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Higher education for sustainable agriculture and agri-food systems to meet the Sustainable Development Goals in Southeast Asia

Challenges, opportunities and policy options for the
Association of Southeast Asian Nations

Policy brief #1

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Background: This policy brief is one in a series led by Chulalongkorn University with support from the Office of the Higher Education Commission, Ministry of Education, Thailand, in partnership with FAO. The series was initiated to support the Association of Southeast Asian Nations (ASEAN) Work Plan on Education, 2016–2020 implementation while Thailand was Chair of ASEAN in 2019 under the theme: “Advancing Partnership for Sustainability.” The briefs in this series offer critical interdisciplinary perspectives on agri-food systems from social and sustainability sciences.

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Acronyms

ASEAN	Association of Southeast Asian Nations
ASTI	Agricultural Science and Technology Indicators
AWPE	ASEAN Work Plan on Education
ESD	Education for Sustainable Development
FAO	Food and Agriculture Organization of the United Nations
HEIs	higher education institutions
HESAFS	Higher Education for Sustainable Agriculture and Agri-food Systems
IPES-Food	International Panel of Experts on Sustainable Food systems
SAFS	sustainable agriculture and agri-food systems
SDGs	Sustainable Development Goals
SEAMEO	Southeast Asia Ministers of Education Organization
SEARCA	SEAMEO Regional Center for Graduate Study and Research in Agriculture
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization

The unsustainable agri-food system

Modern monocrop-intensive, industrial-scale agriculture fuels a global agri-food system that causes agrochemical pollution, desertification, deforestation, drought, aquifer depletion, biodiversity loss, land degradation and more (IPES-Food, 2016; UNEP, 2012). Agriculture, forestry and other land uses together are responsible for at least one-third of all global anthropogenic greenhouse gas emissions, and may be the world's greatest contributors to climate change (Smith *et al.*, 2014). Climate change also threatens crop yields and creates food insecurity (FAO, 2015). Moreover, this mainstream agri-food system depends on natural resources, yet many policies and practices undermine the ecological foundations of food and nutritional security (UNEP, 2016). The system encourages agrochemical dependency, and existing extension services tend to push farmers' reliance on often costly, unsafe and unnecessary external inputs (Nelles and Visetnoi, 2016) instead of promoting sustainable approaches. This system does not adequately enable self-sufficiency or serve smallholder farmers, poor families and rural communities. Recent data suggest that around 64.7 million people in Southeast Asia (9.8% of the population) were undernourished or food insecure in 2019, with farmers and rural communities most vulnerable. Moreover, projections suggest that the region, despite some modest progress since 2015, is off track to meet UN agreed global Sustainable Development Goals (SDGs) for zero hunger by 2030 with the COVID-19 pandemic creating further vulnerabilities and uncertainties (FAO *et al.*, 2020).

Paradigm shift needed to meet SDGs and create sustainable agri-food systems

One major practical challenge is to understand and enable policies, knowledge and skills necessary to increase viable alternatives for a widespread, significant and measurable¹ transformation towards genuine sustainable agriculture and agri-food systems (SAFS). The International Panel of Experts on Sustainable Food systems (IPES-Food) argued for a paradigm shift towards a “fundamentally different model of agriculture based on diversifying farms and farming landscapes, replacing chemical inputs, optimizing biodiversity and stimulating interactions between different species, as part of holistic strategies to build long-term soil fertility, healthy agroecosystems and secure livelihoods” (IPES-Food, 2016, p.3). FAO suggests that agroecology is a viable, transformative approach based on “ecological and social concepts and principles to the design and management of a sustainable and fair food system” and which contributes to multiple Sustainable Development Goals (SDGs) (FAO, 2018, p.8).

HEI challenges and responsibilities

Higher education institutions (HEIs) in general, but agriculture universities especially, have contributed to the growth and modernization of production agriculture, but have often failed to adjust their curricula to rural concerns (Atchoarena and Holmes, 2004). Beginning in the 1960s, many HEIs and scientists embraced knowledge and applied research about Green Revolution technologies that were based on monocropping systems with modern breeds and a high reliance on chemical fertilizers and pesticides, without adequately protecting genetic crop diversity or ecosystems. Conventional HEIs, along with their inadequate curricula and narrow research specializations, paid little attention to social or environmental sciences. In addition, their top-down technology transfer models typically discounted participatory, interdisciplinary and ecological approaches (Ison, 1990; Nelles, 2011). HEIs have still not adequately reformed teaching, research,

¹ Measurable through shared targets and indicators.

