revolving around the diversity of food, emphasising the importance of slow cooked food,the forgotten foods,the uncultivated greens and much more. These festivals emphasise that diversification is key to ensure food security. These festivals speak of diversifying food systems and the importance of diversified food in our diets and thereby promoting health and nutrition among the urban people. They reiterate the fact that there are endless possibilities in which one can prepare and eat your single favorite food in many ways too. Did you ever know how versatile Kokum is? Buda conducts Kokum festival in summer (May), Jaggery festival during winter (Feb) and Mungaru (Rice planting) in monsoons (August).

For a very long time, Savita never sold her products. She also refuses to brand her products. But, as the genuineness of her products is well known, orders started flowing in for her products. She sells her products during *Ragi Kana* in Bangalore. Even though her products are sold in cities, Savita is keen on partnering with organisations, that allow her to include a detailed story of each product that is given to the customer, along with the product.

Isn't it truly admirable what individuals like Savita are passionately following? They speak their hearts, refuse to brand the food, urge more and more people to come, enjoy the festivals, the place, go back to slow living, travel down the memory lane,enjoy the forgotten foods, give us some goodness along with some good laughter and lipsmacking food? It is truly wonderful to visit their place, to see how things are grown and appreciate the value of work done and share learnings.

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Tribal women engaged in post harvest processing of grains

Scaling up agroecological farming

Capacity building is the key

Siva Muthuprakash and Shashank Deora

Wider adoption of agroecological practices are limited by certain constraints which are highly region and community specific. A study across the tribal communities in Odisha found that capacity building activities with a focus on women farmers will be of strategic value which would result in better adoption of sustainable farming practices, leading to multiple benefits like livelihood improvement, family nutrition improvement and empowerment of tribal households.

Generally, farmer related challenges are perceived as the major constraints in scaling up organic farming practices. Limitations of knowledge or intervention processes are seldom perceived as challenges. Organic farming is always considered as labour intensive and therefore perceived as not preferable by farmers.

Context matters

Interactions with a group of farmers in Tiruvallur district of Tamil Nadu and a group from Mysuru district of Karnataka show nothing otherwise. Farmers consider buying a bag of urea and broadcasting it to be a convenient option than searching for good quality dung manure, hiring labors to load and unload in cart, and spreading it in their paddy field. Infact many lead farmers consider that lack of motivation among their fellow farmers as a major challenge in scaling up organic farming.

In stark contrast, our survey across eight villages in Kandhamal and Koraput districts of Odisha showed that farmers doesn't see the labor-intensive operations in organic farming as a barrier. These farmers who were practicing seed broadcasting for cereals and millets till five years back, have started transplanting seedlings recently. While they acknowledge the increase in labour requirement and intensity in adopting transplantation, they do not have any second thought as it visibly gives them better yields and income. A male farmer from Kandhamal district in Odisha says *"farming is our livelihood; how can we see it as drudgery?"* and similar opinion was expressed across villages. However, not different from other places, majority of the operations, especially those involving more drudgery are done by women.

> Community labour management has also come handy for learning and adopting new practices like transplantation and line sowing.

Women in Tumudibandh block of Kandhamal district, thresh pulses.

A group discussion with farmers in Sodakia village of Kandhamal district

Interestingly, farmers especially the women in many of the villages in Kandhamal and Koraput, have a community understanding and each of them works on their neighbors' farm during the time of sowing and harvesting, free of cost. Although the landholding among them vary marginally, they do not shy away from spending an extra hour in neighbors' farm. This community labour management has also come handy for learning and adopting new practices like transplantation and line sowing.

Visible benefit motivates

The interaction with farmers in Kandhamal district showed that almost all the farmers practice subsistence farming with almost no links with market, either for inputs or for selling their farm produce. However, a three quarter of them work as wage labour in nearby town or migrate to other states during non-cropping season to meet their growing household expenditure. As these farmers are relatively new to transplantation practice, over 70% of them reported transplantation to be the hardest work in the entire farming operation process. However, the visible increase in yield and surplus that could fetch income has resulted in 100% adoption and continuation of transplantation, even after the withdrawal of promoting agency.

In Koraput district, several groups of women farmers have adopted few organic practices which helped them harvest better yields and increase the number of crops produced for self-consumption from their farm. This led to better nutritional access and intake for the entire family and also increased access to cash incomes.

Similarly, a group of several hundred farmers in Kalahandi district continue to grow non-BT cotton inspite of acute seed shortage. They take all the efforts to pre-order the seeds or collect, conserve and reuse seeds from traditional cotton varieties.

Need for capacity building

Analysis of average yield level in Odisha over a decade shows that the yield in almost all the principal crops is significantly low in Odisha than that of the national average. Further, we could also observe a stark difference in the yields, farm incomes and in farming practices in villages like Gachergan and Sodakia within the same block (Tumdibandh) that are hardly couple of kilometers apart. Although both the villages are inhabited by similar

community, farmers from Gachergan are well-versed with various organic farming practices and marketing of their farm produce as well.

