ISEAS YUSOF ISHAK INSTITUTE

ISSUE: 2022 No. 103

ISSN 2335-6677

PERSPECTIVE

RESEARCHERS AT ISEAS – YUSOF ISHAK INSTITUTE ANALYSE CURRENT EVENTS

Singapore | 25 October 2022

A Ground-Up Approach to Climate-Resilient Agriculture in Southeast Asia

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A rice farmer salvages crops from a paddy field following flooding in Munje village in Lhoksukon, Aceh on 12 October 2022. Picture: Azwar Ipank /AFP.

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ISSUE: 2022 No. 103
ISSN 2335-6677

EXECUTIVE SUMMARY

- For decades, sustainable farmers and their networks have been experimenting and practicing farming techniques that increase climate resilience in agricultural production. Their experiences suggest that, in addition to changes in production methods, climate-resilient agriculture should also seek to address socio-economic concerns facing small- and medium-scale farmers. This will help to expand sustainable agricultural production and retain labour in the agricultural sector in the long run.

- It is important to develop multiple market channels at local, national and international levels for sustainable agrifood products. This helps to diversify sources of farm incomes and increase resilience in agrifood chains. Support networks and fair prices for consumers and farmers are also essential to the continuation and expansion of sustainable agricultural production. Amongst other supportive measures, Southeast Asian governments should increase investments on education and research on sustainable and climate-resilient agriculture.

- This article contributes to discussions about climate-smart and climate-resilient agriculture by highlighting important policy insights that can be drawn from experiences of farmers and other grassroot actors in sustainable agriculture movements in Southeast Asia.

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INTRODUCTION

It is widely recognised that current agricultural production models are not ecologically sustainable (see Chiengkul 2017, 11; Clapp et al. 2022; FAO 2021c, 7-23; Nicholls and Altieri 1997). Current agricultural practices are pushing the sustainability limits of land and water resources, and they are also becoming less productive due to climate change (FAO 2021c, 7-23; GCF 2021, 1). For these reasons, many scholars and international organisations have called for transitions to climate-resilient agrifood systems, which can be defined as "the capacity over time of agrifood systems, in the face of any disruption, to sustainably ensure availability of and access to sufficient, safe and nutritious food for all, and sustain the livelihoods of agrifood systems' actors" (FAO 2021b, 9).

Public discussions of these challenges often focus on the roles of governments, the private sector and high-tech innovations in promoting climate-smart or climate-resilient agriculture. Scholars have warned, however, that some "climate-smart" technological solutions might reinforce current industrial agrifood models that are responsible for environmental unsustainability and vulnerability to disruptions in the first place. These include techniques and technologies that promote dependency on agrochemicals and a small variety of patented plant seeds, as well as increased usage of fossil-fuel powered machineries in farmlands (Clapp and Ruder 2020, 57-58; Newell and Taylor 2017). Genetically modified seeds, for example, have sometimes been promoted as a solution to global food security. However, such gene-editing technology has widely raised ecological sustainability and socio-economic concerns (see Chiengkul 2017, 11-16; Clapp and Ruder 2020, 57-58; Newell and Taylor 2017, 122).

Farmers and other actors in sustainable agriculture networks are essential to the promotion of climate-resilient agriculture in Southeast Asia. For decades, these actors have been experimenting and practising sustainable farming techniques that improve climate resilience. Through trial and error, they have also developed many forms of market channels for sustainable agrifood products that aim to offer fair returns to farmers. For these reasons, their experiences can significantly enrich academic and public discussions on climate-resilient agriculture in Southeast Asia.

SUSTAINABLE AGRICULTURE IN SOUTHEAST ASIA

Sustainable farming practices have been labelled under different names, such as agroecology and organic farming. General principles include the promotion of biodiversity in farmlands and sustainable land management, and common techniques include the use of intercropping, crop-livestock integration, a variety of traditional/local seeds, and organic inputs instead of agrochemicals (Clapp et al. 2022, 6; FAO 2021a; GCF 2021, 15-16; IPCC 2019, 23-24; Mbow et al. 2019, 499-501). Agroecology, in particular, is committed to the production of diverse agrifood products based on the understanding of ecological interactions between plants, insects and other organisms, which help to increase climate resilience (Altieri and Nicholls 2020; Clapp and Moseley 2020, 1410). Biodiverse agroecosystems improve soil fertility and naturally control for pests and weeds, and studies have found that agroecological practices can