learning or extension relationships with smallholder farmers to serve rural communities (Acker and Gasperini, 2008; Nelles, 2016), and continue to favor the dominant (i.e. conventional) model of agriculture, thus preventing a transition to more sustainable food systems (HLPE, 2019). HEIs have not adequately debated, taught, studied or promoted the SAFS idea, much less agroecology specifically (see Policy brief #3 in this series). As significant knowledge producers – sometimes with research farms, adult training and extension programmes – publicly funded universities in particular have an important responsibility to facilitate research, academic programmes, participatory learning, skills training and advisory services for a sustainable agri-food system. They must improve educational quality and relevance among rural youth (see policy brief #2 in this series), women and farming families for decent “green jobs” or viable small businesses. New and emerging challenges such as climate change and land degradation are leading to a paradigm shift from input-intensive to knowledge-intensive agriculture. There is a need to reorient the institutional capacities of extension systems to better align with the change in research focus towards sustainable practices. It is also necessary for extension systems to move beyond a narrow commodity focus on advisory services, and adopt a broader focus on diversified farming systems, sustainable value chains and industries (CAPSA-ESCAP and FAO, 2013). The Masters Programme in Agroecology at the Swedish University of Agricultural Sciences offers a good example of a new approach that could be developed (Carlsson *et al.*, 2019).

HEIs, crosscutting SDGs and gaps

The SDGs – adopted in 2015 by United Nations member states and the Association of Southeast Asian Nations (ASEAN) – now guide the global development agenda to 2030. Scientific expertise is essential for SDG implementation, but a consolidated, interdisciplinary approach is needed (UNESCO, 2016). So far, SDGs do not sufficiently address the integration of agriculture with education and science. For example, SDG 2 – “End hunger, achieve food security and improve nutrition and promote sustainable agriculture” says nothing about education and does not define sustainable agriculture. Likewise, SDG 4 – “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” does not mention agriculture education.

SDG target 4.3 commits to quality tertiary education for all and SDG 4.7 mandates universal education for sustainable development knowledge and skills. Yet problematically, SDG 4 does not elaborate on implications of education for sustainable development for agricultural or agri-food systems education. There are potential synergies with SDG 2, especially for target 2.a, which calls for increased investment in agricultural research and extension services. Nonetheless, the ASEAN SDG baseline study (at 2015) reported deterioration in progress to reach food security and zero hunger (as stated in SDG 2), yet suggested SDG 4 was on track for 2030 (UNESCAP, 2017). However, one can question how reliable such projections are without information or assessment of agriculture education. A critical issue that should be taken into consideration is how we can improve SDG 2 and SDG 4 synergies.

Inadequate data or studies on HEIs, agri-food systems and SDGs

Over 6000 HEIs exist in Southeast Asia (ASEAN Secretariat, 2014). Yet, no publicly accessible database on regional HEI statistics exists, and there are no means by which to systematically document, update or assess quantity, types, quality or scope of agriculture or agri-food systems education, and rural-urban differences or roles of HEIs in meeting SDGs. International organizations such as the United Nations Educational, Scientific and Cultural Organization

(UNESCO), FAO, World Bank and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) do not systematically gather or publish such data. The Agricultural Science and Technology Indicators (ASTI) project – coordinated by the International Food Policy Research Institute and hosted in Bangkok by the Asia Pacific Association of Agricultural Research Institutions – has done useful work that has been summarized in recent publications (e.g. Flaherty, Stads and Srinivasacharyulu, 2013; Stads, 2015). ASTI has helped us better understand agricultural research investment gaps and capacities in Asia. But so far, agricultural research data for Southeast Asia is not systematically collected, kept in one place, disaggregated, analyzed or published in ways that could be more useful to university administrators and policy-makers, or for SDG monitoring, reporting and evaluation. In sum, there are significant data or knowledge gaps and research needs, as well as considerable capacity building issues, impact assessment challenges and implementation imperatives. However, with adequate dedicated resources and strengthened capacities, HEIs could assist governments and the ASEAN community with data gathering and analysis of evidence for specific localities, contexts, countries and delivering on SDGs.

Intergovernmental HEI actors, plans and ASEAN gaps

Two important intergovernmental bodies that have taken the lead on Southeast Asia regional higher education dialogue and innovation are: 1) Southeast Asia Ministers of Education Organization (SEAMEO), founded in 1967; and 2) ASEAN University Network, established in 1995. SEAMEO's Regional Center for Graduate Study and Research in Agriculture (SEARCA) is a specialized body for agri-food system learning and research among the region's HEIs. The ASEAN Secretariat in Jakarta also has an Education, Youth and Sports Division. Numerous ASEAN policies, strategies, plans and committees promote sustainable agriculture, food security and food safety in partnership with governments, international agencies, experts and donors. The GIZ (German development agency)-supported ASEAN Sustainable Agrifood Systems project and others have done useful work. The ASEAN University Network, SEAMEO and ASEAN all have various working groups, committees, centers and plans implicating SAFS, but interorganizational cooperation is limited in focus or scope, and constrained by available resources. The ASEAN Work Plan on Education (AWPE), 2016–2020 makes no agricultural education, science or extension commitments, and has had limited coordination across relevant sectors (e.g. education, agriculture, health and environment) or how they might link to delivering on SDGs (see CUSAR and SEARCA, 2018).

