

Agri-tech Start-ups Uplift Farmers and Cut Emissions in Southeast Asia

The agriculture industry is responsible for nearly 25 percent of greenhouse gas emissions, so its impact on climate change is huge. At the same time, though, farmers are experiencing devastating impacts from climate change. A multitude of start-ups in Southeast Asia are helping them produce more efficiently, reduce emissions and overcome effects of climate change.

Agriculture Affects Climate Change

Agricultural producers in Southeast Asia lost about U\$21 billion between 2008 and 2018 due to extreme weather events that caused crop failures and more, Chiang Mai University's Pushpanathan Sundram [wrote](#) in *Frontiers*. Losses are increasing. A variety of climate impacts are expected to hit most cereal crops in Southeast Asia, for example, causing negative effects on income and total calorie availability. Another issue is unsustainable farming methods that afflict the agricultural sector, the ADB [noted](#). Furthermore, CGIAR [said](#), yield stagnation is becoming pronounced as sea level rise leads to saltwater intrusion and flooding in the deltas of Southeast Asia. The rate of sea level rise is likely to worsen and will affect the land used for rice cultivation as well as other crops.

With climate change intensifying, smallholder farmers face an urgent need to adapt their farming practices.

Since agricultural GHG emissions are projected to increase by at least 28 percent by 2050, compared to 2010, it is also essential to reduce agricultural biomass waste from crops such as rubber, oil palm and rice. Indonesia, Malaysia, and Thailand produce 854.1 million tons of biomass waste from the oil palm industry alone. Methane produced from growing rice [accounts for 12%](#) of global emissions of methane, Mongabay said, and Brinc also [noted](#) that rice straw that is typically burned releases methane too.

Technology is a Solution

Overcoming the multitude of issues in agriculture is essential for people and the planet, and of course for farmers in particular. Start-ups are working on solutions. Indeed, entrepreneurs and investors in Southeast both see tremendous potential for technology to transform agriculture and increase productivity, Pixel Play Ventures [observed](#).

One of the biggest challenges for agri-tech startups in Southeast Asia, however, is the complexity of the agriculture industry. A key issue that startups are likely to have, Brinc said, is smallholder farmer adoption. Typical farmers, who depend on chemical fertilisers, are concerned about the impact on their crop yields and livelihoods if they make any changes. A wide range of crops, farming practices and markets makes developing technology in one location that can be applicable across the region even more difficult. As agricultural technology solutions such as soil enhancement or waste reduction move out of the lab and into the field, then, startups need to establish trust through practices such as education and building "on-the-ground" awareness. The startups can also demonstrate safety and efficacy through research, case studies, and onsite measurements.

The challenge also presents an opportunity for startups that develop niche solutions that address specific pain points for farmers farmers' actual needs and that can communicate their solution effectively.

Improving soil health, curbing overuse of fertilisers that leads to residues ending up in the soil, maximising soil cover and protecting biodiversity are some of the key strategies for ASEAN, the ADB said. Farmers can also reduce emissions by enhancing the soil as a carbon sink, deploying technologies to reduce and capture livestock and crop emissions, and using renewable energy systems. They can also benefit significantly by creating value from agricultural waste through recycling or composting.

Start-ups have Innovative Solutions

A multitude of start-ups across Southeast Asia are indeed working on increasing production, reducing emissions and overcoming the challenges caused by climate change.

One key area of focus for start-ups is precision agriculture, Theia Ventures [said](#), which aims to cut costs, optimise yields, and minimise environmental impact. It also targets improvements in decision-making with technologies that enable crop and soil monitoring, irrigation management, and planning software for inputs such as fertilisers and pesticides. Drip irrigation protocols enabled by combined IoT devices and software solutions, for instance, can reduce water usage by 80 percent, increase fertiliser efficiency by up to 50 percent and improve yields by 30-100 percent.

[Village Link](#) in Myanmar and [ListenField](#) in Thailand, for example, leverage remote monitoring and satellite imagery as well as climate data to offer predictive models of soil health and other software-based farming advisory services. [Neurafarm](#) in Indonesia focuses on fertiliser management as well as pest control through image identification and insights from their database. And [Impact Terra](#) in Myanmar provides governments and smallholder farmers with climate analytics tools and actionable insight that can improve farmers' crops. The company's Golden Paddy application provides farmers with alerts, chat, product, and financing options.

Another is Indonesia-based [Mertani](#), which specialises in precision agriculture technology that offers IoT sensor integration, cloud data solutions and software for real-time agricultural data. Its Automatic Weather Station is a solar-powered, wireless irrigation system tailored to crop needs, and it also uses IoT sensors for remote data transmission.

Qarbotech, a Malaysian-based firm revolutionising leafy plant cultivation, focuses on inputs and offers a liquid fertiliser. Its QarboGrow product can enhance photosynthesis rates by 30 percent, Tech Collective highlighted, which can result in [25 percent shorter crop cycles](#), 20 percent sweeter fruits, greater drought resistance, optimised fertiliser use and up to 60 percent higher crop yields.

A number of start-ups are working on better usage of crop residues, which would otherwise have adverse climate and health effects. Crop residue upcycling offers economic opportunities for farmers, Brinc explained, with potential applications including packaging, textile, battery electrolytes, dye colours, and personal care and food preservative products. Several startups in Southeast Asia are working on biochar, for example, including [WasteX](#), [Thai Carbon](#), and Husk.

Start-ups Solutions Solve Real Problems and Create Hope

While these examples of solutions are just a fraction of the many products or services start-ups around Southeast Asia are developing, the innovations demonstrate the impact that start-up can have on improving agriculture, reducing hunger and mitigating climate changes. They offer new hope for farmers and tremendous opportunities for investors.