



**Agroecology  
education**



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Address : AME Foundation  
No. 204, 100 Feet Ring Road, 3rd Phase,  
Banashankari 2nd Block, 3rd Stage,  
Bangalore - 560 085, India  
Tel: +91-080- 2669 9512, +91-080- 2669 9522  
Fax: +91-080- 2669 9410  
E-mail: leisaindia@yahoo.co.in

#### Leisa India

Chief Editor : T.M. Radha  
Consultant Editor : K.V.S Prasad  
Assistant Editor : B.M. Sanjana

#### EDITORIAL Team

This issue has been compiled by T.M. Radha  
and K.V.S. Prasad

#### ADMINISTRATION

G.G. Rukmini

#### SUBSCRIPTIONS

Contact: G.G. Rukmini

#### DESIGN AND LAYOUT

S Jayaraj, Chennai

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*Mutual learning is central in agroecological education.*

(Photo: WASSAN)

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The editors encourage readers to photocopy and circulate magazine articles.

# Dear Readers

Education in any discipline needs to foster continuity and change. In applied sciences like Agriculture, Engineering, needs to be responsive to changing needs from the field. In case of agriculture, farming is pursued by rural majority, many of them illiterate too. They are the actual 'practitioners' - their role in shaping curriculum has been minimal or less distinct.

In India, Agriculture is not a new occupation. It has been practiced over centuries. India can boast of classical texts like *Vrikshayurveda* too. Modern agricultural sciences too backed by comprehensive curricula, robust institutions, strong extension and enthusiastic farming communities dealt with threatening food shortages. However, the over emphasis on certain approaches led to counterproductive and harmful practices; while specialisations side stepping holistic approaches. Holistic Agroecological pathway is being recognised as necessary in terms of sustainable livelihoods and ecologies, worldwide. Also, agroecology education is not just content; it is also pedagogy, alternative research paradigm and extension. Agroecological education needs to recognise and adopt necessary changes.

Focusing on how to deal with challenges, inspiring examples are being shared in this issue on all these above aspects. Use of social media and ICT tools have opened up new ways of reaching out, sharing knowledge and helping each other.

As readers and committed authors, please continue to share your inspiring stories. Also, as individuals and groups, keep supporting us voluntarily to sustain our efforts.

## The Editors

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**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](http://www.misereor.de); [www.misereor.org](http://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](http://www.amefound.org)

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Many passionate farmers are giving back to the society by sharing their knowledge and experience on growing food in an eco-friendly manner. This is how knowledge got passed from generation to generation, traditionally. But, present day farmers are moving a step ahead by integrating the modern technology and social media, thereby reaching and educating a large number of people interested in farming. Mr. Ayyub is one such passionate and innovative farm teacher.



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# Agroecology education

‘Agroecology’, as a fairly new term in India, is finally catching up. The principles of agroecology have been practised for several generations following traditional agriculture. Of late it has taken different names and forms like sustainable agriculture, natural farming, Zero budget natural farming, permaculture etc., with the underlying principles and values remaining the same.

Agroecology is all about nurturing the diversity, be it plants or microbes. The basic underlying principle is that everything is connected to everything else. While this makes it complex, it also makes it flexible to a given situation. It is totally opposite to the modern approach of ‘one size fits all’. Being knowledge-intensive, agroecology necessitates building and co-creation of knowledge. Positioned as an alternative paradigm, agroecology implies an approach to collective learning that is also transformative.

While the concept of agroecology itself sounds complex, how do we take it to those interested. What are the different ways in which it is being promoted? Who are the players in agroecology education? What approaches are being used to teach this complex subject? In this issue, we have attempted to include some emerging initiatives in agroecology education.

### Approaches to education

In the conventional agriculture education, farmer always remained as a knowledge receiver from the extension system. Participatory approaches became central to development processes promoted by NGOs in the early eighties. Approaches like Farmer Field Schools and Participatory Technology Development which recognised farmers knowledge and built on what they already knew, were used by AME, since the nineties. Pedagogy has to be built around Adult Learning Principles based on practical learning, importantly, experiential learning methods. The pedagogy enables

them to discover the ‘truth’ and understand the ‘science’ behind the practice through studies, games, models, to mention a few, thus, demystifying concepts through innovative learning events (Prasad K V S, p.11).

Farmer exchanges is yet another approach to co create knowledge on agroecology. Agroecology centers like the Thanal Agroecology center and the Agroecology school in Karnataka are striking examples where agroecology farming is practised and people learn a lot on agroecology by visiting these farms which include a lot of discussion and knowledge exchange.

Only since recently, specific programmes/courses are being designed to educate students and farmers on agroecology. These are mainly from the NGOs. For example, *Welthungerhilfe* has been organising course on Agroecology for researchers, activists and practitioners since last 7 years with a paradigm shift from a linear to a cyclical approach to learning focusing on an active action reflection based pedagogy. “*How we learn to see the world influences what we do in future. There is an urgent need to re-think education and shift the overall focus in education from theoretical knowledge alone to the competences which is coming out from their experience*”, says Anshuman Das of *Welthungerhilfe* (p.6).

Farmers’ experience, knowledge on local resources and their uses are key to promoting agroecological approaches. While training, it is very important for the trainers to become facilitators and to understand the local ecosystem (Chandrasekhar et.al., p 21). Agroecological approaches are highly location specific as they connect the links between the food needs, livelihoods, local culture, environment and the economics. Education on agroecology is therefore a holistic approach connecting these links, where farmers are in the centre of the entire process.

Besides institutions, many passionate farmers are giving back to the society by sharing their knowledge and experience on growing food in an eco-friendly manner. Mr. Ayyub Thottoli from Mananthvady in Wayanad, Kerala is one such passionate and innovative farm teacher, who feels sharing knowledge is a social responsibility. Till now, he has taught more than 1000 people including farmers, retired personnel, women and students. (Archana Bhatt et al., p.33).

Strengthening agricultural advisory services to make agroecological knowledge and practices available to small and marginal farmers is critical to transition towards agroecology and organic farming. Digital learning tools are emerging as a cost-effective way to reach out to large number of farmers, training them on agroecological practices, encouraging farmer-led experimentation and local innovation, and upscaling agroecology. For example, Access Agriculture's video-led learning approach has reached an estimated 90 million smallholders in over 100 countries since it started in 2012, enabling them to learn about agroecological principles and rural entrepreneurship, leading to improved rural livelihoods and sustainable food systems.

Organisations are catching up with the internet era, and reaching out to farmers through various means. For example, the Center for Sustainable Agriculture (CSA) has developed Pestoscope as one such app which is useful for pest identification at the field level. Similarly,

a Youtube channel, ekrishi.tv run by CSA has various video based content covering the experiences, preparations, films on various topics in different languages (CSA). This has particularly been very helpful during the pandemic, by which farmers were kept in touch and reached out with agroecological approaches. Farmers too are reaching out to other farmers using social media.

### Way forward

The beginning has been made. How we move forward depends on how much importance we give to promoting agroecological approaches for sustainable food systems. Farmers who practise agroecology and grassroot organisations that promote agroecological approaches can only show the way, but the impetus has to come from the government and policy makers to include it in the mainstream institutions. Presently some of the mainstream institutions include agroecology as a chapter or a course, that is narrowly defined, which will not make a great impact on the learners. What we need is a strong commitment to educate the younger generation in the agriculture sector, so that they transform into professionals in promoting sustainable food systems, in a given ecosystem. This needs a paradigm shift in the thinking, pedagogy and practice.



Photo: S Jayaraj for AMEF

# Agroecology Education

## *The pedagogy and practice*

Anshuman Das

There needs to be a paradigm shift from a linear to cyclical approach to learning. This can happen when students move towards system thinking and build key competencies by engaging in a learning process, which is rather facilitated and not taught.

*Students interact with farmers to understand farm situation and farmers perspectives*



‘Going to the field is compulsory for our students’ – told a professor, ‘...even I go to field regularly. As you see, the knowledge of the farmers is quite poor, particularly about the latest technologies.’ ‘We go to collect data to understand farmer’s problem’ – chirped a student from behind.

Our agriculture education still sees farmer as only an outside stakeholder – we ‘go’ to ‘them’ to understand ‘their problem’ and ‘offer solution’. While uttering this sentence in front of professors and students from an eminent university, explicitly mentioning the quote-unquote, I realised – I failed to convey what I wanted to mean through this sentence. Various such responses came to defend their position vis-à-vis my observation.

We were burning our hands by conducting a certificate course on Agroecology for researchers, activists and practitioners since last 7 years. About 170 students from 15 States of India and 4 other countries attended. Agroecology, as a subject in mainstream education system was fairly new in India that time. Though methods of agroecology have been ‘practiced’ since long – the science of it is quite new, so is the movement. There were farmers’ movement and peasant’s movement in India – but is mostly around economic issues, land right and forest rights. Even the current farmer’s struggle was revolving around market issues only. Agroecology learning still brings out the connotation and expectation of an organic agriculture or sustainable agriculture course. It has been a challenge in initial days of the course to make pupil understand that it deals with open ended questions where the students get to learn through problem solving related to real phenomena rather than pre-fixed prescriptions.

The initial expectations of the pupil were mostly to learn techniques of organic farming. Overfocus on technology had been a modern phenomenon of simplistic way of handling a challenge. As the days go by, the divide between Science and Technology is slowly melting away. The modern-day Science has become quite simplistic and reductionist – like providing a quick prescription – which is also looming

in to our education system, particularly agriculture. One pesticide for one pest, is a wonderful example of such reductionism. Even the so-called alternatives to conventional input intensive agriculture are also falling back on a prescriptive mode offering technologies. *Beejamrit, Jeevamrit, Mulching, Brahmastra*. This is a different domain of discussion though – but overfocus on techno-fixing has also crept into our agriculture education system conveniently.

### What is it all about

However, it took some time for the students to understand that Agroecology is not mere technique replacement in conventional agriculture. They gradually understood that the course was more to provide framework for how to study, design and manage agroecosystems that are both productive and natural resource conserving. As the focus was more on developing agroecologist rather than teaching agroecological theories, students were exposed to real life situation and simulation of real phenomena. Compared to a simplistic view, it also created scope to understand any situation from interaction between various systems like farm system, natural ecosystem, food system, market system, social system and political system.