Academic cooperation, research and network gaps

There are currently no common Southeast Asia or ASEAN platforms or academic networks for policy dialogue, documentation, research or harmonized curricula on agricultural or food systems education in tertiary institutions that are linked to SDG 2, SDG 4, or other SDGs. Similarly, there has been limited study of university-based farmer extension services or scientist–farmer partnerships in Southeast Asia (for analysis see Nelles, 2017). SEARCA, ASEAN and other organizations do useful work, but academic associations such as: the ASEAN Agriculture University Network, the Asian Association of Agricultural Colleges and Universities, and the Asia Pacific Association of Educators in Agriculture and Environment have been founded with FAO support, among others, and need to be strengthened through ASEAN partnerships. AWPE 2016–2020, sub-goal 5 (Education for Sustainable Development) under Project 47 – commits to “Conduct[ing] multi-disciplinary research on social and sustainability sciences for understanding

social, environmental and economic issues and impacts of ASEAN integration, including analyses of significant policy implications for governments.” Two other goals were establishing an ASEAN Scholars Network on Social and Sustainability Sciences to facilitate knowledge exchange, cross-disciplinary learning and collaborative policy-relevant research, and a publication of the ASEAN State of Social and Sustainability Sciences Report by 2020 (MOE 2017). AWPE outputs, however, will not be met without adequate resources.

Regional quality, academic reforms and SDG reporting

ASEAN, in cooperation with the European Union, recently undertook policy dialogues on quality assurance for higher education. A number of policy and practical challenges need addressing, from mutual degree recognition and academic mobility support, to reconciling differing quality assurance standards with comparability of curricula or evaluation systems (Niedermeier and Pohlenz, 2016; SHARE, 2016). The ASEAN University Network also leads a Quality Assurance Network thematic group. Such initiatives, however, have so far not thoroughly addressed broader sustainability concerns. One review suggested a need for “alignment with the existing national quality frameworks specific to the university sector” (Adams, 2013, p. 390). Another concern for ASEAN is its neglect of HEI sustainability issues and quality debates specifically implicating sustainable agriculture or agri-food systems curriculum and teaching, or impacts relevant to SDG 2 and SDG 4, with crosscutting linkages with other SDGs. HEIs could lead such conceptual, technical and assessment studies and debates on SDGs while improving academic sustainability reporting on sustainable agriculture curricula and programmes (for general background that is not specific to sustainable agriculture, see SDSN Australia/Pacific, 2017).

ASEAN curricula and learning competencies for sustainable agriculture and SAFS

One neglected study area (related but distinct from quality assurance) is what should count as “literacy” and key competencies or skills development required in sustainable agriculture curricula, training or potentially shared ASEAN learning objectives. Similar issues have been discussed elsewhere (Barth *et al.* 2007), but previous works have not addressed sustainable agriculture or agri-food education in the ASEAN regional context. Future work should consider at least the following questions:

- What should be core agricultural competencies and learning outcomes in harmonized, shared or common sustainable agriculture curricula?
- What should be essential “agri-food system literacy” content (scientific-technical, social, economic, political, geographic knowledge or on themes such as agrobiodiversity, agroecology, climate change) in ASEAN curricula?
- What core skills for sustainable agriculture and food systems (critical thinking, business, management, farming, participatory, community development, leadership) should all students graduate with? And what are training priorities for “green” agri-food careers?
- What roles should online or experiential learning, undergraduate research, internships and field work play in harmonized curricula? What is the best mix of theory and practice?
- How should quality assurance standards or goals be best integrated into and assist in delivering and assessing harmonized sustainable agriculture and food systems curricula?

- What existing models or best practices of sustainable agriculture and food systems curricula can be drawn on or enhanced? Within or outside Southeast Asia?
- How can these competencies and skills be linked to praxis (i.e. How can these then be put into practice via research, outreach, extension, agri-processing, farming)?
- How should multi-disciplinary social and sustainability sciences inform agricultural development, agri-food systems and SDG studies?

Recent ASEAN innovations and leadership

Thailand was co-sponsor and co-lead government (with the Philippines) of AWPE for 2016–2020. Project 47 on Education for Sustainable Development, through multi-disciplinary social and sustainability sciences. Thailand, during its Chair of ASEAN in 2019, established two regional bodies: a SEAMEO Centre for Sufficiency Economy Philosophy and the ASEAN Centre for Sustainable Development Studies and Dialogue in Bangkok. The new SEAMEO Centre for Sufficiency Economy Philosophy will focus on capacity building and international cooperation related to the sufficiency economy philosophy. The Centre for Sustainable Development Studies and Dialogue aims to promote research and capacity building on sustainable development; and facilitate policy dialogue on sustainable development issues between ASEAN, the European Union, and others. There could be opportunities to advance agri-food systems studies through AWPE and its subsequent plan for 2021–2025.