ISSUE: 2022 No. 103
ISSN 2335-6677

increase yields of staple food crops such as maize (Altieri and Nicholls 2020, 890-891). Moreover, local traditional knowledge are often important building-blocks for farmers in developing sustainable and climate-resilient agriculture (FAO et al. 2018, 102). Integrated rice-fish systems, for example, are used by farmers in Malaysia, Indonesia, Vietnam, the Philippines, Laos and Thailand. Inspired by traditional knowledge, these production systems have reportedly increased rice yields and reduced agrochemical usage in paddy fields, since fishes help to control weeds and pests (Frei and Becker 2005, 139). Producing both rice and fish also helps farmers earn extra income and source protein from fish. However, more research is needed on minimising methane emissions from paddy fields (FAO 2001, 2022; Frei and Becker 2005).

Scholars and international development organisations have also recognised that traditional crop varieties can potentially increase climate resilience, household food security and farm incomes (FAO et al. 2018, 98-99). Over generations, traditional crop varieties have adapted to suit local conditions, and they tend to have greater resilience to droughts and other climate stresses. They require less water, no chemical pesticides and fertilisers, and are often found to be high in nutrients (Altieri and Nicholls 2020, 884; FAO et al. 2018, 102). There are sustainable farming groups in Southeast Asian countries that have been saving, exchanging and developing traditional seeds, which has helped to promote agrobiodiversity and climate resilience for decades. In the Philippines, for example, the Farmer-Scientist Partnership Development (MASIPAG) has been helping farmers transition to organic farming as well as promote traditional rice varieties (Heckelman et al. 2022, 13, 15). Further examples of sustainable agricultural production practices from Thailand and Vietnam are discussed in Box 1 and Box 2 below.

ISSUE: 2022 No. 103
ISSN 2335-6677

Box 1: Examples of sustainable agricultural practices from Thailand

The sustainable agriculture movement in Thailand has been inspired by domestic, regional and transnational sources of ideas and practices, including traditional farming knowledge, natural farming principles of the Japanese farmer and philosopher Masanobu Fukuoka, effective micro-organism soil improvement technology, food sovereignty and organic agriculture movements in other countries. They use various terms to describe their practices, such as diversified farming, agroecology, agroforestry, natural and organic farming (Chiengkul 2017, 87-97). Many farmer groups and civil society networks, such as the *Khao Kwan Foundation*, *Tamor* natural farmer group in Surin province, and the *Kammad* sustainable agriculture group in Yasothon province, have been preserving and developing rice strands for many decades to promote agrobiodiversity and challenge corporate control over seeds. They have also found that planting a variety of seeds reduces labour costs and production risks from extreme weather patterns (Chiengkul 2017, 96-97).

Box 2: Examples of sustainable agricultural practices from Vietnam

Since floods are occurring more frequently due to climate change, some farmers in Vietnam have adapted to the changing environment by developing ratoon rice cropping methods[1] based on indigenous knowledge. Since the ratoon system quickens growth time, rice can be harvested before flooding begins (Sen and Bond 2016, 277, 279). Another interesting example is how ethnic minority groups in Vietnam have developed and implemented intercropping and integrated crop-livestock methods, based on indigenous knowledge and modern knowledge provided by government agencies, which have increased biodiversity and reduced soil erosion (Huynh et al. 2020; Son et al. 2020, 11). In the northern mountainous district of Ba Be in Bac Kan Province, climate change has caused longer periods of drought as well as flash floods, landslides and abnormally cold weather. Ethnic minority farmers have tried to adapt by producing multiple native crop varieties (such as hilly sticky rice, green bean, red peanut, tangerine) and heritage livestock, which have high pests and disease resistance, as well as high adaptability to local climate and weather patterns. Native crop varieties also reduce production costs because farmers do not have to purchase seeds and agrochemical inputs from companies (Son et al. 2020, 8-19).

For sustainable agriculture movements in Southeast Asia to survive and expand, it is important that strong support networks and market channels that provide premium or fair prices to sustainable farmers are developed. In Thailand, successful sustainable farming groups have received support from NGOs, academics, consumer groups, the media, government agencies, green social entrepreneurs and international buyers in organic and Fairtrade movements. These actors provide financial support (such as pre-payment for products), technical advice, skills

training, and also help with the development of local, national and international market channels for sustainable agrifood products (Chiengkul 2017, 87-104, 111-112). Similarly, studies from the Philippines suggest that small-scale organic farmers require adequate training, access to production inputs, and secure markets for their products (Heckelman et al. 2022; Salazar 2013). Civil society networks such as MASIPAG in the Philippines have also helped to empower sustainable farmers and connect them with NGOs, scientists and church-based organisations who share similar visions (Heckelman et al. 2022, 6).