A paradigm shift from a linear to a cyclical approach to learning was practiced in the course focusing on an

*Students working with farmers*



active action reflection based pedagogy. The hypotheses considered was - active, social learning having the complex reality as point of departure - with theory in a supporting role - is generally more effective than traditional, theory-based strategies and more suitable when it comes to understanding and handling complex sustainability challenges. Action learning happens in the complex world outside the classroom – so each component of learning started with a real life experience followed by reflection and further theory on the topic. The main task, was to engage with a farm to find out challenges while working in the farm and co-develop options to address those. The learning started in an ideal farm and ends with sharing the experience with larger audience through exhibition. It followed a cyclical way, where students were first exposed to a real life phenomena or action and learn and acquire knowledge through reflection and move on to next action cycle as described in the figure below.

### From exposure to engage

In agriculture education, farmer always remained in the periphery as a knowledge receiver from the extension system – everybody is out there to teach a farmer how to farm! As opposed to just collecting information or technology transformation, farmer and other practitioners played an important role in this course as knowledge centre. The students, throughout the course thus have multiple interaction with the farmers, staying with them to understand their perspective. At the beginning students are placed in well-established ecological farms to learn from them about farm planning, techniques, practices, interaction with the market etc. The framework of such interaction is free flowing – but also structured where the farmers are already oriented to make the students work

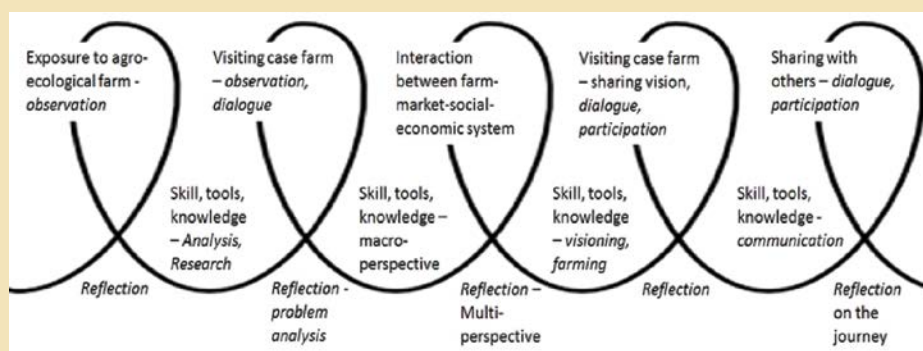
in the farm, explain about farm planning, resource flow etc. Learning from that experience, a group of students are then assigned to one farm to assess the challenges through various tools and co-develop solution through rest of the period. The knowledge input and interaction with the experts were all according to the identified challenges. The farmers give their feedback about the students’ performance - like how eager they were to learn, if anyone had any inhibitions in staying and working in the farms, engagement etc. In some cases, students worked with food processors, seed growers as well.

### From knowledge to key competencies

The course focused on developing agroecologists, rather than teaching agroecology – so it is imperative to focus on the students rather than the content only. How we learn to see the world influences what we do in future. Consequently, if we are aiming to bring in more sustainability in our future action, there is an urgent need to re-think education and shift the overall focus in education from theoretical knowledge alone to the competences which is coming out from their experience. The next generation of professionals in the field of agriculture need to acquire and practice certain key competences that will be essential through their academic and field studies, and subsequent activities in future professional positions. This means that students must observe and participate in the practices, dialogue with the stakeholders and use experiences from participation and observation to generate knowledge about farming and food systems through reflective activities.

### From teaching to facilitation

Currently acquisition of knowledge through a system where the teacher is the ‘owner’ and ‘giver’ of knowledge, who fills in the students’ empty brain. Knowledge flows from the teacher to the students and never the other way round or between learners. It is considered most appropriate to *fill in* the minds of the students with knowledge, than leave it to the uncertainty of ‘knowledge would evolve’. A role reversal of teacher to facilitator







*Students working on the farm*

is thus now not accepted yet. In the course, the teachers were requested switch over to facilitation – however had not been easy in many cases, especially for the professors. Facilitation is a higher level task where a teacher now has to design task, assign task, set expectations, create and provide scaffolding tools and review the progress.

To facilitate a smooth transition, we created scope for Collaborative Learning, Cooperative Learning, Discussions, Group Projects, Peer Tutoring, Experiential Learning, Problem Based Learning, Games, creative expressions, etc, so that the students can exchange ideas, form opinions and construct knowledge even in the absence of a facilitator. Rather than monologues, we used Case Studies, Simulations, Presentations, Projects, Debates, Dialogue etc. The idea is to support student’s ability to become an independent/self-reliant and lifelong learner by using a variety of interactive methods.

### Towards system thinking

Teachers often feel the urge to tell the answer rather than allowing students to ponder on critical questions. This refers back again to the know-it-all simplistic solution oriented agriculture since teaching paradigm. In the course we tried to bring this by not providing theories first, but starting with a phenomena/challenge and letting students find many different options themselves.

Understanding environmental, economic, political, and social challenges require transdisciplinary, systems thinking and facilitation of informed action in an era of uncertainty and rapid change. Yet, our formal education is still largely based on the transmission of neatly packed disciplinary bodies of knowledge, presented as unambiguous truths. Reductionist, linear, disciplinary thinking is very effective in simple situations but insufficient or even inappropriate when confronting complex

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*Students presenting their work on the final day of the course*

ones such as complex problems of farming and food system. System thinking was core of the course where multiperspective understanding of a situation was practiced through as an insider – and not as an outside researcher. This was not an easy approach to build the capacity of the students to deal with the whole of a situation, and not just the parts – otherwise it remains like the story of few blind men trying to understand an elephant by touching different parts of it.

## Challenges

Such paradigm transition is not smooth. The process demands time to explore, make mistakes, revisit findings and come to conclusions with support from the teachers – students often get impatient. On the other hand, to facilitate that process, the classroom space is to be redefined. A typical Indian classroom is always designed in a way where the entire class literally *looks upto* the teacher, who is on a raised platform, without any scope to interact with each other. The scope was limited inside the university – but diversifying learning arena and taking it to farm, market and factories – we could break the boundaries. Such diversification brings is new

challenges to tune various types of resource persons to a same level of facilitation skill.

Covid, in last two years brought some challenges – while learning to adapt to it, we also realised that online also created certain opportunities in terms of getting in students and teachers from various countries, adding onto diversity. In spite of all these challenges, we enjoyed a lot – we are now part of a big network of agroecology practitioners spread over 5 countries.



*Anshuman Das is working with small farmers for over two decades. Is currently associated with Welthungerhilfe. He was part of global research consortium developing pedagogy for future professional in food and farm system. To know about the pedagogy, visit <https://www.nextfood-project.eu/>.*

# Effective Pedagogy and Research perspective

K V S Prasad

Experiential learning based pedagogy, farmer-centric participatory research and knowledge exchange are essential for promotion of agroecological education.

Way back in 1982, recognising the negative effects of high input agriculture, and link between agriculture, ecology and human dimensions, a few enthusiastic individuals in the Netherlands launched Agriculture, Man, Ecology as an international training programme on ecological agriculture. Attracting many participants from developing countries, during the early eighties, Agriculture Man Ecology, made a significant contribution in building awareness on ecological agriculture. Moving to India, AME continued as a project continuing its efforts in propagating LEISA (becoming popular as agroecology) as an answer to the high input agriculture that was being promoted extensively in India. It focused on extending technical support to interested organisations through hands-on trainings as well as by pioneering participatory learning processes in promoting LEISA/ agroecology. Since late 90's, intensified its efforts in farmer centric participatory learning processes in rain fed areas where small holders are the majority. In 2002, since becoming AME Foundation, further promoted a combination of Sustainable Agriculture practices in dry lands for improved farm productivity and farm livelihoods based on agroecological principles.

The pedagogical journey gradually moved from 'training courses' to 'experiential' participatory learning processes. Every intervention starts with PRA (Participatory Rural



*Participatory approaches were central to AMEs training processes*

Appraisal) at village level. PRAs helped to understand the village context, the communities and their specific needs and opportunities. Use of suitable PRA tools helped in learning from the communities about the ground realities and in designing suitable learning processes and working strategies.

This was generally followed by a season long joint learning process like the PTD (Participatory Technology Development). Here, the farmer groups try out a basket of options in a limited area, compare the results with their own normal practices, decide simple, affordable

and culturally acceptable options. Through specific crop based PTD processes, farmers identify major problems; include options they know and suggested by specialists; identify new problems emerging. The process empowers the farmers in learning to address their own situations through experimentation and finding suitable options.

At the end of the season, farmers assessment is consolidated and shared in the *multistakeholder* annual meets. For example, two crop based working groups – *Groundnut Working Group and Cotton Round Table* emerged. The significant and challenging aspect has been creating ‘mutual respect’ between formal and informal knowledge systems. The practitioners and academics put their minds together, reviewed previous season’s suggestions, examined local solutions emerging from the field. Thus, it enabled ‘two way learning’ ... and in milder terms, a two way validation process!, enabling enhanced mutual respect, and in a way, mutual accountabilities too. There was no ‘blue print’ approach. Growing organically from a group of few committed experts, gradually included national and international research institutions leading to joint research initiatives, access to better seed varieties, ecological options for disease control and enhanced NGO–GO collaborations. AMEF also facilitated multi stakeholder knowledge exchange processes in other programmes like urban agriculture and knowledge exchange on agroecology.

FFS (Farmer Field Schools) have been the most recognisable contribution AMEF has made to agroecological education process. In this *season long learning process*, 20-30 farmers meet every fortnight, jointly observe agro eco systems, analyse and take

‘decisions’ on soil, water, and crop management. The pedagogy enables them to discover the ‘truth’ and understand the ‘science’ behind the practice through studies, games, models, to mention a few, thus, demystifying concepts through innovative learning events. For example, ‘insect zoos’, helps them to observe the behaviour of pests and predators. Farmers share their learnings with other farmers through field days organised at village/block level enabling scaling up of suitable alternatives. The facilitator creates the necessary learning environment rather than jumping to ‘teach’ and ‘instruct’. Special attention is paid towards learning needs of youth and women.

