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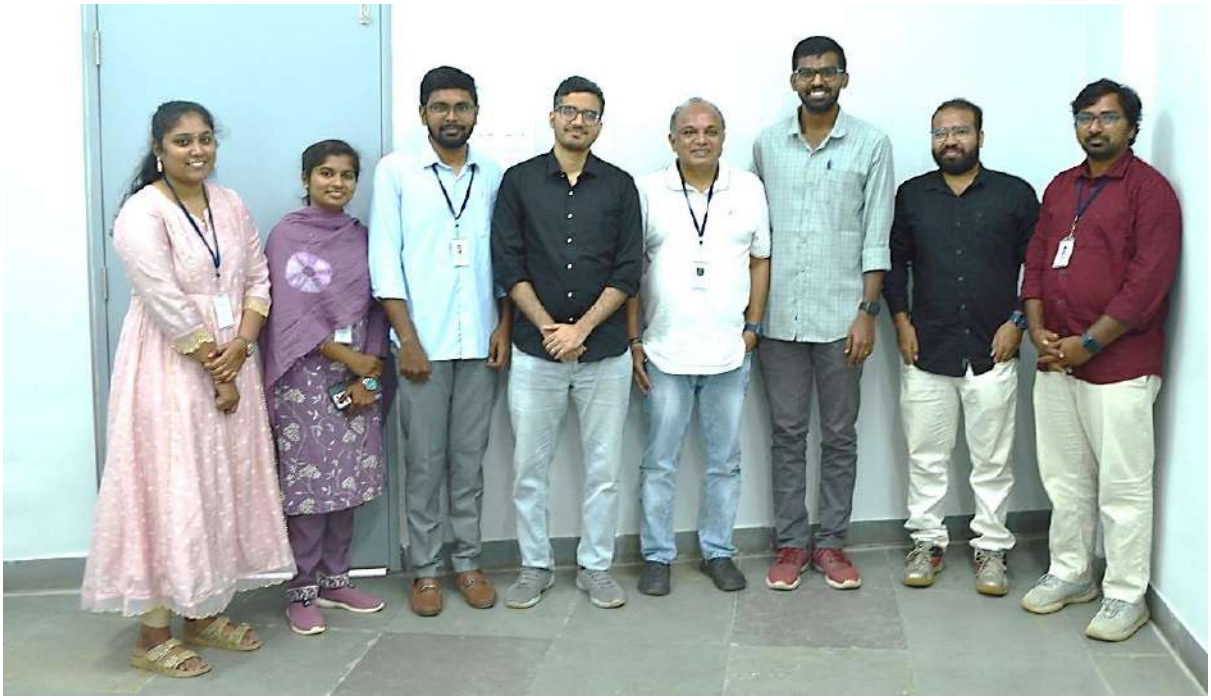
EXPLORING AGROECOLOGY: REFLECTIONS FROM OUR VISIT TO KRISHNA SUDHA ACADEMY FOR AGROECOLOGY

While many talk about the importance of agroecology in India and also globally, there are very few who are willing to walk the talk. Krishna Sudha Academy for Agroecology, established in Nuzividu (Andhra Pradesh), India, is the first of its kind education and research centre in the country that has been promoting agroecology through adaptive research and capacity development. In this blog, Ayush Lal and Shaktiranjan Das highlight experiences from their recent visit to the Krishna Sudha Academy for Agroecology.

CONTEXT

Agroecology offers potential answers to some of the most pressing challenges in agriculture today, viz., nutrition insecurity, biodiversity, climate change, soil degradation, and the struggles of small and marginal farmers. Can focusing on agroecology rather than exploiting the land truly meet the needs of a growing population? Can a combination of ecological and social concepts embedded in agroecology make a difference? Can a new policy ecosystem be designed to support farmers' livelihoods while ensuring a resilient food system?

With these questions in mind, we scheduled our visit to the Krishna Sudha Academy of Agroecology, located in Kondaparva, NTR district, Andhra Pradesh (India). We were eager to explore how the academy is addressing these pressing challenges through its work.



With the Krishna Sudha Academy team

Box 1: Krishna Sudha Academy for Agroecology

Krishna Sudha Academy for Agroecology was established in 2022 as a transdisciplinary research and education centre working on agroecology, providing an alternative paradigm for food, farming and livelihoods in a growing ecological, economic, and social crisis. The Academy is a unit of Sree Padmavathi Venkateswara Foundation (SreePVF) in collaboration with the Centre for Sustainable Agriculture (CSA) as a knowledge partner.