To encourage farmers to keep practising or making transitions to sustainable agriculture, it is also crucial that they are able to voice their concerns regarding production problems, pricing and fair returns. Many sustainable rice farmers in Thailand have formed cooperatives or social enterprises to increase their bargaining power and share profits. Some groups have also invested in rice mills to process their own paddy, which allows them to capture the value-added from vertical integration. They usually sell their rice through domestic and international organic and Fairtrade markets in large quantities. However, in many provinces such as Chiang Mai, Surin and Yasothon, local green markets and community-supported agriculture (where consumers subscribe to receive a box of produce on a regular basis) also serve as important market channels for seasonal agrifood products. These local market channels have created more jobs in the community and substantially helped to increase and diversify sources of farm incomes (Chiengkul 2017, 97-104). There are also many examples of socially-conscious agribusinesses in Southeast Asia that have helped to find markets for sustainable agrifood products, whilst respecting farmers as partners. In Indonesia, for example, *Javara Indigenous* has utilised local wisdom and modern business management techniques to develop and market a diverse range of organic agrifood products. *Javara* also includes farmers in the price setting decision-making process (Mahita et al. 2015).

POLICY RECOMMENDATIONS

In sum, this article has suggested that climate-resilient agriculture should be based on sustainable agriculture and that it is important to address socio-economic concerns facing small- and medium-scale farmers. This includes creating support networks and developing multiple market channels for sustainable agrifood products where prices are fair to both consumers and farmers. Not only will this help to promote poverty reduction and social justice, it will also help to expand sustainable agricultural production and retain labour in the agricultural sector in the long run. More specific policy recommendations are discussed below.

- Climate-resilient agriculture significantly relies on farmers who should be given sufficient training on agroecology and business management (FAO 2021a, 7; see also Huynh et al. 2020, 18). Research in Thailand suggests that the knowledge- and labour-intensive nature of sustainable agriculture is one of the most important reasons that has discouraged many farmers from adopting such production methods (Chiengkul 2017, 102-105). Therefore, Southeast Asian governments should increase investments in education and research on traditional plant varieties and sustainable production

methods. This includes increased support for farmer field schools, vocational schools and universities (FAO 2021a, 11).

- Governments should also encourage research collaborations between academics and farmers to gain farm-level insights (see examples at: Chiengkul 2017, 97, 114). Moreover, it is important to develop technologies for small- to medium-scale agrifood production and processing which help farmer cooperatives/social enterprises reduce their labour and fixed costs (Chiengkul 2017, 108). Research should also focus on reducing the costs of production and distribution of sustainable agrifood products to make them accessible to consumers at all income levels.

- Government support for sustainable climate-resilient agriculture should go beyond easily quantifiable short-term programmes, such as one-day trainings and free handouts of organic fertilisers (Chiengkul 2017, 113). Southeast Asian governments should look into supportive policies that will reduce production risks, such as weather index insurance programmes (GCF 2021, 16-17), and also use public procurement to support sustainable agrifood products (FAO 2021a, 9).

- Both governmental and non-governmental actors in Southeast Asia should help promote local, national and regional green markets, as well as community-supported agriculture. These markets create jobs, increase and diversify farm incomes, and reduce farmers' dependency on export markets. These markets also increase the resilience of agrifood supply chains, in support of local and national food security (Chiengkul 2017, 98, 104, 108; Clapp and Moseley 2020, 1409-1410; FAO 2021a, 7-9).

- At the regional level, ASEAN should actively support the production and trading of a diverse range of sustainable agrifood products. It should be noted that, globally, people's diets mainly rely on three crops – wheat, rice and maize. Production failure in any of these crops can be detrimental to global food security (Altieri and Nicholls 2020, 883-884). Therefore, increased crop diversity in Southeast Asia will increase resilience in agrifood supply chains and promote food security in the region.

- More farmers can potentially be encouraged to adopt sustainable or organic production if there are guaranteed markets for their products (Chiengkul 2017, 110). There are already some examples of contract farming arrangements where farmers are also given advice on sustainable production methods. The *Khao Kwan Foundation* in Thailand, for example, has helped to draw up contract farming arrangements between sustainable rice farmers and a local rice mill in their area (Chiengkul 2017, 110).