Knowledge on farming techniques seems to be a critical factor that limits their development. Interestingly, while we were interviewing couple of men farmers in one of the hamlets in Sodakia village, a group of 8-10 women farmers surrounded the community resource person who accompanied us and requested him to demonstrate the preparation of straw base for mushroom cultivation. A few more gradually joined the group with paddy straw in hand and eventually, it turned out to be a good half an hour session of demonstration which showed the level of desperation to learn.

The results from survey across several villages showed that the adoption rate is as high as 85% for almost all the techniques demonstrated by various development agencies. However, the reach of any sort of training or demonstration for any type of organic management practices is less than 40%. This confirms with the national sample survey that, only 40% of the farmers have ever interacted with any resource agency with a meager 10% from public utilities. The adoption rate and value addition through capacity building activities holds a huge potential both for improving the livelihood of the farmers as well as decreasing the yield gap in Odisha compared to other states. The risk averse tribal communities are visibly better off with systematic capacity building and marketing support for organic farming practices.

Women farmers play a key role

Within the existing limited extension activities, most of them have been engaging primarily with men farmers due to rigorous socio-cultural restrictions. However, in the last four years, participation of women has increased. During a focus group discussion, a woman who kept shying away from any discussion, stood up suddenly and told us aloud that a few years back they wouldn't even come out of their home in the presence of any outsider, but now they go to district headquarters to attend training programs and have their say in farm management decisions. Thus, the training programs have mobilized women and improved their self-confidence in adopting organic farming practices.

Further, women farmers give higher priority for the health and nutritional intake of their household than the men farmers. Hence, in districts like Kandhamal and Koraput, capacity building activities with a focus on women farmers will be of strategic value that would result in multiple benefits like livelihood improvement, adoption of sustainable farming practices and empowerment of women farmers.

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Sustaining agroecological farming practices

Need for support

M N Kulkarni

There is an encouraging trend in farmers returning back to traditional practices, that are eco-friendly which provide sustainable production. There is a great need and urgency for spreading the knowledge and providing adequate support if farmers have to switch to agroecological farming on a large scale.

Coconut fronds are chopped and applied to orchards

Traditional practices are still relevant today. They are the backbone of small and marginal farmers. Switching over to modern practices, many farmers have stopped adopting traditional practices. However, some farmers are still continuing to adopt these practices. Also, with increasing focus on organic farming, one can hope that these traditional practices of resource management regain their importance.

Application of Farm Yard Manure, a traditional practice is being adopted with value addition. FYM is converted into enriched compost by adding compost culture, rock phosphate or through Nadep method. Earlier, in northern parts of Karnataka, cattle urine was collected and poured into the manure pit, enriching the manure. Today, this practice is fast disappearing.

There are some efforts by the mainstream agencies in reviving and promoting traditional organic practices. For example, Government of Karnataka through its organic farming project promoted preparation of enriched compost by providing compost culture. Farmers were also trained to prepare organic urea by mixing sand with cattle urine. Shri. K.R.Rajashekharaiah, an innovative farmer of Koragere village, Chikkanayakanahalli taluka, mixes cattle urine with ash and uses it as manure. He has noticed good results.

There are several other practices that are useful but not being practiced. For example, application of tank silt which increased the water holding capacity of soils; winter ploughing which helped in incorporating crop residues and weeds into the soil, sheep penning etc. Sheep penning, however, is still prevailing in traditional sheep rearing regions. In very few places, we can see cattle penning (Raichur district) and donkey penning, (Tumkur and Arasikere). Large quantity of

> With growing awareness farmers have started to chop the coconut fronds into small pieces and put them back to soil.

dung and urine get recycled back to soil which otherwise would have gone waste.

Resource Recycling

In the context of climate change and raising cost of inputs, recycling of resources is gaining much significance. One can see a lot of awareness among farmers on the proper use of crop residues, manure, cattle urine etc. Around a

Ravikumar grows fodder to feed his farm animals

decade back, one could see burning of crop residues in farmlands. This was very common scenario in sugarcane growing regions like Belagavi, Bagalkote, Mysore etc. Now, farmers have understood the nutrient value of crop residues and converting them into manures, so that nutrients are recycled back to soil.

Once the crop residue goes out of a farm or burnt, nutrients in them are gone forever. Earlier, in coconut belts such as Tumkur, Hassan, Mandya, Chikkamagalore etc, farmers used to sell coconut fronds at cheaper rates, thus losing the nutrients. With growing awareness, farmers have started to chop the fronds into small pieces and put back to soil. Professor Nanjundappa (Tiptur, Tumkur district) an educationist turned organic farmer, chops the coconut fronds into small pieces using a chopping equipment and applies them to the orchard. He is also engaged in creating awareness on zero cultivation and recycling of resources, since ten years.