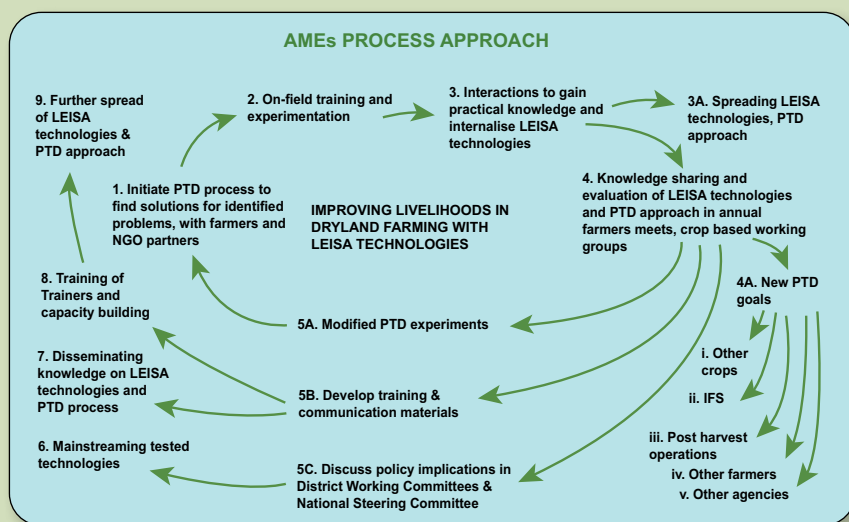
**Preparing trained agriculture professionals** is a big challenge. Visualising the need for creating a new cadre of young agri professionals, AME ventured into organising 9 month long Sustainable Agriculture Fellowship programme to selected young graduates on agroecology and participatory learning processes. The programme however could not be continued owing to lack of donor support. However, sustainable was, systematically training local farm youth involved in development programmes through 15 day TOT’s. They became the torch bearers of ecological agriculture in the field.

### Reflections on learning processes

Being associated with AMEF for more than two decades and International Year of Family Farming events, following are are my reflections.

Firstly, agroecological education needs to recognise multiple realities – the ‘Bigger picture’ as well as the ground realities – Ecosystems being global, interrelated, interdependent. For instance, climate changes do impact globally, though differentially. Two farms in the neighbourhood are not identical - a legendary organic farmer’s life long efforts in improving soils gives spectacular results while neighbouring farm returns are dismal owing to depleted soils.

Agroecological education is built on recognising context specific realities and complexities – constantly enriched by local community innovations. Agroecological education should recognise the importance



of 'learning from communities' and 'learning from each other'.

Fundamentally, agroecological education has to be strongly rooted in basic principles/value premises of *Participation, Mutual respect and Empathy*. *Farmer's participation* meaning farmers being involved right from problem identification, trial design, assessment, acceptance or rejection. *Mutual respect* meaning respecting farming community and NGOs' contextual knowledge in terms of needs, priorities and challenges, therefore, recognising them as providers' of knowledge/co-generators of knowledge, rather than passive recipients of options. *Empathy* meaning relating to and identifying with diverse 'realities' farmer is facing - landscape, climate aberrations, markets, gender roles, migratory patterns etc. while conceptualising suitable technologies or social processes for interventions.

Effective agroecological education needs to be built around three pillars

- Pedagogy - context and group specific
- Knowledge exchange based on mutual respect
- Alternative Agroecological research

**Pedagogy** needs to recognise that a) agricultural education deals with farmers who are *adult learners*, entrepreneurial and innovative b) farming community is *not homogenous* – diverse in terms of access to resources, capacities etc. c) farming situation and challenges are multiple - climate, markets, finance, knowledge, low self esteem. One fit curriculum and one fit pedagogy does not work.

Pedagogy has to be built around *Adult Learning Principles* based on practical learning, importantly, experiential learning methods. It is well known that, for durable and changed behaviours besides enhanced skills, the learning processes have to be experiential, more so, as farmers are adult learners. To keep youth interested, the pedagogy and content needs to be exciting and appropriate – rewarding in terms of financial returns, social recognition – both, immediate, as well as long term.

**Knowledge exchange:** Recognising that multiple knowledge systems exist, creating an enabling environment for exchange is required. For example, in one of the programmes on millet varieties, while

scientific assessment highlighted the nutrient content, the farmer's assessment was based on fodder suitability, nutrition, taste, cuisine, shelf life etc. Sometimes, an eco-friendly option too could be considered as gender inappropriate or culturally unacceptable.

**Alternative agroecological research:** An international conference was organised during IYFF in Montpellier, France, 2014, involving FAO and global research organisations, NGOs and Farmer organisations. The following perspectives were presented in the plenary based on working paper prepared and multi-stakeholder group discussions facilitated by me. Recognising the importance of context and constituency specific research; understanding the differential needs and abilities of the communities; recognising complex social issues including resource access, entitlement and knowledge; need for farmer centric participatory research based on mutual respect towards alternative knowledge systems; research 'validating' field phenomena; focusing on cyclical and systemic research rather than linear models alone; and, inclusive governance where research needs to closely work with farmer organizations and civil societies. If not all, some of these perspectives need to be mainstreamed. Research should become increasingly farmer centric. Formal research should encourage field innovation, recognise and examine the working of popular local alternatives. Fostering mutually inclusive partnerships in development with civil society and farmer organisations is necessary.

Other critical enabling factors for agroecological education include a) familiarity of educators with experiential learning processes besides technological choices; b) systematic documentation of local experiences, and, c) systematic consolidation of learnings based on multiple evidences, data triangulation, systematic feedback and impact assessment.

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## K V S Prasad

Consultant Editor, LEISA India  
E-mail: [prasadkvs@amefound.org](mailto:prasadkvs@amefound.org)



# Training videos on agroecology

## *Putting the power of learning in farmers' hands*

**Savitri Mohapatra**

Strengthening agricultural advisory services to make agroecological knowledge and practices available to small and marginal farmers is critical to transition towards agroecology and organic farming. Digital learning tools are a cost-effective way to train farmers on agroecological practices, encourage farmer-led experimentation and local innovation, and upscale agroecology.

*ERA team member showing videos to farmers using smart projector in Durdih village in Bihar*



**E**cological farming is knowledge-intensive, complex and hard to share. Small and marginal farmers, rural women and youth in particular, who are faced with diverse challenges, have limited access to relevant agricultural information and knowledge in their own language and are desperate for such resources. Strengthening the knowledge and skills of these farmers is critical to local food systems.

However, due to the low ratio of extension workers to farmers (1:1162 in India, for example), only a small percentage of farmers have access to face-to-face extension. For decades, extension services have been informed by research that was geared towards supporting the green revolution model of agriculture and therefore do not have the right mindset nor skills and knowledge to support agroecological transition. While some development projects have farmer-training programmes on agroecology, their reach is limited. Strengthening agricultural advisory services to make agroecological knowledge and practices available to small and marginal farmers therefore remains a major challenge.

As new information and communication technologies (ICTs) are rapidly becoming more available, there is a growing realisation that quality digital learning tools should be used to reach more farmers to transition towards agroecology and organic farming. Videos are a cost-effective way to train farmers on agroecological practices, encourage farmer-led experimentation and local innovation, and scale agroecology.

### Power of video-mediated learning

Access Agriculture, a non-profit organisation that supports agroecology and organic farming, has clearly shown that videos can be very effective for building farmers' agroecological knowledge, stimulating learning across countries and cultures, and triggering farmers to experiment and change behaviour more than farmer-to-farmer extension carried out by extension workers.

Access Agriculture enables South-South exchange of quality farmer-to-farmer training videos in local languages. The Access Agriculture open access platform ([www.accessagriculture.org](http://www.accessagriculture.org)) hosts over 225 videos in more than 90 languages that are freely downloadable.

Based on the principle that farmers like to learn from each other and try out new ideas, Access Agriculture



*Farmers can easily learn from videos and experiment with sustainable agriculture techniques*

videos show the challenges faced by ordinary farmers and the steps they take to overcome them, often including examples of social cooperation and institutional innovations. Care is taken to keep the language simple so that the videos are easy to understand for rural people.

Combining scientific and farmer knowledge, the videos follow a logical step-by-step format, featuring empowered farmers, who provide practical information and advice on sustainable agricultural innovations. The videos explain not just what to do, but also the underlying biological and physical processes and principles—why something is done in a particular way, so that other farmers can adapt the learning to their own context.

The videos cover a wide range of topics proposed by local partners based on local needs. Besides sustainable agricultural practices, the videos cover subjects, such as post-harvest, marketing and processing which add extra income to farming households. The topics also include human health and nutrition, ways of using traditional animal health practices that are within reach of poor farmers, and climate change adaptation.

**The video-led learning approach reached an estimated 90 million smallholders in over 100 countries since 2012**

## Sharing proven indigenous animal health knowledge and practices through videos

Access Agriculture has partnered with the women veterinarians-led NGO “Anthra” in Pune, Maharashtra, India, to develop a series of farmer-training videos on herbal medicines in animal healthcare. The videos are locally produced by one of the Access Agriculture trained video partners.

As antimicrobial resistant (AMR) bacteria against drugs used in animal health has tremendous implications for public health, videos can be an important way to educate the public about the dangers of misusing antibiotics, according to Dr. Nitya Ghotge, Founder Director of Anthra.

Dr Ghotge explained that despite face-to-face training of thousands of animal health workers, the uptake of ethnoveterinary practices remains low. So Anthra decided to partner with Access Agriculture to develop videos on herbal medicines and natural animal healthcare.

*“These videos have been very well received amongst livestock owners in Maharashtra as well as other states. Farmers are able to re-play the videos and make medicines as needed. As livestock keepers play an active role in the video-making process, it is a participatory approach. The videos have also become an integral part of our training programmes,”* Dr Ghotge said.

