

MAINSTREAMING AGROECOLOGY IN AGRICULTURAL EDUCATION



REGIONAL BRIEF 2

BACKGROUND

Agroecology is a promising approach that is transforming agrifood systems across the Asia-Pacific Region. Indeed, there is increasing evidence of positive results with the transition to agroecology, and these include stable yields, crop resilience, higher incomes for farmers, fishers and producers, improved nutrition and food security and enhanced biodiversity (Global Alliance for the Future of Food 2023). Several events and workshops across the region over the last year (including TARASA23), have emphasised the need for agroecological approaches. However, to promote agroecology at scale, the domain needs more professionals who can

understand, appreciate, adapt, and promote agroecological principles to suit varied agroecological settings, and to support farmers in designing and managing sustainable and resilient farming systems.

But are our educational institutions developing professionals who can effectively support this transition to agroecology? Currently, a gap exists in agricultural education programs - both in higher education and vocational education systems, in developing a deeper understanding of agroecological approaches. Thus the regional (Asia-Pacific) working group on

agroecology was established by the Food and Agriculture Organization (FAO)'s TAP-AIS project¹ funded by the European Union (EU) to discuss the integration of agroecology into the agricultural education system. The working group was led by the Asia-Pacific Islands Rural Advisory Services Network (APIRAS) in close collaboration with the Asia-Pacific Association of Agricultural Research Institutions (APAARI), the Office of Innovation (OIN) and the Plant Production and Protection Division (NSP) of FAO. This Regional Brief primarily serves to present results from the productive discussions among working group members.

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¹ For more information of the TAP-AIS project, please see: <https://www.fao.org/in-action/tap-ais/en/>

BOX 1: The working group on agroecology

The regional working group on agroecology was created under the framework of the ‘Developing Capacities in Agricultural Innovation Systems: Scaling up the Tropical Agriculture Platform Framework’ (or TAP-AIS) project funded by the EU and implemented by FAO. The project supports the Tropical Agriculture Platform (TAP) to strengthen national agricultural innovation systems (AIS) in the context of climate-relevant, productive, and sustainable transformation of agriculture and food systems in Africa, Latin America, Asia and the Pacific. The project has a strong focus on strengthening functional capacities that are needed to promote innovation in agrifood system transformation. As the promotion of agroecology is an important strategy for agrifood systems transformation, the Regional Research and Extension Organisations in the Asia-Pacific, namely APIRAS and APAARI, working together with FAO, facilitated a working group comprising key experts and advocates working on agroecology, mainly in the Asia-Pacific Region.

The working group meetings held in 2022 and 2023 focused on the role of research, extension and education in mainstreaming agroecology as well as the development and promotion of curricula on agroecology in the Asia-Pacific region with an eye towards integrating functional capacities development into curricula to complement technical capacities. The meetings identified the key challenges in mainstreaming agroecology in regional research, extension and education systems, and developed a regional brief² on strengthening the contribution of agricultural research, extension, and education in mainstreaming agroecology in the Asia-Pacific (APIRAS and APAARI 2023). Around 25 experts from 16 countries across Asia-Pacific Region and Europe representing research, education and extension sectors participated in each of these meetings.

COURSES ON AGROECOLOGY

Several courses related to agroecology are currently offered at institutions across the region. These are proposed under varied titles such as organic farming, sustainable agriculture, natural farming,

permaculture, biodynamic farming, and agroecology. These courses are available at different academic levels including as graduate, undergraduate, diploma, and certificate courses. To enable one stop info-point on

the courses that are offered on topics related to agroecology, an online repository of course content in agroecology was developed by the APIRAS, following the recommendations from the WG (Box 2).

BOX 2: Online repository of agroecology course curricula

APIRAS has initiated an online repository for course curricula on agroecology with main focus on sharing content offered through courses related to agroecology by various universities across countries on a single platform. It is a work in progress as the process of updating and revising the content is an ongoing one. Further work may be carried out in order to link with other potentially similar initiatives such as the one led by the Research, Innovation and Education working group³ of the AE coalition. A quick text analysis of 29 courses (available till December 2023) revealed the predominant presence of courses on organic farming and agroecology. The courses were taught as part of the curricula, or as standalone major curricula. The courses tend to emphasize technical and conceptual aspects particularly in organic agriculture production practices and sustainable management. The courses mostly focus on crop and livestock management with less focus on soft skills/functional capacities development.