The mission of the academy is:

(a) To establish a world-class research facility on agroecological approaches to farming, rural business enterprises and public policy and

(b) To develop human resources by building an excellent learning ecosystem for farmers, students, consumers and policymakers.

The academy's focus is to compile and curate existing knowledge on organic/natural farming and develop new knowledge in social, agroecological, hydrological and environmental processes, climate resilience, public policy and community organisations. Contemporary innovations and community-generated knowledge form an essential base on which the academy will build the new paradigm of agroecology.

ARRIVAL AT KRISHNA SUDHA ACADEMY FOR AGROECOLOGY

On the morning of 25th March 2025, we arrived at Krishna Sudha Academy for Agroecology at 7:30 AM, greeted by the pleasant and refreshing aroma of soil and water. The academy is located in a serene rural setting of the village Kondaparva in the NTR District of Andhra Pradesh, flanked by small hills on both sides, accessed through a temporary dirt road leading to the farm layouts. At first sight, the academy's main building stood out with its impressive architecture, blending beautifully with the surrounding environment.

Even in the early morning, we could see farm workers actively working in the fields-some scouting the farmland while others engaged in daily agricultural activities.

Our arrival was met with a warm welcome from Dr. Gowri Sankara Rao (Chief of Operations, Centre for Sustainable Agriculture) and Miss Guntapalli Sai Sree (Customer Care Executive and Admin, Krishna Sudha Academy for Agroecology), two of the key figures at the academy. From our very first interactions with the few staff in Dr. Gowri's chamber, we could sense their enthusiasm and commitment to sustainable agriculture. The people working here were more than just employees; they functioned as a close-knit team with a shared purpose. Their sensitivity towards the farming community and their strong belief in the academy's mission were evident in their sense of belongingness.

TOUR, ENGAGEMENT, AND LEARNING AT THE ACADEMY'S MAIN BUILDING

A Thought-Provoking Discussion in the Seminar Hall

After our initial introductions, we were led to the seminar hall. Once seated, we received a plantable stationery set, which included a notepad and a pen. This small yet meaningful gesture reflected the academy's deep commitment to eco-friendly and sustainable practices. The session then began with a round of introductions, where both the visitors and the academy staff shared their backgrounds and areas of work.

Interactive presentation and discussion session in the seminar hall

Academy's Vision & Training Programs

A detailed presentation followed, offering insights into:

- The aims and objectives of the academy.
- The various research and funding partners involved.
- The layout of the academy, including the division between farm and building lands, water resources, and soil types.

We were introduced to the academy's various training programs, which cater to a wide range of stakeholders, including farmers, state agriculture officers, and tribal farmers from different states. The academy offers capacity building under four different schools, such as the Agroecology school,

Livelihood school, Rural business school and Agriculture policy school. Each of the courses is tailored as per the stakeholders' knowledge and skills and focused on their core areas of work.

Training Pedagogy: Making Farmers the Experts

1. Agroecosystem Analysis

The presentation also highlighted their training pedagogy, with one of the most unique aspects being the academy's emphasis on Agroecosystem Analysis (AESA). Unlike traditional extension programmes that focus primarily on technology transfer, AESA adopts a multidisciplinary approach to agriculture by considering ecological, social, economic, and political factors. This method enhances decision-making skills and farm management abilities, ensuring that farmers and other frontline workers gain a deeper understanding of their farming systems.

At the academy, farmers are encouraged to bring their own soil samples, diseased plants, pest-infected crops, and insects for analysis in the academy's laboratory. The academy provides them with pH papers, soil meters, and magnifying glasses, allowing them to study pest life cycles, soil quality, and nutrient levels. This approach ensures that farmers and the frontline workers not only learn how to apply a technology but also understand why and how it works.

A key application of this method emerged later during our discussions during the field visit. Some farmers think that bio-pesticides are ineffective. However, this is often due to incorrect application. Most bio-pesticides are contact-based and work best when applied during specific stages of a pest's life cycle. When farmers understand both the how and the why behind the technology, this type of confusion can be resolved, leading to better results and increased confidence in sustainable practices.

2. Demonstration

The academy has developed several demonstration models that emphasize the principles of "seeing is believing" and "learning by doing". These models include soil management, soil erosion, cropping systems, and more, along with various probes.

One of the most eye-opening demonstrations at the academy was related to soil conservation. To showcase the impact of mulch and cover crops on water retention and nutrient leaching, the academy set up a simple yet powerful three-container experiment.