*“We reach out to over 20,000 livestock owners including mobile pastoralists through our partner networks in Maharashtra, and about an equal number in other states. Today, we are also sharing the videos with the Department of Animal Husbandry, Government of Maharashtra to help them kickstart a programme on natural livestock farming,”* she added.

## Partnering to scale natural farming across India

Access Agriculture is exploring ways in which its partner organisations in India can use its experience and resources to scale natural and organic farming across India. It would like to work with partners to have more videos translated in relevant Indian language and support a quality learning experience for farmers and other members of society to help them transition towards a healthy sustainable food system.



*Farmers provide practical guidance on making farmyard manure*

*“The Indian government is supporting the transition to natural and organic farming in a big way, aiming to grow the global market for ecological and organic products. Access Agriculture videos can effectively help in this,”* said Dr Mahesh Chander, Head of the Division of Extension Education at the Indian Veterinary Research Institute, Indian Council of Agricultural Research (ICAR).

*“Farmers and extension agents are experienced and trained, but oriented in conventional agriculture. Mindsets need to be changed through knowledge and skills on agroecological and organic farming approaches – it is here that Access Agriculture videos can prove their value,”* he explained.

## Dissemination

Access Agriculture’s last mile delivery model involving a growing network of young rural changemakers has attracted a lot of interest. Known as “Entrepreneurs for Rural Access” (ERAs), these youth are equipped with digital skills and tools to screen farmer-training videos and make them available to rural communities in order to bring about a positive change in the lives of farmers, especially women and youth.

The ERAs use a solar-powered smart projector (containing all Access Agriculture farmer-training videos), which can be used even in remote rural areas where technology, power and internet are limited. They not only provide for themselves and their families but



also bring to the local farmers, a wealth of new ideas on agroecology from around the world to improve their lives.

### Impact in the Global South

Surveys conducted in 2015, 2018 and 2021 indicate that the Access Agriculture videos have been used worldwide by over 5,000 research, extension, education and grassroots organisations, as well as by media houses across the Global South.

Access Agriculture’s video-led learning approach reached an estimated 90 million smallholders in over 100 countries since it started in 2012, enabling them to learn about agroecological principles and rural entrepreneurship, leading to improved rural livelihoods and sustainable food systems.

The global impacts have been significant, as shown by the various respondents from the 2021 on-line survey. Nearly 50% of the responses said the videos had improved farmers’ yield. “Improved pest management”, “better soil health”, and “better produce” were all noted by over 40% of respondents. More than 30% mentioned “more appreciation of local knowledge”, “involvement of youth”, “better food and nutrition”, “higher profits”,

“empowerment of women” and “improved group formation”.

The cost-effectiveness and sustainability of the Access Agriculture model, as well as the scale of its impact, were the main reasons why the organisation received the International Innovation award for Sustainable Food Systems from the Swiss Government and FAO in 2021. It was also recently honoured with the 2022 Arrell Global Food Innovation Award for excellence in community impact.

### Reference

Van Mele P, Okry F, Wanvoeke J, Fousseni Barres N, Malone P, Rodgers J, Rahman E and Salahuddin A, 2018, *Quality farmer training videos to support South-South learning*, CSI Transactions on ICT 6, p.245–255.



### Savitri Mohapatra

Mass Media Officer

Access Agriculture

No.3 Kumaran Street, Puducherry 605001, India.

E-mail: [savitri@accessagriculture.org](mailto:savitri@accessagriculture.org)

*Videos clearly depict step by step process for farmers to practise*



### From traditional practice to top climate solution, agroecology gets growing attention

The recent Intergovernmental Panel on Climate Change (IPCC) report states in its strongest terms yet the need for action to reduce emissions and one of the key strategies it outlines for policymakers is agroecology.

Encompassing a range of techniques from intercropping to agroforestry, agroecology is a solution that can “contribute to both climate mitigation and adaptation,” the IPCC stressed.

Based on traditional knowledge, agroecology can solve multiple challenges at once, including the biodiversity crisis and food insecurity.

As part of a special series, top food systems author Anna Lappe discusses the power and promise of agroecology to mitigate and adapt to climate change.

One strategy the report highlights is agroecology. Defined in the report as a “holistic approach” to farming,

agroecology as a practice includes techniques such as intercropping and planting cover crops, integrating livestock and trees into landscapes, and deploying organic farming methods to enhance biodiversity and soil health while eliminating dependence on external inputs like pesticides and synthetic fertilizer. It’s a nature-based solution that can “contribute to both climate mitigation and adaptation,” the IPCC stresses. It’s also a solution grounded in an embrace of the human rights of Indigenous and small-scale producers, as articulated in the 13 principles of agroecology from the United Nation’s High Level Panel of Experts on Food Security and Nutrition.

Source: <https://news.mongabay.com/2022/04/from-traditional-practice-to-top-climate-solution-agroecology-gets-growing-attention/>

### India and Germany sign Joint Declaration on agro-ecology and sustainable management of natural resources

Germany will provide coordinated support for this lighthouse initiative, as well as technical assistance to India’s agroecological transformation process through the Technical Cooperation Project.

Initiatives on agro-ecology and sustainable natural resource management have been launched by India and Germany. In this regard, in a virtual meeting that was held on 3 May 2022, Union Minister of Agriculture and Farmers Welfare- Narendra Singh Tomar and Germany’s Minister of Economic Cooperation and Development Svenja Schulze signed the declaration.

Joint research, knowledge sharing, and innovation will be promoted between academic institutions in both countries and practitioners, including farmers, as a result of this. Encourage exchanges, partnerships, and research collaboration with the private sector to promote the transfer of technology and scientific knowledge.

The Federal Ministry of Economic Cooperation and Development of Germany intends to provide up to 300

million euros for financial and technical cooperation for projects under this initiative by 2025.

Germany will provide coordinated support for this lighthouse initiative, as well as technical assistance to India’s agro-ecological transformation process through the Technical Cooperation Project.

To address the changing agenda of agroecology, the two countries plan to establish a joint research centre supported by financial cooperation to develop and share cutting-edge knowledge with practitioners from India, Germany, and other countries, while also facilitating value-added technology and scientific transfer.

A working group will be formed with the concerned Ministries, namely the Ministry of Environment, Forests, and Climate Change, the Ministry of Fisheries, Animal Husbandry, and Dairy, and NITI Aayog, to oversee the implementation.

Source: <https://krishijagran.com/agriculture-world/india-germany-sign-joint-declaration-on-agro-ecology-sustainable-management-of-natural-resources/>

## Earth Day 2022 – Climate smart farming for a sustainable future

The pressing need for sustainable agricultural practices is a global concern. Out of the 17 sustainable development goals (SDGs) as proposed by the United Nations in 2015, the ‘End of Hunger’ goal lays a primary focus on sustainable agriculture, and one of its 2030 targets is to ensure the full implementation of food production systems that are sustainable, and of resilient practices, that can double agricultural productivity as well as income of smallholder farmers.

The Government of India initiated multiple schemes to increase investment in the agriculture sector such as upgraded institutional credit to farmers, scientific warehousing infrastructure for the increased shelf life of produce, setting up Agri-tech Infrastructure and funds to make farming competitive and profitable. Despite these developmental measures, lack of knowledge among farmers causes hindrance to the practice of sustainable agriculture. The usage of harmful pesticides and fertilizers has become a serious concern as it involves damage to human health and the environment. There is a requirement to create awareness about usage of environmentally safe pesticides to prepare farmers to practice sustainable agriculture. A focused approach to farming can bring equilibrium into the pest control measures and also promote environmental friendly

practices, thus enhancing the overall wellbeing of the crops while protecting the environment.

Besides pests, multiple climatic factors affect the quality and quantity of crops. The future of agricultural growth will be highly impacted by climate change, hence there is an imminent need for initiating a paradigm shift in agricultural development approaches that can mitigate the effects of climate change and make agriculture sustainable. Climate change has already been impacting the livelihoods of farmers by exacerbating droughts, heatwaves, floods and other extreme weather events, and not to mention the influx of new pests and diseases. Agriculture and climate change are inextricably linked, hence, unless the emission trends alter additional changes in global climate will only increasingly devastate vulnerable agricultural communities.

Sustainable agriculture, thus, has become extremely important for farmers to help in the reduction of harmful gases. Subsequently, they can also help in the optimal usage of natural resources that are depleting rapidly. Once agricultural sustainability is promoted in full swing in India, the food production capacities will increase significantly.

Source: <https://theCSRjournal.in/earth-day-climate-smart-farming-sustainable-future-wrms/>

## Engineer couple builds all-in-one ‘Electric Bull’ to solve their village’s farming woes

When India locked down due to the pandemic, couple Tukaram Sonawane and Sonali Veljali returned from Pune to Andarsul village, their native town, for the first time in 14 years. And here’s how that visit resulted in an ‘electric bull’.

“We would visit our homes during festivals and other occasions, but not for more than a couple of days, as we had to rush back for our jobs. However, during the lockdown, we started working from home and received an opportunity to spend more time with family and friends,” Tukaram, a mechanical engineer, tells The Better India.

After weeks of staying at home, he realised that not much had changed in his village. The farmers were

still struggling to reap better yields. There was little mechanisation and the community continued to depend on cattle and labour for farm work. I learned that many farmers in the neighbourhood were facing these issues. Cattle and labour are expensive, and marginal farmers with half-an-acre or 1 acre of land suffer the most,” he says.

Tukaram and Sonali, an industrial engineer, realised that such issues meant that production costs were extremely high. “The processes of ploughing, tilling, sowing, and spraying insecticides usually take place manually, with the help of labourers. Moreover, there is a constant shortage of bullocks as they are expensive to maintain, and farmers tend to share resources. A delay in any of the processes by even a week directly affects the harvest

time, resulting in poor sales. If they sell their produce a week later, they do not fetch good profits,” he explains.

As a solution to this problem, the couple has built an innovative ‘Electric Bull’, which holds big promises to help farmers, especially those with fewer land holdings. They explain how it performs all the processes at 1/10th of the cost.

