

Disaster Risk Finance Solutions for the Agriculture Sector

Recommendations for ASEAN and ASEAN Member States (AMS)



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Executive Summary

From cyclones and floods to heatwaves and droughts, natural disasters are on the rise around the world. In the past decade alone, nearly one in five people have been affected by extreme climate- and weather-related events.¹

When disaster strikes, resources must be mobilised quickly and efficiently to assist people in affected areas. Having the right financial instruments, policy mechanisms, and disaster management strategies in place allows governments to not only provide emergency humanitarian assistance, but also to repair national assets and infrastructure like buildings, bridges, roads, and communications networks.

Governments typically use a mix of financial tools to address the short-term (emergency response), mid-term (recovery), and long-term (reconstruction) impacts of a disaster. However, these efforts carry a high price tag, and ASEAN member states (AMS) face a variety of challenges, from budget constraints to a lack of cross-sector coordination, enabling legal and regulatory frameworks, internal capacity, quality data, and funding.

In Southeast Asia, where natural disasters are common, there is strong scientific consensus that extreme weather events will become more frequent and severe in the next century. Agriculture, which is heavily dependent on weather patterns, is an especially vulnerable sector. In most AMS, agricultural insurance can provide a pathway for farmers to become more resilient to the financial shocks of natural disasters and climate change, more self-reliant in food production, and better able to apply new technologies and commercialise their operations.

Combined with other disaster risk financing tools, strategies and systems, agricultural and disaster risk insurance markets and programmes can provide a vital financial safety net in times of crisis.

This report looks at the state of disaster risk finance in AMS, addresses barriers to widespread uptake, and highlights potential solutions and best practices. It concludes with a set of recommendations for ASEAN and AMS to build resilience to climate and weather-related disasters, through:

- **Regional cooperation, coordination, and knowledge exchange** between AMS on disaster risk standards, systems, policy, and regulations.
- **Coordinated disaster risk financing and agricultural insurance strategies and instruments**, as well as investments in risk reduction.
- **Robust regional knowledge platforms** that build the technical capacities of governments, insurance companies, and authorities at the ASEAN level.
- **Investments in data, innovative new technologies, and risk market infrastructure and services** to strengthen domestic insurance markets.
- **Well-designed insurance products** that meet the needs of farmers and low-income populations most vulnerable to climate- and weather-related disasters.

¹ IFRC, (2020). *World Disasters Report 2020: Come Heat or High Water*.

Acronyms

AADMER	ASEAN Agreement in Disaster Management and Emergency Response
AAL	Average Annual Loss
ADB	Asian Development Bank
ADCM	ASEAN Committee on Disaster Management
ADPC	Asian Disaster Preparedness Centre
ADRFI	ASEAN Disaster Risk Financing and Insurance
AFD	Agence Française de Développement (French Development Agency)
AHA Centre	ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management
AMS	ASEAN Member States
APEC	Asia Pacific Economic Cooperation
APF	Agriculture Productivity Fund
ASEAN	Association of Southeast Asian Nations
ASWGC	ASEAN Sectoral Working Group on Crops
AUTP	Asuransi Usaha Tani Padi (Rice Farming Insurance)
AUTS	Asuransi Usaha Ternak Sapi (Cattle Insurance)
AYII	Area-Yield Index Insurance
BAAC	Bank of Agriculture and Agricultural Cooperatives
BAPPENAS	Ministry of National Development Planning of the Republic of Indonesia
BCP	Business Continuity Plan
BND	Bruneian Dollar
BNPB	Badan Nasional Penanggulangan Bencana (National Disaster Management Agency, Indonesia)
BPBD	Regional Disaster Management Agencies, Indonesia
CADENA	Non-profit, non-governmental organisation dedicated to prevention and assistance in emergencies and disasters around the world
CAMAIS	Cambodia Micro Agriculture Insurance Scheme
CAT	Catastrophe
CAVAC	Cambodia Agricultural Value Chain Project
CBDRM	Community Based Disaster Risk Management
CBDRR	Community-Based Disaster Risk Reduction
CCFSC	Central Committee for Flood and Storm Control
CEDAC	Cambodian Centre for Study and Development in Agriculture
DA	Department of Agriculture
DBM	Department of Budget and Management
DDMC	District Disaster Management Council
DDMCC	Department of Disaster Management and Climate Change

DDMRC	District Disaster Management and Relief Committee
DDPM	Department of Disaster Prevention and Mitigation
DM	Disaster Management
DMO	Disaster Management Order
DMR	Department of Mineral Resources
DND	Department of National Defence
DNDPC	Department of Natural Disaster Prevention and Control
DPM	Disaster Prevention and Mitigation
DRFIP	Disaster Risk Financing and Insurance Program
DRM	Disaster Risk Management
DRP	Disaster Recovery Plan
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
DWR	Department of Water Resource
EPU	Economic Planning Unit
EU/EC	European Union/European Commission
FAO	Food and Agriculture Organization
FAP	Flood Action Plan
GAA	General Appropriations Act
GDP	Gross Domestic Product
GEM	Global Earthquake Model
GIA	General Insurance Association
GIS	Geographic Informational System
GIZ	German Agency for International Cooperation
GoP	Government of the Philippines
GWI	Global World Insurance
HFA	Hanoi Farmers' Association
ICCO	International Cocoa Organization
ICS	Incident Command System
IDR	Indonesian Rupiah
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
INSARAG	International Search and Rescue Advisory Group
IRRI	International Rice Research Institute
IWE	Industry-Wide Exercises
JICA	Japan International Cooperation Agency
LDRRC	Local Disaster Risk Reduction Councils
LDRRM	Local Disaster Risk Reduction and Management
LDRRMO	Local Disaster Risk Reduction and Management Offices

MADB	Myanmar Agricultural Development Bank
MAFF	Ministry of Agriculture, Forestry and Fisheries
MARD	Ministry of Agriculture and Rural Development
MAS	Monetary Authority of Singapore
MCDF	Malaysia Civil Defence Force
MLSW	Ministry of Labor and Social Welfare
MMK	Myanmar Kyat
MOA	Ministry of Agriculture
MOF	Ministry of Finance
NADMA	National Disaster Management Agency
NaSOP	National Standard Operating Procedures
NCDM	National Committee for Disaster Management
NCIF	National Catastrophe Insurance Fund
NDC	National Disaster Council
NDCC	National Disaster Coordinating Council
NDMO	National Disaster Management Organization
NDMO	National Disaster Management Office
NDPC	Natural Disaster Prevention and Control
NDPCC	National Disaster Preparedness Central Committee (Myanmar)
NDPCC	National Disaster Prevention and Control Committee (Lao PDR)
NDPMC	National Disaster Prevention and Mitigation Committee
NDRRM	National Disaster Risk Reduction and Management
NDRRMC	National Disaster Risk Reduction and Management Council
NDWC	National Disaster Warning System
NGO	Non-Governmental Organisation
NSC	National Security Council
NTU-ICRM	Nanyang Technological University's Institute of Catastrophe Risk Management
OCD	Office of Civil Defence
OIC	Office of Insurance Commission
PCIC	Philippine Crop Insurance Corporation
PHP	Philippine Peso
PPP	Public-Private Partnership
PPPP	Private-Public-Producer-Partnership
QRF	Quick Response Fund
RDRRMC	Regional Disaster Risk Reduction and Management Council
RGC	Royal Government of Cambodia
RID	Royal Irrigation Department
RIICE	Remote Sensing-based Information and Insurance for Crops in Emerging Economies
RM	Malaysian Ringgit
RMPFRD	Royal Malaysian Police & Fire and Rescue Department
RRD	Relief and Resettlement Department
SDMRC	State Disaster Management and Relief Committee
SEADRIF	Southeast Asia Disaster Risk Insurance Facility
SFA	Singapore Food Agency
SME	Small and Medium-sized Enterprise
SNAP	Strategic National Action Plan
SNV	Netherlands Development Organisation

SO	Standing Order
SPA	Strategic Plan of Action
SPRVs	Special Purpose Reinsurance Vehicles
SPTP	Paddy Takaful Coverage Scheme
TC	Typhoon Committee
TGIA	Thai General Insurance Association
THB	Thai Baht
TMD	Thai Meteorological Department
UN GAR	United Nations Global Assessment Report on Disaster Risk Reduction
UNDAC	United Nations Disaster Assessment and Coordination
UNDP	United Nations Development Programme
UNISDR	United Nations International Strategy for Disaster Reduction
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USD	United States Dollar
VAT	Value Added Tax
VND	Vietnamese Dong
VNDMA	Vietnam Disaster Management Authority
WFP	World Food Programme
WOCAT	World Overview of Conservation Approaches and Technologies
WOG-IRM	Whole of Government Integrated Risk Management

Disaster Risk Finance: An Overview

Worldwide, natural disasters are on the rise. From cyclones and floods to droughts and earthquakes, 1.7 billion people – nearly one in five in the world – have been affected by weather-related disasters in the past decade.² In low- and middle-income countries (LMICs), heatwaves, storms, and other natural disasters have destroyed lives, homes, and livelihoods.

Climate change is magnifying these risks. Changes in global atmospheric greenhouse gas (GHG) concentration are leading to higher temperatures, changing weather patterns and local weather extremes, among other effects. In Southeast Asia, there is strong scientific consensus that extreme weather events will become more frequent and severe in the next century. Agriculture, which is heavily dependent on weather patterns, is an especially vulnerable sector.³

The effects of natural disasters are felt not only in the lives of individuals and communities, but across entire economies. In the aftermath of a disaster, governments must respond quickly to provide

emergency assistance to people in affected areas and repair government assets and infrastructure like buildings, bridges, roads, and communications networks. However, disaster prevention, preparedness, response, and recovery all carry a high price tag, and mobilising resources quickly and efficiently requires having the right financial instruments, policy mechanisms, and disaster management strategies in place.

1.1 What is disaster risk financing?

➔ **When disaster strikes, disaster risk finance provides a safety net.**

Disaster risk finance helps countries address the fiscal impacts and economic losses of natural disasters.

From contingency funds and insurance to disaster management plans, disaster risk finance provides the tools that individuals, communities, and governments need to cope with a natural disaster, reduce the physical risk of disasters in the future, and become more resilient to financial shocks.

² IFRC, (2020). [World Disasters Report 2020: Come Heat or High Water](#).

³ See IPCC, AR5, [Ch. 24: Asia](#).

Disaster risk finance gives governments greater financial security.

The main purpose of disaster risk finance instruments is to pay out money to affected populations and repair and rebuild critical national assets and infrastructure. Having disaster risk financing instruments in place ensures that governments have sufficient resources to respond quickly and efficiently and to know in advance what disaster response will cost.

Disaster risk finance helps people recover from a disaster.

Whether a one-time cash payment from the government, an insurance policy, derivative, or insurance-linked security, disaster risk finance provides people in disaster-affected areas with the short- and long-term financial support they need to access supplies and essentials, such as food, medicine, clean water, shelter, electricity, and communication.

Disaster risk finance allows farmers to stay in business.

Farmers, especially smallholders, are some of the most exposed and vulnerable to the impacts of climate change and weather-related disasters, such as drought and heatwaves, pests and diseases, storms, and flooding. Agricultural insurance can provide a vital financial safety net for farmers whose livelihoods depend on the weather and who can fall into a precarious financial position when crops fail, or livestock is lost.



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Investing in disaster risk reduction helps individuals, communities, and governments become more financially resilient.

→ Disaster risk finance gives individuals, communities, and governments the financial tools they need to prepare for, respond to, and recover from a natural disaster.

Disaster reserve funds, contingent credit lines, and risk transfer solutions such as insurance all help to address the short-term (emergency response), mid-term (recovery), and long-term (reconstruction) impacts of disasters. These tools can be used in combination to cover various “risk layers” depending on the relative frequency and severity of disaster events.

1.2 Financing disaster preparedness and emergency response

There are three main types of short-term disaster risk financing tools that governments can set up in advance and use when disaster strikes.

1. Disaster reserve funds

Government reserves, such as annual disaster contingency funds (that lapse at year end) or multi-year disaster reserve funds (that build up over time), provide immediate, short-term funding to help affected populations cope with the impacts of a disaster. These ad hoc government pay-outs are typically used to rebuild infrastructure and meet life essentials. For example, for subsistence households to repair or rebuild private dwellings and household property, or for low-income households to pay for basic supplies, such as food, clean water, shelter, electricity, and internet. While budget constraints can limit the size of these reserves, without them, governments are forced to rely more heavily on foreign aid.⁴

→ Disaster reserve funds are best suited to low-severity, high-frequency disasters like floods, landslides, and earthquakes.

2. Contingent credit lines

Contingent credit arrangements with the World Bank or other international and regional financial institutions are pre-arranged loans disbursed to national governments after a disaster to deliver a quick and robust response.

→ Contingent credit lines are best suited to medium- and high-severity disasters that require extraordinary government spending.

3. Insurance and other risk transfer solutions

Risk transfer solutions, such as insurance and global and regional risk pools, transfer risks to a third party and provide the insured – whether a government, a business, or an individual – with a contractual right to receive a set amount of funds in the event of a disaster. Insurance policies protect the policyholder against the risk of financial losses to their property or other assets.

Without insurance, governments must bear the full cost of disaster relief and recovery. It is usually not financially sustainable for governments to assume this risk, especially since climate change is making natural disasters more frequent, severe, and expensive. Insurance pools and shifts the burden of risk and protects individuals, businesses, and households from financial ruin. For example, with an insurance policy, a small business can cover their business assets, the value of their products, or business interruption.

→ Risk transfer solutions like insurance are best suited to high-severity and low-frequency disaster events, such as storms, extreme rainfall, or drought.

There are many types of insurance – catastrophic, property, business interruption, liability, and agricultural (multi-peril, yield insurance, weather index) – but the main function of each is to provide financial compensation for damages suffered from a risk event, such as a natural disaster.

⁴ Ibid.

Catastrophe insurance

Disaster risk financing instruments like catastrophe insurance work at regional, sectoral and country levels, and can be purchased or acquired by local and central governments to receive compensation for financial losses from a certain risk event. It can cover damage to government assets, such as buildings and infrastructure, and provides governments with the liquidity and financial security they need to respond and recover from a disaster. If the insured (central government or responsible government agency) underestimates the potential loss from the disaster, the funds paid via the insurance policy or derivative structures may not be enough to cover all reconstruction and recovery costs.

Agricultural insurance

Agricultural insurance protects a farmer's assets and investments in production from the negative impacts of certain risks, such as low crop yields or the loss of livestock. There are several different types of agricultural insurance: crop, livestock, aquaculture, forestry and plantation, and greenhouse insurance. Agricultural insurance can be index- or indemnity-based (see Box 1).

Farmers that qualify for agricultural insurance and hold an insurance policy can expect to receive a pay-out following a risk event. Agricultural insurance also helps national and regional governments concentrate on social and infrastructure recovery after a natural disaster since farmers' production risks can be managed through their own insurance instead.

→ Farmers might choose different levels of reimbursement and insurance premiums based on their risk preferences and beliefs about the future.

Weather index insurance

Weather index insurance (see definitions in Box 1) solutions provide financial resources for emergency response quickly after a disaster event and allow regional or country authorities to disburse pay-outs based on post-disaster needs. Such products have a lower basis risk as they do not cover individual farmers, but rather certain areas (a local government area, province, region, or the entire country).

→ Weather index insurance is best suited to insuring catastrophic weather events for large groups or in large areas.



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Box 1. Definitions

Indemnity insurance

An insurance policy that compensates the insured for certain unexpected damages or losses up to a certain limit, usually the amount of the loss itself. Insurance companies provide coverage in exchange for premiums paid by the insured. The intention is to make the insured party “whole” again, or in the same financial position as they were before the disaster.