Soil conservation demonstration

Each container was filled with soil under different conditions:

- Bare soil (without mulch or cover crops).
- Soil with a cover crop but no mulch.
- Soil with both a cover crop and mulch.

Water was applied through an overhead shower system, and the amount, colour, and clarity of water draining from each container were observed. The differences were stark, with the mulched and covered soil retaining more water and nutrients, highlighting the importance of sustainable soil management.

Tour of the Academy's Main Building

Our tour was guided by Mr. Uday Kiran Viswanadhuni, Training & Research Associate at Krishna Sudha Academy for Academy.

1. Microbiology Lab: Mass Multiplication of Beneficial Microorganisms

The Microbiology Lab at the academy plays a crucial role in producing bio-inputs for farmers. It receives inoculums from external sources and multiplies them in controlled mediums, allowing for large-scale production of organic soil amendments in the academy's own bio-resource centre. These bio-fertilizers and bio-pesticides are then provided to farmers at a low cost, reducing dependency on chemical inputs.

Learning at the academy microbiology lab

They also offer a training and agri-entrepreneurship program focused on establishing bio-resource centres. This initiative supports the academy's goal of making farmers self-sufficient by empowering them to produce their own agricultural inputs, reducing dependence on costly external sources.

2. Soil Laboratory: Understanding Soil Health

The Soil Lab at the academy provides farmers with a deeper understanding of soil composition. The lab helps in:

Soil health analysis in the academy laboratory using models and probes

- Analyzing soil texture (ratio of sand, silt, and clay),
- Identifying nutrient deficiencies (NPK levels and micronutrients),
- Teaching farmers how to select suitable crops based on soil type.

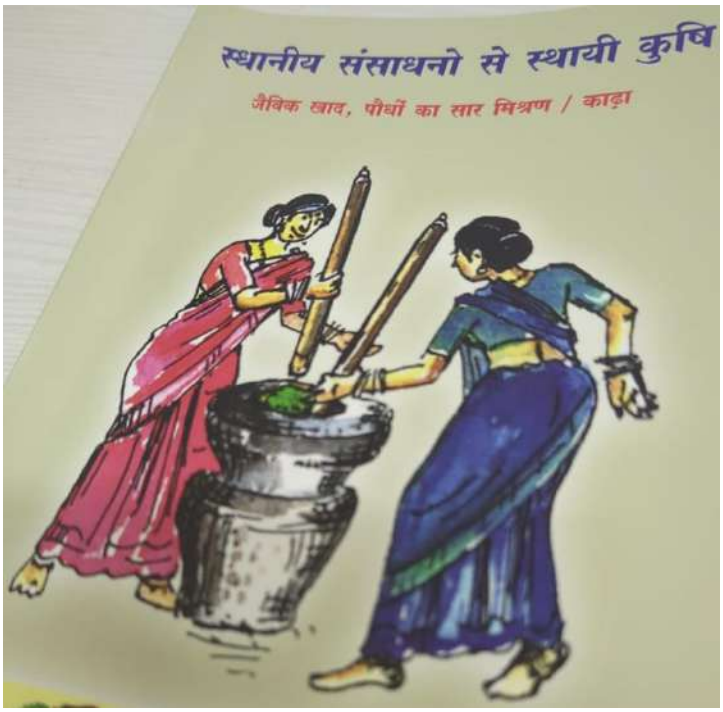
Samples of alkaline soil, sandy soil, silty soil, and compost were displayed, allowing farmers to visually and practically understand soil dynamics.

3. A Dedicated Library, Farmer-Friendly Learning Material and a Gesture of Kindness

As part of our visit, we were given a farmer-friendly book titled *"Permanent Farming Through Locally Resourced Materials",* published by the Centre for Sustainable Agriculture. The book, available in multiple languages, aims to make sustainable farming practices more accessible to farmers.
This book provides simple, step-by-step instructions on:

- Soil fertility management practices
- Use of mixture and decoction in management of crop disease
- Management of viral disease
- *Neemastram* mixture suggested by Shri Subhash Palekar
- Use of plant botanicals.

With illustrative sketches and practical insights, this book serves as an invaluable resource for both farmers and agricultural extension workers.



Farmer-friendly learning material

FIELD INSIGHTS: INNOVATIVE TECHNOLOGIES AND DEMONSTRATION PRACTICES

Our field visit was guided by Mr Bhairava Kumar, Programme Manager (Training and Research) at Krishna Sudha Academy for Agroecology.

