



# Food & Agriculture Newsletter

Confederation of Aisa-Pacific Chambers of Commerce and Industry

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## Message from CACCI Director-General

As Director-General of CACCI, I am pleased to present the eighteenth issue of the Newsletter of the Asian Council on Food and Agriculture (ACFA) to all our colleagues in the food and agriculture sectors, and other CACCI members and associates.

This issue highlights the trends, the latest news and interesting reports on food and agriculture in the Asia-Pacific region. I hope that you will find the articles included in this Newsletter of great value, and look forward to your contribution to the Newsletter in the future.

As many of you may know, this Council has been a valuable platform for information exchange and networking for all representatives from the region's food and agriculture industries. Therefore, all CACCI members are encouraged to take advantage of the Council and the Newsletter as channels to voice their opinions and viewpoints.

My Best Wishes

David Hsu

Director-General

The Confederation of Asia-Pacific Chambers of Commerce and Industry (CACCI)

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# Greening the Rice We Eat

By Dina Umali-Deininger



Vietnamese woman working in a paddy field. © Dina Umali-Deininger/World Bank

Many of us love to eat rice, and for more than half of the world's population, about 3.5 billion people, rice is a staple food. The grain is not only crucial for food security, but cultivating it is an important source of livelihood for about 150 million smallholder farmers worldwide, most of whom are poor, and many of whom grow their crop on small plots of land of less than 1 hectare.

What is less well known is that rice is both a victim of and a contributor to climate change.

The effects of changing climate—rising temperatures, more frequent droughts, floods, and intense typhoons—are devastating rice farms and farmer livelihoods. However, rice production itself has an impact on the climate: significant greenhouse gas (GHG) emissions—methane, nitrous oxide (N<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>) are byproducts of rice farming and the rice value chain. Rice is responsible for 10% of global methane emissions, and in Southeast Asia, one the world's major rice bowls, rice cultivation accounts for as much as 25-33% of the region's methane emissions.

The good news is that climate-smart agriculture (CSA) solutions are available to “green” the rice we eat: these practices can increase productivity, improve climate resilience and reduce GHGs. Some of these approaches are in practice already, with encouraging results that hold promise for application elsewhere.

## How does rice cultivation account for such a large volume of emissions?

Rice is grown in flooded fields, which create the ideal anaerobic conditions for bacteria to thrive on decomposing organic matter (mainly rice straw residue) and release methane. Poor absorption by the rice plant of nitrogen-based fertilizers, often overused by farmers, leads to nitrous oxide emissions.

Burning of rice residues and food loss and waste in the value chain add to GHG emissions. Burning is a convenient way for farmers to quickly dispose of large volumes of leftover rice straw. Vietnam's Mekong Delta produces around 29 million tons of rice straw per year and over 80% of it is burned in the fields after harvest. Traditional drying practices (including on rural roads) and low rice milling efficiency (the ratio of milled rice output to paddy input) in many countries add to food loss and waste.

## What are some of the climate-smart agriculture solutions applicable to rice?

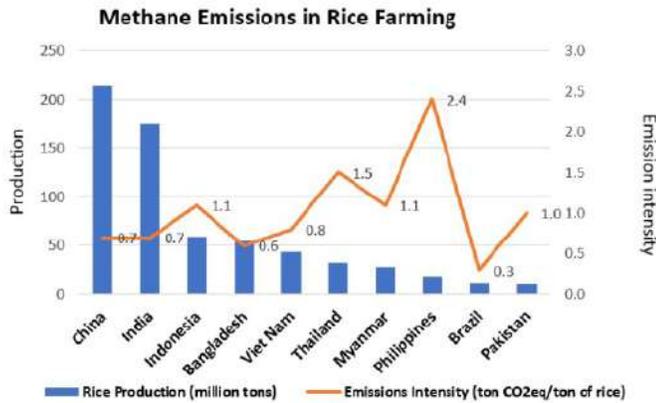
- **Changing rice production practices:** Adopting CSA practices such as Alternate Wetting and Drying water management combined with good agriculture practices, such as Vietnam's 1M/5R, have shown the potential to cut methane and nitrous oxide emissions significantly. These approaches include a package of improving irrigation water delivery, land leveling, and use of improved seeds (e.g. drought-, pest-, and flood-resistant high yielding varieties), improved tillage practices, soil testing combined with improved fertilizer application, and farmer training, often facilitated by digital technology.

The successful application of these practices has been demonstrated by the Vietnam Sustainable Agriculture Transformation Project, which supported the adoption by almost a quarter million rice farm households of the government's 1M-5R program in the Mekong Delta (one “Must” of using improved seeds and five “Reductions” in irrigation water, seeding rate, nitrogen fertilizer, pesticides, and post-harvest losses in drying and milling). The program increased farmer yields by 10-18%, increased farmer profits by about 28.6%, and reduced GHG emissions by 7.3 tons CO<sub>2</sub>eq per hectare per year, while lowering water use by 15-40%.

Similarly, the China Climate Smart Staple Crop Production Project (CSSCP) promoted farmer adoption of a CSA package for rice, consisting of improved seeds, water services, and good fertilizer, pesticide, tillage, and rice straw management practices. Farmers in Huaiyuan County, Anhui Province, where rice is a key crop, benefited from an increase in rice yields of 22%, reduced GHG emissions by about 2.9 t CO<sub>2</sub>equivalent/hectare, while cutting fertilizer and water use by 30% and 38% respectively, thus increasing farmer incomes. Building on the lessons learned, the CSSCP developed technical guidelines to enable the scaling up of these CSA packages to other regions in China.

- **Better management of rice residues:** Rice residues (straw and rice husks) can be repurposed for other uses, such as animal fodder, growing beds for other crops such as mushrooms, inputs for bio-energy production and the resulting by-products as organic fertilizer.

- **Reducing food loss and waste.** Increasing rice milling efficiency to 70% and modernizing rice storage facilities can reduce product loss, preserve rice quality, and generate GHG savings. Rice post-harvest losses in Indonesia are estimated at 10%, and in Vietnam at 10-12%. With paddy (unprocessed rice) output reaching about 99 million tons in these two countries in 2021, raising country level rice milling efficiency alone by 5%, currently at about 63.5% and 62.5% respectively, would make available an additional 4.9 million tons of rice.



primarily at increasing rice productivity and output. Gradually, the emphasis on climate resilience has been added. Today, there is great potential to leapfrog to a Green Revolution 2.0, that mainstreams cutting edge digital technologies (artificial intelligence, internet of things, mobile apps, blockchain, etc.) and pioneering science and innovation systems, to deliver the more demanding goals of increasing rice productivity, improving climate resilience and reducing rice GHG emissions. To get there, rice producers will need support. Creating an environment that will enable farmers and agribusinesses to embrace new CSA technologies and approaches will require governments, the private sector and the international development community to help finance this transition to greener production of the rice so many of us love to eat.

*World Bank Blogs*

*World Bank staff calculation based on FAOSTAT and CAIT Climate Data Explorer 2018*

- **Diversification:** Sustainably increasing rice productivity would allow diversification in some areas to other higher value crops that could raise farmer incomes, while cutting GHG emissions.

The Green Revolution started in the 1960s, aimed

### About the Author



### Dina Umali-Deining

Agriculture and Food Practice Manager for the East Asia and Pacific Region of the World Bank

## Gender-smart agriculture: The only way forward for women and climate

*By Martien Van Nieuwkoop, Patricia Van de Velde, Sophia Huyer, Katie Kennedy Freeman*

Climate Smart Agriculture (CSA) is the only way forward for food and nutrition security and the planet's resilience. But we need to make sure that the climate-smart agriculture policies, technologies, and tools also work for women who, despite being a significant percentage of the world's farmers, face major gaps in capturing the benefits provided by CSA.