Index insurance

Index insurance pays out benefits for the loss of assets and investments from weather and catastrophic events. It is based on a predetermined statistical index that measures deviations from typical levels of rainfall, temperature, earthquake magnitude, wind speed, crop yield, livestock mortality rates, and other indicators. Benefits are triggered when a natural disaster exceeds the levels in the index, such as a certain amount of rainfall in a certain period. Index insurance provides a more objective and faster way to receive benefits since insurers do not need to assess the damage, and the insured do not need to make a claim. It is important to note, however, that the statistical deviation from the index may not necessarily reflect actual, “real life” losses.

Sources: Investopedia. “[Indemnity Insurance](#)”; International Finance Corporation (IFC). “[Index Insurance – Frequently Asked Questions](#)”.



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1.3 Financing disaster recovery and reconstruction

Traditional insurance instruments require losses to be reported and verified, which takes longer to make pay-outs than the three emergency response instruments described in the previous section. However, traditional insurance and reinsurance can be more efficient for longer term disaster recovery and reconstruction. Reinsurance is essentially insurance for insurers. For example, an insurance company that offers drought insurance to farmers in Southeast Asia pools local drought risks. However, if there is a widespread drought that affects the entire region, the insurer would not be able to resolve claim payments since all insured

farmers would make claims at the same time. The insurer must therefore transfer this risk to a reinsurer that pools risk from many different sectors and geographical areas.

→ Investments in physical risk reduction, such as strengthening flood defences and building codes, are the most efficient use of government resources for high-frequency disaster events.

Box 2. Other Disaster Financing Tools for Emergency Response

Market-based instruments, such as catastrophe (CAT) bonds, index-based contracts and insurance-linked securities, can all bolster disaster financing although these instruments typically require premium payments in advance. These instruments have proven especially useful when national and regional governments need financial resources for emergency response as quickly as possible after a disaster.



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Disaster Risk Management and Finance in the ASEAN Region

The ASEAN region is more prone to natural disasters than any other region in the world. From cyclones and typhoons to floods, drought, earthquakes, and volcanic eruptions, natural disasters have taken an enormous toll on ASEAN member states (AMS) in terms of loss of lives, livelihoods, and development gains.

Of the 10 countries most affected by the impacts of extreme weather events between 2000 and 2019, four are ASEAN member states: Bangladesh, Myanmar, Philippines, and Thailand. Meanwhile, rapid economic growth, urbanisation, and climate change are magnifying the impacts of natural disasters and driving up the costs of disaster relief, response, and recovery. Over the past decade, it is estimated that natural disasters have cost the ASEAN region on average USD 4 billion a year.

Most ASEAN countries⁵ have disaster risk management funds or other types of reserves to mount disaster relief efforts, including national budgetary allocations and reallocations. Credit arrangements are in place with the World Bank and Asian Development Bank (ADB) to respond quickly to disasters. Insurance is used to a limited extent to provide financial compensation after a disaster, but insurance uptake is low in most AMS, and

national insurers have limited financial capacity. This has left governments with few options but to absorb most of the costs. However, given the dynamic economic development underway in the ASEAN region, and low market penetration for many types of insurance (property, business interruption, motor, life, and health), there may be major potential for growth in domestic insurance markets.

“Climate change increases the frequency and intensity of extreme weather events such as floods, typhoons, and droughts. Rapid growth puts more people and assets in harm’s way.”

– Southeast Asia Disaster Risk Insurance Facility (SEADRIF)

⁵ Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam.

2.1 Disaster risk management tools in AMS

All ASEAN countries have national legislation on disaster risk management that provides a legal framework for governments to respond quickly to disaster events.

Brunei, Malaysia, and Singapore have specific laws that focus on emergency preparedness and response to natural hazards, as well as some technological hazards. Each of these countries have elements of early warning and recovery response in place.

Cambodia, Indonesia, Lao People's Democratic Republic (PDR), Myanmar, Thailand, and Vietnam have broad legislation covering the full spectrum of disaster risk management, including prevention, preparedness, early warning, mitigation, emergency management/response, and early recovery. The legislation establishes special national institutions responsible for coordinating disaster risk management, as well as local structures with varying responsibilities and functions in each country.

The Philippines is the only AMS with a permanent disaster risk management system that gives high priority to disaster risk reduction. The aim of the national system is to establish a whole-of-society approach to disaster risk governance.

→ Governments in AMS currently retain most of their disaster risk. To finance disaster response activities, they rely heavily on annual (contingency) budget allocations for potential disaster events and post-disaster reallocations.



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Table 1. Disaster risk management tools in ASEAN member states

Country	Disaster risk management tools
Brunei Darussalam	There are no specific provisions on financing disaster risk management in Brunei, but legislation gives the National Disaster Management Centre the authority to reallocate funds from the state budget to respond to disasters.
Cambodia	Legislation provides the National Committee for Disaster Management with national budget funds and authorises it to receive external funds in compliance with legal procedures and regulations.
Indonesia	Budgets are allocated annually for disaster preparedness, response, and recovery. The national government also makes an annual allocation to a “ready fund” to support fast disaster response. Regional governments are also required to budget funds for disaster management.
Lao PDR	National legislation requires the government to allocate three per cent of the annual budget to the National Emergency Fund, which is to be used for disaster management and relief assistance, including holding rice reserves, money, and fuel.
Malaysia	Funds for disaster risk management are budgeted annually at state and district levels. The National Disaster Management Agency has a specific fund for disaster risk response that makes funds available quickly in the event of a disaster.
Myanmar	The National Disaster Management Committee manages the Disaster Management Fund, providing an annual allocation of MMK 20 billion (around USD 20 million). Regional and state bodies have similar disaster management roles and powers.
Philippines	National legislation has a high degree of detail and a broad mandate for disaster risk management institutions, including sub-national governments, civil society, and the private sector. The National Disaster Risk Management Fund has a special quick response fund (30 per cent of annual allocations are for disaster risk management) for standby relief. The rest of the funds are used for broader disaster risk reduction and management activities. National legislation requires local governments to set aside five per cent of estimated regular revenue to support disaster risk management activities, including preparedness programmes, training, purchase of rescue equipment, and response activities.
Singapore	The Government of Singapore makes no annual budgetary allocations for disaster response because disaster risks in the country are low. In the event of a disaster, the Operations Civil Emergency Plan is activated, which gives the Singapore Civil Defence Force the authority to direct all response forces under a unified command structure and allows the required resources to be pooled.
Thailand	The Disaster Prevention and Mitigation Act of Thailand requires the central government and provincial governors to identify and budget funding for disaster relief, but there are no specific provisions for the amount of funding. Thailand’s Ministry of Finance is responsible for financing and managing the Disaster Relief Contingency Fund.
Vietnam	Financial sources for natural disaster prevention and mitigation come mainly from state budget funds, but national legislation specifically establishes procedures for accepting voluntary contributions from organisations and individuals, including from abroad.

2.2 Disaster risk financing for the agriculture sector in AMS

Agriculture is a core sector in the ASEAN region, with 40 per cent of the working population relying on farming for their income and livelihood. Dependence on the weather makes the sector extremely vulnerable to climate- and weather-related disasters, and AMS face frequent disaster risks that threaten food security and social stability in highly populated rural areas.

Disaster risk management frameworks in AMS usually do not have specific funding arrangements for major disaster events in agriculture.

Disaster risk management frameworks in AMS concentrate mainly on providing immediate and short-term humanitarian support to people suffering from the impacts of a disaster. A high proportion of rural farming households in the ASEAN region depend on publicly provided disaster relief.

Other than agricultural insurance programmes in Indonesia, the Philippines, Thailand and Vietnam, there are few suitable climate and disaster risk financing tools for affected farming and rural communities. Instead, government disaster assistance is provided to farmers through direct payments or the provision of in-kind seeds, fertilisers, and other agricultural inputs and support (see Table 2). Numerous cases of ad hoc post-disaster financial assistance have been reported in Cambodia, Indonesia, the Philippines, Thailand, and Vietnam.

Microloans and bank credit are developing rapidly in many AMS and have the potential to provide greater financial security for farmers affected by disaster.

In Thailand, rice and maize farmers who have agricultural loans from the Bank for Agriculture and Agricultural Cooperatives (BAAC) are automatically covered by crop insurance at no cost. Governments may also allow credit

repayments or interest to be rescheduled to help farmers recover from a sudden financial setback.

State-subsidised agricultural programmes are widespread in AMS.

Government-funded agricultural refinancing is available for seeds, fertilisers, fuel, machinery, and water access (irrigation). Several pilot projects are assisting farmers with the cost of agricultural insurance, including in Cambodia where a local insurance company has subsidised premiums.

One of the greatest disaster risks in AMS is drought. In 2019 it accounted for over 60 per cent of average annual losses from all disasters in Southeast Asia – around \$51 billion.⁶



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⁶ ESCAP, (2019). "Asia-Pacific Disaster Report 2019", as cited in *The ASEAN, The Inside View: Disaster Management*, pp.17–18.

Box 3. Spotlight on Myanmar

In Myanmar's Central Dry Zone, years of drought have significantly affected crop production, leading to food shortages for both people and livestock.

In 2010, severe drought depleted village water sources across the country and destroyed agricultural yields of peas, sugar cane, tomato, and rice. Short spurts of excessive precipitation are expected to alternate with longer periods of drought.

Meanwhile, the intensity of rains has increased, and flooding is common during the rainy season across the entire country. In 2008, the situation worsened when dam spillways collapsed, heavily flooding rice paddy fields and covering them with sand that had to be removed before the next growing season.

→ Myanmar does not currently have a flood risk model, which could help strengthen knowledge and capacity in risk management.



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Table 2. Government disaster assistance for the agricultural sector in AMS

Country	Disaster risk management tools for the agricultural sector
Brunei Darussalam	50 per cent subsidy for the market price for fertiliser, pesticides and machinery (as of 2018).
Cambodia	Irrigation system improvements and occasional financial relief from the government.
Indonesia	Fertiliser and seed subsidies, provision of pre- and post-harvest machinery, improvements to irrigation infrastructure, construction of new dams, and maintenance of existing dams and irrigation canals.
Lao PDR	Technical assistance, agricultural training, tools, and seeds.
Malaysia	The Malaysian National Disaster Relief Fund provides financial aid to victims to alleviate the loss of income, damaged or demolished houses, and agricultural damages, including to livestock and aquaculture.
Myanmar	In the aftermath of Cyclone Nargis, the Government of Myanmar provided loans to affected households for the purchase of seeds and agricultural tools. Following Cyclone Nargis in 2008, the Ministry of Forestry provided subsidised timber for reconstruction at less than 20 per cent of its production cost.
Philippines	Provision of seeds, fertilisers and inputs, rescheduling of credit repayments or interest may be granted, and support for infrastructure rehabilitation (e.g. irrigation). The PCIC programme also provides non-crop agricultural assets, credit, and life insurance.
Singapore	No disaster risk assistance is currently available for farmers.
Thailand	Direct payments to farmers are provided through an agricultural insurance scheme for rice, maize, and livestock. Farmers can make claims to cover damages at any time following the disaster event, which are assessed based on criteria for triggering the payment and validation of the damage. For rice, the insurance pay-out is THB 1,260/rai. In response to the ongoing drought in Thailand, the government recently made a pay-out to every rice farmer affected by the drought based on the amount of land they have, regardless of whether they were part of an insurance programme.
Vietnam	Financial resources for natural disaster prevention and mitigation come mainly from state budget funds, but national legislation specifically establishes procedures for accepting voluntary contributions from organisations and individuals, including from abroad. Following major typhoon and flood events, farmers receive compensation payments, usually in the form of seeds and fertiliser or small animals to replace lost livestock.

Spotlight on SEADRIF & ADRFI-2

In December 2018, several ASEAN countries, supported by the Government of Japan, established the Southeast Asia Disaster Risk Insurance Facility, or SEADRIF. SEADRIF is a regional platform that provides ASEAN member states with technical advice and financial services to be more prepared and financially resilient to climate and disaster risks.¹ It is anticipated that SEADRIF will become a regional catastrophe risk pool to help ASEAN manage natural catastrophic events and disasters and protect people and livelihoods.

Technical assistance for SEADRIF is provided by the World Bank Disaster Risk Financing and Insurance Program (DRFIP) to help countries in the region develop or enhance insurance arrangements for public assets. SEADRIF is planning to assist ASEAN countries in creating a structure for a regional risk mitigation facility, to develop a flood risk assessment model, and to contribute suggestions to the design of insurance products.

The SEADRIF insurance company was licensed as a general insurer by the Monetary Authority of Singapore in October 2019. The first product is a regional CAT pool that covers flood risks in Lao PDR and Myanmar.

The strategic plan of action (SPA) for ASEAN cooperation was adopted by the Sectoral Working Group on Crops (ASWGC) and concentrates on the following activities:

- Ensuring higher crop production and quality of commodities;
- Enhancing trade and economic integration between countries in the region and market access;
- Ensuring food security, food safety, and better nutrition for populations in AMS;
- Strengthening resilience to climate change, natural disasters, and other shocks;
- Improving access to resources for small producers to improve productivity and competitiveness; and
- Strengthening ASEAN joint disaster risk management approaches on international and regional issues.

An examination of SEADRIF's planned activities has revealed no direct link to agricultural risk management and mitigation, nor to specific insurance mechanisms in agriculture. Agricultural insurance is mentioned only once in the SPA under Objective 4.1 "to promote good agriculture practices incorporating resilient technologies (climate, natural disasters) to minimize the negative effects on natural resources".¹ Capacity building activities are anticipated for crop insurance, but there are no references to other types of agricultural insurance (livestock, forestry, aquaculture, perennial plantings, greenhouses, etc.).

Spotlight on SEADRIF & ADRFI-2

The SPA does not reference activities to develop agricultural insurance or output indicators to measure the effectiveness of activities. This indicates there is no strategic focus on agricultural disaster insurance at the ASEAN secretariat. The activities of SEADRIF may result in some targeted solutions for the agricultural sector, such as pricing flood risk for agricultural production, but there is no guarantee this will be a key focus.

In 2019, ASEAN launched Phase 2 of the Disaster Risk Financing and Insurance Program (ADRFI-2), which aims to enhance knowledge and build capacity in ASEAN for ex-ante risk financing and risk transfer strategies. ADRFI-2 will adopt an open architecture structure to support global collaboration with stakeholders, including policymakers, governments, multilateral development organisations, banks (African Development Bank, World Bank, etc.), and the private sector. Key focus areas are risk assessment, risk advisory, and capacity building.

Activities under ADRFI-2 will strengthen ASEAN's overall disaster risk management capabilities and complement public and private disaster risk finance solutions, such as SEADRIF. However, efforts are currently targeting more general aspects of disaster mitigation and financing, not agricultural insurance specifically.

¹ <https://asean.org/storage/7.-SPA-ASWGC-2021-2025-Final.pdf>

² ESCAP. (2019). "Asia-Pacific Disaster Report 2019." As cited in *The ASEAN, The Inside View: Disaster Management*, pp.17–18.

2.3 Agricultural insurance in AMS

In Southeast Asia, an estimated 100 million smallholder farmers produce commodities and staple food crops, such as rice, vegetables, and maize. Agricultural insurance could provide a pathway for these farmers to become more resilient to the financial shocks of natural disasters and climate change, more self-reliant in food production, and better able to apply new technologies and commercialise their operations.

Agricultural insurance is still in early stages of development in most AMS.

Several agricultural insurance programmes based on weather or yield index principles have recently been introduced in Cambodia, Indonesia, Thailand, and Myanmar. Insurance policies are purchased by individual

farmers, but group policies are available in some countries, such as Indonesia. However, some programmes been suspended due to lack of interest from farmers, significant basis risk, limited risk coverage, and the cost of insurance premiums.



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Government subsidies can boost farmers' interest in agricultural insurance, encourage uptake in some contexts, and address potential market failures.⁷

In some AMS, agricultural insurance is heavily subsidised by the government, offering lower premiums and providing greater certainty for farmers since subsidised agricultural insurance has certain rules for loss compensation that allow farmers to calculate their potential pay-out in advance. Disaster assistance, on the other hand, often depends on emergency funding from the government, which cannot be accurately forecasted.