After working on trials, they conceived an engine-operated equipment that does all the work except ploughing. “Once the farm is ready after ploughing, and the first rain is received, the machine can take care of all the maintenance work, from sowing until the harvest,” he says.

As the lockdown restrictions eased, the couple decided to introduce their innovation at the Centre of Excellence Motion, Pune, a state government scheme that supports startup incubation in agriculture.

“We applied and were scrutinised by a panel. The jury found our machine appealing. One jury member,

Ashok Chandak, an entrepreneur leader in agriculture equipment manufacturing, suggested that we convert the machine into an electric one, rather than working on conventional fuel,” Tukaram says. Based on this recommendation, the duo conceived the Electric Bull. “We also set up a startup named Krishigati Pvt Ltd to sell the product,” he says.

**Source:** <https://www.thebetterindia.com/285107/engineer-couple-builds-electric-bull-for-farm-maintenance-work-help-marginalised-farmers/>

## Call for Articles

### Building farm resilience

**Vol. 24, No. 3, September 2022**

Transforming our food system to make it less susceptible to disturbances is key to building farm resilience. Small scale farmers have been the most vulnerable to external shocks and stresses, like droughts, famines, climate change, pest attacks etc. While some are predictable and short term, others are not. While the disruption caused by COVID-19 was sudden and unexpected, climate change is a long term challenge that farmers face.

Building resilience is all about equipping farmers to absorb and recover from shocks and stresses to their agricultural production and livelihoods. There are ways to build resilience. For instance, healthy soils which have lot of organic life in it and not susceptible to erosion are the foundation of agricultural resilience. Without them, a prosperous agriculture is impossible. For small holder farm family, farm diversity offers resilience, providing food and nutrition, sustainable incomes, and gainful engagement throughout the year. Another basic step to increasing resilience of our food system is to generate on-farm renewable energy and reduce dependency on non-renewable sources of energy.

What does agroecology – as a science, movement and practice – have to offer here? Certainly agroecology offers ways to cope with and prepare for threats such as increasingly uncertain and

extreme weather events. Agroecology builds resilience as it is grounded in local and relevant knowledge, low external inputs and both biological and cultural diversity. Agroecological practices support biological processes that drive the recycling of nutrients, biomass and water within production systems. Recycling and reuse of resources also means increasing the autonomy of producers and reducing their vulnerability to market and climate shocks.

The September 2022 issue of LEISA India will explore the strategies that family farmers and civil society are developing to adapt and transform, thereby building resilience. How do these strategies feed into the science of agroecology? How do farmers perceive and deal with changes in their environment, be it climatic, social or economic? How did farmers cope during COVID-19 situation? We are particularly interested in hearing about grassroots experiences where family farmers have innovated or revived old farming practices to cope with extreme shocks and disturbances.

**Articles for the September 2022 issue of LEISA India should be sent to the editors before 31<sup>st</sup> July 2022 at [leisaindia@yahoo.co.in](mailto:leisaindia@yahoo.co.in)**



# Pathways to promote agroecology

*Understanding the local ecosystem is crucial for trainers*

**G Chandra Sekhar, G Rajashekar and G V Ramanjaneyulu**

Agroecological approaches are highly location specific as they connect the links between the food needs, livelihoods, local culture, environment and the economics. Education on agroecology is therefore a holistic approach connecting these links, where farmers are in the centre of the entire process.

**W**ith the realisation of the ill effects of chemical pesticides and fertilizers on the environment and the health of the people, Non-Governmental Organisations (NGOs) and Community Based Organisations (CBOs) have been promoting non-chemical approaches in agriculture, since many years. These are being promoted under

various names, like sustainable agriculture, organic farming, bio-dynamic agriculture, natural farming, regenerative agriculture, agroecological approaches, Low External Input Sustainable Agriculture (LEISA), cow-based farming, etc. With agriculture being reported as a major contributor to the Green House Gas (GHG) emissions as per the third biennial report of India to

The United Nations Framework on Climate Change Convention (UNFCCC), Government of India is also encouraging agroecological approaches in the name of natural farming all over the country.

Modern agriculture is more geography independent compared to the agroecological approach. Also, modern agriculture technology has turned farmers into mere consumers of technology. With this, farmers are getting de-skilled or losing their traditional skills like selecting seed suitable to their land, based on the soil type, assessing the weather and planning the activities, selecting better seed varieties from the crops etc.

In agroecological approaches, one has to understand the ecosystem of the agriculture. Ecosystem is not just about the biotic and abiotic environment but also about the economic and socio-political environment. All the ecosystems that influence farmers and farming need to be considered. Farm ecosystem is different from farmer's ecosystem. The educators need to understand this.

Farming is not about how efficiently resources are used to produce food. Farming is what farmer does in a given agro ecological situation with the resources he or she has. It is a livelihood option connected to the local culture, the local conditions and the local environment. Hence, agroecological education should enable farmers make rational decisions that not only enables food production but also protect the health of fellow humans and the

environment. Education that connects the food needs, livelihoods, culture, environment and the economics is the need of the day.

### Approaches to farm education

Three key aspects are important for any new technology or process to be adopted: (1) materials and tangible resources (hardware) required, (2) knowledge and training on how to use the technology, and (3) understanding of why such technology should be used and its related outcomes. Even though the principles remain the same, with change in agroecosystem or geography, the technology (materials used) may vary and the methodology need to be adapted based on the local conditions. For example, training materials and methods must be different for farmers with lower literacy compared those with higher educational achievement. What works in black soils may not work in red sandy soils, plains have a different ecosystem compared to mountains.

For a very long period, the government has been the major player in disseminating information to farmers, through its Agriculture Extension System. However, as it is very difficult to reach out to each and every farmer with the existing mechanism of the Government, various other players, like NGOs, Private companies, financial institutions etc., have got involved in reaching out to farmers.

*On farm learning is central to agroecological education*



With NGOs coming into the arena, experiential learning became the centre of focus. Farmers are trained through methods like Farmer Field School (FFS), to experience the process of discovery learning. In this method, a group of selected farmers meet periodically and observe the crop in the selected fixed plot over a season and understand the crop. Weather-pest dynamics, pest life cycle, pest and defender relationships, observing the loss created by the insects, effectiveness of the solutions opted are some of the key learning s. While the learning is effective and empowering, the process is resource intensive. This method can be used for developing community resource persons.

Trainings and demonstrations are yet another approach to help farmers understand the process, materials required and its use. Many organisations educate farmers through the training process. In pedagogy, the education is to begin with what is known to the farmer and building on it. In educating farmers, local language and terminologies become very important. Farmers' experience, knowledge on local resources and their uses are key in agroecological approaches in agriculture. While training, understanding the local ecosystem is very important for the trainers. Farmers are not accustomed to sit in the classrooms for the whole day and listen to lectures. Keeping them active through audio-visuals and activities is important.

## CSA – Role in agroecology education

Centre for Sustainable Agriculture (CSA) is an independent impact creating organisation engaged in promoting sustainable agriculture. It has been establishing models based on scientific background, in collaboration with governments, Non-Governmental Organisations, Community Based Organisations and farmers' organisations (Farmer producer organisations (FPOs) etc.), by scaling up the successful models. The major contributions of CSA are Non-Pesticidal Management (NPM), organic/natural farming, open source seed systems, farmer producer organisations and public policy issues.

In late 90's and early 2000, pesticides were the major issue. CSA addressed the pest problems by educating farmers and the people working with farmers on NPM. NPM is about various methods of pest management practices without chemical pesticides. Farmers were educated on the life cycle of pests, difference between beneficial and harmful insects and various preventive methods like including trap crops and border crops in the cropping system, setting up pheromone traps and preparing biological inputs with the locally available resources like plants, animals etc. When farmers understood the principles behind the practice, they

*Involvement of all stakeholders enables knowledge exchange*



started experimenting with various other plants based on their traditional knowledge and CSA added on modern scientific knowledge. Though CSA started its work with NPM, it worked with a holistic understanding. Starting with an issue on hand, it integrated other aspects of agriculture, seamlessly.

In the process of educating the farmers, developing community resource persons as extensionists gave very good results. The community resource persons played crucial role in scaling up the agroecological approaches in farming community.

Agroecology is not about going back to the old systems, but combining traditional knowledge with modern scientific understanding to address the current and future projected issues in agriculture. In this process, policy makers were made aware with evidences to encourage them to initiate programs that help farmers in taking up agroecological approaches.

Catching up with the internet era, CSA has developed several mobile (android) based apps which are useful for the field functionaries, community resource persons and educated farmers. *Pestoscope* is one such app which is useful for pest identification at the field level. The field functionaries can take a picture of the problem and send query. The photos sent are automatically geo-tagged. The expert panel responds and sends the solution. The app can be downloaded from google play store and is also available as a web page (<https://pestoscope.com/>). Similarly, a Youtube channel, *ekrishi.tv* (<https://www.youtube.com/c/KrishiTV>) is run by CSA. This has various video based content covering the experiences, preparations, films, on various topics in different languages.

CSA has trained many NGOs, Governmental officials, Community based organisations and individuals on agroecological approach, since its inception. The lockdown condition during COVID 19, gave an opportunity to CSA to explore virtual trainings. Though virtual trainings were very new to the community as well as to CSA, soon CSA adopted to it and the content was modified accordingly. Presently, virtual trainings and online discussions have become part of everyday life.

CSA has initiated Grameen Academy (<http://www.grameenacademy.in>) a rural education portal which

regularly organises courses on various rural development topics. Grameen Academy was started with an aim to create an alternative learning ecosystem to build the knowledge and skills of rural youth, women and others who want to have their employment or entrepreneurial journey in the rural sector. It offers courses on various subjects related to rural development, physically, virtually and a mix of both. Grameen Academy collaborates with various other organisations in offering courses. Apart from CSA, other organisations too can bring their expertise by offering courses on this platform with mutual discussions.

CSA has also launched Krishna Sudha Academy of Agroecology, to initiate formal education in agroecology in partnership with various universities globally. CSA has signed an MoU with centurion university for jointly offering courses on organic/natural farming, rural livelihoods, FPOs, on research and other areas of mutual interest. CSA would develop content for the courses it offers, offer trainings to the teachers on organic farming/natural farming, FPOs, policy issues etc.