Similarly, nothing goes out of the farm of Sri. Malleshappa Hakkalada, a small farmer residing at Kamplikoppa village, Dharwad district. He has adopted tree based farming and is cultivating fodder on bunds. All the crop residues are converted into compost and applied back to farm. Leaf litters of fruit trees are mulched back into the basins. He also has four dairy animals. This has helped him to adopt biogas unit with the support from local gram panchayat. Fodder is fed to animals. In turn, dung is produced and fed to biogas unit, slurry from the biogas unit goes back to FYM pit and then to the field. *"Only grains, milk and fodder root slips go out of my farm"* says Malleshappa.

"My dependency on external resources is very less. I have chaff cutter and use the fodder efficiently and apply waste decomposer for FYM pit." asserts Mr. Ravikumar, a small farmer at Sagaram village, Madugala Mandal, Vizag district, Andhra Pradesh. He has seven cows and two buffaloes. He is growing fodder on one acre. About eight tons of farm yard manure produced in his farm is applied for growing crops. He uses waste decomposer, adopts azolla cultivation for efficient recycling of resources. Ravikumar has adopted multiple cropping system in his seven acre farm with Guava, coconut, banana, paddy and fodder cultivation.

Way forward

Agro ecological farming is still seen in pockets. For efficient recycling, at least one dairy animal, few small ruminants (goat/sheep), fodder, tree fodder on the bunds and converting crop residues into compost are required. Many external agencies do encourage and promote alternative methods, but they get limited to the project requirements and project periods. For example, NABARD in its initiatives on climate proofing of watersheds, focused on efficient recycling of resources through green manuring, silt application, deep ploughing and vermicomposting. The Department of Agriculture and KVKs promote value addition to FYM by supplying compost culture for preparation of enriched compost. Therefore, there is a great need and urgency in spreading the knowledge on a larger scale. Also, adequate support needs to be provided if farmers have to switch over to agroecological farming.

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Organic Agriculture Key to Combat Land Degradation

By Devinder Kumar

NEW DELHI (IDN) – In 2018, the first 100% organic state in the world, Sikkim in the North of India, received the Gold Award of the UN backed Future Policy Award, also known as 'Oscar' for best policies. The policy enhances soil fertility and increases biodiversity at field and landscape level. Further states in India and the Himalayas have adopted 100% organic farming goals or aim to adopt them.

A side event on September 6 during the 14th Conference of Parties (COP14) of the United Nations Convention to Combat Desertification (UNCCD) – UNCCD COP14 – in New Delhi highlighted innovative policies from India and the Himalayas, which help achieve the land degradation neutrality target and improve the living conditions of people affected by desertification, land degradation and drought. The session also launched the study *"The Mainstreaming of Organic Agriculture and Agroecology in the Himalaya Region. Policy Contexts in Bhutan, India and Nepal"*.

"The transition to sustainable food and agriculture systems is critical for a sustainable future. Both Sikkim and Bhutan show with their 100% organic goals that such a transition is possible. UNCCD is proud to showcase, along with the World Future Council and IFOAM – Organics International, their leadership and political will towards achieving land degradation neutrality. We can learn many lessons from their exemplary actions on policy making," said UNCCD Executive Secretary Ibrahim Thiaw.

"By scaling up organic agriculture and agroecology, it is possible to tackle malnutrition, social injustice, climate change, and loss of biodiversity. Through effective, holistic policymaking, we can transform our food systems so that they respect people and the planet," said Alexandra Wandel, Executive Director of the World Future Council.

Sikkim proves that it is feasible – and how. Sikkim, Bhutan and other Himalayan states are part of a growing movement pursuing organic farming and agroecology as an effective pathway for achieving the Sustainable Development Goals (SDGs) and delivery on the entire 2030 Agenda, Wandel said. "They show that achieving land degradation neutrality is no longer a pipe dream but can become reality," she added.

Louise Luttikholt, Executive Director, IFOAM - Organics International said: "The Indian state of Sikkim was chosen for the Future Policy Gold Award 2018, because it is the first state in the world to become fully organic. It set an ambitious vision and achieved it, reaching far beyond organic farming production and proving to be truly transformational for the state and its citizens. Sikkim sets an excellent example of how other Indian states and countries worldwide can successfully upscale agroecology."

The importance of combating desertification and its consequences is underlined by the fact that families and communities are breaking up, losing their homes and sources of livelihoods, often from single instances of droughts, flashfloods and forest fires.

These negative impacts of unpredictable and extreme climatic conditions are now recurrent, more frequent and intense in many parts of the world. Today, over a million species are on the verge of extinction, threatening global food security, largely due to habitat loss and land degradation.

Three out of every 4 hectares of land have been altered from their natural states and the productivity of about 1 in every 4 hectares of land is declining. Poor land health is on the rise, and is impacting 3.2 billion people all over the world. Land degradation working in tandem with climate change and biodiversity loss may force up to 700 million people to migrate by 2050.

It was against this backdrop that over 3,000 participants from all over the world are participating in COP14 that concludes on September 13. The Parties to the Convention

will agree on the actions each will take over the next two years and beyond to get us on a sustainable development path.