Agricultural insurance subsidies are available in four AMS. Farmers in Indonesia, Philippines, Thailand, and Vietnam can enrol in state-subsidised agricultural insurance programmes for crops and aquaculture.

Numerous studies have found that insurance premium subsidies may create incentives for farmers to protect their assets and investments against natural hazards.

Subsidies may also encourage farmers to consider better risk management and production technologies that can stimulate higher productivity. However, international development organisations and reinsurers, such as the World Bank, ADB, and Swiss Re,⁸ do not necessarily agree that premium subsidies are sufficient incentive for crop and livestock producers to purchase insurance cover.

In general, farmers are interested in applying for and purchasing agriculture insurance if premiums are affordable, it is carefully tailored to their real risks and needs, and the claim and payment process is fast and transparent.

Still, agricultural insurance markets may require long-term support from government.

Insuring the large number of farmers in the ASEAN region is extremely challenging for insurance companies. Complex distribution, extensive loss adjustment costs, significant investments in infrastructure to manage large volumes of data, and communication issues with clients to conclude insurance policies and manage insurance claims, are all barriers. Premium subsidies from national governments can provide the support needed to boost farmers' interest in insurance and trigger expansion of domestic insurance markets.

→ Government and the private insurance sector have vital roles to play in strengthening domestic insurance markets, raising awareness of the value of agricultural insurance, and creating incentives for farmers to adopt it.

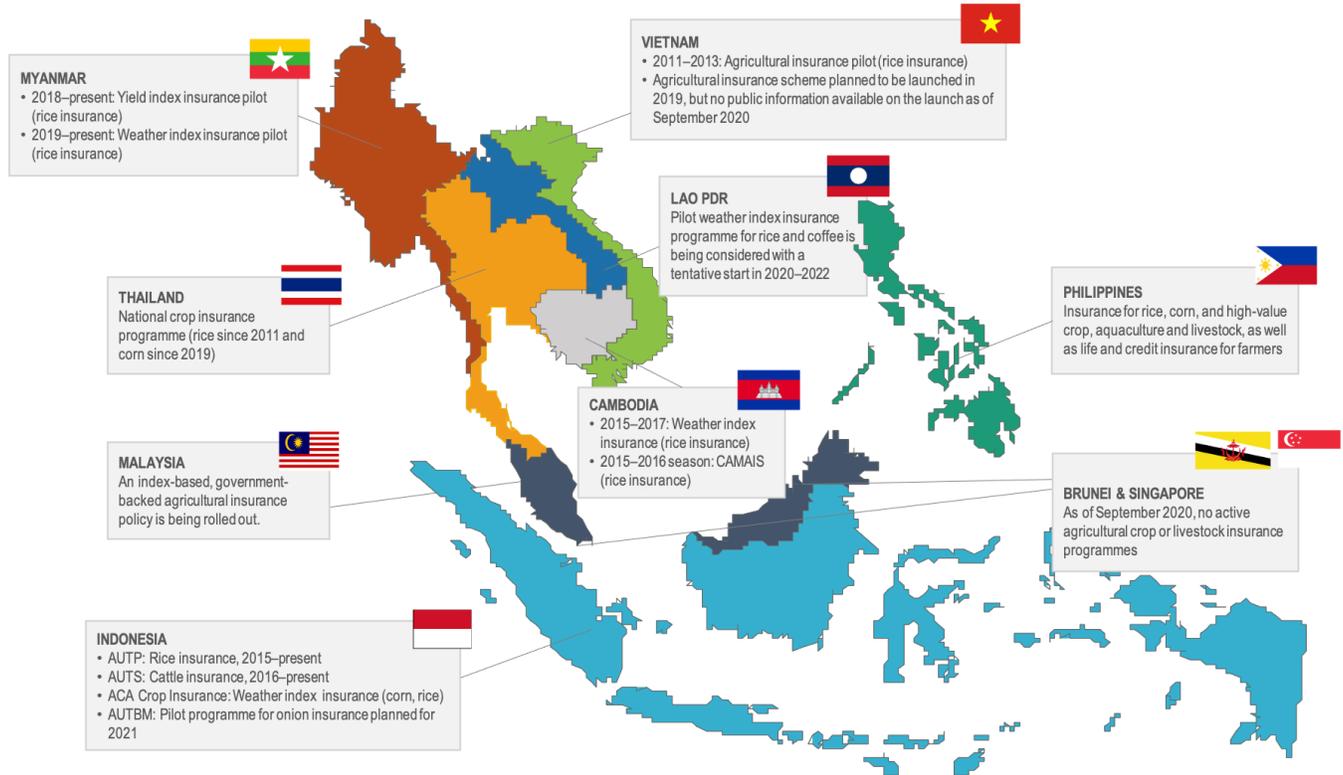
Box 4. International cooperation in agriculture in AMS

AMS are developing their agricultural sectors with financial and technical assistance from development organisations active in the region, including the ADB, Swiss Agency for Development and Cooperation (SDC), IFC/World Bank, International Fund for Agricultural Development (IFAD), JICA, GIZ, KfW, Oxfam, and others. Support is provided primarily in the form of research, technical assistance, and capacity building. For example, the multi-partner RIICE (Remote Sensing-based Information and Insurance for Crops in Emerging Economies) project promotes the use of innovative, satellite-based remote sensing technology for assessing crop losses.

⁷ According to numerous sources, the most developed agricultural insurance programmes are in countries with long-term commitments to government support, such as the US, Canada, Turkey, and Spain.

⁸ Swiss Re, (September 2019). "Revolutionizing agricultural insurance", a presentation to the OIC executive programme.

Figure 1. Agricultural insurance initiatives in AMS



Source: Agriinsurance, 2020

Brunei and Singapore do not have active agricultural insurance programmes since they are primarily urban with small agricultural sectors and low exposure to disaster risk. However, both countries have disaster risk mitigation legislative frameworks and action plans. Brunei and Singapore actively participate in regional disaster mitigation activities, including with the Asian Disaster Reduction Centre, the Asia Disaster Preparedness Centre, the Pacific Tsunami Warning Centre, and the Pacific Disaster Centre.

In **Cambodia**, the volume of agricultural insurance business is low (less than USD 100,000 per year), mainly due to an underdeveloped insurance sector and limited technical capacity. Crop insurance has been almost entirely underwritten by the Forte insurance company under piloted products that have since been abandoned due to poor performance. A weather index crop insurance pilot for rice was discontinued due to the high investment

costs required to install and maintain weather stations, and a soil moisture index crop insurance pilot generated little interest from farmers due to unaffordable premiums and no premium subsidy.

There are currently no on-going programmes, although these pilots provided important lessons for future insurance pilots and the value of supportive government policy. Other than Forte, only one other pilot has been tested in Cambodia to insure rice farmers against climate risks, but it was abandoned due to low uptake from farmers. Other insurance companies in Cambodia have limited interest in crop or livestock insurance due to lower potential returns, the complexity of programmes, and the high administration costs of launching and maintaining programmes sustainably in rural areas. Government support for subsidies is expected to stimulate the

country's agricultural insurance market, but legislative and insurance regulatory frameworks need to be strengthened.

In **Indonesia**, agricultural insurance has been actively underway since 2012, and several programmes provide cover for farmers through a public scheme, a public-private partnership (PPP), and a pilot supported by an international donor (development agency). Other pilots are planned to be launched by the end of 2021, including rice indemnity insurance and livestock insurance (both subsidised by the government), commercial weather index insurance for maize and rice, and yield index insurance for rice and red shallot. Private insurer ACA recently offered maize and rice index insurance together with Japanese insurance company Sampo, but the programme was suspended in 2020 due to unsustainable performance.

An area-based yield index insurance programme has been in development since 2019 with the assistance of the Japan International Cooperation Agency (JICA). The programme has a major focus on West Java and will launch in 2021. Indonesia's national meteorological agency has collected good-quality weather data that could be used to enhance agricultural insurance in the country, but better agricultural insurance data is still needed to improve underwriting and loss adjustment practices. The Indonesian Government has introduced a legislative framework for disaster risk management and launched a catastrophe insurance pilot for state-owned property under the Ministry of Finance.

In **Lao People's Democratic Republic**, agricultural insurance is not widespread. Although agricultural and forestry insurance are available (according to public data sources), it is not compulsory and uptake is unknown.

According to some sources, the government is considering a crop insurance pilot for rice and coffee that

would launch between 2020 and 2022. Weather index insurance has also been suggested for piloting.

Malaysia participates in regional disaster risk management platforms and a government-backed, index-based agricultural insurance product is currently being rolled out. While index solutions may be the best option for agricultural insurance, developing risk profiles for major crops, livestock, and key production areas would reveal the best options for disaster risk management, insurance solutions, and financing approaches.

In **Myanmar**, agricultural insurance programmes are in the pilot stage. Crop insurance projects currently being promoted include pilots for yield index insurance and weather index insurance for rice. A feasibility study is also being conducted by Mitsui-Sumitomo (backed by JICA) to understand the opportunities of weather index insurance for the agricultural sector. The Action Plan on Disaster Risk Reduction has been launched, which includes vulnerability and risk assessments and the production of a national hazard and vulnerability atlas. However, disaster risk management is still in an early stage. There is no comprehensive disaster risk management law, and capacities at all levels are reported to be rather limited. State-owned Myanmar Insurance has a monopoly over all insurance and reinsurance business in the country.

The Philippines and Thailand are home to the longest running agricultural insurance programmes in the ASEAN region.

The Philippines has a comprehensive agriculture insurance programme, with the government-owned Philippine Crop Insurance Corporation (PCIC) offering a variety of crop insurance covers (e.g. rice, maize, high-value commercial crops) to farmers, as well as livestock, fishery, non-crop agricultural assets, credit, and life insurance. The crop insurance programme provides limited cover to farmers based on a percentage (share) of production costs. Claims are paid only if the government declares a disaster (a legislative requirement), which may be too restrictive to scale up certain products among SMEs and commercial smallholder farmer groups.

In **Thailand**, agricultural insurance is relatively developed with over 20 insurance companies providing insurance cover to rice farmers. Insurance is supported and partially subsidised by the government. The loss ratio for the rice insurance programme in 2019 was estimated at over 150 per cent, and the rating structure may need to be revised to balance actual risk exposure with the premium rates for different insurance products.

Key challenges include low coverage levels (28 per cent of total production costs) and the claim to be triggered when the government declares a disaster. Insurance is primarily bundled with loans for farming clients of the Bank for Agricultural and Agricultural Cooperatives (BAAC), although farmers without loans can get insurance cover if they pay 40 per cent of the premium. Several pilots are underway, including a government-backed maize project, a BAAC-intended programme for fruit and dairy farmers, and a crop insurance pilot for commercial longan farmers.

In **Vietnam**, the government is planning to implement agricultural insurance for rice, buffalo, cattle, black tiger prawn, and white-legged shrimp. Vietnam has a well-developed natural disaster management system, with a post-disaster emergency relief and reconstruction scheme funded in part by the national government and local government bodies.



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Table 3. Agricultural insurance products available in AMS

Country	Insurance Products			Major Crops	Major Risks	Risk(s) Covered	Target Beneficiaries	Source of Premium	Size of Subsidy	Implementing Agency	Total Premiums in 2019, USD	Total Sum Insured in 2019, USD	Total Payouts in 2019, USD
	Indemnity	Index	Target crop(s)										
Brunei Darussalam	–	–	–	Vegetables, fruits, rice	Flood, forest fires, strong winds, landslides	–	–	–	–	–	–	–	–
Cambodia	–	✓	Rice (2015–2017)	Rice, cassava, vegetables/ fruits, maize, rubber	Drought, flood, fire, strong winds (storm), typhoons/ tropical cyclones, pest outbreaks, diseases	Excessive rain, drought, dry days	Smallholder farmers, individual farmers	Unsubsidised	–	Private company	N/A	N/A	N/A
Indonesia	✓	✓	Rice, maize	Rice, maize, rubber, cocoa, coffee, palm oil	Drought, flood, heat stress, windstorm	Flood, drought, named pests and diseases, rainfall, windstorm	Smallholder, farmer groups, individual farmers	Subsidised and unsubsidised programmes	AUTP–80%	Government and private companies	N/A	N/A	N/A
Lao PDR	–	–	–	Rice, maize, cassava, coffee	Flood, drought, typhoons, landslides, earthquake	–	–	–	–	–	N/A	N/A	N/A
Malaysia	–	–	–	Palm oil, rubber, cocoa, rice	Flood, hurricane, windstorm, typhoon	–	–	–	–	–	–	–	–

Disaster Risk Finance Solutions for the Agriculture Sector:
Recommendations for ASEAN and ASEAN Member States (AMS)

Country	Insurance Products			Major Crops	Major Risks	Risk(s) Covered	Target Beneficiaries	Source of Premium	Size of Subsidy	Implementing Agency	Total Premiums in 2019, USD	Total Sum Insured in 2019, USD	Total Payouts in 2019, USD
	Indemnity	Index	Target crop(s)										
Myanmar	–	✓	Rice	Rice, wheat, maize, pulses, vegetables, sugar cane, rubber, palm oil	Drought, flood	Weather-related risks	Paddy rice farmers	Unsubsidised	–	Government in cooperation with international donors and private companies	N/A	N/A	N/A
Philippines	✓	–	Rice, maize, high-value crops	Rice, maize, coconut, sugar cane, pineapple, banana, mango, coffee	Drought, flood, typhoon, landslide, earthquake, volcano eruption	Natural calamities, pests and diseases, other perils insured	Smallholder farmers, other stakeholders in agriculture, fisheries and forestry sectors	Subsidised and unsubsidised programmes	54% for rice and maize	Government institutions (PCIC and others) and private sector	\$118.1 m	\$1.52 bn	\$65 m
Singapore	–	–	–	Leafy vegetables, bean sprouts	Flood	–	–	–	–	–	–	–	–
Thailand	✓	–	Rice, maize	Rice, maize, cassava	Flood, drought	Flood, drought, windstorm/ typhoon, frost, fire, hail, pests and diseases, elephant damage	Rice and maize farmers	Subsidised	60%; additional 40% subsidy is available to BAAC loan customers	Government in cooperation with private companies	N/A	N/A	N/A
Vietnam	–	✓	Rice (2011–2013)	Rice, cassava, maize, sweet potato, cereals	Flood, typhoon, tornado, landslide, drought	Storm, flood, drought, cold, frost, tsunami, named pests, diseases, epidemics	Poor and near-poor households, agricultural production organizations	Subsidised	90–100% poor/near-poor households; 60% other households; 20% agricultural organisations	Government in cooperation with private companies	N/A	N/A	N/A

Disaster Risk Financing Challenges in AMS

With climate-related disasters and other natural hazards on the rise, it is not financially sustainable for governments of AMS to continue to bear the burden of disaster relief, response, and reconstruction. Farmers are particularly vulnerable to the impacts of climate change and require a financial safety net, not only to protect their assets and grow their businesses, but also to safeguard agricultural production and food security in the region. Other financial resources must be harnessed, and the private sector needs to be involved.

A major challenge in the ASEAN region is that disaster risk insurance is not market or demand driven.

There is low market penetration across the region for property catastrophe insurance, agricultural insurance, and disaster microinsurance. This is due to a combination of challenges on the supply side (product development, limited delivery channels, lack of data and technical capacity), challenges on the demand side (lack of insurance education, low awareness of exposure to risks), and a lack of enabling policies, laws, and regulations.

→ Tackling these challenges will require cross-sector coordination, enabling policy, regulatory and legal environments, capacity building, and better data.