1. The *Kalpatharuvu* Model: Ensuring Regular Farmer Income

One of the biggest challenges faced by farmers in the region is the fluctuation in market prices. Many monocrop tomato farmers experience bumper harvests every 1-2 years, but the uncertain market prices make it difficult for them to earn a consistent income. To sustain their farming, they are often forced to take loans, trapping them in a cycle of debt.

The academy responded by coming up with The *Kalpatharuvu* (the word symbolizes abundance, generosity, and fulfilment) model which offers a practical solution to provide farmers with continuous income. Instead of focusing on a single crop, this model promotes:

Kalpatharuvu Model (Staggered Vegetable Production Model)

- Short-, medium-, and long-duration crops for year-round harvesting.
- Relay cropping, ensuring a steady flow of produce.
- Companion cropping, maximizing space and resource efficiency.

Through this diversified approach, farmers can generate daily, weekly, and monthly earnings, ensuring financial stability and reducing dependency on loans.

2. A-Frame Technology for Tomato and Creeper Vegetables

The academy has developed A-frame structures to support tomatoes and other creeper vegetables. These frames:

- Provide better plant height and support.
- Allow proper aeration, reducing pest and disease attacks.
- Make intercultural operations easier, like weeding and harvesting.

An 'A-Frame' structure

Compared to traditional bamboo frames, which can get infested with termites, and concrete frames, which are fixed in one place, the A-frame structures offer flexibility and durability. This low-cost solution is particularly beneficial for resource-poor farmers.

3. Mango Orchards: Overcoming Productivity Decline

High-density mango orchard

One of the common issues faced by mango farmers is that after 15-20 years, the yield and fruit quality deteriorate. Additionally, traditional spaced planting methods make it difficult to carry out intercultural operations.

The academy has introduced a High-Density Planting (HDP) system using dwarf mango varieties. This method allows for:

- More trees per acre, increasing overall productivity,
- Easier nutrient and water management,
- Companion cropping with legumes (e.g., groundnut and sunn hemp) to improve soil nutrition through nitrogen fixation.

This system offers a sustainable alternative to traditional mango orchards while ensuring higher productivity and ease of maintenance.

4. Agro-Silviculture: Integrating Trees and Crops

The academy has also developed an agro-silviculture model, demonstrating the intercropping of:

- Sandalwood + Malabar Neem + Turmeric + Red Gram.

This model optimizes land use by combining high-value tree species with short-term income-generating crops, ensuring both economic and ecological benefits.

Agro-silviculture model

5. Demonstration practices: Adaptive Trials and the Crop Cafeteria Approach

Rather than imposing a fixed set of recommendations, the academy follows an adaptive trials approach, allowing farmers to choose what suits them best. The Crop Cafeteria Approach is another innovative concept where different crop combinations are demonstrated. This approach provides farmers with a range of options, enabling them to select the most suitable cropping system based on the bio-physical characteristics of their land and socio-economic conditions.

This participatory approach respects farmers' own knowledge and allows them to modify and adapt farming technology according to their unique conditions. The academy believes that farmers are the best judges of what will work for them.

Academy's Commitment to Promoting Organic Inputs

During the field visit, we also observed:

1. Composting Trials: Exploring Efficient Organic Matter Breakdown

The academy is conducting various composting trials using locally sourced raw materials such as:

- Poultry waste,
- Wood powder,
- Green manure,
- Groundnut husk.

The trials follow the Windrow Composting technique, an open-air composting method that does not require permanent structures. This method is:

- Cost-effective,
- Reduces odour, soil, and water pollution,
- Suitable for handling large volumes of organic waste.

A constant factor in all the trials is the use of PUSA decomposer and FYM (Farm Yard Manure) as a nitrogen source. Other than this, the academy has also explored a rapid composting technique developed by Visvesvaraya National Institute of Technology (VNIT), Nagpur, using *Bajaran Baan*. This method:

- Converts wood powder into compost in just 24 days,
- Produces more nutritious manure than FYM,
- Costs ₹6-7 per kg but sells at ₹10-12 per kg.

Window composting trails

However, farmers were initially reluctant to use this compost due to its high temperature immediately after production. To address this concern, the academy stores the manure for a month before distribution, ensuring safe application.

This approach reflects the academy's sensitivity to farmers' perceptions, making sure that scientific advancements are practically accepted by end users.