Over the years the World Bank has worked hard at ensuring that investments in the agriculture and foods sector match the urgency of the climate crisis. Agriculture projects are also overwhelmingly inclusive of women and their enormous roles in the rural sector. The FAO estimates that women make up 43% of the agricultural workforce globally. This number goes up to over 60% in least developed countries.

Women are experiencing increased responsibilities and workloads, especially in situations where there are climate driven outmigration of men and young people. For example, workloads increased for women in rainfed farming households in Maharashtra, India, due to fluctuating crop yields and longer distances to travel for fuel, fodder and water for their livestock. Women may also be hesitant to adopt new adaptive practices in agriculture out of concern that their workload might increase.



*Through baobab powder production, women's group in Senegal participated in management of natural resources. Photo: Marvis Derigubah/CSIR-SARI*

Ensuring equitable access to technologies that reduce women's burden and increase their productivity is essential, and in some cases can lead to increased diversity of crops, improving household nutrition.

Women have less access to technologies, information, resources, and finance for their agriculture activities across the globe. The cost of the gender productivity gap in agriculture – inequalities in access

to and control of productive and financial resources – inhibits agricultural productivity, reduces food security, and costs millions to countries. For instance, UN Women estimates that the gender productivity gap in agriculture is \$100 million in Malawi, \$105 million in Tanzania, and \$57 million in Uganda.

However, policymakers do not yet always make these connections. A recent analysis of nationally determined contributions (NDCs) submitted before October 2021 found that only 43 countries (22%) addressed gender in relation to agricultural adaptation or mitigation actions. A total of 48 NDCs were submitted by African countries, and only 23 included a reference to gender in relation to agriculture.

We need to continue to find more ways to support women's agriculture activities that will overcome the gender gap

in productivity and promote gender equality for the benefits of their communities and society, while also understanding the critical role women play in mitigating and adapting to climate change.

For example, in Senegal, a project has helped establish a women-run baobab powder micro-enterprise. Women in the local community were trained in fruit processing and financial management, while environmental restoration activities such as increased vegetation cover and use of indigenous trees were introduced. The project has now increased women's access to and control over forest resources. Incomes have increased through fruit powder sales, and women participate in community decision-making on tree management including through women's group control of the funds used for community improvement.

Meanwhile in Nepal, the large number of male out-migration from rural communities is significantly escalating women's responsibilities in agriculture. Women are over-burdened with their involvement in agriculture and are increasingly making farming decisions that were traditionally the responsibility of men. The good news though is that there are solutions that can benefit women. Installation of solar based irrigation systems have benefitted women to grow high value crops and earn higher incomes. By substituting mechanical for manual irrigation, women's workloads are greatly decreased.

One of our more innovative projects is Accelerating the Impact of CGIAR Climate Research for Africa (AICCRA) which focuses on how climate-smart agriculture can contribute to women's resilience and empowerment in the context of climate change.

As part of project roll-out, AICCRA developed a "gender-smart agriculture" framework to plan, implement and assess gender-responsive CSA. It includes gender gap analysis, identification and prioritisation of gender-responsive CSA, participatory and consultative implementation models as well as gender-targeted climate information services and value chain approaches.

"Gender-smart indicators" measure gender results in five main areas to measure the degree of gender empowerment, based on the Gender Profile of Climate-smart Agriculture in Ghana and the Gender Empowerment Index: 1) access and control of CSA technologies, farm inputs, personal assets; 2) increased production; 3) access to climate information services; 4) access to credit; and 5) decreases in workload, and how these affect women's participation in decisions at household and community levels.

Together with the AICCRA project, the World Bank will soon be offering a learning event on how to make use of these tools that harness the broad research experiences of the CGIAR system in research and the 1 spaces in our work to make use of them.

On International Women's Day, we take the opportunity to renew our ambitions on reaching the food system goals of feeding the world in a climate-positive way to ensure that the tools we have also work for a large number of the people working in agriculture: women. Let's make sure that climate-smart is gender-smart!

*World Bank Blogs*

## About the Authors:



**Martien van Nieuwkoop**  
**Global Director, Agriculture and Food**  
**Global Practice, World Bank**

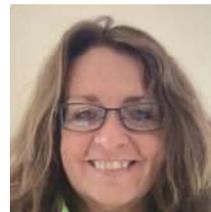
As Global Director for the World Bank's Agriculture and Food Global Practice, Martien provides leadership to the formulation and implementation of the Bank's strategy and knowledge in agriculture and food, oversees the operationalization of the Bank's vision on agriculture and food in regional and country programs, and acts as senior spokesperson for agriculture and food Bank-wide and globally. Prior to his current position, he has held numerous managerial and leadership positions covering the Bank's engagement on agriculture in Africa, Latin-America and South Asia. Martien is a Dutch national, who holds post-graduate degrees in Agricultural Economics from Wageningen University, The Netherlands, and in Business Administration from Georgetown University, Washington, D.C, USA.



**Patricia Van de Velde**  
**Gender Focal Point for the Food and**  
**Agriculture Practice**

Patricia van de Velde is the Gender Focal Point for the Food and Agriculture Practice since 2017. She has worked in the Agriculture GP for ten years (on Gender, Innovation Systems, Agriculture Public Expenditure), after two years in the Financial Systems unit.

Patricia has a B.A. in Philosophy and Political Science from Trinity College Dublin, and an M.A. in International Affairs from the Korbel School, University of Denver.



**Sophia Huyer**  
**Gender and Social Inclusion Leader,**  
**Accelerating the Impact of CGIAR**  
**Climate Research (AICCRA) program**

Sophia Huyer is Gender and Social Inclusion Leader at the CGIAR Accelerating the Impact of CGIAR Climate Research (AICCRA) program, as well as Director of Women in Global Science and Technology (WISAT) based in Brighton, Canada. She has extensive experience in research and policy analysis on global gender equality issues relating to technology, innovation and sustainable development. She is a member of the Gender Advisory Board of the UN Commission on Science and Technology for Development (GAB-CSTD) and was Senior Advisor to the Organization for Women in Science for the Developing World (OWSD) at The World Academy of Sciences (TWAS) from 2009-2013. Recent publications include "From vulnerability to agency: gender equality in climate adaptation and mitigation" in *Advancing gender equality through agricultural and environmental research: past, present and future* (IFPRI, 2020), "Weathering the Storm or Storming the Norms? Gender Equality in CSA (2020)" (as Guest Editor of a special issue in *Climatic Change on Gender Equality and Climate-smart Agriculture*); and "Gender and Food Security in a Changing Climate" (2019) in *Taking stock: Data*

and evidence on gender equality in digital access, skills and leadership, UNU Institute on Computing and Society/International Telecommunications Union. Sophia is a Visiting Fellow at the Canadian International Development Research Centre (IDRC) and a member of the Scientific Committee of the AWARD One Planet Climate Fellowship. She held a Fulbright Fellowship at the Kennedy School of Government at Harvard University in 2000. She received her Ph.D. from York University in Toronto.



Farmers' revenue can increase as the result of improved shipping methods. Photo: ADB



**Katie Kennedy Freeman**  
Senior Agriculture Economist

Katie Kennedy Freeman works with the World Bank's Agriculture and Food Global Practice as a Senior Agriculture Economist focused on the areas of climate smart agriculture, digital agriculture and the intersection of agriculture and energy. Currently she works on these areas specifically in Latin America. Before coming to the World Bank in 2012, she worked at the Earth Institute at Columbia University implementing research programs on ICT in agriculture and energy for agriculture.

## Farmers are Rolling On and Rolling Off to Increased Revenue in the Philippines

By Eugenia Co Go

RORO transport systems can help level the playing field and diminish the use of middlemen as farmers get their products to market.