² For more information on Regional Brief, please see: <https://www.fao.org/family-farming/detail/en/c/1640714/>

³ For more information on Research, Innovation and Education working group, please see: <https://agroecology-coalition.org/research-innovation-and-education-working-group/>

COURSE DEVELOPMENT PROCESS

The working group meetings discussed four diverse cases (Table 1) in the development of agroecology curricula across institutes in the Asia-Pacific Region, showcasing the involvement of government, universities, NGOs, and international collaboration. The cases are from India, Vietnam and the Philippines. The two cases from India illustrate two approaches to curricula development, namely, a government-driven curricula standardization approach and an NGO-driven capacity development approach.

Led by the Indian Council of Agricultural Research (ICAR), the government-driven initiative established a standardized national curriculum for 'natural farming'. They convened an expert committee to develop a natural farming curriculum for the entire country. This four-year Bachelor's programme in Natural Farming is going to be implemented by various State Agricultural Universities in India, ensuring wider reach and potential government support. Dr YS Parmar University of Horticulture and Forestry (YSPUHF) in the state of Himachal Pradesh will launch the programme in the academic year 2024-2025. Currently, YSPUHF is providing a one-week training for the BSc (Agriculture) graduates to motivate and train farmers and farm families on transforming their conventional agricultural practices to agroecological practices in the mountains of

Himachal Pradesh. Involving scientists from universities, Krishi Vigyan Kendras (KVKs/ Farm Science Centres), and farmers, YSPUHF has developed 46 sustainable agriculture models in the state on farmers' fields. Mentioning the unique initiatives of YSPUHF, the Vice Chancellor, Dr Rajeshwar Singh Chandel informed the WG that YSPUHF has been declared as the 'National Resource Centre for Natural Farming' by ICAR and the university has started training scientists from KVKs across the country. Additionally, the central government has been fully committed to the promotion of natural farming, and since 2019, it has been implementing a scheme entitled the 'National Mission on Natural Farming'.

The Centre for Sustainable Agriculture, an Indian NGO working in agroecology for the past two decades, set up a new Centre, the 'Krishna Sudha Academy for Agroecology'⁴ in 2023 to serve as a hub for agroecological learning and practice. This is in response to the lack of field-oriented graduates willing to co-learn with farmers, as graduates coming out of formal public sector universities often lack field-oriented functional skills. Currently, the academy primarily caters to producers by offering a range of courses designed for capacity development. The offerings include a Master Trainer Training Programme for developing community resource persons

through Farmer Field Schools, an advanced course on agroecology, and a specialized training programme for managing farmer cooperatives known as the 'Kisan Business School,' developed in collaboration with the National Institute for Agri Marketing (NIAM). The Krishna Sudha Academy adopts a five-level course structure to address the diverse needs of individuals within the agricultural sector (Box 3). Levels 1 to 3 are at the agroecosystems levels while levels 4 to 5 are at the food system level.

In Vietnam, the university-driven agroecology course development approach is noted. In this case, the Vietnam National University of Agriculture (VNUA), historically included elements of agroecology in their course curricula. Since 1956, components of sustainable agriculture and ecology has been a part of their curriculum under different names such as 'Department of Farming and Meteorology', later renamed as 'Department of Meteorology and Ecology', and subsequently as 'Department of Ecology and Environment'. From 2003 onwards, it has been known as the Department of Agroecology, and courses continue to be taught under this department at both undergraduate and post-graduate levels. However, these courses are not considered important by students, who perceive them as elective or optional.

⁴ For more information on the Krishna Sudha academy, please see: <https://www.krishnasudhaacademy.org/>

BOX 3: Five-level course structure of Krishna Sudha Academy

Level 1: The participants engage in the ‘Good Agricultural Practices’ module, concentrating on enhancing the efficiency of current models through improved water and irrigation practices, reduced chemical inputs, and sustainable agriculture techniques.

Level 2: The ‘Sustainable Agriculture Practices’ module guides learners in transitioning toward sustainable farming, incorporating soil health maintenance and environment-friendly pest management.

Level 3: Introduces ‘Regenerative Agriculture’, focuses on redesigning agro-ecosystems based on ecological processes and local natural resources.