2. Bioresource Centre: Strengthening Farmer Access to Organic Inputs

There are two types of bio-inputs prepared at the academy:

1. Traditional Fermented Organic Inputs: These include *Panchagavya, Jeevamruth*, and *Neemastra,* which are made by mixing and fermenting natural farm ingredients without the deliberate addition of microbial inoculants. Instead, they rely on indigenous microflora for nutrient release and plant protection.
2. Biofertilizers and Biopesticides: These are prepared by first fermenting a carrier medium and then inoculating it with well-characterized strains of beneficial microorganisms. This process ensures standardized cell counts and targeted functions, such as nitrogen fixation, phosphate solubilization, and pest suppression.

Rapid compost cooling

To further support natural farming practices, the academy is setting up a permanent bioresource centre infrastructure. This facility will provide readily available organic inputs and will:

- Mass-multiply bio-inputs, including bio-fertilizers, bio-pesticides, and traditional fermented organic inputs and
- Serve as an input hub for local farmers.

For their training and agri-entrepreneurship programme focused on establishing bio-resource centres the academy offers two models of bio-input establishment for bio-fertilizer and bio-pesticides:

1. A *Panchayat*-level model for community-scale production: In this a custom-made 1000-litre fermentation tank embedded with heating rods will be used to prepare the media, which will then be transferred to ten separate tanks, each with a capacity of 200 litres. In these tanks, different beneficial organisms will be inoculated.

Bio Resource Centre Infrastructure: 1000-litre capacity model and 20 litre capacity model

2. A farmer-level model for individual and group use: In this model, a 20-litre water bottle and a commonly available cooking stove will be used as a fermentation setup to prepare the media. The media will then be transferred to another 20-litre bottle, where beneficial organisms have to be inoculated.

A *Pruthviraj* filter tank has also been installed for large-scale preparation of traditional fermented organic input. This permanent structure features a filtration system and a fermentation chamber with a capacity of 1600 litres. It is primarily used to prepare Jeevamrut. The advantage of this system is that it produces a clog-free, crystal-clear Jeevamrut liquid, which can be effectively used for drip irrigation.

Pruthviraj Tank

These initiatives aim to reduce input costs and enhance local self-reliance, ensuring greater accessibility to organic farming resources.

ADDRESSING CHALLENGES: SOIL COMPACTNESS, WATER SCARCITY, AND SALINITY

The academy initially faced significant challenges, including poor soil porosity, water scarcity, and high water salinity. To tackle these issues, they took several proactive measures:

- Installed two borewells and water-harvesting structures to improve water availability.
- Adopted drip irrigation and rain gun technology to ensure efficient water use.
- Installed an electromagnetic water conditioner to combat salinity without relying on harmful chemicals.

These efforts not only addressed the immediate challenges but also reflect the academy's resilience and commitment to sustainable, long-term solutions.

FUTURE PLANS: COMMUNITY SEED BANK AND BIODIVERSITY BLOCKS

Moving forward, the academy aims to establish a Community Seed Bank (CSB) to conserve and distribute local seed varieties. CSBs will help to:

- Maintain crop diversity.
- Provide farmers with independent access to seeds.
- Ensure adaptability to local environmental conditions.

Additionally, the academy plans to develop biodiversity blocks, which will serve as ex-situ conservation sites and participatory breeding platforms.

FINAL REFLECTIONS: A SPARK FOR CHANGE

The Krishna Sudha Academy for Agroecology, though still in its early stages, has already trained over 1,500 individuals through approximately 60 training programmes. With a strong focus on curating traditional wisdom and generating new insights in agroecology, climate resilience, public policy, and community organization, the academy offers a distinct and transformative approach to farmer education.

What makes the academy unique compared to conventional training centers is its commitment to meaningful community engagement and farmer-led innovation. Its approach is built around:

- **Empowering farmers** with knowledge and decision-making power
- **Developing technologies** rooted in the real needs of farmers
- **Promoting sustainable, locally sourced solutions**
- **Fostering community-centred innovation** through an adaptive, cafeteria-style model, where farmers can select and customize practices based on their local context

By moving away from top-down, one-size-fits-all solutions, the academy is creating a dynamic learning environment that values local knowledge and supports diverse agroecological transitions.

While our initial questions about agroecology's role in solving agricultural crises remain open-ended, this visit has shown me its immense potential to create meaningful change. The academy is not only teaching agroecology but also redefining the farmer's role—from a passive recipient of technology to an active decision-maker and innovator. Through this, the academy is developing and promoting alternative agricultural practices that India urgently needs to promote sustainable agriculture.

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