Agricultural production in the Philippines is dominated by small-scale farmers. The Agricultural Census of 2012 indicates that close to 90% of agricultural land holdings are less than three hectares, and most farmers rely on multiple layers of intermediaries to consolidate and transport their products to final markets.

The dependence of farmers on these marketing channels increases the further they are from their markets. In these settings, intermediaries often bargain down prices without passing on the reduction to consumers.

One of the reasons for the lack of bargaining power by farmers in dealing with intermediaries is high trade costs, which allow the latter to engage in price gouging. When trade costs are low, more intermediaries compete in both producer and consumer markets, and prices tend to decrease while farmers benefit. Studies have shown that lower trade costs take pricing power away from intermediaries. For example, intermediary profits tend to be larger for remote locations in Sub-Saharan African countries and are also associated with higher consumer prices. Reducing trade costs can alter the distribution of profits along the marketing chain and benefit farmers.

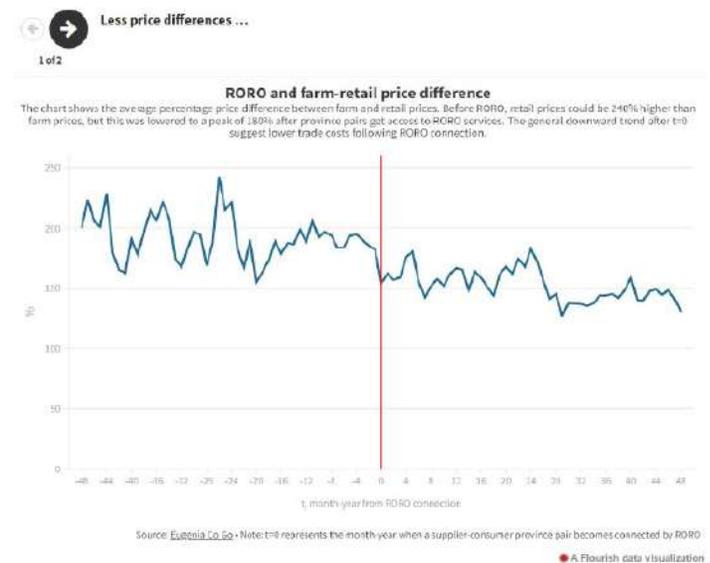
The Roll-On Roll-Off (RORO) Terminal System in the Philippines, introduced in 2003, presents an opportunity to examine how lowering trade costs can increase income for small farmers.

Domestic maritime trade costs in the Philippines are high. It cost three times as much per nautical mile to move a twenty-foot equivalent unit container in domestic waters than in international shipping. The RORO-based transport program aims to bring down trade costs by promoting the use of ships that allow trucks and other vehicles to easily drive off and on vessels for more efficient inter-island trade. This dispenses with the need for cargo handling, leading to significant time savings.

The RORO program in the Philippines strategically connected ports with major roads to ease transport, trade and travel. The program started with 36 routes in 2003 and grew to more than 150 by 2016.

By enabling direct deliveries, ROROs help firms cut inventory and warehousing costs. These savings are valuable for perishable agricultural products. The smaller size of RORO ships compared to conventional liner vessels also makes them more suitable for regular short-distance inter-island trade.

The figure below shows that before RORO services, retail prices could be 240% higher than farm prices. Afterward, they were in the range of 180%. In more rigorous analyses that control for factors that may affect prices in supplier and demand provinces, such as product seasonality and province characteristics, this translates to a difference between farm and retail prices that is on average 28% lower for provinces with short-distance RORO connections.



However, the smaller price difference does not necessarily imply lower intermediary markups. Estimating the effect of ROROs on markups involves examining a scenario where trade costs by RORO status do not change but markup opportunities do change. This can be mimicked using price shocks from typhoons that affect some provinces but not others.

For example, the Philippine provinces of Agusan del Norte, Cebu, and Negros Oriental, are major suppliers of mangoes to Southern Leyte. Imagine a typhoon that damages supplies in Agusan but leaves supplies in the other two provinces unscathed. Because Agusan is a major supplier of mangoes to Leyte and supplies cannot be immediately obtained, the typhoon in Agusan translates to an overall price increase of mangoes in the local markets.

Intermediaries keen to make money off the situation try to source mangoes from Cebu and Negros. But because Cebu has direct RORO access to Leyte, while Negros does not, more intermediaries can compete for sources in the former. This should translate to farmers in Cebu receiving a higher share of the price increase than farmers in Negros.

The results confirm that farmers in provinces unaffected by the typhoon all obtain higher prices during typhoons. Based on average prices in the sample, farmer revenues can increase by 9 percent during these times of scarcity. However, the price increase is up to three times larger in producer provinces with RORO services, by an additional 10 to 19 percentage points.

Meanwhile, the increases in retail prices by RORO connection are consistently lower than the farm price rise, in line with a squeezing of intermediary markups.

The use of RORO systems improves the welfare of farmers. Farmers receive higher revenues without raising consumer prices. During episodes of typhoons, the higher passthrough of positive price shocks to farmers without the corresponding price increase in retail markets indicates greater competition and lower markups for go-betweens.

The impact is potentially substantial. Nearly all farms in the Philippines are household operated. A quarter of the Philippine labor force rely on farming as livelihood, and agricultural products account for over 20% of the total volume and value of domestic maritime trade in 2019. From this perspective, the RORO transport program can be a powerful tool for spurring rural development.

*Asian Development Blog*

#### About the Author:



**Eugenia Co Go**  
**Economics Officer, Economic Research and Regional Cooperation Department, ADB**

Eugenia's main research interests are agriculture, trade, and transport economics. She holds a PhD in Economics from the University of Sussex, UK.

## 'Carbon rights' could net NT\$7 billion for farmers

*By Yang Yuan-ting and Jake Chung*



*A drone sprays pesticides over a farm in Kaohsiung on February 17, 2022. Photo: Chen Wen-chan, Taipei Times*

**CIRCULAR AGRICULTURE:**  
*Creating carbon storage could help farmers monetize carbon credits, while other measures could help farmers create and sell power*

Taiwan's production of "carbon rights" at 5 million tonnes per year would yield an annual NT\$7.13 billion

(US\$251.41 million) if monetized via a carbon tax or other mechanisms, and augment Taiwanese farmers' income, the Council of Agriculture's Zero Emission Taskforce said.

Carbon rights refers to carbon stored by plants and other biomass. It has potential value because such storage serves to mitigate climate change, and its value could be monetized or "traded" via a carbon tax or other mechanisms.

Six years ago, the council began researching and breeding plant cultivars that would be more resilient to severe climate patterns, Council of Agriculture Minister Chen Chi-chung said in an interview on March 16, 2022 with the Liberty Times (the Taipei Times' sister newspaper).

However, such measures only support more effective climate-change solutions, and climate problems could only be resolved through a reduction of carbon emissions to zero, Chen said.

Such measures are being

implemented internationally, he added.

In an effort to reduce carbon dioxide emissions, the International Energy Agency has said that fossil fuel sources should not be used past 2028, Chen said.

The EU is scheduled to begin implementing what is called a novel carbon border adjustment mechanism starting in 2023, and to require EU importers to purchase certificates equivalent to weekly EU carbon prices starting in 2026.

Taiwan should also pursue similar goals and frameworks by using Taiwan's agricultural resources as carbon sinks, Chen said.

The creation of carbon sinks would allow the council to help farmers obtaining "carbon rights," he said.

This would occur within the Environmental Protection Administration's carbon rights exchange program, which follows the UN Clean Development Mechanism and Voluntary Carbon Standard, he added.

The council is pushing for measures to help farmers obtain the equipment necessary to implement “circular agriculture” and cut down on carbon emissions, he said.