Summary and recommendations

HEIs in Southeast Asia still contribute to unsustainable agri-food systems. They must do more to assist society, farmers and governments through alternative policies, curricula, learning, research and extension services. Better documentation and evaluations of tertiary agricultural education, research and extension data and impacts are needed to properly monitor and assess SDG progress. Strengthened universities can encourage critical thinking, teaching and multi-disciplinary research on sustainable agriculture concepts, practices and SDGs, which will help students, government decision-makers and farmers make practical choices based on reliable evidence. ASEAN organizations and member states should also reform their policy priorities and plans to better support Higher Education for Sustainable Agriculture and Agri-food Systems in meeting the SDGs. As co-sponsor and co-lead government for AWPE, the Thai government should initiate leadership with academia, ASEAN, SEAMEO, international partners and/or donors, and other key stakeholders on the following 10 recommendations.

Policy dialogue, strategic planning and investment

1. **Conduct** national and regional multi-stakeholder consultations about HESAFS, with evidence-based policy dialogues among governments and HEI stakeholders to assess HEI roles in achieving SDGs through sustainable agriculture or agri-food systems studies and academic services. Work in close collaboration with FAO, SEAMEO centers (ASEAN Centre for Sustainable Development Studies and Dialogue, SEARCA, SEAMEO Regional Centre for Higher Education and Development), UNESCO, and other partners in Southeast Asia.

2. **Draft** specific and clear regional HESAFS strategies and proposals for the next AWPE for 2021–2025, in collaboration with academia, extension, SEAMEO Centre for Sufficiency Economy Philosophy, SEARCA and ASEAN to foster a transdisciplinary approach. Work with agencies or partners such as UNESCO, FAO and UNESCAP to address SDG gaps supporting an education-driven paradigm shift towards sustainable agriculture and agri-food systems in Southeast Asia.
3. **Invest** more in strategies and plans for teaching, learning and university-based agricultural research and extension services (aligning SDG target 2a more closely with SDG targets 4.3 and 4.7) to improve the quality of tertiary education with knowledge and skills regarding sustainable agricultural development and agri-food systems.
4. **Collaborate** regionally to define essential knowledge, literacy and competencies for common or harmonized ASEAN curricula in order to inform viable alternatives and assist widespread, measurable transformations toward a genuinely sustainable agri-food system.

Academic assessments, partnerships and innovation

5. **Incentivize** and encourage academic study and reforms for sustainable agriculture and agri-food systems in Southeast Asia, including but not limited to, curriculum reviews and innovations for sustainable agriculture and agri-food systems teaching and learning.
6. **Design and initiate** with partners and donor support a regional project on agri-food system sustainability reporting for universities linked to SDG monitoring and evaluation.
7. **Launch** a multidisciplinary ASEAN Scholars Network on sustainable agriculture and agri-food systems (supported by ASEAN, SEAMEO, FAO and UNESCO) to help complete the implementation of AWPE for 2016–2020, Project 47 commitments, which are still not fulfilled to date. Invite and include ASEAN Plus experts, youth groups, producers, indigenous local knowledge holders and other key partners.
8. **Design and launch** an online, open-source database on sustainable agriculture and SAFS studies, including HEI policies, courses, programmes and research projects in Southeast Asia. This can also provide practical information, courses or modules to assist teaching, reforms, academic mobility and exchange, and research collaboration. It can also provide baseline and updateable information to monitor and evaluate SAFS education in HEIs and how SDGs are being achieved in Southeast Asia.

Regional research cooperation and outputs

9. **Systematically collect and analyze** data on agricultural development and agri-food systems policies, curricula, teaching, research and extension among all 6000+ universities, colleges and other tertiary institutions across Southeast Asia.
10. **Publish** (subject to adequate donor support) a triennial assessment report on the “State of Agri-food System Higher Education and Sciences in Southeast Asia”, synthesizing data and multi-disciplinary evidence-based policy-relevant recommendations aligned with SDG monitoring, evaluation, reporting and learning for ASEAN and SEAMEO officials, academic leaders and international agencies.

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Web resources for further consideration

- Food and Agriculture Organization of the United Nations (FAO) Agroecology Knowledge Hub. <http://www.fao.org/agroecology/home/en/>
- Higher Education for Sustainable Agriculture (HESA) and Food Systems in Southeast Asia Expert Group. www.siani.se/expert-groups/higher-education-sustainable-agriculture-hesa-southeast-asia/
- SHARE: European Union Support to Higher Education in the ASEAN region project. <https://www.share-asean.eu/>
- SEAMEO Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) <http://www.searca.org/>

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