Level 4: Encompasses ‘Market Transformation’, teaches strategies for building farmer cooperatives and creating alternative market channels.

Level 5: The ‘Public Policy Transformation’ module is aimed at informing learners about redesigning subsidies, support systems, and other incentives, as well as advocating for policies that align with agroecological principles.

This customised approach ensures that for farmers the courses will be around regenerative agriculture, sustainable agriculture practices; and for others in the ecosystem, it’s about markets and building the ecosystem for a transition at the policy level.

The faculty members teaching agroecology do not have a background in agroecology, and funding is limited for undertaking research on agroecological practices. So, the courses tend to be theoretical and lack practical application, thus reducing both students’ interest and engagement. Agroecology courses in Vietnam thus face many challenges such as inadequate curriculum design, low student participation, and inadequate practical exposure. There is a need to raise awareness of the potential of agroecology among various stakeholders, including researchers, faculty, think tanks within universities, students and farmers, to encourage innovation and bring about positive change.

In the Philippines, a collaborative international partnership approach was taken in developing the agroecology course curriculum. Central Luzon State University (CLSU) developed a curriculum for a Master of Science in Agroecology as part of the Curriculum Development in Agroecology project (CDAE)⁵, an Erasmus+ co-funded initiative with international collaboration. The collaborative project involves a consortium of universities from Asia and Europe, including institutions from Vietnam (Hue University and National University of Agriculture), Sri Lanka (University of Peradeniya and Rajarata University of Sri Lanka), the Philippines (Benguet State University and CLSU),

the Czech Republic (Mendel University), and Portugal (the Instituto Polytechnico de Coimbra) as well as a Nobel group from Luxembourg. Mendel University, a European partner, played a crucial role in assisting the Asian partners - for example, CLSU - in developing the agroecology curriculum. The content of each course was designed and adapted to local conditions, primarily based on the subjects suggested by Mendel University, except for the optional course, where CLSU chooses the subjects to be offered (Box 4).

⁵ For more information on the Agroecology project, please see: <https://www.agroecologyproject.eu/>

BOX 4: Course structure of Agroecology, CLSU

The programme at CLSU, Philippines, consists of eight required courses, one optional course, a practicum, and a thesis. It also includes a comprehensive examination and the requirement for publication in a peer-reviewed journal for graduation. A student must earn 36 units in order to complete the course or the programme, and that is equivalent to 120 European Credit Transfer and Accumulation System (ECTS) credits. Students can choose optional courses based on their research focus or desired career track. The required courses cover general agriculture, applied soil science, water management, precision agriculture, bioclimatology, landscape ecology, environmental science, spatial planning, environmental security, environmental law, statistics, and managerial economics. The content of the courses emphasises practical learning, integration of social science skills, and alignment with sustainability goals reflecting a holistic approach to agroecological education.

Table 1: Overview of the four cases discussed in WG meetings

Features	ICAR & YSPUHF, India	Krishna Sudha Academy, India	VNAU, Vietnam	CLSU, Philippines
Focus	Promoting natural farming practices	Transitioning farmers to agroecological practices	Promoting agroecological research and training	Developing a graduate programme in agroecology
Approach	Top-down, government-led	NGO driven	University driven	Collaborative, international
Course development process	National curriculum developed by experts	5-level course structure, hands-on training	Courses related to the field of ecology and sustainability were part of the curricula since decades	Adapted international (European) programme
Strengths	Standardized curriculum for wider reach, potential for government support and infrastructure	Flexible, responsive to farmers and environmental needs; Dedicated academy for agroecology education	Existing infrastructure and potential for integration with ongoing programmes	Combines international expertise with local context, emphasizes practical learning and multi-disciplinarity
Weaknesses	Limited scope for regional adaptation	Limited reach, compared to university-based programmes, potential resource constraints	Low student engagement, limited practical application and faculty expertise gaps	Requires ongoing collaboration and adaptation to ensure continued relevance and sustainability

MAJOR GAPS IN CURRENT AGROECOLOGY COURSE CURRICULA

The working group identified key areas where existing agroecology curricula fall short. These are:

Content that supports functional capacity development

One of the major observations by working group members was that existing agroecology curricula lack, or inadequately address, the development of functional capacities among students. For instance, there is

not enough course content on aspects related to community mobilization, participatory planning, entrepreneurship development, business planning, behavioural change communication, multi-

stakeholder engagement and policy engagement/advocacy, etc. An analysis of existing course curricula also confirms this gap in content related to enhancing functional capacities. Yet these are essential skills for professionals to have and utilize if they are to serve as change agents supporting the transition to agroecology at scale.