Ministers from 196 countries, scientists and representatives of national and local governments, non-governmental organizations, city leaders, the private sector, industry experts, women, youth, journalists, faith and community groups will share their expertise, and agree on the most viable solutions. New actions will be guided by an assessment of the outcomes of the decisions they took two years ago.

Contributing to the objectives of UNCCD COP14, the event showcased, in particular, innovative policies that support the much needed transformation of food systems in India and the Himalayas, and thereby help achieve the land degradation neutrality target and improve the living conditions of people affected by desertification. [IDN-InDepthNews – 07 September 2019]

Source: https://www.indepthnews.net/index.php/sustainability/forest-desertification-land-degradation-biodiversity/2954-organic-agriculture-key-to-combat-land-degradation

Strong nexus between land use and drought: UNCCD report

By Shagun Kapil

There is a strong nexus between land use and drought and the management of both, land and drought, need to be fundamentally linked, a technical report published by the Science-Policy Interface of the United Nations Convention to Combat Desertification (UNCCD), has said on September 4, 2019.

Stressing that an improved understanding of the relationship between land-based interventions and drought mitigation is urgently needed, the report proposed strengthening interlinkages between national land and national drought policies and even considering changing the policies to reflect the influence of land use and management and land degradation on water availability and scarcity. It also suggested that the government departments dedicated to drought management integrate land use change and land degradation as factors in drought and drought-risk management practices. ”Investing into interventions that seek to simultaneously address both has high economic, social, and environmental returns,” it said.

The report also said there was a connection of the land-drought nexus to human activities which impacted water scarcity and stressed that policies needed to ensure that the “human factor” embodied in the land and water use decisions was integrated in drought-risk management programmes. ”Management of both land and drought is fundamentally connected through water use and the significant capacity of human decisions in land and water management to alter, either positively or negatively, the resilience of communities and ecosystems,” it said.

The report recognised that there was no universally accepted definition of drought, which was one of the five ‘Strategic Objectives’ of the UNCCD for 2018-2030 and introduced the concept of ‘drought-smart land management’ (D-SLM) within the broader group of SLM (sustainable land management)-based interventions which are categorised under four major land use types — croplands, grazing lands, forests, and woodlands.

D-SLM practices such as understanding the socio-ecological system defining the landscape, geospatial analysis by allowing the monitoring and mapping of land surfaces including water bodies, and effective mobilisation of financial resources, etc will work as a framework for designing and implementing scientifically sound drought management and mitigation programmes.

Source: https://www.downtoearth.org.in/news/climate-change/strong-nexus-between-land-use-and-drought-unccd-report-66559

Urbanisation to cause huge loss of prime farmland: UNCCD

By Shagun Kapil

Urbanisation is projected to cause the loss of between 1.6 and 3.3 million hectares of prime agricultural land per year in the period between 2000 and 2030, an upcoming report by the United Nations Convention to combat Desertification (UNCCD) has said.

The share of the global population expected to live in cities projected to grow by around 2.5 billion people by 2050. Such growth often results in urban sprawl, with built-in land spilling over in some cases onto fertile soils and farmland, resulting in a permanent loss of arable land, the soon-to-be released Global Land Outlook report said. The impact of these losses is more acute as expansion takes place on prime agricultural lands.

In 2000, a projected 30 million hectares of croplands globally were located in areas that are expected to be urbanised by 2030, representing in a total cropland loss of around two per cent, out of which Asia and Africa are projected to experience 80 per cent of the global cropland loss due to urban area expansion, the report said. The loss of these valuable croplands translates into a six per cent production loss in Asia and a nine per cent drop in Africa.

"Human settlements have historically developed in the most fertile areas, and on accessible lands. Their growing size is beginning to significantly displace fertile agricultural land. In one region of China, more than 70 per cent of the increase in urban land took place on previously cultivated land," the report said. In that scenario, agriculture is then often then displaced to other, sometimes less productive locations.

According to the report, in 2014, 28 megacities were home to 453 million people; by 2030, 13 new megacities are expected to emerge in the less-developed regions.

It cautions that urbanisation will lead to an increase in global urban land cover in biodiversity hotspots by over 200 per cent between 2000 and 2030. "In total, the habitats of 139 amphibian species, 41 mammalian species, and 25 bird species that are on either the Critically Endangered or Endangered Lists of International Union for Conservation of Nature (IUCN) could either be encroached on or devastated as a result of urbanisation," it said.

The biodiversity loss due to expansion of urban land calculated by the report points out that large scale urbanisation in Eastern Afromontane, the Guinean Forests of West Africa, and the Western Ghats and Sri Lanka hotspots could, by 2030, increase urban areas by approximately 1,900 per cent, 920 per cent, and 900 per cent respectively over their 2000 levels.

Moreover, as far as water use is concerned, the demand for water is projected to outgrow extraction capacity by 40 per cent by 2030, and by 2050, up to one billion urban dwellers could experience water shortages.

