

The climate crisis turns up the heat on Malaysia's food security

Malaysia, already reliant on imports to satisfy domestic food demand, will need to take immediate measures to ensure enough food for the future as we face the devastating impacts of climate change.

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LAST December, Malaysia witnessed a phenomenon that is supposed to only happen once in 100 years: some parts of the country received one month's average rain-fall all in just one day, an incident that led to massive floods.

We were also told that the nine years spanning 2013-2021 were all listed among the 10 hottest years ever recorded.

In recent times, "rare" extreme weather events have become increasingly regular in Malaysia, indicating the troubling state of the climate crisis.

This was underscored by the second instalment of the United Nations' Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) published in February 2022, which warned that "nowhere on Earth would escape the dire impacts from the rising temperatures and increasingly extreme weather", including heatwaves, droughts, floods and rising sea levels. Earlier IPCC reports had already identified South-East Asia as among the world's most at-risk regions for extreme climate events.

The third instalment of the IPCC's AR6, released on April 4, highlighted that global temperatures are still rising, with the window of opportunity to prevent the worst impacts of extreme climate change rapidly closing. According to the report, urgent climate action needs to be taken to keep global temperatures from rising 1.5°C beyond the pre-industrial average, including the rapid transformation of all sectors of the global economy, from energy and transport to buildings and food.

In Malaysia, the growing frequency of unpredictable and extreme weather has directly affected our agricultural sector, painting a potentially distressing future for the country's long-term food security.

Malaysia currently ranks 39th out of 113 countries in the Global Food Security Index, second after Singapore in South-East Asia. We produce about 60%-70% of total rice demand in Malaysia, relying on imports to fulfil the remaining gap.

With population growth, demand for food in the country is expected to increase by 70% to 100% by 2050. In October last year, Agriculture and Food Industries Minister Datuk Seri Dr Ronald Kiang said Malaysia's food security has been affected by the increase in the average annual rainfall and frequency of dry and hot weather over the past few decades, more than 40,000ha of padi fields nationwide were destroyed by floodwaters between 2017 and 2021. Major environmental crises have also caused significant damage to the food producing industry. For example, Malaysia's agriculture and agribased industry suffered a RM239m loss in the aftermath of the 2014/15 floods.

Malaysia must prepare for worst case scenarios that may take place in the future as a consequence of global warming. According to the Asian State of Climate Change Report 2021, a 2°C increase in tem-



At risk: Submerged padi fields after a flash flood in November 2017 in Seberang Prai, Penang. More than 40,000ha of padi fields nationwide were destroyed by floodwaters between 2017 and 2021. — AZHAR MAHFUF/The Star



There must be a unified effort to encourage the development of more resilient crops, says Wan Fazilah. — Pic provided



Agriculture and climate are mutually interdependent. Although climate change affects agriculture, agriculture also affects climate, says Prof Nasir. — Pic provided

perature could cause a decline of rice yields by one tonne per hectare. As a result, rice yields in Malaysia could face a projected decline in the range of -5.9% to -30.9% by 2050 in various parts of the country.

In response to the threat of food insecurity brought about by climate change, the government announced the National Food Security Policy Action Plan 2021-2025, to ensure the sustainability of the country's food supply at all times, especially in the face of unexpected situations. It will focus on all four dimensions of food security in line with the Food and Agriculture Organisation: availability, access, consumption and stability and sustainability.

Lower crop output

Climate change affects the growth of agriculture crops, and recent erratic weather patterns,

such as extreme floods and heatwaves, have had a direct impact on Malaysia's ability to produce food.

Dr Wan Fazilah Fazli Iahli, from Universiti Putra Malaysia's (UPM) department of agricultural technology, says that changes in climate factors such as temperature, sun radiation, wind, rainfall and humidity will affect plants' evapotranspiration (evaporation and transpiration of water from the plant into the atmosphere).

"Needing to survive, the plants have to adapt with the erratic climate. This adaptation may interrupt the plants' growth, which in some cases may reduce yield because of plant stress," she explains.

Wan Fazilah warns that if no action is taken, Malaysia may face insufficient food supply in the long

term and will need to put more reliance on imported agricultural products.

To avoid such an eventuality, there must be a unified effort to encourage the development of more resilient crops.

"The government, agriculture authorities, non-government bodies as well as research universities must focus on finding new ways of either managing or developing new plant varieties that can adapt to climate change," says Wan Fazilah, adding that the findings from such research should be tested and applied to all farm levels from small to large-scale.