“Agriculture in the past played a supporting role in the development of industry, but today it must work with the industrial sector to be more competitive on the international market,” Chen said.

The council plans to establish 10 model facilities to promote circular agriculture, which minimizes environmental harms, he said.

Recycling animal waste to generate biogas would make farms and farming villages self-sufficient in power generation, he said, adding that excess power could be sold to the electricity grid.

*Taipei Times*

## Vending machine selling ‘nutritious’ insect snacks creates buzz in west Japan



An employee is seen promoting insect snacks sold in a vending machine in the city of Matsuyama, Ehime Prefecture, on April 27, 2022. (Mainichi/Yasutoshi Tsurumi)

### Mainichi Japan

A vending machine that lets people try “nutritious” insect snacks was unveiled along a national road in this west Japan city on April 27.

The vending machine, which promotes the snacks as “highly nutritious meals of the future,” is the first of its kind in western Japan’s Shikoku region, according to the firm that introduced it. A representative commented, “I’d like people to pick them up as a snack for their journey or sightseeing trips.”

Nine types of insect snacks, including fried crickets, mole crickets, bamboo worms, diving beetles, locusts and silkworm pupae, are sold for 1,000 yen (about \$8) each. The project was started by Sanpuku Holdings, based in the city of Matsuyama, which handles real estate and other businesses, with a subsidiary that operates vending machines, as an initiative to contribute to the realization of the United Nations’ Sustainable Development Goals (SDGs). The vending machine uses insects processed by Hamaru

Foods, a manufacturer of insect meals in the city of Sasebo, Nagasaki Prefecture.

The vending machine is set up along National Route 11 in the parking lot of a fitness club near a public middle school. A sign reading “insect meals” in large letters attracts the attention of passersby. Transparent jars containing silver bags can be viewed through the window, but the actual contents cannot be seen unless they are bought.

The new project has the added benefit of allowing old drink vending machines owned by the firm’s subsidiaries to be reused. The annual electricity used to store insect snacks in vending machines is half the amount required to refrigerate or warm drinks. The company has set a target of selling 300 products in one month, and will consider setting up more vending machines if sales go well.

Tomoko Kira, 43, an employee of Sanpuku Holdings who tried the fried crickets, described them as “crunchy like a snack, with a taste like the head of a shrimp.” She said they were not bitter, and were salty and had a pleasant smell.

Eating insects, which are rich in protein despite feeding on less food compared to chickens, pigs and cows, is said to be environmentally friendly, and a potential solution to a food shortage crisis stemming from global population growth. The company is calling on people to try them as healthy next-generation snacks, while cautioning that those with shellfish allergies may not be able to eat them.

(Japanese original by Yasutoshi Tsurumi, Matsuyama

Bureau)

*The Mainichi*

## Farming evolves with the help of IT, AI

By Park Han-na

Becoming a farmer carries a high risk, with volatile weather and soil conditions affecting farm crops in a blink.

The risk, exacerbated by global warming, has been mitigated for Lee Kyung-ju, a former IT office worker-turned farmer who has been growing cucumbers with the help of a smart farm system since 2020.

He kicks off his day by checking his smartphone application showing the farming weather forecast and agricultural commodity prices.

He then arrives at his 6,000 square-meter farm in Cheonan, South Chungcheong Province.

Using smart farming software and hardware, Lee controls temperature, light quantity and humidity of the greenhouse for the cucumbers to ensure they have an even dark green color and uniform size.

A dynamic monitoring system also calculates energy efficiency, costs and growth rates of the crops.

“Through the smart farm system, cucumbers’ preferred environment can be adjusted allowing the plants to make their own hormones and enhance the natural taste,” he said.

Empowering the farmer with six years of agricultural experience is the technological capability he adopted from agtech startup Green Labs in 2020.

Smart farming is emerging as an effective alternative here to respond to natural disasters caused by climate change and manpower shortage in the farming sector due to the low birth rate and aging population.

“Our ultimate goal is to make future agriculture a category of business with low entry barriers and high return by enhancing predictability in farming,” said Shin Sang-hoon, co-founder and CEO of Green Labs, which was founded in 2017.

Agriculture is a big industry, with its market size exceeding 150 trillion won (\$125.1 billion) just for the country, but attempts at digital transformation in the sector have been fragmented or focused on the delivery industry, as seen in the birth of unicorn startups like Market Kurly and Baedal Minjok.

“I don’t think there was a company that sought to digitalize the entire life cycle of agricultural production and distribution comprehensively,” he said.

Green Labs’ mobile application Farm Morning has



Lee Kyung-ju checks the temperature of his cucumber green house in Cheonan, South Chungcheong Province. (Lee Kyung-ju)

attracted 500,000 users, about one-quarter of the 2 million farmers in the country.

Shin, who previously worked for e-book service provider Ridibooks and founded blind dating mobile app Amanda, said his new company’s business strategy not so different from those of the IT companies he worked for.

“It is a game of who attracts more users. The basic structure is that we provide necessary solutions to users using accumulated data from users,” he said.

For instance, its vision recognition system monitors the growth of strawberries to analyze environmental data that increase the yield and quality of the crop. The data collected from multiple farmers advances its system engine to offer better solutions for other strawberry farmers.

This also reduces farmers’ workload to check on the growth of their livestock and crops and increases the accuracy of the process, Shin said.

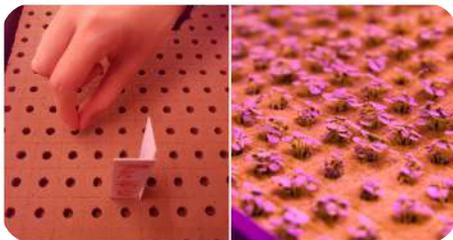
“In the near future, farmers will be able to switch crops, like from strawberries until this month to watermelons next month, by adjusting their smart farm systems,” he said.

*The Korea Herald*

## Inside Georgia’s first indoor vertical farm: How SpaceFarms may foreshadow the future of Georgian agriculture

By Mariam Papidze

Imagine walking into a supermarket to pick up freshly harvested lettuce, basil, rucola or micro greens harvested from a vertically stacked farm only hours before you’d arrived.



Georgia’s first indoor vertical farm, SpaceFarms, will soon put up its first produce kiosks in different locations of the capital city of Tbilisi to bring healthier, better tasting, and longer lasting greens to consumers.

At the initial stage of the project six modular farms will be placed around Tbilisi next month. One kiosk will produce about 500 plants and the price of one plant will be about 3-4 GEL.

Consumers will be able to pick the plant themselves directly from the modular farm and take it at home. It comes with roots and sustains all the healthy nutrients until consumption. Isn’t it amazing to know your food, where it’s from and how it’s grown?”, said young Georgian entrepreneur Tusya Gharibashvili, who is the founder of SpaceFarms and aims to shake up traditional farming practices in Georgia by developing a new generation of high-tech farming in the country.



Before the modular farms appear in the city consumers can purchase a healthy mix of greens upon request. To get

the mix of greens handpicked and delivered to your doorstep, you can subscribe here.

This is also a unique service as I was the first in Georgia to introduce a subscriber service on vegetables. From our farm, straight to your table within a couple of hours after harvesting. It’s that fresh”, Gharibashvili said.

### What is SpaceFarms?

Housed within the award-winning Stamba Hotel in Tbilisi, SpaceFarms is the first commercial indoor farm in Georgia where plants are grown on top of each other, rather than in traditional, horizontal rows. In addition to growing fresher and





Georgian entrepreneur Tusya Gharibashvili, the founder of SpaceFarms. Photo: Nino Alavidze/Agenda.ge.

healthier micro and leafy greens year-round, SpaceFarms is environmentally friendly, produces very little waste and has a significantly smaller carbon footprint than traditional agriculture.