- It is important to educate consumers about agroecological principles and the production difficulties facing small-scale sustainable farmers. Urban consumers in Thailand, for example, often seek to purchase cold-climate vegetables despite the fact that these tend to be water-intensive and not very suitable to local conditions. This increases farmers'

production risks and costs (Chiengkul 2017, 106-107). Producer-consumer networks, community-supported agriculture and farm visits can also help create long-term supportive social relations between farmers, retailers and consumers (Chiengkul 2017, 110).

- Organic and Fairtrade certification costs can be prohibitive for small-scale farmers, so NGOs and farmer organisations often have to bear the costs. A study in Laos, for example, suggests that obtaining organic certificates for farms in remote areas can double the usual fees (UNCTAD 2020, 6-7). However, the development of local certification bodies can help to reduce costs. A good example is that of the Northern Organic Standard in Thailand (Chiengkul 2017, 109).

- Successfully transitioned farms in Thailand have reported lower costs of production and comparable yields to conventional farming. However, farmers will likely face many technical issues and receive lower incomes in the first few years following their transition into sustainable agriculture (Chiengkul 2017, 102-105). Gaining organic certifications will allow farmers to receive higher prices for their products, but adequate technical and financial support should be given to them during the transition period. Since sustainable farmers create positive environmental externalities through their production methods, they could also be given direct payments for ecosystem services in addition to incomes from the sale of their products (FAO 2021a, 11).

Overall, this article has highlighted how actors in sustainable agriculture movements in Southeast Asia, such as farmers, consumer groups and NGOs, play important roles in promoting climate-resilient agriculture. It is important to explore different paths to climate-resilient agriculture to avoid technological "lock-ins" where reliance on a few technologies serve to encourage monopoly concentrations in agrifood systems and suppress alternatives that might be more promising (Clapp and Ruder 2020, 59). Moreover, as Clapp et al. (2022, 3-4) has argued, the ability of individuals and groups to have a say in the governance of their agrifood systems should be recognised as an important dimension in food security.

REFERENCES

Altieri, Miguel A., and Clara I. Nicholls. 2020. "Agroecology and the reconstruction of a post-COVID-19 agriculture." *The Journal of Peasant Studies* 47 (5): 881-898. https://doi.org/10.1080/03066150.2020.1782891.

Chiengkul, Prapimphan. 2017. *The Political Economy of the Agri-Food System in Thailand: Hegemony, Counter-Hegemony, and Co-Optation of Oppositions*. Oxon and New York: Routledge.

Clapp, Jennifer, and William G. Moseley. 2020. "This food crisis is different: COVID-19 and the fragility of the neoliberal food security order." *The Journal of Peasant Studies* 47 (7): 1393-1417. https://doi.org/10.1080/03066150.2020.1823838.

Clapp, Jennifer, William G. Moseley, Barbara Burlingame, and Paola Termine. 2022. "Viewpoint: The case for a six-dimensional food security framework." *Food Policy* 106. https://doi.org/10.1016/j.foodpol.2021.102164.

Clapp, Jennifer, and Sarah-Louise Ruder. 2020. "Precision Technologies for Agriculture: Digital Farming, Gene-Edited Crops, and the Politics of Sustainability." *Global Environmental Politics* 20 (3): 49-69. https://doi.org/10.1162/glep_a_00566.

FAO. 2001. *Integrated agriculture-aquaculture: A primer.* https://www.fao.org/3/Y1187E/y1187e00.htm.

---. 2021a. *COVID-19 building back greener and more resilient: Contributions of agroecology to a "new normal" in Asia and the Pacific.* Food and Agriculture Organization (FAO), (Bangkok). https://www.fao.org/documents/card/en/c/cb3114en.

---. 2021b. *In Brief to The State of Food and Agriculture 2021. Making agrifood systems more resilient to shocks and stresses.* FAO, (Rome).

---. 2021c. *The state of the world's land and water resources for food and agriculture – Systems at breaking point. Synthetic report 2021.* FAO (Rome: FAO). https://www.fao.org/publications/card/en/c/CB7654EN/.