Research and evidence to strengthen agroecology curricula

There is a need for context-specific knowledge in order to tailor agroecology courses to the local environment. While agroecology boosts numerous successful farm-based practices, its translation into universally applicable curriculum content presents a challenge for educators. One of the key drawbacks is the limited availability of context-specific research on agroecological performance. However, there is a growing amount of scientific evidence on the performance of agroecology. In addition, there is a growing number of tools and approaches developed and validated to measure the performance of agroecology, such as the Tool for Agroecology Performance Evaluation (TAPE)

developed by FAO, or the B-ACT developed by Biovision, which focuses on private sector/small and medium-sized enterprises (SMEs).

These tools could be integrated with courses on agroecology in order to generate additional knowledge and contribute to better address the measure of performance. A recently published article highlights all the different tools existing for measuring AE performance (Geck et al. 2023). Ongoing collaborations and consultations with practitioners facilitate continuous mutual learning, but it is crucial to acknowledge that the practices effective in one context might not be feasible for farmers with varying resource constraints (land, animals, labour, and finances).

Cross-learning to design relevant agroecology courses

It was observed that agroecology efforts often work in isolated silos, limiting knowledge sharing and affecting comprehensive curriculum development. The working group discussions pointed out that agroecology courses require a thorough understanding of existing regional efforts, which was found

to be missing from prevailing courses on agroecology. Such partial efforts slow down cross learning and collaborations among stakeholders of agroecological systems. Furthermore, fragmented funding sources restrict the potential for large-scale initiatives and integrated approaches, further limiting progress in agroecology education.

Disciplinary boundaries

We currently observe only a few comprehensive curricula on agroecology. As agroecology is a transdisciplinary subject/academic field/practice, it is struggling to integrate well into existing university structures which tend to be siloed/fragmented into more narrow, traditional subjects such as ecology, economics, agriculture, etc. This fragmented approach, though well-intentioned, makes it difficult to understand how everything works together in an agroecological system. Consequently, designing effective agroecology courses becomes more challenging. Such disciplinary boundaries constrain both holistic understanding and curriculum development.

RECOMMENDATIONS

1. Promote curriculum development opportunities

Conduct comprehensive regional mapping to promote cross learning and collaborations among those involved in developing curricula on agroecology. For example, as part of

the Working Group on Research, Innovation and Education of the Agroecology Coalition,⁶ the European Association for Agroecology is currently organising a survey on agroecology in higher education across countries. This survey

mainly aims to understand what is being taught in agroecology. Such initiatives provide valuable insights into existing curriculum practices and can inform efforts to identify gaps and strengthen curriculum development across regions. Encouraging

partnerships between ecologists, economists, biodiversity experts, farmers and others is important for a transdisciplinary approach to agroecology education.

2. Enhance research on agroecology

Support rigorous research involving participatory approaches that assess agroecological performance across diverse contexts by increasing funding and resource support. Utilize existing resources by incorporating tools and frameworks such as the Tool for Agroecology Performance

Evaluation (TAPE)⁷ by FAO, the Business Agroecology Criteria Tool (B-ACT)⁸ by Biovision and the Million Voices of Agroecology map,⁹ to measure performance, generate new knowledge, and contribute to a robust body of evidence on agroecology's benefits.

3. Align curricula with job markets

This requires incorporating consultations with a broad set of employers in the agrifood systems into curricula development, equipping graduates with relevant skills (both

technical and functional) and knowledge for careers in agroecology. Emphasize practical skills by training students in measuring and evaluating agroecological practices through hands-on experience. Providing students with relevant agroecology courses that strengthen both their functional and technical capacities will enable them to better support farmers transitioning to agroecological practices.

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⁸ <https://www.agroecology-pool.org/b-act/>

⁹ <https://onemillionvoices.agroecologymap.org/en/map>

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www.fao.org/in-action/tap-ais

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