Source: https://www.downtoearth.org.in/news/agriculture/urbanisation-to-cause-huge-loss-of-prime-farmland-unccd-66562

Sustainable farming is the way

Shri Mallikarjun Patil belongs to Mukkal village in Kalghatagi taluk in Dharwad, Karnataka. While majority of the farmers across the nation are frustrated and leaving farming as it is not remunerative, Shri Patil is setting a different example. He has proved that one could make enough money through farming and has been a role model for the youth to remain in farming. By practicing sustainable and natural farming methods and avoiding chemical use, Mallikarjun Patil has been harvesting good yields while maintaining the health of the soils.

Shri Patil has been growing several crops like millets (bajra, ragi and foxtail millet), blackgram, cowpea, soyabean etc. Even today, he provides the seeds of these crops to those farmers who seek. He owns three cows. He grows fodder on ten guntas of land which provides enough fodder for his cattle. He sells around 225 litres of milk every week.

He also has backyard poultry with a mix of Giriraja and local hens. These birds give a monthly income of Rs.5000.

By harvesting a record production of 24 quintals of Rabi Jowar per hectare, Shri Patil became the top producer of jowar grain at the taluk level. Similarly, he has harvested a record yield of 38 quintals of paddy from one acre of land.

Shri. Mallikarjun Patil has received several accolades and awards for his efforts in achieving good yields – Best farmer award at the taluk level by the Department of Agriculture in 2014-15 and Sri. Siddaroodha State Award in 2017 are a few among them.

Shri Patil firmly believes that one who depends on the soil will never fail. His firm belief in farming is evident as his both sons continue to live on farming. Whole heartedly, Shri Patil credits all the success to his wife, who is a partner in his farming journey.

Zero budget farming

K V Patil and I S Rao

Mr. Malleshappa Gulappa Biserotti is from Hiregunjal village, Kundgol taluk, Dharwad district, Karnataka, India. The region has been experiencing severe water shortages from 1990 onwards.

He has been practising organic farming since the last one decade. Biserotti, initially started using Farm Yard Manure (FYM), compost and vermi-compost. Over four years of usage, he noticed that his crops were getting better. He started using liquid Jeevamrutha, a biological preparation. But, the catch was that sufficient water was required to prepare liquid Jeevamrutha. With the water shortage situation in mind, he started experimenting with the use of solid Jeevamrutha and succeeded in raising crops over the last six years.

Solid Jeevamrutha is prepared by mixing 10 kg cow dung from a local cow or ox with 250 gram pulse flour, 250 gram jaggery, 500 gram soil and 1.5 to 2.0 litres cattle urine. These products are mixed well and a heap is made under the shade and covered with a gunny bag for 24 hours. The next day, the gunny bag is removed and dried under the shade for 25-30 days, which results in the pebble form of solid Jeevamrutha. Then, pebbles are sieved to separate fine and coarse particles. It is then used either directly along with the seeds during sowing or as top-dressing. With this method, Mr. Biserotti noticed the development of an enormous number of earthworms, which provided a new ray of hope to organic farming.

He started developing earthworms in trays. For three days, 2.5 litres of water was added to 20 kg solid Jeevamrutha. He found around 1,000 earthworms in the tray after 45 days under incubation. After 71 days of vermi-compost preparation, he found more number of earthworm colonies, pupa and small worms and noticed 1,500 well grown and developed earthworms in the tray. He gets 20 kg of vermi-compost from each tray, which is mixed with compost and solid Jeevamrutha and is used for crops.

Every day, he prepares a minimum of 15 kg of solid Jeevamrutha per tray, which amounts to more or less 5 MT of solid Jeevamrutha a year. Mr. Biserotti produces 10 MT of vermi-compost every year. With these organic products, he has been able to produce sustainable crops that are naturally better than those produced through inorganic farming practices. He also prepares 200 kg of neem cake with the seeds collected from 17 neem trees and uses neem leaves for vermi-compost production.

Mr. Biserotti practised sustainable agriculture using locally available natural resources with compost, vermi-compost and local seed material. By adopting this method of organic farming, he has been able to achieve better crop productivity per acre of land, under scanty rainfall conditions. Also, the culinary value and shelf life of the end produce is good and retains its original nutrient contents on storage. Mr. Biserotti believes that these methods will greatly benefit in maintaining sustainable agriculture and getting remunerative income from agriculture, even under uncertain and unpredictable rain fed conditions.

Mr. Malleshappa Gulappa Biserotti can be contacted at Hiregunjala (Village), Kundgola (Taluk), Dharwad (District), Karnataka, India. Mobile: +91 99450 11754

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This is an edited version of the original published in Dr. Muttanna, Dr.Lakshmi Murthy, Dr.Saravanan Raj (eds.), ***Inspiring Stories from Innovative Farmers****, 2018, National Institute of Agricultural Extension Management (MANAGE), Rajendranagar, Hyderabad- 500030, Telangana State, India.*

Climate Change and Global Food Security - 1st Edition

Rattan Lal, Norman Uphoff, B.A. Stewart, David O. Hansen (Eds.), *2019, CRC Press*, 808 p., £54.99, ISBN: 9780367392758

Developing nations will need to double cereal production by the year 2050. This increase will have to come from existing land, as little potential exists for bringing new land under cultivation — a daunting with a severe depletion of the carbon pool in the world's soils.