Built across 150 sq.m. on seven levels of racks, SpaceFarms uses 85% less water, 90% less transportation, 80% less land and 75% less fertilizer than traditional farming.

“By using disruptive technologies, we fully control the environment (light intensity, nutrient intake, humidity, carbon dioxide emissions, and temperature) to yield optimal plant growth. Regardless of the season, we’re able to deliver fresh micro and leafy greens directly to your table within hours of harvest. We are proudly supplying all Adjara Group’s properties and several other loyal restaurants in Tbilisi and beyond”, said Gharibashvili.

“Using advanced technologies, precise heating, ventilation, and air conditioning (HVAC Systems), we have full control over the environment where the micro and leafy greens grow. By managing Co2 emission, water recycling, nutrient intake, temperature and humidity sensors, lighting brightness, and intensity, we create perfect conditions for nurturing fresh, 100% pesticides free, high-quality produce”, she added.



One kiosk will produce about 500 plants and the price of one plant will be about 3-4 GEL. An artist impression.

### How was the idea of SpaceFarms born?

Gharibashvili said she had spent several years researching and developing technologies to grow plants at more yield with minimal impact on the environment compared to conventional farming.

In 2017 Gharibashvili opened her first project, Urban Greens, with a friend. Their first production facility was housed in a 15 sq.m. cultivation area where various micro greens were grown.



Housed within the award-winning Stamba Hotel in Tbilisi, SpaceFarms is the first commercial indoor farm in Georgia where plants are grown on top of each other, rather than in traditional, horizontal rows. Photo: Nino Alavidze/Agenda.ge.

Produce was delivered to restaurants and other organisations in the catering sector.

After the initial success, Gharibashvili started to follow up on more research in indoor vertical farming. SpaceFarms is her second project which was launched later in 2018.

“From scratch, step-by-step, through study, in consultation with international experts, I was able to gather information on how to set up an indoor farm and grow large quantities of vegetables in a small space. Then I presented my plan to the founder of Adjara Group, Temur Ugulava and introduced him to my business plan. I offered him Adjara Group’s restaurants to have direct access to healthy vegetables. So we both decided to give this plan a try”, said Gharibashvili.

She recalled how she had bruised fingers when was personally involved in setting up the indoor farm, however the hardest part of the process was to cultivate the first generation of the vegetables, Gharibashvili said.



“Every species needs its own conditions to grow. Every species has its own cycle. I started experimenting with different species and created recipes for each of them. I have accumulated knowledge of which species need what conditions to grow. Today I can plan and control the growing circle of each species and I am confident of this knowledge and experience.



“Time has come to realise that the integration of modern technologies is very important in agro-farming. What obstacles we have in agriculture, such as bad weather, unstable

environment, water consumption, pesticide consumption, can be avoided with these new technologies. My future plan is to export this experience, these technologies that I have created and not the produce itself”, Gharibashvili said.

SpaceFarms has become a member of the Association of

Vertical Farming. This is the leading global, non-profit organisation that enables international exchange and cooperation in order to accelerate the development of the indoor/vertical farming industry.

Gharibashvili was an invited speaker of the large-scale conference held in Munich on September 4, where she presented her farm as well as Georgia as the first country in the region to have indoor vertical farming practice.

“The association has a global map on its website where little Georgia was illuminated in our region with its indoor farming. It is the only Georgia in the region that shines on this map thanks to SpaceFarms”, Gharibashvili said.

*Agenda.ge*

## World Bank approves \$341M loan to boost Turkey's 'green' agriculture



*A worker is seen harvesting at a farm in the Kızıltepe district of southeastern Mardin province, Turkey, March 8, 2022. (AA Photo)*

The World Bank said on March 30, 2022 it had approved a loan of \$341.27 million (TL 5 billion) as part of a project to support a more sustainable and competitive agricultural sector in Turkey and encourage using “climate-smart technologies.”

The Turkey Climate Smart and Competitive Agricultural Growth Project (TUCSAP) seeks to help improve the collection and use of information on soil and land covering nearly 14 million hectares, enhance animal disease surveillance and diagnostic capabilities, and boost technology adoption to improve resource efficiency and reduce harmful carbon emissions, the World Bank said.

The project will directly benefit over 80,000 farmers, service providers and veterinarians. It will also have broader impacts through availability of relevant sectoral data reaching a wider set of stakeholders, as well as via improvements in animal health services, benefiting farmers and businesses across Turkey.

More broadly, the World Bank said the TUCSAP project will contribute to long-term sustainable growth of the agricultural sector, provide job opportunities for youth, contribute to preventing out-migration and, ultimately, improve prosperity in rural areas.

Agricultural output in Turkey has increased significantly

in recent years, with exports of agri-food products rising to about \$20.7 billion in 2020, representing about 10% of national exports.

The sector accounts for 6.6% of Turkey's economy and employs about 18% of the labor force. However, it faces important productivity challenges as growth in agricultural output has been driven primarily by input intensification and far less by improvements in resource-use efficiency and technological adoption.

Agricultural expansion in Turkey is creating significant environmental and climate pressure due to the inefficient use of land, water and energy, while accounting for more than 13% of Turkey's greenhouse gas emissions, it said. On the other hand, the sector is impacted by climate events such as droughts, floods and wildfires.

The bank said the project would contribute to addressing gender gaps by encouraging the participation of women in training and agricultural advisory support services, improving access to funding opportunities; and generating data for facilitating gender-related analysis and policymaking.

“Additionally, project activities should contribute to enhancing working conditions for women in the agriculture sector,” it noted.

“We hope this partnership will contribute to putting the agriculture sector on a more competitive and sustainable growth path and help Turkey achieve net zero carbon emissions by 2053,” said Auguste Kouame, World Bank Country Director for Turkey

Turkey ratified the Paris climate agreement late last year, and has said it aims to achieve net-zero carbon emissions by 2053.

The bank said spurring Turkey's agri-food sustainable transformation could preserve and enhance trade opportunities, while enhancing the sector's competitiveness, especially with the country's biggest agri-food trade partner, the European Union, promoting climate action through the EU Green Deal.

“Bringing digital technological solutions to the agriculture sector and generating relevant information on crop production, soils and land to support its sustainable management can enhance productivity and contribute to reducing the negative impacts of climate change on ecosystems and rural incomes and employment,” said Luz Diaz Rios, World Bank Task Team Leader for the Project.

“This project will support the agriculture sector's transition to a more sustainable, competitive and climate-smart orientation.”

*Daily Sabah*

## Vietnam: Hanoi moves towards more modern and sustainable agriculture

Hanoi is moving towards a smart, high-tech and sustainable agriculture that can adapt to climate change.

Along with synchronous investment in infrastructure in rural areas, the city will focus on developing key agricultural products, including longan, Canh oranges, Dien pomelos, flowers,

ornamental plants, and seeds to improve product value, according to Vietnam news agency (VNA).

For sustainable development, the city's agriculture has been focusing on supporting localities to build concentrated and safe production areas, develop key products, and attract business investment.

The high-tech vegetable growing model of the Cuoi Quy Organic Vegetable Cooperative in Dan Phuong district, was one of the 30 excellent agricultural projects that entered the final round of the "I am a farmer in the 4.0 period" contest organised by the Vietnam Farmers' Association, it reported.

The cooperative's Director, Dang Thi Cuoi, said: "The application of growing vegetables in greenhouses using drip irrigation technology has improved both productivity and product quality."

"On average, each day, we harvest two to four tonnes of safe vegetables to supply clean food stores, supermarkets,



*A mushroom production model with Japanese technology in Kinoko Thanh Cao Import-Export Co., Ltd in My Duc district. - Vietnam News/ANN*

cultivation and farming.