3.1 Challenge #1: Lack of cross-sector coordination

The susceptibility of the agricultural sector to large and catastrophic risks has made agricultural insurance a low-profit enterprise for private insurers. For most insurance companies in the ASEAN region, agricultural insurance represents a negligible share of their portfolios.⁹

⁹ Except in the Philippines where there is a government-owned agricultural insurance institution, the Philippine Crop Insurance Corporation (PCIC): <https://pcic.gov.ph/about-us/>

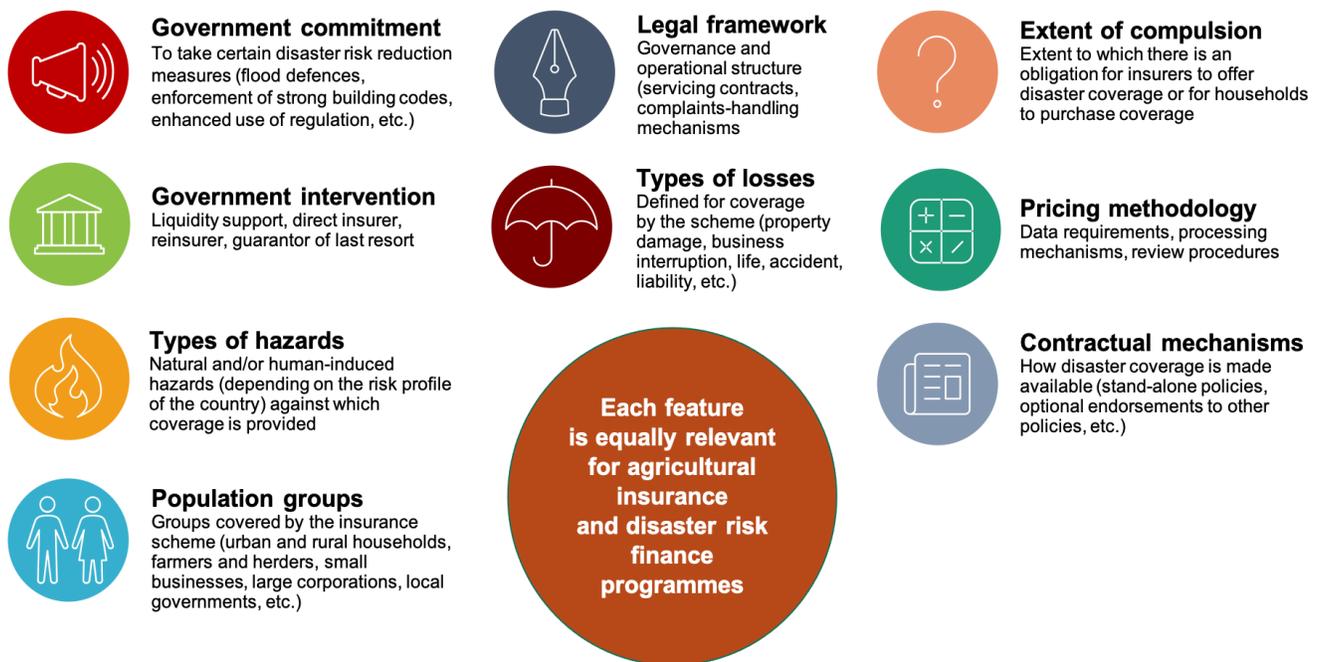
As private insurers struggle to make the business case for agricultural insurance, governments are providing premium subsidies to make insurance more affordable and accessible to farmers. However, these subsidies currently account for 50 per cent or more of total premiums in the ASEAN region – a significant financial burden for AMS. Underdeveloped risk market infrastructure and a lack of public-private coordination are magnifying these challenges.

➔ **Public-private partnerships can enable widespread coverage of catastrophic risks.**

➔ **See Recommendations 6–9**

One way to strengthen the role of the insurance industry is through public-private partnerships (PPPs). National governments can establish risk management programmes in cooperation with the insurance industry. In countries with more developed insurance markets and infrastructure, different forms of disaster insurance schemes encourage widespread coverage of catastrophic risks. The key features of these schemes are outlined in Figure 2.

Figure 2: Key features of a PPP scheme for disaster risk finance



Source: Agroinsurance, 2020

All the key features of a PPP scheme for disaster risk finance apply to agricultural insurance schemes. In countries such as the US, Turkey and Spain, the government provides a primary reinsurance facility to agricultural insurers at a lower cost than international reinsurance markets. The subsidised agricultural insurance programme may have mandatory requirements for farmers, such as signing up for insurance to be eligible for disaster assistance or receive subsidised seasonal loans or inputs. The government may stimulate the development of special agricultural insurance programmes for specific regions or types of agricultural assets.

3.2 Challenge #2: Lack of enabling regulatory and legal frameworks

As in other parts of the world, the insurance regulatory regime in AMS is based on a traditional (indemnity) insurance concept. This has created a major gap between the need for disaster risk insurance and available supportive legal and regulatory frameworks.

To extend insurance from traditional indemnity-based insurance products to index-based solutions, insurance regulators must allow for less restrictive and traditional interpretations of the law.¹⁰

Several commercial agricultural insurance products (indemnity and index-based) have been piloted recently in Cambodia, Indonesia, Myanmar and Thailand, with limited success. According to various sources, insurers have had to package index solutions in a format that insurance regulators would recognise (declaration of loss).

At the same time, governments have much more freedom than the insurance industry to obtain disaster risk financing instruments. While government agencies can obtain disaster insurance via a disaster risk management legislative framework, insurance companies cannot provide it directly since they must comply with various regulatory and supervisory requirements.

Another challenge is that extreme natural hazards may not be captured in the stress-testing frameworks of insurance companies.

However, insurance regulators issue guidelines for financial institutions that outline business continuity management (BCM) principles and specific requirements for the formulation of business continuity plans (BCPs)

and/or disaster recovery plans (DRPs), as well as the implementation, testing, and maintenance of these plans. In response to disaster risks, government authorities often issue additional guidelines on precautionary measures to ensure critical business services and operations are not interrupted (e.g. in Brunei, Indonesia, Thailand, Singapore). Regulators may review the capital adequacy of all companies to ensure that companies remain fiscally strong.

Coherent and coordinated policy, regulatory and legal frameworks help to maximise available resources and manage risks more efficiently.

Government has a vital role to play in creating an enabling policy, legal, and regulatory environment that:

- Encourages the financial sector, especially the insurance sector, to develop products that cover specific risks (e.g. enacting special regulatory regimes for parametric products, microinsurance schemes or catastrophe-linked securities);
- Introduces tax incentives for private insurance coverage; and
- Enables public entities to use insurance as a risk management tool.

→ Supportive and coherent legal and regulatory frameworks would make disaster risk management more effective across the region.

→ See Recommendations 1–5

¹⁰ International Association of Insurance Supervisors, (November 2017). *Issues Paper on Index-based Insurances*.

The regulation and supervision of the insurance sector requires addressing the various features of disaster risk. This includes catastrophe risk models, specific capital charges or reserves, reinsurance arrangements, liquidity, and claims management. The ability of insurance companies to cope with disaster risk depends on their capitalisation, portfolio structure, product mix, operational and business models, client mix, the reinsurance programmes in place, and other insurance-specific factors.

3.3 Challenge #3: Lack of capacity

To create sustainable disaster risk insurance programmes, governments and the insurance industry must build their capacity – not just knowledge and skills, but also the range of products and amount of insurance they offer.

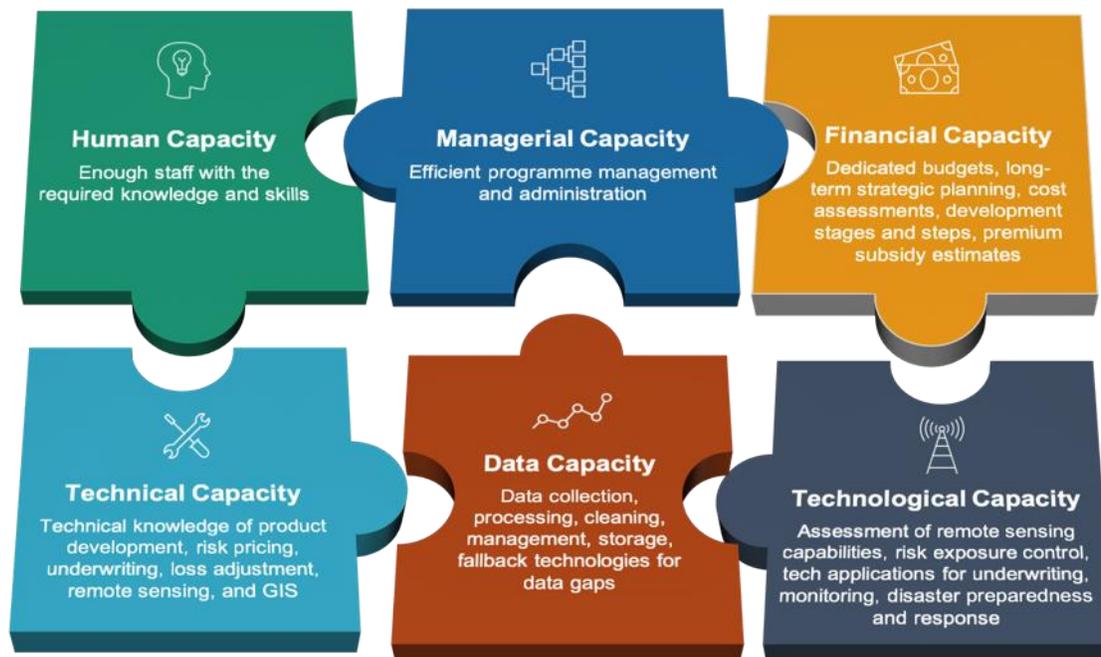
This requires making investments in several areas, from hiring enough qualified staff to collecting data with new technologies and engaging in long-term strategic planning.

The first step is assessing existing capacity to identify gaps in skills and competencies. Figure 3 details the types of capacity that governments and private insurers will need.

→ **Governments and the insurance industry must build their capacity to ensure disaster risk insurance programmes are sustainable.**

→ **See Recommendations 10 & 11**

Figure 3: Capacity required for sustainable disaster risk management programmes



Source: Agroinsurance, 2020

3.4 Challenge #4: The data gap

There is not enough data available to provide farmers with tailored, high-quality agricultural insurance products

Designing high-quality agricultural insurance products, particularly index products, requires a clear picture and in-depth understanding of the agricultural cycle. This, in turn, requires good data on seasonal rainfall, yields, crop damage, and other factors influencing crop yields. Without this data, it is more difficult for insurers to understand the risks farmers face, to conduct more sophisticated forecasting, and to price and monitor insurance contracts. For farmers, a lack of quality data can lead to higher premiums for insurance products that do not meet their needs.

In countries where agricultural insurance is new or still under consideration, there may not be suitable data to design quality insurance products for farmers.

Innovative data collection methods are not being used to their full potential

New technologies are providing opportunities in agricultural risk and disaster management. For example, satellite remote sensing data helps insurers develop individual and catastrophe insurance solutions that were not available before. Satellites can now supply weather data in addition to data from ground-based weather stations, overcoming the coverage challenge in agricultural areas.

Satellite data can be used for crop monitoring, advance underwriting, loss assessment, and the development of new insurance solutions for farmers. Remote sensing data can be calibrated with in-field inspections and crop yield assessments for quick and more accurate yield estimates. This can help agricultural insurers to overcome

classic insurance problems of moral hazard and information asymmetry, and to offer new insurance products for crops, livestock, perennial plantations, and aquaculture.

Box 5. Spotlight on the RIICE project

There are several regional and international remote sensing data providers on the market, but the practical application of earth observation technologies is still rather limited in most AMS.

However, the RIICE project, a satellite remote sensing data application operating in Cambodia, Indonesia, the Philippines, and Vietnam, is helping insurers determine the size of a rice production area, monitor rice growth, estimate biomass, identify crop yields in relation to standard production practice, and track damages caused by various perils, including drought and floods.

Although the RIICE technology has been a trusted tool for addressing food security issues in the region, it is still used primarily to monitor rice crops and has not yet been applied to agricultural insurance.

Different data is needed for different types of agricultural insurance products

Indemnity-based products

The design of indemnity-based agricultural insurance products requires historical data on crop production and crop damage gathered throughout the country and using consistent measurements at selected sample sites. If crop yield data was collected in a similar

fashion, and links were established between crop damage and yield shortfall, insurance could be redesigned to provide claim payments to farmers that reflect actual yield losses rather than pre-defined input values or production costs, as in most ASEAN countries.

Area yield index products

Area yield index insurance require the same data as individual field/farm insurance. The only difference is the focus area. Both require an indication of normal yield for the insured area and a measurement of production for the current insured year. The current year's yield is compared to a percentage of normal yield (e.g. 60 per cent, 70 per cent, 80 per cent) to determine whether a production shortfall warrants an insurance claim.

As with indemnity-based design, historical losses and subsequent premium rates can be calculated for each coverage level offered to farmers in the focus area. Governments can subsidise premium rates at different levels and subsidised coverage for catastrophic insurance could be offered. Subsidy costs can be calculated for any coverage level and group of target farmers.

Weather index products

Weather index insurance products are usually offered to protect against specific perils, such as drought, temperature, and wind speed. However, developing weather indices to manage several weather perils under one contract is challenging.

Weather index products are complex and have a significant basis risk, which means the claim pay-out can be very different from the actual loss. The worst outcome for a farmer is experiencing significant crop damage or loss, but the weather index is not triggered and, according to the policy, no pay-out is warranted.

The pay-out structure is typically calculated based on simulated or assumed losses due to a certain weather parameter. However, it is still extremely difficult to build a

weather index that accurately correlates with the actual loss of every farmer.

Another challenge is that weather index insurance requires at least 15 years (preferably 20 to 30 years) of consistent, uninterrupted, good-quality data, which is often difficult to obtain in LMICs. At present, weather data sets can be supplemented with satellite weather data or simulated data that is calculated using historical data and various analytical models.

→ **Governments need to invest in data collection, monitoring, management, storage, and sharing.**

→ **See Recommendations 12–14**



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Box 6. A unified approach to data

A unified approach to data collection and management would provide the datasets, methodology, technologies, institutional capacity, and farmer trust necessary to tackle the challenges outlined here and close the data gap.

This approach has five key steps:

1. Develop a dataset

This will improve existing or planned catastrophic and agricultural insurance programmes and support the introduction of a yield-based programme.

2. Collect data consistently and efficiently

Develop strategies to ensure data collection is consistent and can support the creation of national databases for agricultural insurance programmes with broader applications for food security and disaster management. Also consider specific mechanisms to ensure the operational efficiency of data collection in the field.

3. Test new technologies

Test the value of new technologies to improve operational efficiency and data management (i.e. data gathering, quality control, storage, security, and data use/query access).

4. Build capacity

Build capacity to offer better insurance options to farmers and improve participation in agricultural insurance and disaster risk finance programmes.

5. Engage with farmers and build trust

Provide engagement and reporting mechanisms to inform, educate, and build farmers' trust in the agricultural insurance system and disaster risk finance. This can ultimately help to enhance food security by improving farmers' productivity.

Recommendations for ASEAN and AMS

Government support following extreme weather events is usually part of a comprehensive approach to disaster risk management that includes emergency response, a recovery phase, and long-term reconstruction. Having the right mix of financial and policy instruments are key to covering different types and layers of risk at each stage.

Agricultural insurance is one financial instrument that can provide protection to farmers at a manageable cost, reduce financial pressure on governments, and form a key part of robust domestic insurance markets.

Combined with other disaster risk financing tools, strategies and systems, AMS can become more resilient to disasters and the growing risks of climate change. The following recommendations for ASEAN and AMS address the challenges outlined in the previous section and offer a path to greater financial resilience by:

- **Promoting regional cooperation, coordination, and knowledge exchange** between ASEAN member states on disaster risk standards, systems, policy, and regulation.
- **Developing coordinated disaster risk financing and agricultural insurance strategies and instruments**, as well as investing in risk reduction.

- **Strengthening regional knowledge platforms and building technical capacity** – of governments, insurance companies, and authorities at the ASEAN level.
- **Investing in data and technology and risk market infrastructure and services** to grow domestic insurance markets.
- **Supporting the development of insurance products that meet the needs of farmers and low-income populations** most vulnerable to climate change.