Throughout this timely text, the authors address six complex themes:

1) The impact of projected climate change on soil quality, water resources, temperature regime, and growing season duration on net primary productivity of different biomes; 2) Soil carbon dynamics under changing climate; 3) The impact of changes in carbon dioxide and ecological environments on agronomic yields and food production in different regions of the world; 4) World food demands and supply during the 21st century; 5) Policy and economic issues related to carbon trading and enhancing agricultural production; and 6) Research and development priorities for enhancing soil carbon pool and food security

This hard-hitting text is essential reading for anyone involved with soil and crop sciences as well as policy makers and change agents who need to come to the forefront of this issue armed with the latest information and viable solutions.

Nature's Matrix
Linking Agriculture, Biodiversity Conservation and Food Sovereignty, 2nd Edition

Ivette Perfecto, John Vandermeer, Angus Wright, *2019, Routledge*, 296 p., £36.99, ISBN: 9780367137816

When first published in 2009, *Nature's Matrix* set out a radical new approach to the conservation of biodiversity. This new edition pushes the frontier of the biodiversity/agriculture debate further, making an even stronger case for the need to transform agriculture and support small- and medium-scale agroecology and food sovereignty.

The text is thoroughly revised, including a reorganization of chapters with new and timely topics introduced; updates to the discussion of agroecology and food sovereignty, bringing it in line with the current debates; greater coverage of the role of agroecology, in particular agroforestry, as an important component of climate change adaptation and mitigation, and more attention given to the discussion of land sparing versus land sharing.

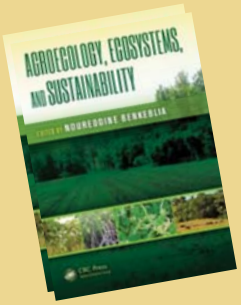
By integrating the ecological aspects of agriculture and conservation biology, with a political and social analysis as well as historical perspective, the book continues to set a progressive agenda and appeals to a wide range of students and professionals.

The Water Footprint of Modern Consumer Society - 2nd Edition

Arjen Y. Hoekstra, *2019, Routledge*, 272 p., £36.99, ISBN: 9781138354784

Using the water footprint concept, this impactful book aids our understanding of how we can reduce water consumption and pollution to sustainable levels. This new edition is fully revised and updated to reflect continued developments in this rapidly growing field of knowledge.

The Water Footprint of Modern Consumer Society is a key textbook for students of interdisciplinary water studies and those taking other related courses within the environmental sciences. It will also be of interest to those working in the governmental sector, environmental and consumer organizations, the business sector and UN institutions, where there is growing interest in the water footprint concept.



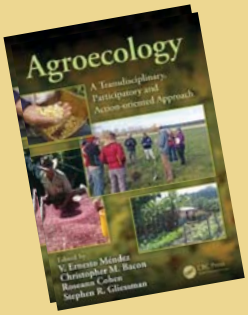
Agroecology, Ecosystems, and Sustainability - 1st Edition

Noureddine Benkeblia, *2014, CRC Press*, 393 p., 78.99 pounds, ISBN 9781482233018

Agroecology, Ecosystems, and Sustainability explores a modern vision of ecology and agricultural systems, so that crop production can be sustainably developed without further environmental degradation.

With contributions from experts from more than 20 countries, the book describes how to make the transition to modern agroecology to help the environment. It examines the global availability of natural resources and how agroecology could allow the world population to reach the goal of global sustainable ecological, agricultural, and food production systems. The book discusses important principles that regulate agroecological systems, including crop production, soil management, and environment preservation.

Making the link between theory and practices, the book includes examples of agroecology such as an interdisciplinary framework for the management of integrated production and conservation landscapes and the use of mechanized rain-fed farming and its ecological impact on drylands. An examination of how ecology and agriculture can be allied to ensure food production and security without threatening our environment, the text shows you how natural resources can be used in a manner to create a "symbiosis" to preserve ecological systems and develop agriculture.



Agroecology
A Transdisciplinary, Participatory and Action-oriented Approach, 1st Edition

Edited by V. Ernesto Méndez, Christopher M. Bacon, Roseann Cohen, Stephen R. Gliessman (Eds.), 2019, CRC Press, 284 p., £43.99, ISBN: 9780367436018

Agroecology: A Transdisciplinary, Participatory and Action-oriented Approach is the first book to focus on agroecology as a transdisciplinary, participatory, and action-oriented process. Using a combined theoretical and practical approach, this collection of work from pioneers in the subject along with the latest generation of acknowledged leaders engages social actors on different geo-political scales to transform the global agrifood system.

An explicit and critical discussion of diverse perspectives in the growing field of agroecology, this book covers the conceptual and empirical material of an agroecological approach that aspires to be more transdisciplinary, participatory, and action-oriented. In addition to illustrating systems of agroecology that will improve food systems around the world, it lays the groundwork for further innovations to create better sustainability for all people, ecologies, and landscapes.