"Furthermore, climate prediction models can be used to help farmers plan their future planting management. Such predictions have the potential to empower authorities to make their own assessments of the vulnerability of agriculture production to climate change," she says.

Geographically vulnerable

Despite advances in biotechnology, climate is still a key factor in determining agricultural productivity, says UPM agricultural economist Prof Datuk Dr M. Nasir Shamsudin.

"Of all economic sectors, climate change has the most significant impact on food production because of its broad geographic dispersion and obvious close dependence on climate and environmental factors," Prof Nasir tells *Sunday Star*.

Our geography also plays an important role in the severity of consequences from climate change.

According to the IPCC, South-

East Asia is among the world's most at-risk regions as we face rising sea levels, heat waves, droughts and increasingly intense rainstorms.

Prof Nasir explains that studies conducted around the world have consistently shown that overall production in countries located in the middle and high latitudes are likely to benefit in the near term (approximately until mid-century), while production systems in the low latitudes are likely to decline.

"This has implications for world food security, as most developing countries, including Malaysia, are located in lower latitude regions," he explains.

There also exists potential for greater increases in water stress for crops under a warming climate, further increasing the vulnerability of agricultural produce in developing countries.

Adding to this, Prof Nasir points out that developing countries also have fewer resources to develop appropriate measures to counter negative impacts compared with richer nations.

"If the effects of climate change are not abated, agricultural production in the middle and high latitudes is also likely to decline in the long term, approximately by the end of the 21st century," he says, explaining that this would be primarily due to the detrimental effects of heat and water stress on crop growth as temperatures rise.

In 2020, Malaysia imported RM55.5bil worth of food products compared with RM33.8bil in exports. Since Malaysia is a food deficit country, a policy framework that deals with the effects of

Self-sufficiency ratio (SSR) 2020

SSR: The extent to which a country's supply of agricultural commodities meet domestic demands. SSR of 100% or more indicates that production is sufficient to meet domestic needs.

MORE than 100%		LESS than 100%	
Sugarcane	157.7	Mutton	9.60
Papaya	156.0	Ginger	18.9
Watermelon	139.4	Mango	20.2
Tomato	123.7	Beef	22.2
Starfruit	117.3	Chilli	30.9
Salad	114.0	Round cabbage	37.5
Chicken/duck egg	113.5	Fresh milk	65.0
Binjai	112.3	Rice*	63.0
Cucumber	112.1	Coconut	66.6
Spinach	112.0	Sweet potato	75.6
Jackfruit	109.9	Sardine	80.7
Tuna	108.1	Mackerel	88.2
Long bean	107.2	Lime	91.1
Sweet corn	105.6	Mangosteen	93.1
Durian	105.2	Crab	94.2
Pineapple	104.7	Pork	94.9
Lady's finger	102.2	Langsat	96.6
Shrimp	101.7	Cuttiefish	96.6
Banana	100.1	Torpedo scad	96.9
		Guava	97.6
		Mustard	98.1
		Rambutan	98.2
		Poultry meat	98.4
		Cassava	98.9
		Freshwater catfish	99.9
		Tilapia	99.9

Source: Supply and Utilisation Account, Selected Agricultural Commodities Malaysia 2016-2020, Statistics Department. * Refers to 2019.



In response to the threat of food insecurity brought about by climate change, the government announced the National Food Security Policy Action Plan 2021-2025. — RONNIE CHIN/The Star

climate change on food production is crucial, says Prof Nasir. "Some possible areas in the framework include adaptation strategies to build resilience into production systems, mitigation strategies to reduce or offset greenhouse gas emissions, research and development strategies to enhance food production capacity in response to climate change, and awareness and communication strategies to inform decision-making by agricultural producers," he says.

Interlinked factors

When we look into how we can limit the negative impacts of climate change on our food production, we must acknowledge that the way we grow food also contributes to the climate crisis.

After all, agriculture and climate are mutually interdepend-

ent. Although climate change affects agriculture, agriculture also affects climate, says Prof Nasir.

He explains that their interactions involve temperature effects, water supply and demand, and fluxes of carbon through the processes of photosynthesis and respiration. Emissions from agricultural sources are believed to account for some 15% of today's human-related greenhouse gas emissions, says Prof Nasir.

Recent studies have shown that improved agriculture practices can help significantly reduce emissions of carbon dioxide by increasing carbon sequestration.

Being able to reduce carbon emissions from the agriculture sector depends largely on environmentally-friendly land use and management practices — both of which need strong political and public will.

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