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Regional coordination and cooperation

Managing and financing disaster risk is a transboundary and regional issue that requires the cooperation of all AMS, but cross-sectoral coordination is limited, and government support programmes are not aligned. There is also a big gap between the need for disaster risk insurance and available supportive regulatory frameworks. ASEAN has an important role to play in providing policy guidance, facilitating the harmonisation of regulation, and coordinating different ministries and government agencies.

Recommendations for ASEAN

→ **Recommendation 1: Establish working groups and technical committees on agricultural insurance, climate finance, and disaster risk management and mitigation under the ASEAN secretariat.**

Such a group or committee would include different ministries and government agencies, from agriculture and finance to those responsible for climate change, disaster risk management, and rural devtment. can operate as a knowledge hub and experience exchange centre for ASEAN countries. It may also stimulate the development of agricultural insurance in the region and establish standards for regional risk financing programmes.

→ **Recommendation 2: Regional cooperation on disaster risk management can be strengthened with regional risk information, assessment, and modelling systems.**

A coordinated approach to disaster risk management is more cost-effective than countries working on their own. Regional risk assessments can be used to develop country-specific disaster risk profiles for agricultural sectors/sub-sectors in AMS.

Recommendations for AMS

→ **Recommendation 3: Introduce and operate effective and efficient agricultural insurance schemes at the national level.**

Clearly define policy objectives and make financial resources available to support policy development. Ensure that available funding matches post-disaster needs by establishing comprehensive tracking systems to monitor the scale and timing of resource flow. Disaster risk financing and agricultural insurance strategies should be carefully coordinated with risk reduction strategies at national and local levels and reinforce sound risk reduction principles, for example, bundling insurance with seasonal loans and subsidised inputs. Since a high proportion of rural farming households in the ASEAN region depend on publicly provided disaster relief assistance, governments will need to plan disaster risk financing programmes carefully to ensure farmers do not switch from agricultural insurance to post-disaster assistance.

Enabling policy, legal, and regulatory frameworks

As disaster risks increase and the impacts of climate change worsen, AMS need more coherent and coordinated policy, regulatory and legal frameworks to maximise available resources and manage risks more efficiently.

Recommendations for ASEAN

→ **Recommendation 4:** The ASEAN secretariat should develop legislative and regulatory guidelines for national governments to define clear requirements for insurance companies offering indemnity and index-based agricultural insurance products.

A comprehensive review of national legislation and regulatory documents should be conducted for each AMS to assess whether there are any impediments to offering index-based or parametric insurance products. Insurance legislation may need to be amended when new index and parametric insurance products are introduced to ensure they can be offered legally in insurance markets.

Recommendations for AMS

→ **Recommendation 5:** Create an enabling policy, legal, and regulatory framework to allow the insurance market to grow.

This includes providing regulatory incentives to insurers and reducing disincentives. Governments have an important role to play in expanding and strengthening agricultural insurance by providing premium subsidies to farmers, especially for national insurance programmes. When a government decides to use subsidy as an incentive, it is important to budget for the premium in the scheme to ensure resources for the scheme are always there. There is no appropriate level for an insurance premium, and will need to be assessed on a case by case basis depending on the context, cost dimensions, and other considerations.

Cross-sector coordination

The private sector has a vital but untapped role to play in disaster risk financing in AMS. Insuring large numbers of small farmers is extremely challenging for insurance companies due to complex distribution, extensive loss adjustment costs, and communication issues with concluding insurance policies and managing insurance claims.

Recommendations for AMS

→ **Recommendation 6:** Rather than subsidising agricultural insurance premiums, governments may find it more strategic and cost-effective to promote private catastrophe risk insurance markets.

This can be done through public-private partnerships dedicated to agricultural insurance and risk management, and the development of an enabling regulatory and risk market. Governments can develop risk market infrastructure, such as a strong and enabling legal, regulatory and supervisory framework that controls insurers' exposure to catastrophe risk using a risk-based capital approach. Regulation could also be used to support the growth of emerging insurance products that have the potential to increase insurance penetration and reach low-income populations.

→ Recommendation 7: Governments should develop risk market infrastructure to support the development of cost-effective, affordable, and sustainable insurance markets.

This would include product development, risk assessment and pricing, loss adjustment procedures, and distribution channels. Governments could also facilitate disaster risk pooling, creating larger and more diversified portfolios that should lead to lower reinsurance and transaction costs. Finally, governments could conduct public awareness campaigns to help farmers understand the value and function of insurance, collect and manage data, and build the technical capacity of government agencies and the insurance industry.¹¹

→ Recommendation 8: Allow insurers to operate agricultural insurance schemes using an attractive business model.

For example, insurance companies could participate in catastrophic insurance programs as domestic reinsurers. This has the potential to reduce the cost of reinsurance for the government or insurers and helps both the private and public sector better understand the needs of agricultural producers. Private insurers may have an opportunity to develop the insurance market in their country and encourage greater uptake by offering supplementary agricultural insurance products on top of catastrophic cover. They can also partner with value chain actors for marketing and distribution to scale up product offerings and reach customers in the last mile.

→ Recommendation 9: Governments should consider developing catastrophic insurance products specifically for smallholder farmers in the AMS.

Catastrophic insurance products can be designed as a yield or weather index solution and offered to different types of agricultural producers as a basic cover to manage their production losses after disaster events.¹² ASEAN member states could consider solutions that have been tested in other parts of the world, including the CADENA programme in Mexico and African Risk Capacity.

¹¹ Mahul, O. and Stutley, C., (2010). *Government Support to Agricultural Insurance: Challenges and Options for Developing Countries*. World Bank.

¹² Further research is required to assess the potential for these instruments in the region.

Capacity building

Skills and knowledge in agricultural insurance and disaster risk management for agriculture are lacking in ASEAN member states.

Recommendations for ASEAN

→ **Recommendation 10: Establish a regional knowledge platform at the ASEAN level to exchange knowledge on best practices and build skills and capacity in agricultural insurance and disaster risk management.**

Part of this platform would be a training facility that provides online and in-person workshops, conferences, training, and country-specific advisory support. Such a training programme could help government agencies, insurance companies, financial institutions, and agricultural producers in AMS to engage in constructive discussions and develop or enhance existing agricultural insurance and disaster risk management programmes. The training could be provided under ADRFI-2 programme activities to support consistent and uniform agricultural insurance and disaster risk management practices in the ASEAN region. The training should differentiate between the types of capacity required to develop and operate sustainable agricultural and climate insurance programmes (Figure 3).

Potential activities include:

- Holding regional technical workshops on crop insurance and related topics.
- Establishing a long-term platform to host knowledge products on crop insurance that is accessible to general audiences interested in the topics. The knowledge products could be stored on a suitable online platform hosted by one of the AMS or by ASEC and would need to be well maintained.

→ **Recommendation 11: Develop knowledge products to build capacity and knowledge on agricultural insurance.**

Drawing on their own experience and possibly with the ASEAN guidelines, “10 Phases in Developing a National Crop Insurance Program”, AMS can better understand the challenges of implementing insurance programmes, contribute suggestions and lessons learned, and disseminate information. Knowledge products on technical topics of common concern can provide further. Countries with more experience with agricultural insurance or disaster risk finance would have an important role to play in knowledge sharing and peer-to-peer learning.

Potential activities include:

- Publishing a stock-taking report on country experiences with crop insurance implementation and the way forward, including inputs from AMS and technical topics of common interest.
- Developing knowledge products on crop insurance for different target groups, such as a training course, webinar, VDO clips, animations, and others.
- Through a pilot or actual implementation, provide lessons learned and a basis for fine-tuning, planning, and developing a national crop insurance programme.

Closing the data gap

Historical and real-time data are either insufficient or inaccessible to the industry, making it difficult to design tailored, high-quality agricultural insurance products for farmers and monitor their performance. Innovative new data collection technologies like satellite remote sensing data can help, but they are not being used to their full potential in the region. All this makes it more difficult for insurers to understand the risks farmers face, conduct sophisticated forecasting, and price and monitor insurance contracts.

Recommendations for AMS

→ **Recommendation 12: Governments can support the introduction of index insurance by investing in weather station networks.**

This would increase storage capacity for weather/yield data and improve the crop yield assessment capabilities of the public sector. Regional disaster risk management programmes, such as the African Risk Capacity, Caribbean Catastrophe Risk Insurance Facility, and Pacific Catastrophe Risk Insurance programme, have found that catastrophic-level weather index insurance solutions work best at providing financial resources quickly for emergency response after a disaster event and allow regional or country authorities to disburse payout funds based on post-disaster needs.

→ **Recommendation 13: Governments should explore the use of innovative new technologies to collect agricultural data, monitor disaster risk, and manage loss assessment.**

This can include using remote sensing satellite data, as well as data collected by drones and mobile phones. Farmers who participate in agricultural insurance and CAT-level disaster management programmes can also take on certain data collection responsibilities, such as reporting crop planting area, crop yields, losses, and risk events. This would provide national governments with additional data that they could use to match disaster risk mitigation needs and formulate more efficient agricultural risk management policy.

→ **Recommendation 14: Governments should provide insurers with access to data that public agencies collect and manage.**

Significant investments in infrastructure are required to collect and manage large volumes of data effectively. Opening access to the industry for pricing and loss assessment could bring down the costs of insurance products and make agricultural insurance a more affordable and attractive offering.

Annexes

Annex 1: AMS briefs

BRUNEI DARUSSALAM

Overview

Brunei has a low risk of natural disasters. Earthquakes and cyclones are uncommon and there is no record of any significant disaster caused by earthquakes, as the country is not located in a major earthquake zone. However, Brunei is still prone to floods, forest fires, air pollution, strong winds, landslides, and haze. Extensive flooding in 2014 was so damaging that the government mitigated future risk by dredging the waterways.

Brunei has a small agricultural sector. According to the “Agriculture & Agrifood Statistics 2018” report, there were 5,500 farmers in the country working on 7,700 hectares, and the gross output of agricultural production was \$436 million: \$245 million in livestock, \$63.7 million in crops and \$128 million in agrifood processing.¹³ Brunei is self-sufficient in chicken, meat and eggs, but imports still account for up to 53 per cent of vegetables and 63 per cent of fruits on the market. The domestic supply of cattle and sheep covers only 29 per cent of market demand.¹⁴

Agricultural insurance

The Bruneian insurance industry is small and highly competitive. This has led to consolidation in the industry, with the number of insurers declining from 21 in 2006 to 13 in 2017. Motor insurance accounted for nearly half (46.8 per cent) of the country’s insurance premiums followed by fire (8.3 per cent in 2014), workers’ compensation (7.5 per cent), marine, aviation and transit, (4.8 per cent), public liability (3.8 per cent), and performance bonds (0.2 per cent). Other lines made up the remaining 28.7 per cent.

¹³ Brunei Darussalam, (2018). [Agriculture and Agrifood Statistics 2018](#).

¹⁴ Wong, A., (28 June 2019.) [“Brunei agriculture output up 13% in 2018; gov’t pledges more farmland and support”](#). *Biz Brunei*.

According to publicly available information (as of September 2020), there are no special agricultural insurance programmes or products available in the country, and there is no available data on government support for agricultural insurance. Disasters affecting farmers, such as floods and landslides, are covered by property insurance.

Catastrophe risk insurance for public assets is limited in Brunei, with most insurance cover purchased through state-owned (or part-owned) insurers.

Disaster risk management and finance: the legal framework

As part of a government effort to develop Brunei's agricultural and agrifood sectors, \$7 million in subsidies was provided to farmers in the 2017/18 financial year – a 50 per cent subsidy for the market price of fertiliser, pesticides and machinery, as well as agricultural infrastructure.¹⁵

The Government of Brunei Darussalam issued the Disaster Management Order (DMO) in August 2006, establishing the National Disaster Council (NDC) as a high-level policy and planning body, and the National Disaster Management Centre (NDMC) as the secretariat and implementing body in support of the Council. The Council is required to prepare the National Disaster Management Plan (NDMP). Sub-national structures (national institutions) only are established under the DMO. With these general powers, the government has established multi-stakeholder District Disaster Management Councils (DDMCs) in all four districts of the Sultanate. With funding and a budget under the DMO, the NDC is required to "identify resources that may be used for disaster operations". Under the National Standard Operating Procedures (NaSOP), the NDMC makes funds available for disaster management assistance.¹⁶ About \$236 million and \$136 million were allocated during the 8th (2001–2005) and 9th (2007–2012) National Development Plans, respectively, and another \$122 million was allocated under the Flood Action Plan (FAP) of 2012.¹⁷ Dedicated disaster reserve funds established in Brunei Darussalam with allocated funds can be used to cover an array of natural disasters and provide funding for different purposes. The Ministry of Home Affairs is allocated BND 5 million a year for natural disaster-related purposes.

The NDMC ensures the safety and well-being of the population in all aspects of disaster management: prevention, mitigation, preparedness, response and recovery through policies, strategies and practices guided by international, regional and national drivers. Prior to the establishment of the NDMC, national response to disasters was on an ad-hoc basis with committees formed to manage various disasters. The NDMC does not currently have specific instruments or programmes for the agricultural sector or agricultural producers.

¹⁵ Abu Bakar, R.H., (29 November 2018). "[Agriculture, agrifood subsidies rise to \\$7 million to keep growth momentum](#)". *The Scoop*.

¹⁶ International Federation of Red Cross and Red Crescent Societies. (2017). *ASEAN Disaster Law Mapping, Implementing AADMER: ASEAN Country Profiles*.

¹⁷ Banyouko Ndah, A. and Onu Odihi, J., (2017). "A Systematic Study of Disaster Risk in Brunei Darussalam and Options for Vulnerability-Based Disaster Risk Reduction". *International Journal of Disaster Risk Science*, 8. pp. 208–223.

The NDMC has acknowledged the importance of disaster risk and loss assessment, as well as the need to monitor financial impacts and track disaster costs. The establishment of a centralised disaster loss database is being considered, but several obstacles still need to be overcome, including a lack of technical expertise and operational guidelines, lack of coordination among relevant agencies and departments, and insufficient resources to develop a data collection and sharing mechanism. The UN Office for Disaster Risk Reduction (UNISDR) is assisting in the development and implementation of DesInventar,¹⁸ a centralised disaster loss database to be used for disaster preparedness.

The NDMC has several tactical components (e.g. medical and health services, fire and rescue, community development) but no special component for agriculture. Government policy for the agricultural sector is defined by the government and implemented through the Ministry of Primary Resources and Tourism.

Brunei has a Community-Based Disaster Risk Management Program (CBDRM) that was launched in 2010. The CBDRM includes training for an education programme focused primarily on teachers. It operationalises the Strategic National Action Plan (SNAP) for Disaster Risk Reduction 2012–2025. The CBDRM is aimed at increasing community preparedness for disasters by (i) identifying disaster risks in the areas surrounding villages and sub-districts; (ii) producing hazard maps; (iii) introducing basic techniques for first aid and cardiopulmonary resuscitation; and (iv) training people how to prevent fires, use fire extinguishers, and other skills.

Disaster response in Brunei is aimed mainly at providing social welfare assistance, including food rations such as rice, sugar, tea, cooking oil and canned foods; basic necessities such as clothes, mattresses, towels, blankets and pillows; temporary shelters; financial assistance; and free health and medical treatment.

The Autoriti Monetari Brunei Darussalam, the central bank and financial market regulator, has established a crisis management plan with responsibilities assigned to offsite bank officers.

At the regional level, the NDMC is the focal point for the ASEAN Committee on Disaster Management (ADCM). For international cooperation in disaster management, the NDMC is actively cooperating with the United Nations International Strategy for Disaster Reduction (UNISDR) and the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA). The NDMC is also engaged with other regional centres, such as the Asian Disaster Reduction Centre, the Asia Disaster Preparedness Centre, the Pacific Tsunami Warning Centre, and the Pacific Disaster Centre. With the cooperation of the United States Forest Service, the Incident Command System (ICS) has been adopted in Brunei Darussalam for the command, control, and coordination of emergency response.