Agroecology - Simplified and Explained

Wojtkowski, Paul, *2019, Springer International Publishing*, 437 p., 107,09 €, ISBN: 978-3-319-93209-5

This book presents the core elements that underwrite agroecology. Expressed across twelve chapters, the universality of the core is the essence of agroecology. This alone would be of interest to researchers, students, and academics.

The book begins by comparing agroecology against conventional, monoculturally-based agriculture. The book goes on to discuss the underlying technologies, the various manifestations of biodiversity, and the risk countermeasures associated with agroecology. The book concludes by summarizing the key findings, and assessing the macro-challenges facing agroecology.

Agroforestry

The future of family farming

Dipankar Dasgupta

Inspite of the ever increasing challenges that farming faces, we still find several motivated and passionate individuals who are striving to make our lives on the planet, better. Some of such inspiring examples are presented here.

The Karma of AD Negi

The cold desert of Kinnaur, Himachal Pradesh was stretched endlessly till the eyes could see. The place is called Thang Karma - in local dialect it means 'the white open area'. Not a single blade of grass was visible there. The whole area was a vast expense of sandy loam soil and boulders. A man was staring at this desert with hopeful eyes. He was an official in the finance department of Himachal Pradesh Government. He was in charge of finance for a Government of India project for afforestation of this area. His name is Anand Dhwaj Negi or in short AD Negi.. From 1977, the government is trying to change the topography of this desert but all the experts were of the opinion that there is no technology to grow anything on this vast stretch of rocky and sandy land. In 1999, Negi took leave of absence from the office and took it upon himself to start planting trees in this desert. Finally, he took voluntary retirement from his service in 2003, to dedicate full time to this project. He donated his life's savings for this project.

By his tireless efforts, 90 hectares of desert land became lush green with vegetation. He channelled the water from melting glacier to irrigate the fields and used contour planting to grow clover, peas, apples and other trees to turn this portion of desert into an oasis. He is now

The Shahs Permaculture Farm

popularly known as the 'desert healer'. Local farmers who thought nothing could grow on this mountain, are flocking to Negi to learn the technique of desert farming to get back to farming. Negi has resisted pressure from agricultural experts to use chemical fertilizers in his farm and thinks that the compost produced at the farm from animal waste is enough to add nutrients to the soil. Negi has achieved what was once thought to be impossible. He has shown the way forward for today's ailing earth.

Vast areas on our planet are turning into deserts. Forests are being cut down to pave way for so called development. Our world today is going through a multi pronged onslaught of erratic climate, devastating natural catastrophes, food shortage, water shortage, poverty and deteriorating health condition of the people. Farmers, who feed us are frustrated and are committing suicide. Rural economy is shattered and there is an exodus towards already over burdened cities. Communities in our villages are going hungry and are dependent on subsidized grains doled out by our governments. We seldom realize that all these problems are inter connected to each other and are a direct consequence of abuse of environment and misuse of natural resources by mankind.

A Brindavan at Ahmedabad

Vivek Shah and his wife Brinda were driving along a countryside road in San Francisco. Both were well settled professionals at the silicon valley. While speeding by the side of a strawberry farm, they noticed that the farm looked more like a military barrack than a growing area. All plants were lined up, one after another, and were being sprayed with pesticides by workers wearing protective suits resembling soldiers in a chemical warfare zone. If these chemicals are so dangerous that one needs protective gears while spraying them, what will happen to those consumers who actually eat these fruits? That is the thought that changed the course of life for this couple. Thus started the journey of developing their own food forest. In 2016, they left their cushy job in United States to come back to India and start a farm based on principles of Permaculture. In a short period of three years, they have gone commercial and are catering to the needs of the local community.

Truly speaking, today agriculture is treated more like an industry than a natural process of growing food, all

> Including trees in agriculture is a must to make it infinitely sustainable.

because of a blindfolded journey, ironically called the Green Revolution. With advent of science came the trio of chemical fertilizers, HYV seeds (High Yield Variety) and chemical pesticides. These inventions boosted man's confidence to take up agriculture as an industry. Added to this are: the mechanization of farming equipments, improvement in irrigation facilities and advancements in processing, packaging and storing food. Further, a complex marketing network due to excellent transportation facilities acted as a boost to the booming farming sector. Agriculture, which was more a part of the rural culture, changed from a family based sustainable food security system into a full fledged, modern, mechanized, production oriented factory enterprise.

Miracle at Morni hills

At about an hour's drive from Chandigarh, at the foot hills of Morni, there lies a food forest called Aanandaa farms. This was a barren piece of land that grew almost nothing until Manisha and her husband Agam thought of turning it into a farm using principles of permaculture. They extensively used mulch to change the nature of the soil. Slowly, the whole area transformed into a veritable food forest. Although they have not gone commercial yet, they grow enough food to support the family and the excess is distributed among friends. Life for this couple has changed for ever from an urban Mumbai lifestyle to that of an intimate relationship with nature. (See article on p…. for more details)

Often, the answer to a problem lies hidden in the problem itself. Undoubtedly, if it is the deforestation that has created a whole set of agro ecological problems in today's world, then the restoration of forest cover should be considered as the logical solution. It is only through the development of such sustainable family based food forests all over the world, that we may think of overcoming the present crisis. In this context, a slow reversal of the damage done, can take place only if we go back step by

step, like a rewinding cinema, to those times when forests formed an integral part of life - all life, human, animals or plants. Infact, the sanskrit word for life span is "*Jeevan*". "*Jee*" stands for life and "*Van*" stands for the forest.