## Conclusion

The crux of the agroecological education is understanding the local situation and suggesting suitable agroecological methods in addressing the current needs and future needs of the farming community. Like the staves of Liebig's barrel, if the current problem is addressed, there may be another issue that might become farming communities' major issue. The issues also change over time. Hence, organisations too need to evolve based on the dynamics of the farming community. Timely updating of content and appropriate resource materials based on the learning are important aspects in agroecological education. Also, involving farmers as technological, extension and innovative partners in the education process is essential for evolving local solutions specific to the local agroecosystem.



**G Chandra Sekhar, G Rajashekar and  
G V Ramanjaneyulu**

Centre for Sustainable Agriculture  
H. No. 12-13-568, Nagarjuna Nagar, Street No 14,  
Lane No.10, Tarnaka, Secunderabad - 500017  
E-mail: [sekhar@csa-india.org](mailto:sekhar@csa-india.org)



# Strategies for reviving the agro-ecological approach

Susanta Sekhar Chaudhury, Biswa Sankar Das, Pulak Ranjan Nayak

The centrality of any education system is knowledge. This article highlights how farmer's traditional knowledge on millets was explored, revived and documented; how 'farmer centric research process' was carried out through participatory varietal trials; and, how the community based knowledge centre for testing, access and spread of knowledge was created.

**A**gro-ecology does not promote technical recipes but rather principles. It is not an agriculture of inputs but of processes. The technological generation process ideally must result from a participatory or farmer led research process in which farmers along with researchers provide input into the research questions and the design, running and evaluation of field experiment. Most traditional farmers have an intimate knowledge of their surroundings, especially within a local geographical and cultural radius.

Malkangiri is located in the southernmost district of Odisha. The major inhabitants of the district are *Bondas*, *Koyas*, *Porajas* and *Didayis*. Traditional millet varieties which were being grown traditionally by tribal communities in Malkangiri, gradually got replaced with High Yielding Varieties, promoted by the Government. There was little research and effort taken by government department or any other agency to revive the valuable

genetic resources of different crops. The change of climate drastically affected the survival of HYV which reduced yields and resulted in forced migration of the tribal communities.

This article explains the strategies adopted by Odisha Millet Mission to revive the traditional crops using agro-ecological approach and support their livelihood. Odisha Millets Mission is a flagship programme implemented by Watershed Support Services and Activities Network (WASSAN) with the support of Director Agriculture & Food Production (DAFP), Government of Odisha and Nabakrushna Choudhury Centre for Development Studies (NCDS), Bhubaneswar. WASSAN implemented the OMM activities through selected NGOs and Community Managed Organization (CBO) at CD block level. The mission's overall effort was to raise state level productivity through implementation of various production methods (System of Millets Intensification-

SMI, Line transplanting and Line sowing) in the operational villages of the mission.

The key processes adopted were

- a) Exploration, documentation and *in-situ* conservation of traditional crops
- b) Creating a vibrant community based Agro-ecological Centre at Chitrakonda, Malkangiri for wider exposure
- c) Conducting participatory varietal trials with farmers enabling them to experiment and assess for themselves the merits of such varieties.
- d) Establishing agro biodiversity registers

### Exploration, documentation and in-situ conservation of traditional crops

Odisha Millet Mission has explored the landraces of rice, pulses and oil seeds which are still grown in few pockets of the districts. These varieties are kept both in *field gene bank* established in the block attached to Community Management Seed System (CMSS) programme of OMM and also in State Seed Testing Laboratories (SSTL) in Bhubaneswar in a cryogenic system. Till now, there were 97 traditional millet varieties stored in SSTL. In the field gene bank, landraces are grown in farmer's field every year and farmers choose the best varieties for multiplication. The farmers can access the conserved landraces from SSTL if there is a loss of landrace due to any natural calamities.

Traditional millet varieties are collected from primary conserver/custodians from different districts with a prescribed format. The conservation activities are conducted in the agro-ecological center involving farmers in various stages - twice in a crop cycle, late vegetative stage and physiological maturity stage for collecting seed materials from the conservation plot. It is important to recognize the preferred varietal characteristics highlighted by conservers based on their contextual, multifunctional and cultural knowledge. This is where the traditional knowledge from the field broadens agriculture education with regard to desired characteristics of the local communities.

### Establishment of Agro-ecological Centre at Chitrakonda, Malkangiri

Community led Centre for Excellence for Agro-ecology and Agro-biodiversity was launched in Malkangiri by

Government of Odisha. The centre takes up participatory research on reviving and conserving local biodiversity, involving *in-situ* conservation and maintaining the genetic purity of landraces through collaboration of communities, especially WSHGs. It undertakes diverse seed production of endemic varieties demanded by the farmers and supplies them through Women SHGs/SHG Federations/Farmer producer organizations. Also, it focuses on maintaining biodiversity registers with the support of biodiversity management committees.

The explored millet landraces from different parts of Odisha are grown in Agro-ecological center and characterized on the prescribed format developed by All India Coordinated Research Project (AICRP) of India and Distinctness, Uniformity and Stability (DUS) by ICAR-IIMR. Twelve Ragi landraces among 60 were promoted. The conserved varieties include, Proso millet, Barnyard millet, Browntop millet, Teff. Visitors including farmers and experts from research stations visited the plots and requested seed materials. Material Transfer Agreement (MTA) form is used to provide seed materials to different stakeholders. The visitors to the centre in 2021-22, around 68, included Directors of premier research institutions, Chief Secretary of Odisha, development professionals from civil societies and farmers.

### Preparation of Agro-biodiversity Registers

WASSAN in collaboration with department of Agriculture and Odisha Biodiversity Board has initiated to document traditional knowledge associated with different traditional crops in five clusters of Malkangiri district. The major communities active in these areas are *Bonda, Didiya, Koya and Kondha*. documentation format followed is as per the National Biodiversity Authority prescription. In each Panchayat, the Biodiversity Management Committees are formed to strengthen documentation. The documentation is conducted with the help of Biodiversity Management Committee (BMC) from key informants and knowledgeable persons of the cluster. Consolidation of Agro-biodiversity registers from 5 clusters of Malkangiri districts to make Panchayat level register is in progress. Five agro-biodiversity registers would be available at the end of the project. Specimen copies of traditional crops are collected and preserved in the form of herbaria.

## Practice based education – Farmer centric research in conducting participatory Varietal Selection (PVT)

Participatory Varietal Trial (PVT) is an extension research tool to find out the best varieties from a pool of landraces for a small agro-ecological region. The learning process is simplified in which breeders, agronomists and farmers learn together which varieties perform well in on-farm and are preferred by farmers.

The trials are conducted to identify farmer's preferred varieties of ragi for a micro-agro ecological climate, conduct joint experimentation on farmer's field through involving farmers in various crop stages, laying out the design of Participatory Varietal Trial (RBD method) and finally preparing mechanisms for quickly and cost-effectively making them available for large scale multiplication.

- In each block, planning meeting was conducted with farmers and OMM representatives and WASSAN staff in identifying local ragi varieties, selecting the plot and farmers, irrigation source, designing the layout.
- Few local ragi varieties were collected from the block or districts along with and some local varieties collected by WASSAN from other districts to support the trial.

- The PVT trial was designed in Randomized Block Design (RBD) in three replications with government recommended varieties as check.
- The minimum plot size per variety per replication was 25sq.m.
- Distance between replication to replication was kept 100cm and variety to variety in the replication was 60cm.
- The farmers and grass root workers regularly visited the PVT plots and recorded the date of sowing, planting, weeding and flowering.
- During maturity stage, farmers' field day was organized.

Groups of *farmers* along with Community Resource Person, identified suitable varieties after discussion and put the coloured tags. The *Community Resource person* collected information on the basis for their ranking as well as the characteristics they prefer. *Researcher* collected the Agronomic data which included visual and measurement characters of the varieties during vegetative stage with a prescribed format from each replication and score it;

Data of selected varieties from farmers and researchers is compiled to come out with the best two varieties for the

*Visit to Agroecological Centre made farmers aware of the huge diversity of crops that could be grown.*



block and finally planning for seed production of those varieties in next year. *Bati mandia*, *Ladu mandia*, *Sargi mandia*, *Bada mandia*, *Kalaganthi* and *Mami mandia* were some of the selected varieties.

Exposure trips were organized for village communities to make them aware of different crops grown in the centre. Farmer groups from different districts visited the centre to gain practical knowledge on crop management, nutrient management, disease and pest management. The practical exposure was supplemented by class room teaching by experts from department of agriculture and WASSAN. The farmers were also supported with sample seed materials of preferred millet landraces for multiplication in their field. Implementing FFS for empowering farmers has not yet started, also the desirable residential facilities in the centre need to be operationalized in 2022-23.

## Conclusion

The Odisha Millets Mission has been focusing on guiding farmers on resource conserving and agroecological perspectives. The Agro-ecological Centre is helping farming communities to gain knowledge, enabling collaborative work with mainstream agencies, as well as motivation for wider scaling up. The Agro-biodiversity register empowers farming communities in mainstreaming landraces to public domain as farmer's varieties through suitable registration mechanisms under Protection of Plant Varieties and Farmers Rights Act (PPVFRA).