Director of the city Agricultural Extension Centre Vu Thi Huong said that many models were investing much in modern technology, which initially brought high economic efficiency such as seed production and the Phalaenopsis orchids planting model of Dan Hoai Cooperative in Dan Phuong district, and the mushroom production model with Japanese technology of Kinoko Thanh Cao Import-Export Co. in My Duc district.

*The Star*

## India's Food Security Approach & Innovations Praised in WTO Seminar on Food Security

*By Shivam Dwivedi*



*S. Jagannathan, Joint Secretary, Department of Food and Public Distribution (second from right) making a presentation on India's food security interventions at WTO High Level Seminar on Food Security, Geneva*

*S. Jagannathan recently explained the successful strategies adopted by the Government of India for ensuring the Availability, Affordability, and Accessibility of both normal and free food grains at all times, as India's food security response to the COVID-19 crisis has been hailed as a shining example for its unparalleled speed,*

*scale & transparency, and rightful targeting.*

Participants at the WTO seminar from around the world praised India's food security approach and innovations, which reflect the Government of India's concern and sensitivity towards poor and vulnerable sections of society. On April 26, 2022, the WTO held a high-level seminar on food security in Geneva to facilitate dialogue on trade and food security among Geneva-based trade officials, policymakers, experts from international organizations and think tanks, and others.

Jagannathan, Joint Secretary, Department of Food and Public Distribution, who represented India at the WTO Seminar, emphasized India's outstanding experience in successfully ensuring dignified and foolproof access to adequate food grains

kindergartens in the district, with a stable income of nearly 6.6 billion VND per ha per year."

Phan Trung Kien in Dai Yen commune, Chuong Mi district, owner of a 13,000-chicken farm, said that high-tech poultry breeding with a closed production line of safe methods should limit disease, adding every day, his farm supplies 8,000 eggs to the market.

VNA also reported that the city now has 160 high-tech agricultural production models, of which 105 are in crop production, 39 in livestock, 15 in aquaculture and one combining

cultivation and farming. Director of the city Agricultural Extension Centre Vu Thi Huong said that many models were investing much in modern technology, which initially brought high economic efficiency such as seed production and the Phalaenopsis orchids planting model of Dan Hoai Cooperative in Dan Phuong district, and the mushroom production model with Japanese technology of Kinoko Thanh Cao Import-Export Co. in My Duc district.

to the country's most vulnerable people, particularly during COVID, through a series of bold technology-based reforms and landmark innovations in the Public Distribution System.

In the panel on 'National and Regional Experiences' at the WTO high-level seminar, he gave a detailed presentation on the Indian perspective. He also emphasized the government's efforts to foster inter-departmental data sharing in order to broaden the reach of large-scale citizen-centric government programmes across the country.

Jagannathan recently explained the successful strategies adopted by the Government of India for ensuring the Availability, Affordability, and Accessibility of both normal and free food grains at all times, as India's food security response to the COVID-19 crisis has been hailed as a shining example for its unparalleled speed, scale & transparency, and rightful targeting.

He emphasized the critical role of the Pradhan Mantri Garib Kalyan Anna

Yojana (PM-GKAY) in ensuring additional food security for the country's 800 million beneficiaries during the COVID period, and how the scheme continues to cushion them against supply shocks and rising inflation during the recovery period, with an additional food subsidy outlay of nearly USD 45 billion in addition to the regular food subsidy of nearly USD 22 billion.

Furthermore, he emphasized how India's food security measures in the PDS, ICDS, and PM Poshan, as well as the PMGKAY, directly contribute to the achievement of some of the UN's Sustainable Development Goals (SDGs) in the fields of Women and Child Nutrition, Health, Education, and Food Security, which are also foundational indicators of Human Development.

He emphasized the historic technology-based innovation One Nation One Ration Card Plan, which allows all NFSA beneficiaries, particularly migrant beneficiaries, to claim either full or partial foodgrains from any of the country's 0.5 million Fair

Price Shops (FPS) in a seamless manner using an existing ration card with biometric/Aadhaar authentication.

The system also allows their family members back home, if any, to claim the ration card's remaining food grains.

Because of the rapid implementation of ONORC during COVID, beneficiaries have been able to access nearly USD 5 billion in food subsidies through nearly 580 million portable transactions and around 650 million portable transactions since the program's inception.

The Seminar shared and discussed national experiences from various countries and world regions, with a focus on the relationship between trade and the multiple dimensions of food security, including access, availability, stability, and use, in light of current and future challenges.

*Krishi Jagran*

## Lead agriculture teacher to reconnect South Australian students with food and fibre origins

*By Nicholas Ward and Brooke Neindorf*



*NSW's Yanco Agricultural High School (YAHS) is one of many still specialising in agriculture. (Supplied: YAHS)*



*Sue Pratt is working to reinvigorate agricultural education in SA schools. (Supplied)*



*School students in northern Victoria learning to lead a steer. (ABC Rural: Warwick Long)*

An agriculture teacher with more than 30 years of experience in the industry has embarked on a 12-month mission to support the state's "food and fibre" educators.

Sue Pratt began teaching at Balaklava High School in SA's mid-north during 1987 and has headed up the school's agricultural program since 2007.



*Sue Pratt [L] says there is plenty of agriculture content in curriculums but it is not being taught. (Supplied: Sue Pratt)*

"There's nothing more important than knowing where your food comes from, and we find that a lot of kids are

disconnected from that process," Ms Pratt said.

"Because they are all going to become consumers and make choices about what they buy, we want them to make those choices from an educated point of view."

### A chance to give back

Ms Pratt said she had been lucky to have contacts and be supported by the farming community when she began teaching at Balaklava, but many agriculture teachers did not have the same support.

"There's heaps of agriculture content in the Australian curriculum and we know that in many schools, none of it is delivered," she said.

"If a school hasn't got anybody who is interested or experienced in food and fibre production, it's a difficult thing to actually get it into your curriculum.

"We would love to expand that and make sure that every school in SA is teaching food and fibre content."

### New approach to education

Ms Pratt has been lobbying to create a role that would

support agriculture teachers in SA after she attended a national educators conference in Tasmania in 2018.

“They had a lead teacher of agriculture and it was quite inspiring to see what he was achieving and the way he’d been able to reinvigorate education around agriculture,” she said.

The new role is being funded by the SA Grains Industry Trust for an initial

12-month period.

It will involve Ms Pratt travelling across SA to share her expertise in agriculture education with schools.

“Our main focus is to make sure people are hitting those SACE standards for our ag subjects in year 11 and 12,” Ms Pratt said.

“Because most ag teachers are the only ones in their school, they don’t often

have that academic support around them to make sure they are achieving the rigour that they need to at that level.

“There are incredible opportunities within the agriculture sector at the moment.

“I would really love kids to be aware of the career pathways they could take — from the agribusiness side of things through to academic life.”

ABC News

## New Zealand Winegrowers Report 96% of Vineyards Are Now Certified Sustainable

By Mike Pomranz



MARK MEREDITH / GETTY IMAGES

*The New Zealand Winegrowers 2022 Sustainability Report makes a strong case for the country being one of the greenest in the world for wine production.*

New Zealand is already known for making incredible wine, [Sauvignon Blanc in particular](#). But the country’s wine industry would also like to be [known for something else](#): sustainability.

In the lead up to Earth Day, the trade group New Zealand Winegrowers has released their 2022 Sustainability Report, documenting the success of their Sustainable Winegrowing New Zealand (SWNZ) program which has now certified 1,840 vineyards and 310 wineries, numbers which include the vast majority of vineyards in the region.