Recommendations

Due to the small size of Brunei's agricultural sector, there is no need to develop special risk solutions for agriculture. It would be best to target agricultural production risks through existing disaster risk management arrangements.

¹⁸ Desinventar Sendai / Sendai Framework for Disaster Risk Reduction: <https://www.desinventar.net/>

CAMBODIA

Overview

Cambodia covers an area of 181,000 square kilometres and is home to over 15 million people. Cambodia has a rainy season (May to October) and a dry season (November to April) and experiences tropical monsoons. The country is vulnerable to the effects of climate change, with rural coastal communities prone to floods, mudslides, storms and, potentially, lack of access to clean water. Cambodia has one of the fastest growing economies in the Asian region, which is pulling people out of poverty.

The agricultural sector contributes about 26.6 per cent to the country's Gross Domestic Product (GDP) and employs about 43 per cent of the total labour force (2016). The majority of people involved in agriculture are smallholder farmers who cultivate less than two hectares per household. There are 3.7 million hectares of cultivated agricultural land in Cambodia, 75 per cent of which is under rice cultivation. Rice is the country's main crop and main source of income for most farmers. Industrial crops (primarily rubber) and food crops account for the remaining 25 per cent of agricultural land use. About three million rice farmers, who make up about 19 per cent of the Cambodian population, own or lease 2.91 million hectares of rice fields. Rice yields depend heavily on the quality of seeds, production technology, irrigation infrastructure, and weather conditions.

Agricultural insurance: the roles of stakeholders

The volume of agricultural insurance in Cambodia is very low (less than \$100,000), mostly due to an underdeveloped insurance sector and limited technical capacity. Crop insurance premiums between 2015 and 2017 were almost entirely underwritten by the Forte insurance company for piloted products that have since been abandoned due to poor performance. Other insurance companies in Cambodia have limited interest in crop or livestock insurance due to lower potential returns, the complexity of programmes, and the higher administration costs required to launch and maintain programmes in rural areas.

No agricultural insurance premium subsidies are currently available in the country, according to public sources. However, the Ministry of Agriculture and other government agencies have indicated the importance of implementing agricultural insurance solutions for different groups of farmers.

Forte insurance has been piloting weather index insurance since 2015. Between 2015 and 2017, Forte offered three types of weather index insurance cover for rice producers: (1) excess rainfall cover (three consecutive days with maximum rainfall above the set trigger); (2) water deficit cover (cumulative amount of rainfall below the set trigger); and (3) three dry day cover (number of consecutive days with rainfall less than 2.5 mm). The technical basis of these covers was designed by Weather Risk Management Services Pvt. (India), but they appear to be very complex and difficult for farmers to understand.

Other than Forte, only one other pilot has been tested in Cambodia in the past five years. In the second half of 2015, the Cambodian Agriculture Cooperative Insurance Company, funded by the Achmea Foundation (based in the Netherlands) along with CEDAC, launched the Cambodia Micro Agriculture Insurance Scheme (CAMAIS) to insure rice farmers against climate risks. It was implemented across nine districts in three provinces: Kampong Chhnang, Takeo, and Kampong Speu. Because the scheme was provided by private investors, farmers had to pay an insurance fee of \$10 per hectare every season. A total of 153 agricultural families joined the microinsurance scheme in the first season, paying a total premium of \$1,230 to insure 136 hectares of rice farms. The programme has been abandoned due to low farmer uptake.

The ADB, IFAD, EU/EC, ICCO, SNV, AFD, World Bank, and IFC are the most active development organisations in the country. There have also been several direct intergovernmental programmes in Cambodia since 2004. There are 117 agricultural-oriented projects in total reported by the Ministry of Agriculture, Forestry and Fisheries (MAFF). China tops the list of countries supporting the development of agriculture in Cambodia with a total budget of more than \$101 million. The ADB runs the most projects (21) with a total project budget of \$19.5 million (2018).

Disaster risk management and finance: the legal framework

The Cambodia Agricultural Value Chain Project Phase II (CAVAC, \$84.2 million, 2016–21) is the country's largest support programme for agricultural productivity and farmer incomes. Working with both public and private sector partners, CAVAC helped 52,387 farming households improve their farming practices in 2018–19. This included working with companies to market more appropriate agricultural inputs, as well as mechanisation to reduce manual labour and improve the efficiency of inputs. Work with the Cambodian Government to develop and implement a new pesticides regulation and index for more targeted use of pesticides has been important for the entire agricultural sector, as pesticide use has become more effective, and farmers are using less. Major progress has been made with irrigation, with an estimated 10,313 farming households gaining access to year-round irrigation.¹⁹ All 10 irrigation schemes in the country were completed in mid-2019.

In December 2020, 45,000 hectares of rice paddies were affected by drought, but the government was only able to provide financial relief to half of affected farmers. Farmers are likely to turn instead to the already overheated microfinance sector, which has grown faster in Cambodia than almost any other country in the world. Between 2004 and 2014, the average loan from a microfinance institution rose from \$200 to \$1,000, twice as fast as per capita income growth. A report published in August 2019 by two local NGOs, "Collateral Damage: Land Loss and Abuses in Cambodia's Microfinance Sector", found that 2.4 million Cambodians have combined outstanding microfinance debts of around \$8 billion, a third of the country's GDP. That translates into \$3,370 of average debt per borrower. The Collateral Damage report states that mounting debts are pressuring farmers to sell their land to make repayments, and leading to more child labour, migration to neighbouring Thailand and Vietnam, and even illegal "bonded labor."²⁰

¹⁹ Australian Government, (2019). *Aid Program Performance Report 2018-19: Cambodia*.

²⁰ Hutt, D., (23 January 2020). "[Cambodia rice crisis signals deeper economic rot](#)". *Asia Times*.

Cambodia has recently implemented a series of disaster risk reduction strategies to improve the population's responsiveness to reasonably predictable flooding. This has included improvements to early warning systems and the adoption of the National Action Plan on Disaster Risk Reduction. Schemes include the elevation of schools in flood-prone areas, analysis of the vulnerability of health facilities during emergencies, and the use of hazard risk information in land use planning and zoning programmes.

Cambodia passed the Law on Disaster Management (DM Law) in 2015. This was a major shift from a 20-year disaster risk management system based only on subsidiary legislation to a broader and more authoritative legislative mandate on disaster risk management. The DM Law formalised the National Committee for Disaster Management (NCDM) as the headquarters of the Royal Government of Cambodia (RGC) on disaster risk management. Under the DM Law, the day-to-day operations of the NCDM are governed by a Secretariat-General, focal points for government ministries, and Sub-National Committees for Disaster Management down to the local level, which have a key operational role. The structure of the NCDM's work and relationships with various agencies require additional attention and analysis. Aggregated figures on emergency relief pay-outs, ad hoc assistance, and budget and fund allocation for future emergency response are not publicly available. With the assistance of UNDP and the Red Cross, a system for disaster-related data management and information (CamDi) was created to map the various risks affecting Cambodia's population.

The DM Law requires the re-establishment of "Sub-National Committees for Disaster Management, including City and Provincial Committees for Disaster Management, Town and District Committees for Disaster Management and Commune Committees for Disaster Management," and that their new organisational structure and functions will be determined by sub-decree (Article 9).

DM Law (Article 19) provides for structures and responsibilities at the local level. "It shall be considered as the responsibilities of the commune-sangkat, town, district-khan committees for disaster management if the disaster occurred within the administering territory of any commune-sangkat, town, district-khan. It shall be regarded as the responsibilities of the city-province committees for disaster management if the disaster has affected more than one town, district-khan or occurred in town, district-khan of the city-province."²¹

The DM Law provides NCDM with national budget and authorises it to receive other external funds in compliance with the legal procedures and regulations in force:

- "Art.38 The expenditure for the functioning of NCDM shall be allocated by the national budget in the budget plan of the Office of the Council of Ministers. NCDM shall have the right to receive and utilize funds obtained from other sources for executing its tasks in compliance with the effective procedures."
- "Art.39 The state shall have the appropriate reserve budget and resource to be ensured for the disaster management." The DM Law also requires the NCDM to issue a guideline "to the Sub-National Committees for Disaster Management, ministries-institutions, armed forces, public sector, private sector and civil society," for "reserving assets for disaster relief and emergency response." (Art. 17)

²¹ IFRC, (2015). Law on Disaster Management, Kingdom of Cambodia.

Recommendations

1. Before selecting an insurance platform for managing risks in Cambodia, elaborate the risk profiles for major production regions and crop types.
2. Extensive technical assistance will be needed for agricultural insurance and disaster management.
3. A CAT-level weather index insurance programme may be the most suitable solution to disaster management challenges for smallholder farmers. Due to the rapid commercialisation of rural smallholders, Cambodian insurance companies and the national government may consider developing top-up coverage options for a CAT-level programme to better address farmers' needs. Stand-alone index/indemnity insurance solutions for SMEs and large-scale agricultural producers may also be in demand on the market within the next five years.

INDONESIA

Overview

Indonesia is the world's 16th largest economy as of 2019. Agriculture plays an important role in the economic and rural development of the country, generating nearly 14 per cent of GDP as the country's biggest employer, providing work to about 35 per cent of the labour force. Indonesia is a leading producer of palm oil and a major global producer of rubber, copra, cocoa, coffee, and rice. It is the second largest fish producer in the world after China. Large plantations cultivate export crops on about 15 per cent of all agricultural land, where most farmers (68 per cent) are smallholders operating on less than one hectare. The country is a net importer of grains, horticulture, and livestock.

Rice is cultivated by 77 per cent²² of all farmers in the country. Around 90 per cent of rice production in Indonesia comes from smallholders with most cultivating between 0.1 and 0.5 hectares.²³ Most smallholders in Indonesia cultivate rice without the use of modern machinery or improved seed varieties. It is estimated that only about 10 per cent²⁴ of smallholders operate with a relatively high level of mechanisation. Human and animal power are still the predominant sources of farm labour.

Increased flooding, drought, sea level rise, and heat stress are a threat to Indonesian agriculture, particularly rice production, which comprises about half of all calories consumed nationally. Nearly half (42 per cent) of the working population depends on agriculture for the livelihood, including more than half of poor households. Flooding and drought are the main risks affecting agricultural production in the country. Drought is a key concern for areas heavily reliant on rainfed rice production and for households with no access to irrigation infrastructure.

²² World Bank, (January 2018). *Developing Parametric Insurance for Weather Related Risks for Indonesia*.

²³ Ibid.

²⁴ FAO, (2018). "Small Family Farms Country Factsheet: Indonesia."

Agricultural insurance: the roles of stakeholders

Agricultural insurance has been active in Indonesia since 2012 when a legal framework was established for operating agricultural insurance with state support. With the adoption of Law No.19 of 2013 (Law on Protection and Empowerment of Farmers) several agricultural insurance programmes were underway until 2015 when the first pilot rice insurance programme was introduced. That same year, commercial (non-subsidised) insurance products emerged on the market. There are currently several agricultural insurance programmes already providing insurance cover for Indonesian farmers or planned to be piloted by the end of 2021:

1. **Asuransi Usaha Tani Padi (AUTP, rice farming insurance)** – A government-run insurance programme aimed at protecting farmers against damage caused by drought, flood, and selected pests and diseases. Initially launched in 2015, a multi-peril crop (rice) insurance pilot was launched by the Ministry of Agriculture with the support of Japan International Cooperation Agency (JICA), involving the state-owned insurer PT Jasindo and local state reinsurer Indonesia Re. As part of the arrangement, the Government of Indonesia provided a regulatory and legal framework for the programme to operate and receive support with a premium subsidy. The government set the premium rate at three per cent of the estimated average cost of production (IDR 6,000,000 per hectare), providing 80 per cent premium subsidy support for eligible farmers (members of farming groups). Jasindo collaborates with local government units to raise awareness of agricultural insurance among farmers, as well as market, register and sell the product to farmers in farmer groups.

Loss assessment is conducted at the field level by Jasindo loss adjustors and extension representatives. Crop losses of 75 per cent or more trigger a 100 per cent payout. Jasindo is exploring other distribution channels (e.g. loan-linked insurance and bundled programmes with input suppliers).

The government target is to cover one million hectares of land with insurance for rice producers, but so far this has not been achieved (September 2020). According to AgrolInsurance data, the programme covered only 60 to 65 per cent of the area planned for coverage in 2019–2020. Among the factors limiting the programme's target penetration are: (i) low level of sum insured; (ii) high trigger level for indemnification (75 per cent or more of crop damage per field); (iii) limited number of perils insured; (iv) cumbersome reporting and an untransparent claims settlement process; (v) no reconsideration of the premium rate based on the programme's performance; (vi) lack of proper communication and promotion of the programme within the rice-growing farmers community; (vii) complicated programme administration and no timely subsidy transfers to Jasindo by the MoA.

A recent analysis of AUTP performance by JICA (March to November 2019) generated a long list of recommendations for AUTP to remain sustainable and ensure steady growth in the next three to five years. Recommendations included revising premium setting, modifying underwriting and loss adjustment guidelines, simplifying reporting, and using available technologies (drones, satellites). As of September 2020, none of the recommendations had been applied.

2. **Asuransi Usaha Ternak Sapi (AUTS, cattle insurance)** – Similar to rice paddy insurance, the scheme for cattle insurance was pilot tested in six provinces where the majority of cattle farmers are located: East Java, Central Java, West Java, Yogyakarta, West Sumatra and Bali. The insurance covers one year of cattle production with a maximum claim of IDR 10 million per cattle. The premium is two per cent of coverage of IDR 200,000 per year for each head of cattle. AUTS was introduced in 2016 by Minister Decree No. 40/SR/Permentan/SR.230/7/2015 to facilitate cattle insurance for smallholder farmers. The plan for 2016 was to insure 120,000 head of cattle, but only 20,000 (16.7 per cent) were covered. This was due to the government enactment was initiated in October 2016 at the end of the fiscal term. By 2017, the target was expanded to 26 provinces with a total of 68,522 head of cattle insured with premiums collecting approximately IDR 13,700 billion.
3. **ACA weather index crop insurance (maize and rice)** – Indonesian private insurer ACA offers crop insurance on an index basis. In cooperation with PT Sampo, climate index insurance has been developed for maize and rice. A pilot project with multiple stakeholders (agricultural banks, such as Bank Andara, Rural Bank Pesisir Akbar, Syngenta, fertiliser companies, farmers' groups, grain traders, IT startups, etc.) and under the lead of Mercy Corps Indonesia has been underway since 2015. The private scheme does not include premium subsidies, and distribution is organised via microfinance institutions for their lenders. Data collection and claims administration is facilitated by mobile apps and handled through account officers or extension officers. The goal of the product is to ease access to finance and enhance agricultural technology for poor farmers (commercialisation).
4. **Area-based yield index insurance for paddy (AYI, rice)** – The concept for this insurance programme was developed by JICA project consultants in 2019. West Java was selected for the initial pilot. The start of the programme is pending village/sub-district level yield data collection and analysis for further product rating. The AYI programme is planned to start in 2021 pending regulatory approval of public offering on the market. Sampo Insurance is reported to be developing and delivering the programme. The programme is also pending the premium subsidy budget allocation requested by BAPPENAS.
5. **Red shallot insurance** – This programme, which is in the initial product development stage, plans to cover commercial shallot farmers in Indonesia. The programme is reported to be experiencing issues with the data that is being used for risk pricing and product rating. The insurance product intends to cover part of a farmer's production costs (IDR 40 million per hectare) with an estimated premium rate of seven to eight per cent per hectare of red shallot crop. If the product pilot is successful, the programme will be extended to provide revenue insurance for red shallot producers.

All the programmes featured here are reinsured domestically, transferring some of the risk portfolio to international reinsurance markets.