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**Dharmendra Khara** of Dudumaguda village, G.P Gopinathpur Block, Korkunda, Dist in Malkangiri is a tribal farmer from Paroja ethnic group. He was the key informant on 5 traditional ragi varieties, two varieties of little millets, 5 varieties of pulses cultivated in his field. He has 3 acres of upland and 2 acres lowland of his own. He cultivated different types of traditional varieties of finger millet, little millet, sorghum, black gram, red gram, horsegram, sesame, niger in his upland by following intercropping, mixed cropping, relay cropping and crop rotation. He has good experience on seed selection, rouging, traditional seed preservation techniques. Farmers from same villages and nearby villages came to buy seeds from him. He also created awareness on the importance of traditional seeds and why they need to be conserved. (Survey on "Seed system for landraces" March 2022)

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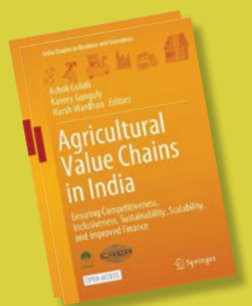
**Susanta Sekhar Chaudhury**  
Regional Coordinator, WASSAN  
Nilakantha Nagar, Nayapalli  
Bhubaneswar – 751012  
E-mail: [sushantasekhar@rediffmail.com](mailto:sushantasekhar@rediffmail.com)  
[susant@wassan.org](mailto:susant@wassan.org)



## **Innovative Approaches for Sustainable Development: Theories and Practices in Agriculture**

Syed Sheraz Mahdi, Rajbir Singh, 2022, *Springer*, 368 Pages, ISBN 9783030905484

This book provides recent understanding about the sustainable development in agriculture. It includes information regarding new approaches for sustainable development in agriculture, horticulture and fisheries. It examines the effect of climate change and provides information on climate smart practices. In addition, some important aspects like quality seed production, role of bioinoculants, on-farm water harvesting, non-thermal processing of food, importance of water use in organic agriculture have also been discussed. It also presents in detail plant disease aspect and their management strategies. This book aims to provide an overall understanding of all aspects related to the study of environment resources, its protection for sustainable development. To meet the growing food demand of the over nine billion people who will exist by 2050 and the expected dietary changes, agriculture will need to produce 60 percent more food globally in the same period.



## **Agricultural value chains in India: Ensuring competitiveness, inclusiveness, sustainability, scalability, and improved finance**

Ashok Gulati, Kavary Ganguly, Harsh Wardhan, 2022, *Springer*, 324 Pages

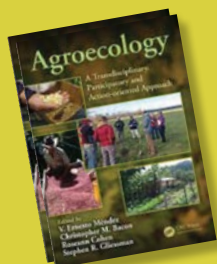
This open access book provides a clear holistic conceptual framework of CISS-F (competitiveness, inclusiveness, sustainability, scalability and access to finance) to analyse the efficiency of value chains of high value agricultural commodities in India. It is based on the understanding that agriculture is an integrated system that connects farming with logistics, processing and marketing. Farmer's welfare being central to any agricultural policy makes it very pertinent to study how a value chain works and can be strengthened further to realize this policy goal. This book adds value to the existing research by studying the value chains end-to-end across a wide spectrum of agricultural commodities with the holistic lens of CISS-F. It is not enough that a value chain is competitive but not inclusive or it is competitive and inclusive but not sustainable. The issue of scalability is very critical to achieve macro gains in terms of greater farmer outreach and sectoral growth.



## **Soil Management for Sustainable Agriculture: New Research and Strategies**

Nintu Mandal, Abir Dey, Rajiv Rakshit, 2022, *Apple Academic Press Inc.*, - Technology & Engineering - 592 Pages

Soil Management for Sustainable Agriculture: New Research and Strategies explores the various soil management techniques and the latest improvements in soil management. Taking a sustainable approach, the volume begins with an overview of the elementary concepts of soil management and then delves into new research and novel soil management tools and techniques. Key features: Explains how clays are a critical component in sustainable agriculture with respect to carbon sequestration in conjunction with its interaction with soil enzymes. Discusses potential utilization of microbes to mitigate crop stress. Presents resource conservation technologies and prospective carbon management strategies. Covers the use of smart tools for monitoring soils Shares a number of nutrient management approaches Explores nanotechnological interventions for soil management. Presents techniques for the remediation of soils contaminated by metals and pesticides. The recommendations and future research directions presented in this valuable book will be helpful to students, researchers, farmers, and policymakers from the disciplines of agronomy, soil science, and natural resource management around the world".



## Agroecology: A Transdisciplinary, Participatory and Action-oriented Approach

V. Ernesto Mendez, Christopher M. Bacon, Roseann Cohen, Stephen R. Gliessman, 2020, *CRC Press*, 284 Pages, ISBN 9780367436018

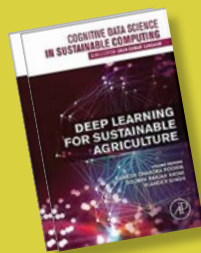
The book is divided into two sections, with the first providing conceptual bases and the second presenting case studies. It describes concepts and applications of transdisciplinary research and participatory action research (PAR). Transdisciplinary research integrates different academic disciplines as well as diverse forms of knowledge, including experiential, cultural, and spiritual. Participatory action research presents a way of engaging all relevant actors in an effort to create an equitable process of research, reflection, and activity to make desired changes. Six case studies show how practitioners have grappled with applying this integration in agroecological work within different geographic and socio-ecological contexts. 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.



## Field and Laboratory Investigations in Agroecology

Stephen R. Gliessman, 2015, *CRC Press*, 256 Pages, ISBN 9781439895719

Agroecology is defined as the application of ecological concepts and principles to the design and management of sustainable food systems. Hence, learning can best be achieved through an experiential approach to the topic. Designed to accompany the manual features includes 24 investigations divided into five sections. This manual facilitates hands-on learning that involves close observation, creative interpretation and constant questioning of findings. The investigations emphasize the importance of careful data interpretation and presentation and the value of a clear, concise, and well-written research report. The book uses simple statistical analysis for data management and interpretation and students are guided through the steps of data analysis in the context of the particular investigations in which it is employed.



## Deep Learning for Sustainable Agriculture

Ramesh Chandra Poonia, Mijander Singh, Soumya Ranjan Nayak, 2022, *Academic press*, 406 Pages, ISBN 9780323852142

The evolution of deep learning models, combined with advances in the Internet of Things and sensor technology, has gained more importance for weather forecasting, plant disease detection, underground water detection, soil quality, crop condition monitoring, and many other issues in the field of agriculture. Deep Learning for Sustainable Agriculture discusses topics such as the impactful role of deep learning during the analysis of sustainable agriculture data and how deep learning can help farmers make better decisions. It also considers the latest deep learning techniques for effective agriculture data management, as well as the standards established by international organizations in related fields. The book provides advanced students and professionals in agricultural science and engineering, geography, and geospatial technology science with an in-depth explanation of the relationship between agricultural inference and the decision-support amenities offered by an advanced mathematical evolutionary algorithm.

# Emerging avenues in Agroecology Education

Agroecology is not new. It is based on traditional ecological knowledge and can be found in family farmers' practices, in grassroots social movements for sustainability and the public policies of various countries around the world. However, the education on agroecology has been largely in an informal manner. Given the challenges that food systems face globally, the focus on agroecological education has been growing. Of late there are a number of agroecology programs being offered in the formal education system too. It is reported that in the last 20 years, over a hundred colleges and universities around the world have begun agroecological educational programs, particularly in Europe. In this article we have attempted to enlist just a few of them, worldwide.

## Certificate Course on Agroecology and Action Research

The certificate course is offered by Centre for Agroecology and Public Health, Department of Economics, University of Kerala in association with European Union H2020 project- NEXTFood and Collaborated with Institutions like Welthungerhilfe (WHH), Norwegian University of Life Sciences (NMBU) and Sveriges Lantbruksuniversitet, Sweden (SLU). The Certificate Course on Agroecology envisages to inculcate capabilities in action-based learning in Agroecology by fostering knowledge and skills for analyzing and developing sustainable agroecological models. The aim of the course is to equip the students with core competencies to address the transdisciplinary challenges of sustainable development based on action reflection methodology. Certification will be based on continuous and comprehensive evaluation. Twelve post graduate students from multidisciplinary background participate in the twenty-eight-day course offered every year since 2017, and gains with soft skills and green skills needed for an envisaged shift in bringing in agroecological transition and there by sustainable development. Learning arenas will involve not only university territory but also extra university territory involving stakeholder actors, comprising of other departments, universities, farmer cooperatives, local self-governments etc. Class room exercises and discussions along with concrete experience in the field will help in developing competences/ skills needed for fostering sustainable agricultural development.

For more information: <https://caph.co.in/>



## Amrita Bhoomi Peasant Agroecology Centre

Amrita Bhoomi is La Via Campesina's agroecology school in South Asia. Amrita Bhoomi is a peasant agroecology training centre, launched in 2013 by Indian farmers to find solutions to the agrarian and ecological crises in India. The training centre with demonstration farms delivers agroecology and ZBNF (zero budget natural farming) training for peasant farmers, and that also promotes and enables a philosophy of self-reliance and local self-governance. Agroecology training is linked with seed banking and distribution, for practical approaches to generating seed sovereignty and food sovereignty through zero budget natural farming. State-level mass training camps in zero budget natural farming methods (ZBNF), are conducted in which on an average around 1000-6000 farmers participate over 5-7 days including women, men and youth. Also, long term residential internships are provided for young people who are keen to learn agroecology and ZBNF methods.

Amrita Bhoomi also conducts short courses (1-2 days) and in-depth courses over a couple of months. These are mostly taught in collaboration with allied teachers, trainers, local NGOs and peasants. Farmer-to-farmer training is a key method used for some of the agroecology courses, where experienced farmers share their knowledge with other farmers, who then engage in a collective reflection as part of the learning process. These courses take place on the Amrita Bhoomi campus, or on farmers' fields.

For more information: <https://springprize.org/shortlisted/amrita-bhoomi-peasant-agroecology-centre/>

## Thanal Agroecology Centre

Thanal Agroecology Centre (TAEC) at Wayanad, Kerala is the centre for training and research on agroecology and agrobiodiversity. Thanal is one of the pioneering organisations in Kerala which undertakes various agrobiodiversity conservation programmes. We also inform the general public about the role of agricultural biodiversity, the need to conserve and use it sustainably, and the agroecology practices required to keep it going. TAEC is also a learning centre of the International People's Agroecology Multiversity (IPAM).

Thanal Agro ecological centre has total 6.5 acres of land out of which 2.2. acres is paddy land. Around 300+ indigenous rice seeds are conserved and around 35 species of trees are maintained on the campus. TAEC also has a collection of tubers, spices, and bananas and vegetables. The center follows and propagates agroecological farming methods which can improve food security and strengthen food sovereignty, while providing better adaptation to climate change and reducing harmful environmental impacts.