“The New Zealand wine industry has rightfully earned its place as one of the most progressive wine producing nations in the world,” Edwin Massey, general manager of sustainability at New Zealand Winegrowers, said in announcing the report ([found here](#)). “Over 96 percent of all vineyard area in New Zealand is now certified as sustainable through the SWNZ programme, with 10

percent of New Zealand wineries holding organic certification. It’s an achievement we can be proud of, but the real work is ensuring we not only sustain but elevate our position with an enduring commitment to continuous improvement.”

New Zealand Winegrowers also aims to be both carbon neutral and zero waste to landfill by 2050, so the report highlights the strides made towards these policies as well. Fifty-eight percent of wineries are “implementing specific initiatives to minimize their carbon footprint”: For instance, over half of New Zealand producers now use lightweight bottles as one of their packaging methods, and 12 percent have installed solar panels. And on the vineyard side, 41 percent are taking similar carbon footprint reducing measures.

Steps are also being made to reduce water usage and waste. Over 90 percent of both wineries and vineyards have water conservation plans, while 98 percent of both wineries and vineyards have recycling or waste reduction programs.

“It’s the positive individual actions of New Zealand wine businesses that add up to make a big impact across the wine industry, and that are helping to deliver lasting change,” Massey continued. “For our growers and wineries, sustainability means growing grapes and producing our world-famous wines in such a way that we can do so for generations to come. Every little bit counts. It means consumers can trust that their bottle of New Zealand wine has been made with respect for our world and for our people.”

Meanwhile, the report itself ends with an interesting analogy: one that wine drinkers can hopefully relate to. “The journey of wine from grape to glass is only possible because of every little bit that adds up along the way,” the authors write. “The journey of sustainability is no different. Everything we do has a ripple effect, through the vines we plant, the footprints we tread and the legacies we leave.”

Food & Wine Magazine

# Rockefeller's \$105M plan to produce climate-friendly food

By Kristen Griffith of The Chronicle of Philanthropy,  
Chronicle of Philanthropy, Associated Press (AP)

The pandemic sent global hunger soaring, but now the war in Ukraine is making the problem far worse. Since Russia and Ukraine together supply 30% of global wheat exports, a big chunk of the world is losing access to food.

Now one of the nation's biggest foundations is trying to deal with some of these challenges with a \$105 million plan to improve food access, make nutritious and healthy food more widely available, and advance production of food in ways that does not harm the planet.

Rajiv Shah, president of the Rockefeller Foundation, said the commitment is the biggest nutrition effort in Rockefeller's history. Over the next three years, the Good Food Strategy aims to ensure that 40 million people around the world have better access to healthy and sustainable food.

"Because of climate change, food prices were already the highest in a decade, even before Russia's barbaric invasion of Ukraine further decimated global food supplies. Now the world is on the precipice of a global humanitarian crisis," Shah said in a statement.

The foundation and other experts say the way the world produces and consumes food is failing people and the planet. So it came up with a new strategy it hopes will shift the focus from increasing the quantity of food to improving its quality.

Rockefeller aims not just to increase access to affordable and healthy food but also to reduce greenhouse-gas emissions in the food system and expand opportunities for small food-production businesses to thrive.

The foundation has some innovative approaches to accomplishing those goals. For instance, it plans to:

- Encourage doctors to prescribe fruits and vegetables instead of drugs when appropriate since they can be both healthier and cheaper. Ten health insurance companies are working with Rockefeller to test the idea.
- Pay for healthy foods at schools, hospitals, prisons, and other state government facilities.
- Help farmers switch their production practices to approaches that reduce carbon from being released into the air after they plow the ground.
- Fund more small and medium-size food businesses to diversify the distributors and prevent supply-chain issues.

The announcement builds on one of philanthropy's most successful efforts, the Green Revolution of the 1960s.



*In this photo provided by the Rockefeller Foundation, Jason Grauer, the Seed and Crop Director at Stone Barns, poses for a photo at Stone Barns's greenhouse on April 7, 2021, in Tarrytown, N.Y. Rockefeller grantee Stone Barns Center for Food and Agriculture is working on innovative, community-based ways to increase access to food and use sustainable environmental practices. (William Rouse/Media RED via AP)*

Rockefeller financed the technology that helped fuel production of food in a way that averted starvation in the world's poorest countries. However, it lacked sustainability and equity. That's what today's effort is designed to tackle, foundation officials say.

Barron Segar, president of the World Food Program USA, agrees that something needs to be done now. Rockefeller gave the program \$3.3 million in 2021 to supply nutritious food for school food programs in Africa.

"We're facing the biggest crisis we've ever faced around food insecurity," Segar said. "There are 811 million people today who don't have access to quality food, and they don't know where their next meal is coming from. We're at a very pivotal moment in history where we have 45 million people that are marching toward starvation."

In 2021, Rockefeller published a report to evaluate all the ways food systems in the United States affect health, the environment, biodiversity, and livelihoods. It found that Americans paid an estimated \$1.1 trillion of the cost of producing, processing, retailing, and wholesaling of food in 2019. But if other costs, like the food system's impact on climate change were included, the cost would be \$3.2 trillion a year.

One of Rockefeller's grantees has been carrying out some of the ideas that are part of the Good Food Strategy.

FoodCorps, which received at least \$500,000 from the foundation in 2021 for its work to provide healthy food to kids in school, has already had some success in influencing food policy.

In California, FoodCorps advocated for passage of Free School Meals for All Act last year. And in Connecticut, the nonprofit helped the state achieve its first farm-to-school grant program, which will put more local foods in school meals, give educators more resources to teach students about nutrition, and sustain relationships with local farmers and producers.

Rockefeller is also working with Kaiser Permanente, a healthcare company, on its Food as Medicine program. A combined investment of more than \$2 million will go toward three research studies that will evaluate healthy food-prescription programs for participants who suffer from or are at risk for diet-related diseases. Both groups are also building evidence to prove prescriptions of produce are healthier and cheaper in some cases than traditional drugs.

"Everyone needs and deserves access to healthy food they can afford," said Pamela Schwartz, an executive director at Kaiser.

Another element of the Rockefeller plan is to focus on changing the mix of who produces food.

Roy Steiner, senior vice president of Rockefeller's food grants work, said the pandemic has revealed how fragile supply chains are. And it doesn't help that only a few large food distributors monopolize the industry, he says. Diversifying power and wealth in the food industry is healthier for the economy, he said, which is why part of the Good Food Strategy is to prioritize small and medium-size food businesses.

"It needs to be a diversity of crops that can be grown by a diversity of farmers," Steiner said. "Therefore, when things break down, you have multiple players and multiple sources of supply."

The pandemic isn't the only crisis that has worsened hunger. Climate change and the conflicts in Ethiopia, Yemen, and Ukraine have also contributed, says Steiner.

"We would not be in such a crisis if we had more regenerative and distributed systems," he said.

Segar, who visited the Ukraine-Poland border in early April 2022, said the World Food Program is pushing to feed 3.1 million people in Ukraine. Food and drinking water shortages are reported in Kyiv and in Kharkiv, two cities bearing the brunt of the war. However, the World Food Program's resources are starting to

dwindle.

Segar said the Rockefeller Foundation takes an original approach to improving food production, and it's one that his organization is working to adopt. The foundation not only gives money, he said, but educates the public about food and uses data and research to make decisions. He referenced Rockefeller's "True Cost of Food" report, which analyzes the impact food has on people and the planet. Segar also cites Rockefeller's Periodic Table of Food, an effort to create a database that breaks down food composition.

Segar said his organization was able to use what it learned from Rockefeller and teach communities in Central America about healthy meals.

Segar said the World Food Program and Rockefeller both want to create a food system that everyone can afford and have access to.

"The right nutrition at the right time can save lives," Segar said.

This article was provided to The Associated Press by the Chronicle of Philanthropy. Kristen Griffith is a staff writer at the Chronicle.