Disaster risk management and finance: the legal framework

Under the national medium-term development plan (RPJMN) for 2014–2019, the government has been implementing a major intensification programme known as Upsus Pajale, a special effort to improve rice, maize, and soybean production with higher fertiliser and seed subsidies, the provision of pre- and post-harvest machinery, improvements to irrigation infrastructure, construction of new dams, and the maintenance of existing dams and irrigation canals. The government has also been conducting a major extension programme to use and optimise abandoned or underused agricultural land for rice, maize, and soybean cultivation, and to connect the new rice fields with irrigation infrastructure.²⁵

As a part of their disaster risk management strategy, the Indonesian Government launched a pilot for catastrophe insurance for state-owned property under control of the Ministry of Finance. In November 2019, the government signed the first contract to protect state assets against disasters. The contract will provide cover for state-owned property valued at around USD 770 million and comes after a devastating year of disasters in 2018 when earthquakes and a tsunami killed more than 3,000 people and destroyed homes and public infrastructure. Despite the risk of disaster in many parts of the archipelago, Indonesia has not previously insured state assets because of difficulties in determining premiums based on the different risks affecting the country's 17,000 islands. The government and insurance firms had settled on a flat rate to insure 1,360 buildings owned by the Ministry of Finance valued at 10.84 trillion rupiah (USD 769.34 million) starting 1 December 2019. The assets are insured against natural disasters, such as earthquakes, floods and fires, as well as human-induced disasters like rioting, terrorism, and plane crashes. Assets controlled by 10 other ministries were planned to be insured in 2020. Insurance companies in the consortium include Asuransi Tugu Pratama Indonesia, Asuransi Astra Buana (a unit of Astra International), Asuransi Sinar Mas (part of the conglomerate Sinar Mas Group), and state-owned Jasindo and Asuransi Kredit Indonesia.

Indonesia's existing disaster risk management system covers the full spectrum of activities: some elements of DRR, prevention, preparedness, early warning, mitigation, emergency management/response, and early recovery. It establishes special national institutions for DRM coordination, as well as some local structures and roles.

The disaster risk management system is underpinned by the Disaster Management Law 24/2007 (DM Law) and a series of regulations. The DM Law provides a broad mandate to the national disaster management agency, the BNPB (Badan Nasional Penanggulangan Bencana). Its role is further elaborated in Government Regulation PP 8/2008. The BNPB is directly accountable to the President, and is led by an appointed Head, a Disaster Management Steering Committee, and a Disaster Management Executive Committee. The DM Law predates AADMER, and the later regulations on international assistance do not relate to interstate or ASEAN regional assistance. A review of the DM Law began in 2016, and in 2017 the Regional Representative Council (Dewan Perwakilan Daerah) endorsed a bill to amend it. The draft National Disaster Response Framework 2017 (14082017_NDRF_v2.1) is being discussed among different government agencies and will become a government regulation defining the various preparedness and response roles across all government ministries.

²⁵ ADB, (2019). *Policies to Support Investment Requirements of Indonesia's Food and Agriculture Development During 2020–2045*.

Regional governments have general authority over disaster management in their regions (DM Law Art.9). The BPBD (Regional Disaster Management Agencies) are established by regional governments and are responsible for local preparedness, response, and recovery (DM Law Ch.4 Part 2, Arts.18–25).

Budgets are broadly allocated for disaster management, including preparedness, response, recovery, and DRR. The national government’s responsibility for disaster management under the DM Law includes allocating sufficient disaster management funds from the national budget and making a budget allocation in the form of a “ready fund” (Art. 6). Regional governments are also required to budget for disaster management (Art.8). There is a specific regulation on “Disaster Aid Financing and Management” that specifies disaster management funding is to come from national and regional government budgets, and that governments are required to allocate sufficient funds for pre-disaster, disaster emergency response, and post-disaster stages (Arts. 4–5). It specifies that the national government is to provide disaster contingency funds, ready funds, and grant-patterned social assistance funds (Art. 5(3)).

Currently, there is no direct connection in Indonesia between broader disaster risk management activities and including agricultural insurance in the larger scope of disaster response governed by the legislation referenced above.

Recommendations

1. Define the purpose of the government’s agricultural insurance programme more clearly, which must be aligned with Indonesia’s general agricultural policy.
2. Consider shifting the rice insurance programme from production cost insurance to yield insurance.
3. Better data management is needed for insurers to understand farmers’ key challenges and gain more control over their agricultural insurance activities. Loss assessment procedures and protocols require significant development to ensure loss adjustments are calculated accurately, and insurers may require technical assistance with key insurance aspects, such as underwriting, programme administration, and rate setting. Adhering to the recommendations related to AUTP underwriting and loss adjustment guidelines is advised.

Lao People’s Democratic Republic

Overview

The Lao People’s Democratic Republic (PDR) is the second most exposed country to flooding in the world, and one of the poorest countries in the ASEAN region. Floods, droughts, and typhoons are the dominant hazards in the country. Natural disasters impact all development sectors, with agriculture, transport, and housing suffering the

most. Almost 30 floods have been recorded in the country over the last 40 years. The country is also susceptible to landslides and, in the north, to earthquakes. It is estimated that typhoons cause an average loss of USD 17.6 million a year, followed by floods (USD 8.3 million) and droughts (USD 4.7 million). The United Nations Global Assessment Report on Disaster Risk Reduction (GAR) estimates that the average annual loss from natural disasters in Lao PDR is USD 212.97 million, 97 per cent of which is due to flooding.

Over the past decade, Lao PDR has experienced rapid economic growth and poverty reduction. Although the national poverty rate declined by 40 per cent over the last 15 years, 26 per cent of the population still live below the poverty line. More than three quarters live in rural areas and depend on agriculture and natural resources for survival. Poverty is largely rural, concentrated mainly in remote and mountainous areas along the northeastern and eastern borders with Viet Nam. More than 80 per cent of the population depends on agriculture for their livelihoods, while more than half of households are subsistence farmers with annual incomes below USD 300.

While agriculture is key to the country's economy, subsistence farming is predominant given poor access to improved technologies. Farmers, especially from large families, often struggle to meet their household's food requirements. Most use traditional farming methods and lack knowledge of new technologies and skills to improve crop yields. Declining soil fertility and lack of access to irrigation infrastructure significantly affect the productivity of farmers.

Challenges to rural development include the country's high vulnerability to climate change, limited technical and business knowledge among farmers and limited access to services, including rural finance. To mitigate these challenges, the country works with the Asian Development Bank (ADB) and cooperates with technical agencies, including the Food and Agriculture Organization of the United Nations (FAO), World Food Programme (WFP), German Agency for International Cooperation (GIZ), World Overview of Conservation Approaches and Technologies (WOCAT), and the International Rice Research Institute (IRRI). The Country Strategic Opportunities Programme (COSOP) complements programmes funded by other development partners, financing innovative approaches for climate-smart agriculture and co-investing in private-public-producer partnerships (PPPPs) and sustainable rural finance.

Agricultural insurance: the roles of stakeholders

Lao PDR's insurance market is relatively small but has grown rapidly in recent years. Premium growth exceeded 29 per cent in 2016 to reach a market size of USD 71.09 million. This growth rate is slightly misleading due to the significant number of large one-off construction projects that skew the non-life insurance market to penetration levels of just 0.5 per cent. As a proxy for the non-life household insurance market, life insurance penetration levels are just 0.02 per cent. In 2017, 24 insurance companies were registered with the Ministry of Industry of Finance with more foreign insurers interested in entering the market.

No agricultural insurance is currently available in Lao PDR. A recent demand study showed that in many rural areas, one of the main forms of household savings was investment in livestock and that farmers perceived livestock illness resulting in death as their second most important risk transfer requirement. Agricultural and forestry insurance are not compulsory, but there is no public information on the volume of agricultural insurance in the country. According to some public sources, the pilot crop insurance programme for rice and coffee is being considered by the government, with piloting planned for 2020–2022. To help farmers better manage risks from weather and climate-related hazards, weather index-based insurance solutions have been suggested by FAO/WFP for piloting across the country. These insurance solutions would make pay-outs to farmers based on changes to an index, such as rainfall, rather than based on crop yields.

In Lao PDR, there is not enough satellite data available to monitor climate hazards (drought, flooding, etc.) and forecast the risk of potential impacts on cereal production and the country's most vulnerable communities. According to recent studies on climate change in the Mekong Basin, the country is expected to experience more frequent and extreme weather events and rising temperatures (expected average 3°C to 5°C by the end of the century). Droughts and floods are significant risks for agriculture, with drought posing the greatest challenge as water shortages impede crop planting. The Mekong River Basin is already experiencing more frequent drought and a 20 per cent increase in drought months is expected by 2050. Longer dry seasons will affect agriculture and farmers' livelihoods, who need to make decisions based on expected rainfall patterns. The FAO and WFP plan to support the implementation of a system that uses large data repositories to provide timely and actionable information products for farmers and decision makers.

Disaster risk management and finance: the legal framework

Of the few alternative disaster risk finance instruments mentioned in public sources, the following could be considered. Between March 2017 and June 2019, the WFP, in partnership with the Ministry of Agriculture and Forestry, supported smallholder farmer groups in 47 villages of Nalae District in Luangnamtha Province. Through the programme, the WFP provided 1,132 farmers with technical expertise, agricultural training, tools, and seeds to produce a variety of fresh vegetables. In year one, the programme provided 11 types of seeds and manual agricultural tools, such as sickles, water sprinklers and water buckets. In the second year, greenhouse plastic sheets, water pumps, and piped water connections were provided to farmers to cultivate vegetables in 10 model villages. Some communities set up mushroom-growing huts while others received support to sell produce at district markets.²⁶

The Government of Lao PDR has identified disaster risk reduction as a national priority and established the National Disaster Management Office and Committee with regional and district offices. Community-based disaster risk reduction is an important pillar of the national plan. This includes engaging local resources and capabilities at the village level to support community resilience. The plan includes the development of a disaster relief fund, the KR1 Social Assistance Scheme, for victims of natural disaster, war veterans, and poor pensioners. According to some sources, Lao PDR has a large fiscal burden as a percentage of government expenditure. This could be improved by

²⁶ Lao People's Democratic Republic: Annual Country Report 2019, Country Strategic Plan 2017 – 2021, WFP

pre-positioning funds at the sovereign level and developing the national insurance market. There is no publicly available information on government expenditure specific to agriculture.

In Lao PDR, a broadly focused disaster risk management system is underpinned by a series of executive decrees that establish national and sub-national structures and mandates and assign ministerial responsibilities. However, the institutional structures are in a state of transition and responsibilities are currently shared. The National Disaster Management Committee (NDMC) created by decree in 1999 was renamed the National Disaster Prevention and Control Committee (NDPCC) by Prime Minister (PM) decree 373/PM in 2011. The National Disaster Management Organization (NDMO) was established in 1991 and was the secretariat to the National Committee until 2013.

Then, as part of a move to integrate disaster and climate risk, PM Decree 220/PM of 2013 moved the Committee's Secretariat to the Department of Disaster Management and Climate Change (DDMCC) in the Ministry of Natural Resources and Environment. At this stage, the new NDPCC and its Secretariat DDMCC continue to share responsibilities with the existing National Disaster Management Office (NDMO) in the Department of Social Welfare, which also supports sub-national disaster risk management structures. None of these frameworks currently address AADMER or the AHA Centre specifically. The NDMO remains the focal point for disaster preparedness and response.

The National Disaster Management Committee (NDMC), an inter-ministerial committee, is the apex body responsible for developing policies and coordinating DRM activities in the country. The NDMC was established through PM Decree No. 158/PM in August 1999. The NDMO is the secretariat of the NDMC located in the Ministry of Labour and Social Welfare (MLSW). The roles and responsibilities of the NDMO and each member of the NDMC have been defined by the internal MLSW decree No. 097/MLSW of June 2000.

A 2013 PM Decree (No.291/GOV 2013) provides for funds for disaster preparedness and response by allocating three per cent of the annual budget to the National Emergency Fund (held as rice reserves, money, and fuel). The Decree on Social Welfare (No. 169) provides the Social Welfare Fund for the Ministry of Labour and Social Welfare, which is to be used for relief assistance once it is established.

Recommendations

1. Elaborate the risk profiles of major crops and production regions to guide the selection of appropriate insurance solutions.
2. CAT-level sectoral weather index solutions may be a preferred option to start an agricultural insurance programme, but more in-depth research and technical assistance are needed.
3. Technical assistance and capacity building are needed to move forward with CAT-level index and indemnity insurance solutions

MALAYSIA

Overview

Malaysia has a relatively low level of disaster risk exposure, other than occasional floods. As a result, there is no pressing need to develop a sustainable domestic disaster insurance market and the penetration rate for disaster insurance among financially vulnerable groups is low. A survey conducted by Bank Negara Malaysia found that property insurance coverage is only two per cent for low-income households and 10 per cent for the rest of the population. Mitigating steps are being taken, including exploring the development of a crop insurance framework for small-scale paddy farmers to provide financial protection against natural disasters, and the development of a micro-insurance/micro-takaful framework to promote the development of micro-risk transfer products to protect the underserved from adverse financial shocks.

Flooding is the major catastrophic risk in the country while earthquakes and typhoons are considered relatively low. Coverage for flood is typically an extension to a fire policy for property insurance with an additional flood-specific component and premium. Flood coverage may be included in a standard fire insurance policy.

Agricultural insurance: the roles of stakeholders

Malaysia has not developed a national agricultural crop or livestock insurance scheme. There is currently no commercial crop insurance product or programme available in Malaysia. Forestry insurance has been written on a limited scale for commercial forestry, oil palm, rubber, and cocoa under a forestry/plantation fire policy that provides cover against the loss of a tree (standing asset) as a result of fire and associated perils of flood, windstorm, and wild animal damage (e.g. elephants). The insurance penetration rates for primary crops, such as oil palm, rubber and cocoa, are low.

An index-based, government-backed insurance policy is being rolled out, suggesting that the government has experience with climate-related insurance triggers.

Disaster insurance in Malaysia is not available on a stand-alone basis as there is little demand for such products. However, selected natural disaster insurance coverage is available from insurers, including household property insurance that covers hurricanes, cyclones, typhoons, windstorms, earthquakes, landslides and floods, and commercial property insurance that can be obtained at an additional premium. Fire and motor insurance with protection against additional perils (floods, hurricanes, and landslides) can be obtained at an additional premium. Catastrophe perils may also be extended to contractor all-risk and engineering-style policies and to industrial all-risk insurance policies. For an additional premium, agricultural insurance can be extended to natural disaster insurance, including floods and windstorms.

In 2019, the government reaffirmed its commitment to safeguard the welfare of citizens, particularly paddy farmers, with the introduction of a Paddy Takaful Coverage Scheme (SPTP). The scheme is expected to benefit 172,000

paddy farmers who own fields smaller than 10 hectares. Total compensation to be received by each farmer is estimated at RM 13,000. The government will initially allocate RM 50 million for this scheme, with aid in the form of cash ranging from RM 500.00 to a maximum of RM 800.00 per hectare, depending on the stage of the crops. Although a crop insurance scheme was announced years earlier in 2013, the details of its operation remain unclear both to farmers and insurance providers. The pilot programme was expected to start in 2020, but this could not be confirmed by public information sources as of September 2020.

Dedicated disaster reserve funds in Malaysia have a broad scope, and allocated funds can be used to cover an array of natural disasters and provide funding for different purposes. The insurance industry is involved in collecting data on losses.

Disaster risk management and finance: the legal framework

The Malaysian National Disaster Relief Fund provides financial aid to victims to alleviate the loss of income, damaged or demolished houses, agricultural damage including livestock and aquaculture, and burial costs for fatalities due to disasters. Each year, the private sector and communities make contributions to help disaster victims who benefit from the Fund.

The Department of Social Welfare is also involved in providing disaster assistance and managing disasters, including: (i) providing and maintaining relief centres; (ii) distributing food supplies, clothing and other basic needs to disaster victims; and (iii) providing advice and counselling to disaster victims.