*For more information: <https://agroecologycentre.in/>*

## EUR-Organic: European master in organic agriculture and food systems

EUR-Organic is a two-year Master in Organic Agriculture and Food Systems. It is a unique study programme in Europe offered by five renowned universities - University of Hohenheim (UHOH), Stuttgart, Germany; University of Natural Resources and Life Sciences (BOKU), Vienna, Austria; Warsaw University of Life Sciences (SGGW), Warsaw, Poland Aarhus University (AU), Aarhus, Denmark; Institut supérieur d'agriculture et d'agroalimentaire Rhône-Alpes (ISARA-Lyon), Lyon, France. These five leading European Universities offer a comprehensive and integrative education in all areas of organic farming, as well as the processing and commercialization of organic food.

The core of EUR-Organic is comprised of areas of specialisation that enable the students to profit from the different foci of organic agriculture teaching and research of the partner universities. These different foci are reflected in thirteen study profiles offered by the partners. It combines high ranking environment with state of the art knowledge from Industry leaders in organic food production.

*For more information: <https://www.eur-organic.eu/en/110974>*

## NextFOOD: Innovative science education for sustainable agriculture

NextFOOD drives the crucial transition to more sustainable and competitive agrifood and forestry systems development by designing and implementing education and training systems to prepare budding or already practising professionals with competencies to push the green shift in our rapidly changing society. The Nextfood approach is a response to the need for education that enables us to deal with complex sustainability challenges. In this approach, the main focus is to train and develop the competencies of observation, dialogue, reflection, participation, visionary thinking and facilitation through action learning in agrifood- and forestry systems. NextFOOD employs a case-based action research to develop relevant and effective education and training programmes for a transition to more sustainable agrifood and forestry systems, and to generate new knowledge needed for similar achievements beyond the specific case.

*For more information: <https://www.nextfood-project.eu/about-2/>*

## International Double Degree Programme - M.Sc Agroecology

The course is offered by University of Life Sciences (NMBU), Norway and ISARA (member of FranceAgro3) in Lyon, France. The objective of the training is to prepare graduates to produce innovation in agroecology, to create and support sustainability in the farming and food systems. The Master of Science Agroecology is designed as a two-year programme curriculum including a practical thesis project. The programme combines 4 semesters with different options for the 2<sup>nd</sup> semester.

*For more information: <https://www.agroecos.fr/>*



*Note: This information has been compiled by Ms. Sanjana B M, Assistant Editor, LEISA India. She can be contacted at [sanjana@amefound.org](mailto:sanjana@amefound.org)*



# Weaving a classroom of hope in the farm

Archana Bhatt, Vipindas and Divya P R

Many passionate farmers are giving back to the society by sharing their knowledge and experience on growing food in an eco-friendly manner. This is how knowledge got passed from generation to generation, traditionally. But, present day farmers are moving a step ahead by integrating the modern technology and social media, thereby reaching and educating a large number of people interested in farming. Mr. Ayyub is one such passionate and innovative farm teacher.

*Students visit Ayyub farm to learn*



In the current face of climate change and food security, a holistic approach is needed to address the various issues in agriculture. Conventional teaching systems do not go much into the practical aspects of agro ecology. Even today, we are very far from including such concepts in our education system though some potential steps are being taken in including topics like nutrition gardens, farmer schools etc., in the curriculum of certain private schools to familiarize young minds on farming.

Some passionate individuals have taken up the responsibility of educating people based on their practical field level experiences. One such farmer is Mr. Ayyub Thottoli from Mananthvady in Wayanad, Kerala who has been keen to share his experiences with the community. Mr. Ayyub conducts classes for farmers, students, women and outsiders on how to make agriculture profitable, organic cultivation, various farming techniques and much more at his farm. Mr. Ayyub is now a well known figure among farmers, students and general public who are interested in learning agriculture as a whole.

## The beginning

Mr. Ayyub is not a conventional farmer. With a background in Economics, he was working at a private firm at Bangalore. In 2004, owing to the ill health of his ageing father, he decided to return to his native to start farming, leaving his well-paid job.

Being new to farming, Ayyub struggled a lot, initially. He first cultivated banana and different vegetables. He then diversified his farm with short duration crops that can help gain a stable income on a daily or monthly basis. For certain crops like papaya, he altered the planting times to get fruit availability throughout the year, instead of getting the entire harvest at one point of time. However, he faced marketing challenges. Though he produced good quality vegetables without chemicals, they were not as attractive as one gets at a supermarket and hence did not fetch good price. To solve these challenges, he started selling the produce from the field itself. Direct marketing helped him in getting more sales especially from tourists and local media also supported him. Over

*Ayyub developed a well diversified farm with plenty of fruits, vegetables, bamboo, fisheries and native trees*



time, Mr. Ayyub by his keenness to learn and his efforts, could make his farming profitable.

Ayyub is also innovative which attracts fellow farmers to his farm. He started bamboo cultivation due to its hardy nature in the harsh climate. He followed Vietnam method of high density planting in pepper which gave him more recognition and improved income. Presently, he is maintaining a well diverse farm with plenty of fruits, vegetables, bamboo, fisheries and native trees. In light of environment hazard and consumer demand, he prefers to restrict his cultivation practices to a fully organic mode by following zero budget farming, natural farming and other organic management practices.

### A classroom of hope

With years of continuous learning, Mr. Ayyub now proudly affirms his success in the farming venture. He strongly believes that learning comes from one's own experience and from the knowledge and wisdom shared by others. He too started his journey by learning from experienced farmers, reading books, articles, participating in workshops and of course the internet.

Around seven years ago, one of the training coordinators, Mr. Ramakrishnan of MSSRF Community Agrobiodiversity Centre in Wayanad, encouraged him to take up teaching. Having gained knowledge from various people and publications, he felt it was his moral responsibility to share the gained knowledge and experience with others. With support of MSSRF and his family, Mr. Ayyub started classes for farmers, retired personnel, women and students. Once he started teaching, he realized that cross learning is very important. He adds that over the years of teaching, he has learnt many things from his audience and that communication has to be from both sides. Last year alone, he conducted classes for more than 1000 people while following Covid protocols.

Mr Ayyub takes sessions on diverse topics mainly organic management practices, climate adaptive practices, Vietnam model of pepper cultivation, livestock and fisheries management, papaya cultivation, soil management, production of biofertilizers like *Jeevamrutham*, Fish amino, etc. to name a few. He especially focuses on the sustainability aspects for which an entire ecosystem has to be kept in mind. His sessions are a perfect mix of theory and practice as he efficiently

#### Box 1: Some technologies shared by Mr. Ayyub

##### Vietnam model of pepper cultivation

In the Vietnam model of pepper cultivation, a dead stand i.e. concrete pillar works as a stand for the pepper vines instead of a tree. The system follows a high density planting approach and also allows efficient utilisation of nutrients. However, the system is suitable for a cooler climate as in high temperature the hot concrete will affect the crop negatively.

##### Papaya Cultivation

Initially, Ayyub incurred loss in papaya cultivation due to unstable market. But by changing the planting times and harvesting 'papain', a latex released by the papaya, he started earning good profits. This experience is shared with fellow farmers for them to benefit.

gives insights on the field experiences to the learners. With his background of economics and field know how, Mr. Ayyub's classes are an efficient blend of wisdom for the learners.

While following innovative methods, Mr. Ayyub makes sure to motivate farmers on maintaining crop diversity by arranging a sustainable mix of diverse vegetables, fruits, native trees and livestock in the farm. His own farm is home to native cow breeds, poultry, fisheries and various fruit varieties (mango, guava, banana, papaya, dragon fruit, sapota, litchi, rambutan, custard apple, mulberry, miracle fruit, Avocado, mangosteen, pomegranate, etc.), vegetables, coffee, areca nut, coconut, pepper, cinnamon, bamboo, moringa, neem and other native trees.

An inspiring point about Mr. Ayyub is that in his teachings, he beautifully combines profit making and sustainable agriculture practices. He insists on conducting the sessions on the farm itself as he strongly believes that people who are cultivating must understand the agro ecosystem as a whole including the crops, the soil, the microbes, the insects and understand the role they need to play in maintaining the balance. He says, *'I have received this land from my ancestors in the purest form and I must give it to my next generation in the same way'*.

Beyond the classes, many learn from visiting his farm. Every year, students from agricultural university and foreigners visit his farm and share knowledge among

them. Officials from agriculture and other government departments and NGOs also arrange exposure visits to his farm.

Mr. Ayyub is very active on social media too. He responds to queries of other farmers and also updates his experiences and relevant information on crop management, marketing, etc., through Facebook and Whatsapp. Through Facebook alone, he is reaching around 10,000 farmers across India. His facebook page can be accessed where he shares his insights on farming <https://www.facebook.com/ayyobkrishwayanad.thotoli>

Teaching has given Mr. Ayyub a sense of pride. He also provides consultation to Resorts, plantation and estate owners. He is invited to deliver sessions. In his farming journey, Mr. Ayyub has been honoured with various accolades from the government and non government organisations.

### Hope for future

In the coming years, Mr. Ayyub wants to develop a good marketing network for farmers using social media and local networks. Another plan is to facilitate organic farms for general public *i.e.*, maintaining farm on a small plot of land for people, who are interested in growing crops, organically. The plan is in the pipeline and many people have already expressed interest. Mr. Ayyub is very firm on practising farming during his entire lifetime and teaching and learning from fellow farmers. His only appeal to the government is to provide policy support for the farming community as they are facing serious challenges in changing climate, wild life conflicts, over use of chemicals and gap between science and practice.



*Ayyub follows innovative techniques like the Vietnam model of pepper cultivation*

◆  
**Archana Bhatt, Vipindas and Divya P R**  
MSSRF-Community Agrobiodiversity Centre  
Puthoorvayal, Kalpetta, Wayanad  
Kerala – 673577  
E-mail: [archanabhatt1991@gmail.com](mailto:archanabhatt1991@gmail.com)