*Taiwan News*

## Taiwan's I-Mei Foods plans environmental campaign to mark 88th anniversary

*By Matthew Strong*



*An I-Mei store in Taipei City. (Taiwan News photo)*

In order to mark its 88th anniversary, leading Taiwan food producer I-Mei Foods Co. will present a series of environmentally themed promotional activities.

A precursor of the company was founded as a traditional cake store on March 30, 1934 by Kao Fan-wang and his wife, Kao Chen Hsiu-ying. Their son, T.C. Kao, transformed the store into a food company and set it on the road to become a major business enterprise.

However, less known is the fact that there was even an

earlier "I-Mei," a dyed cloth shop in Taipei City's Datong District, founded in the spring of 1871 by Kao Chih-kuei, the great-grandfather of I-Mei's current CEO, Luis Ko.

As such, "I-Mei" is one of Taiwan's rare native brands to have been in existence for more than 100 years.

On Jan. 1, 2022, I-Mei CEO Luis Ko announced the company would respond to the global call to fight climate change by fully respecting the plan to cut carbon emissions by 50% by 2030 and to zero by 2050, thus joining the campaign to save Earth.

During 2022, I-Mei will launch a series of promotional activities related to the protection of the environment. Some of the events will take place for Earth Day on April 22, World Ocean Day on June 8, and Taiwan Culture Day on October 17.

I-Mei has been selected seven years in a row as Taiwan's most valuable consumer brand by Kantar Group, the London-based data analytics and brand consulting company. A total of 89.6% of families in Taiwan have bought I-Mei products.

During the COVID-19 pandemic, the company gifted its puff cakes in special packaging to Slovakia and Lithuania as a sign of gratitude for their donations of vaccines.

CEO Luis Ko has said that I-Mei has become inextricably linked to Taiwan, and will in the future continue to contribute to society. If the country and society have the need, I-Mei will be ready and willing to stand up and offer its influence.

*Taiwan News*

# Addressing food security and climate change through regenerative agriculture

By Md. Bodrud-Doza, Manager at the International Centre for Climate Change and Development (ICCCAD) at Independent University, Bangladesh (IUB), and Suraiah Khan, Junior Research Officer at the ICCCAD at IUB



*The rising population of Bangladesh and decreasing available arable lands will increasingly threaten food security.*

*Bangladesh needs to gradually transition to regenerative agriculture to curb the impacts of environmental and climate vulnerabilities to ensure food security for a growing population*

One of the significant challenges that Bangladesh faces is ensuring food security of a growing population. The most viable and holistic solution to this problem is regenerative agriculture. Although the term may not sound familiar to many, it has become a game-changing initiative to sustain agriculture worldwide.

Regenerative agriculture is a farming system that attempts to conserve soil and contribute to multiple provisioning, regulating and supporting services of the ecosystem. And it aims to enhance the environmental, social and economic sustainability of food production. Some practices that are included in regenerative agriculture are diverse crop rotation, no-till/ direct seeding, cover cropping, compost/ manure application, livestock integration, and agroforestry.

Regenerative agriculture can also be considered as a Nature-based Solution (NbS). The International Union for Conservation of Nature (IUCN) defines NbS as “actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.”

Ecosystem based approaches such as agroecology, silvopasture, agroforestry, aquaculture, pasture cropping, biochar, and holistic planned grazing are all regenerative agriculture that falls under the umbrella of NbS. These practices help in ecosystem restoration, ecosystem-based adaptation, mitigation, disaster risk reduction, integrated water resource management, and area-based conservation.

Despite being a densely populated nation that is prone to climate vulnerability, Bangladesh has made various efforts in trying to be prosperous, sustainable, and more resilient to climate change. The country has already taken necessary measures to ensure food security.

People have been practising NbS in Bangladesh for many decades. A rich body of knowledge exists in Bangladesh on how to implement NbS to adapt to climatic impacts. To optimise the positive effects of NbS, the country has implemented a number of projects related to swamp forest restoration, coastal afforestation, floating agriculture, slope vegetation, and many more.

However, if the country is practising NbS then why pay specific attention to regenerative agriculture? The answer is to achieve agriculture sustainability for the long run. This can only be ensured when soil health is improved and prioritised while contributing to improving water and air quality, storing carbon to help mitigate the effects of climate change, and enhancing ecosystem biodiversity.

Methods of regenerative agriculture increase the amount of arable topsoil. It improves soil’s physical properties by decreasing soil compaction, improving aggregate stability, and enhances the chemical quality of soil by increasing their nitrogen and phosphorus content, and increasing exchangeable potassium, sodium, and magnesium.

This form of agriculture also increases the biological quality of soils by substantially increasing soil organic carbon, particulate organic carbon, particulate organic nitrogen contents, and positively affects soil microbial respiration as an indicator for soil biological activity. Causing positive impact to the environment while not compromising crop’s nutritional status, regenerative agriculture is a pre-eminent option for ensuring food security in Bangladesh.

Practices that are incorporated in regenerative agriculture can assist Bangladesh in tackling climate change vulnerability and high population food demands in the future. For example, diverse crop rotation and livestock integration will keep producing food year-round.

Diversification helps improve regulating and supporting ecosystem services such as soil fertility and health, pest control, pollination, nutrient cycling, water regulation, and buffering of temperature extremes. An example of diversification is legume diversification which can be effective for both mitigation and adaptation. Legume diversification does this by reducing the use of nitrogen derived from fossil fuels and providing ecosystem services through nutrient cycling, increasing soil biological activity and erosion control.

As a result, the time adoption of crop diversification can mediate yield stability and decrease the risk of crop loss. Agroforestry practices such as leguminous trees that improve soil fertility and microclimate, no/low tillage or crop residue retention, and organic amendments - in addition to traditional and locally adapted mixed cropping, may increase diversity in soil biological organisms which can contribute to building resilience to multiple stresses such as pest control and drought.

Agriculture has always played an important role in Bangladesh in terms of GDP. The rising population of Bangladesh and decreasing available arable lands will increasingly threaten food security. In a time when we need to be more climate resilient and have sustainable development, giving importance to soil health is crucial.

Soil plays a key role in absorbing carbon and filtering water.

The causes of soil destruction include deforestation which increases erosion, chemical-heavy farming techniques, and climate change. Despite High Yielding Varieties (HYV) of crops, chemical fertilisers and pesticides under subsidised rate, extension of irrigation facilities, mechanisation, the country still faces various challenges in sustainable agriculture development.

Bangladesh has incorporated techniques and tools to sustain soil health, but a more progressive step needs to be taken to make it effectively sustainable. Regenerative agriculture combines all the safe practices from previous and new innovative farming



methods to keep the soil healthy and sustainable for the future. This agricultural method can be designed and decided according to socio-economic and environmental context.

The established practice of tillage systems, use of chemical fertilisers and pesticides, market design of the current agriculture system cannot be changed drastically as it will affect production and cause confusion

among the farmers and related stakeholders.

By studying different geographic contexts and current practices of agriculture, a slow transition needs to be planned and executed to incorporate regenerative agriculture through knowledge generation and capacity building of farmers, relevant institutions and stakeholders.

Hence, a gradual transition with context-based application of the kind of regenerative agriculture that can be used to ensure food security and reduce the environmental impacts and climate change vulnerability must be implemented.

*The Business Standard*

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David Hsu, Director General; Amador R. Honrado, Jr., Editor  
Wendy Yang, Contributing Editor; Teresa Liu, Assistant Editor  
7F-2, No. 760, Sec. 4 Bade Road, Taipei 10567, Taiwan; Tel: (886 2) 2760-1139; Fax: (886 2) 2760-7569  
Email: [cacci@cacci.org.tw](mailto:cacci@cacci.org.tw); Website: [www.cacci.biz](http://www.cacci.biz)