---. 2022. "Case study C1.14 Local innovation and indigenous knowledge to diversify production and build resilience in Laos People's Democratic Republic." Climate Smart Agriculture Sourcebook: Enhancing capacities for a country-owned transition towards CSA. Accessed 19 August. https://www.fao.org/climate-smart-agriculture-sourcebook/enabling-frameworks/module-c1-capacity-development/c1-case-studies/case-study-c114-local-innovation-and-indigenous-knowledge-to-diversify-production-and-build-resilience-in-laos-peoples-democratic-republic/en/.

FAO, IFAD, UNICEF, WFP, and WHO. 11 September 2018. *The State of Food Security and Nutrition in the World 2018. Building climate resilience for food security and nutrition.* FAO, (Rome). https://www.wfp.org/publications/2018-state-food-security-and-nutrition-world-sofi-report.

Frei, Michael, and Klaus Becker. 2005. "Integrated rice-fish culture: Coupled production saves resources." *Natural Resources Forum* 29: 135-143.

GCF. 10 September 2021. *Sectoral Guide Consultation Version 1: Agriculture and food security.* Green Climate Fund. https://www.greenclimate.fund/document/sectoral-guide-agriculture-and-food-security.

Heckelman, Amber, M. Jahi Chappell, and Hannah Wittman. 2022. "A polycentric food sovereignty approach to climate resilience in the Philippines." *Elementa: Science of the Anthropocene* 10 (1): 1-21. https://doi.org/10.1525/elementa.2020.00033.

Huynh, Chuong Van, Tung Gia Pham, Tan Quang Nguyen, Linh Hoang Khanh Nguyen, Phuong Thi Tran, Quy Ngoc Phuong Le, and Mai Thi Hong Nguyen. 2020. "Understanding Indigenous Farming

Systems in Response to Climate Change: An Investigation into Soil Erosion in the Mountainous Regions of Central Vietnam." *Applied Sciences* 10 (15). https://doi.org/10.3390/app10155091.

IPCC. 2019. *Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.* https://www.ipcc.ch/srccl/chapter/summary-for-policymakers/.

Mahita, D. R., D. N. Rifa, and H. Taruli. 2015. "Sustainable Agribusiness for Indonesia's Farmers' Economic Well-Being: Case Study of Javara Indonesia." 15th Indonesian Scholars International Convention, King's College London, 3-4 October.

Mbow, C., C. Rosenzweig, L.G. Barioni, T.G. Benton, M. Herrero, M. Krishnapillai, E. Liwenga, P. Pradhan, M.G. Rivera-Ferre, T. Sapkota, F.N. Tubiello, and Y. Xu. 2019. *Chapter 5 Food Security in Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.* IPCC (IPCC). https://www.ipcc.ch/srccl/.

Newell, Peter, and Olivia Taylor. 2017. "Contested landscapes: the global political economy of climate-smart agriculture." *The Journal of Peasant Studies* 45 (1): 108-129. https://doi.org/10.1080/03066150.2017.1324426.

Nicholls, Clara Ines, and Miguel A. Altieri. 1997. "Conventional agricultural development models and the persistence of the pesticide treadmill in Laitn America." *International Journal of Sustainable Development & World Ecology* 4 (2): 93-111.

Salazar, Robert C. 2013. "Going Organic in the Philippines: Social and Institutional Features." *Agroecology and Sustainable Food Systems* 38 (2): 199-229. https://doi.org/10.1080/21683565.2013.833155.
Sen, Le Thi Hoa, and Jennifer Bond. 2016. "Agricultural adaptation to flood in lowland rice production areas of Central Vietnam: understanding the 'regenerated rice' ratoon system." *Climate and Development* 9 (3): 274-285. https://doi.org/10.1080/17565529.2016.1149440.

Son, Ho Ngoc, Aaron Kingsbury, and Ha Thi Hoa. 2020. "Indigenous knowledge and the enhancement of community resilience to climate change in the Northern Mountainous Region of Vietnam." *Agroecology and Sustainable Food Systems* 45 (4): 499-522. https://doi.org/10.1080/21683565.2020.1829777.

UNCTAD. 2020. *Lao People's Democratic Republic: Sustainable Commercialisation in the Coffee Value Chain.* United Nations Conference on Trade and Development (UNCTAD), (Geneva). https://unctad.org/en/PublicationsLibrary/ditctabinf2020d2_en.pdf.

[1] Second rice crop grown from rice stubble that is left behind after harvesting the first crop (see more explanation in Sen and Bond 2016, 275).

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