Thus, growing trees and living among trees, sustaining life in a forest environment, drawing all our necessities from forest and acting as protector and promoter of forest has been in our genes for ever. One may give it any fancy name today, like Agro-forestry or Permaculture or Food Forest etc., but the basic principle remains the same, that intertwining our life with the forest ecosystem is the most natural environment for human beings. We must realise that a mass monoculture alone, in any form, devoid of diversity, devoid of natural ecosystems and devoid of self sustainability cannot be the answer to our food problems. Including trees in agriculture is a must to make it infinitely sustainable. Drawing from nature, only that much which is enough to sustain us and sustain the ecosystem is the only way forward.

The surprising story of Sohagpur

Importance of trees in our agricultural ecosystem cannot be over emphasized. Trees not only help to bring out the nutritional elements from deeper layers of earth to the surface but they also enrich the earth by adding organic matter to the top soil. They prevent soil erosion, act as wind breaks, prevent run off of nutrients from soil by rain water, preserve soil moisture and act as host to birds, animals and insects that act as pollinators and natural enemies to pests. Trees also have a profound influence on climate. Trees lower temperature of an area, they produce oxygen to purify the air, they attract rainfall and sustain our groundwater resources by acting as natural rechargers. Trees prevent unnecessary evaporation of water from the ground surface. They act as solar cells to utilize all the sunlight falling on their leaves to produce food.

In 2006, a young IIT-IIM alumini, Sandeep Saxena was working in the United States, entrusted with the responsibility of a survey which included study of Indian Agro Economy. As a part of his job, he travelled extensively in rural India and realised that the cutting of forests in the name of development and a fast receding ground water level was playing havoc with the lives of

Intertwining life with trees is essential for sustainability

Indian farmers. He studied the situation for first two years and came up with the idea of developing extensive food forests as the only solution to the present agrarian crisis. He started experimenting with his own 100 acres land at Sohagpur in Madhya Pradesh. He named the project Aranyani after the name of Goddess of the forests. As the first step, he planted hardy tall trees like Banyan, Peepal and Neem at the center, surrounded by fruit trees like Moringa and Bael, followed by trees like Papaya, Banana and Lemon and finally the outermost circle of Lentils and Legumes. Within four years, the trees created a vibrant food forest, pleasant even in the summers. Today, the products of this forest are marketed through e-platforms supported by hundreds of faithful customers. This step eliminates the role of middle men in agriculture and ensures reasonable price to the farmer.

There are about 175 varieties of trees growing side by side at Sohagpur, supporting each other and creating a layer of biomass on a land which, once upon a time, was barren and rocky. He is also helping other farmers to replicate his model all over the country creating sustainable food forests. These forests in villages of Madhya Pradesh produce both organic and exotic products. Unprocessed turmeric and giloy are very popular products of Aranyani among many others. Simple processed products like traditional mango pickles in organically grown and hand pressed mustard oils are promoted and marketed through social media. At the background, continued research and knowledge sharing keeps the whole system active and updated.

The future of family farming

The potentials and possibilities of sustainable agro-forestry in today's context is immense. But the biggest

Aranyaani, the food forest with 175 trees

impediment in convincing farmers about the benefits of agro-forestry is of course, the present agricultural system itself. In a capacity building exercise that I was attending, a farmer rightly pointed out that even today, all our agricultural institutes are teaching us that chemical fertilizers and pesticides are almost indispensable for better yield from a given land. Even now, the multinational companies are allowed to promote their own patented brands of fertilizers, pesticides and even seeds to the farmers, promising great results. The agriculture departments are promoting hybrid seeds and recommending chemical pesticides for plant protection. They dont tell the farmers that chemical pesticides are the greatest cause for soil degradation and the source of contamination of irrigation water. They dont inform the farmers about the health hazards of using these highly toxic and non degradable chemicals in farming. In such a scenario, to convince a farmer about an alternative system of farming is almost unthinkable. Only a paradigm shift in government's policies and an active effort by all of us to promote agro-forestry through various capacity building exercises, technology sharing and adequate awareness campaign can turn the tide away from sure shot disaster. Are we too late to turn around? Are we too slow to respond? Are we too reluctant to change? These are some of the questions that will surely decide the future of mankind. At some point of time, man has to realize that going back to basics and again making forests our true lifeline, can put our lives back on track and save this world from destruction. The quicker we realise the dangers of continuing on a fallacious path, better are the chances of our survival and of leaving a healthier planet for our children.

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