Malaysia has recently reviewed the preparedness and response aspects of the DRM system, which also includes the amendment of the Civil Defence Force Act 1951. It is now a key responsibility of the Malaysia Civil Defence Force (MCDF) under the patronage of the Prime Minister's Department along with the National Disaster Management Agency (NADMA) to adapt multi-hazard approach to disaster risk management. The MCDF is one of the responders along with the Royal Malaysian Police and Fire and Rescue Department (RMPFRD). This includes the implementation of community-based disaster risk reduction (CBDRR) to ensure public involvement in DRR efforts.

Legislation on improving the country's disaster response complements the administrative DRM system, which is comprised of the Natural Disaster Management and Relief Committee, established in 1972 under the National Security Council (NSC) Directive No. 20. The new National Disaster Management Agency (NADMA) in the Office of the Prime Minister was created in 2015 as a separate body, having been part of the National Security Division of the Prime Minister's Department for many years. The new law and the continuing NSC Directive are relatively comprehensive. Together they establish national, district, and local committees and responsibilities for three levels of disaster, and are now proceeding to a fourth level, although the system remains focused on preparedness and response. Since NADMA took over the DRM portfolio from the NSC in 2015, it has been consulting with stakeholders on drafting a new disaster risk management law.

The 1998 Prevention and Control of Infectious Diseases Act and a 1979 Emergency (Essential Powers) Act (as amended to 2006) also form part of the overall framework for disasters and emergencies. The 2016 legislation does not mention AADMER or the AHA Centre, but it does provide for the assignment of Civil Defence Forces to support other countries.

Under the DRM system, the sub-national structures are: State Disaster Management and Relief Committee (SDMRC), District Disaster Management and Relief Committee (DDMRC) and, since the 2016 reforms, small units have been established at the community or village level, creating a fourth tier. Each state DMC is led by the State Secretary and the MCDF's function is to assist them as the secretariat. The district level is led by a district officer and the MCDF acts as the secretariat.

Malaysia's funds for disaster risk management are budgeted annually through the Economic Planning Unit (EPU) and at the state and district level. The sum differs according to the size of the state affected and the number of affected victims. NADMA also has a specific fund for disaster risk management.

Extreme natural hazards are not specifically captured in the stress-testing framework for banks and insurance companies in Malaysia. However, guidelines have been issued for all financial institutions that outline business continuity management (BCM) principles and specific requirements for the formulation of a Business Continuity Plan (BCP) and Disaster Recovery Plan (DRP), implementation, testing, and maintenance of the plans by the institution. When disaster risks arise, the central bank issues additional guidelines on necessary precautionary measures to support the continuous provision of critical business services and operations. During the monsoon season in 2011, a circular was issued to all financial institutions to highlight flood preparedness scenarios under the BCP and required financial institutions to immediately report affected branches/premises.

The National Security Council is guided by NSC Directive No. 20, or The Policy and Mechanism for National Disaster and Relief Management, which prescribes an integrated emergency management system through the Disaster Management and Relief Committee (DMRC) at the federal, state, and district level. This directive is supported by other standard operating procedures that outline the roles and responsibilities of various agencies for specific disasters, and by other related acts, namely: (a) the Land Conservation Act; (b) Environmental Protection Act; (c) Town and Country Planning Act; (c) Irrigation and Drainage Act; and (d) Uniform Building by Law.

At the regional level, Malaysia supports the ASEAN Agreement on Disaster Management and Emergency Response (AADMER), as well as the establishment of the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) in Jakarta (AIPA Caucus Report 2011). Malaysia actively participates in regional platforms, including the Asian Disaster Reduction Centre (ADRC), the Asian Disaster Preparedness Center (ADPC), and the Typhoon Committee (TC). As the focal point for disaster management, the National Security Council works closely with international organisations, such as United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and its subsidiary bodies, the United Nations Disaster Assessment and Coordination (UNDAC), International Search and Rescue Advisory Group (INSARAG) and the Asia Pacific Economic Cooperation (APEC) Task Force on Emergency Preparedness.

Recommendations

1. A good first step would be to formulate the objectives of the country's disaster management policy with a special focus on major crops and livestock and the greatest risks for Malaysian agriculture.
2. Consider index solutions for starting an agricultural insurance programme.
3. Complete risk profiles for major crop and livestock and key production areas.
4. Select options for disaster risk management/insurance/financing approaches based on profiles that reflect actual risk exposure.

MYANMAR

Overview

Agriculture accounts for 22 per cent of GDP and 38 per cent of employment in Myanmar. It is expected to grow by 0.7 per cent for the year due to strong crop production that will offset a weakening livestock and fisheries sector.²⁷ The total estimated agricultural production area in Myanmar is 18.3 million hectares with major production in rice, wheat, maize, pulses, vegetables, sugar cane, rubber, and palm oil. Rice production is widespread throughout the country, but the majority is concentrated in Ayeyarwady Province.

In the aftermath of Cyclone Nargis in 2008, the Government of Myanmar provided loans to affected households for the purchase of seeds and agricultural tools. The Ministry of Forestry provided subsidised timber for post-Nargis reconstruction at a price equivalent to less than 20 per cent of its production cost. As of late June 2008, the Ministry had provided almost 102,000 cubic tonnes of timber at a direct cost to the government of \$16.8 million.

Droughts and floods are the main risks affecting agriculture in Myanmar. Droughts mainly occur during the early monsoon period. In the Central Dry Zone area, drought years have significantly affected crop production, leading to food shortages for both people and livestock. In 2010, severe drought depleted village water sources across the country and destroyed agricultural yields of peas, sugar cane, tomato, and rice. Short spurts of excessive precipitation are expected to alternate with longer periods of drought. Since 1978 there have been approximately 30 fewer rain days during the monsoon season (there used to be about 147 days). Rains have become more intense and flooding is common during the rainy season in all parts of the country. In 2008 the situation worsened and dam spillways collapsed, heavily flooding rice paddy fields and covering them with sand, which had to be removed before the next growing season.²⁸ Myanmar does not currently have a flood risk model, which could strengthen knowledge and capacity in risk management.

²⁷ World Bank, (25 June 2020). [Myanmar Economic Monitor June 2020: Myanmar in the Time of COVID-19](#).

²⁸ FAO, (2019). *Handbook on Climate Smart Agriculture in Myanmar*.

Agricultural insurance: the roles of stakeholders

Agricultural insurance programmes in Myanmar are currently in the initial pilot stage. Crop insurance projects being promoted in Myanmar include the following:

- **Yield index-based project** (status: operational) in collaboration with Global World Insurance (GWI). A two-year pilot project was approved by the Ministry of Planning and Finance in January 2018. The premium rate is two per cent of the market value of rice produced on one acre of farmland.²⁹ The insurance product is offered in the provinces of Ayeyarwady, Mandalay, and Yangon and prices vary across regions. The yield-based insurance programme calculates payouts based on the market price per acre of rice harvested in selected provinces.
- **Weather index-based project** (status: operational) in collaboration with Myanmar Agricultural Development Bank (MADB), Myanmar Insurance, and Sompo Japan Insurance. The product was intended to be launched in February–April 2019 (Cajucom, 2018) and the premium rate is two per cent of the per-acre loan for paddy rice from the MADB. The pilot project will cover Pyay Township in Bago Region and Shwebo Township in Sagaing Region.³⁰ The insurance will cover losses suffered by paddy farmers due to drought.
- **Feasibility survey for a weather index-based project** in collaboration with Mitsui-Sumitomo Insurance Company and Japan International Cooperation Agency (JICA).³¹ No specific activities for programme development or implementation were found in public sources.

State-owned Myanmar Insurance has a monopoly over all insurance and reinsurance business in the country. By law, insurance must be purchased from a Myanmar-licensed entity and Myanmar Insurance is the only company licensed to sell insurance in the country. For some specialised lines of business, Myanmar does not have the technical or financial capacity to provide insurance. In these cases, the risk is passed on to international markets through a fronting arrangement whereby Myanmar issues the policy and cedes the risks to international reinsurance markets. Commercial and government assets in Myanmar are known to be insured this way. No domestic reinsurance is available due to the existing insurance monopoly.

Disaster risk management and finance: the legal framework

An Action Plan on Disaster Risk Reduction has been launched in Myanmar, including vulnerability, risk assessment and elaboration of a “Hazards and Vulnerability Atlas of Myanmar”. However, disseminating information at the community level is challenging. Disaster risk management is still in early stages – there is no comprehensive DRM law, and capacities at all levels are reported to be limited.

²⁹ Myanmar Times, 2019

³⁰ Personal communication with Dr. Khin Myo Nyein, 2019

³¹ Cajucom, 2018

The Myanmar Plan of Action on Disaster Risk Reduction is the country's main roadmap for DRR. At the national level, capacities are being improved, and roles and responsibilities are being allocated to the government departments overseeing DRR in the country. At sub-national and community levels, institutions and capacities are being strengthened to improve disaster monitoring and response. The Ministry of Finance maintains a special fund that can be used for disaster rehabilitation purposes.

The National Disaster Preparedness Central Committee (NDPCC), which is chaired by the Prime Minister, prepared the Standing Order on Natural Disaster Management that sets out the roles and responsibilities of each ministry, department, and disaster preparedness committee. The lack of an overarching DRM law remains the key challenge as there is no clarity on how to integrate DRR into each ministry. While a special relief fund is in place, a policy directive for allocating DRR funds is still missing. A comprehensive National Standing Order (SO) for all government ministries serves as the preparedness and contingency plan. There is no structure for post-disaster review, centralised training, and standard post-disaster needs assessment. Only a limited geographical area is covered by social development programmes to reduce disaster risk as these were mainly Nargis-affected areas.

The disaster risk management system in Myanmar is established under the Disaster Management Law 2013 (DM Law) and the Disaster Management Rules 2015 (DM Rules). Together these create the National Disaster Management Committee (NDMC) as the high-level policy body, and the law also provides for sub-national bodies. The Relief and Resettlement Department (RRD) in the Ministry of Social Welfare, Relief and Resettlement provides secretariat services to the NDMC and implementation of the DM Law and Rules. It also houses the National Disaster Management Centre (Emergency Operations Centre during disasters), which has central responsibility for disaster information and disseminating early warnings based on data obtained from relevant agencies. The Ministry of Home Affairs and Ministry of Foreign Affairs also have key roles in their areas of responsibility. The Armed Forces (Army, Navy, and Air Force) remain the primary responders in disasters and are members of the NDMC. Although the DM Law does not mention AADMER or the AHA Centre, the law's objectives include regional coordination (Art.3), and the role of the NDMC includes national and regional cooperation and coordination with international humanitarian actors (Art.5).

The DM Law (Art.7 and Art.9 on national and regional government powers to form sub-national bodies) and DM Rules (DM Rules Art. 14) mandate the establishment of sub-national bodies, which are:

- Regional or state disaster management bodies;
- Self-administered division or self-administered zone disaster management bodies;
- District disaster management bodies;
- Township disaster management bodies; and
- Ward or village tract disaster management bodies.

Part of the NDMC's role is spending and managing the Disaster Management Fund (DM Law Art.5), and regional and state bodies have similar roles and powers (Art.9). The National Committee is responsible for establishing the

Disaster Management Fund, which has an annual allocation of MMK 20 billion MMK (around USD 20 million).³² The DM Law specifies that the fund be sourced from:

- Allocations from the national budget;
- Contributions and donations from foreign countries, international organisations and external regional organisations, and loans from local, foreign, and other official sources;
- Contributions and donations from local bodies, local and foreign well-wishers, civil society, and other NGOs; and
- Official accrued money received from the fund.³³

Regional or state bodies have the same roles in budget allocation subject to national committee supervision. More detail on the DM Fund is provided in DM Rules Ch.XI. Public sources do not provide any evidence of agricultural insurance being considered part of disaster risk management in Myanmar. No public references were found to the DM Law in relation to agriculture.

Recommendations

Technical assistance and capacity building are recommended for the government and the national re(insurer) if agricultural insurance and disaster risk finance programmes are developed further.

PHILIPPINES

Overview

The Philippines is one of the world's top disaster hotspots with frequent floods, droughts, typhoons, landslides and mudslides, earthquakes, and volcano eruptions. Since 2000, the Philippines has suffered 286 disasters. The country is one of the most exposed nations in the world to tropical cyclones and is hit by 20 storms per year on average. In 2013, Typhoon Haiyan swept the country as the most damaging tropical cyclone in living memory. More than 6,300 deaths were recorded, more than 1.1 million houses were damaged or destroyed, and public infrastructure and agricultural land were damaged across 41 provinces. Total damage and losses in agriculture reached PHP 35 billion (USD 1.4 billion).³⁴ Crops were the most affected followed by fisheries and livestock. Five years later, agricultural damages from another tropical cyclone, Typhoon Ompong, were estimated at PHP 27 billion.

³² Source: Workshop feedback

³³ DM Law Ch. VII Art. 19.

³⁴ UNECE Expert Forum for Producers and Users of Climate Change-related Statistics: Assessing Damage and Loss From Disasters in Agriculture, FAO's Methodology

Agricultural insurance: the roles of stakeholders

The Philippines has a comprehensive agricultural insurance programme through which the government-owned Philippine Crop Insurance Corporation (PCIC) offers a variety of crop insurance covers (e.g. rice, maize, high-value commercial crops) to Philippine farmers. In addition to crops, the scheme also provides livestock, fishery, non-crop agricultural assets, credit, and life insurance.

In 2018, the PCIC paid out PHP 3.4 billion (USD 65 million) in claims for damage to crops and properties in the farming and fishing industries,³⁵ and total insurance cover reached PHP 79.83 billion and PHP 4.88 billion in premiums were collected.³⁶

Launched in 1981, the Philippines National Crop Insurance Program is the longest continuously running agricultural insurance programme in Southeast Asia. The programme was launched by the Government of the Philippines with the Philippine Crop Insurance Corporation (PCIC), a government-owned insurance company specialising in providing agricultural insurance solutions and programme implementation through a public-private partnership. The PCIC has expanded beyond just covering rice and maize to supporting farmers in other activities, including cash crops, agricultural credit, agricultural property, industrial risk, fisheries, and livestock. The government subsidises 54 per cent of the premium for rice and maize insurance, with an additional 18 per cent subsidy paid by the lending institution when the insurance is bundled with agricultural credit.

The PCIC markets directly to farmers, largely through lending institutions, local government units and agricultural cooperatives, to ease distribution and handle the registration process. Farmers can insure their cost of production/production loan plus 20 per cent, within the ceiling established by the PCIC. The farmer must submit their Farmer Plan Budget when applying for insurance. Premium rates are based on risk level per region, per production season, and per risk classification. Claims processing is conducted through field assessments by loss adjusters from the PCIC and the Department of Agriculture.

In addition to the regular PCIC insurance programme, which is open to all farmers and agricultural agents, there are special programmes for smallholder farmers that offer a full premium subsidy. Under the regular programmes, only paddy rice and corn are partially subsidised. Eligible farmers have several coverage options depending on the rice variety, perils to be included, etc.

In 2011 the PCIC, in conjunction with GIZ, launched a new Area-Yield Index Insurance (AYII) programme for rice farmers on Leyte Island. The project was implemented with the national irrigation system in 17 rice growing municipalities of the Leyte and Southern Leyte. This product was designed to provide irrigated rice farmers with optional coverage levels of up to 80 per cent of area yield at affordable premium levels of about four per cent. It is understood that this product did not carry premium subsidies provided by the government.

³⁵ Agriinsurance, (26 August 2019). "[Philippines – Government proposes mandatory crop insurance](#)".

³⁶ PCIC, (2018). *Annual Report 2018*.

The Philippines has experienced fast growth in microinsurance, particularly weather-based index agricultural insurance and disaster microinsurance, likely due to the country's unique exposure and vulnerability to typhoons, floods, and earthquakes. The PCIC also underwrites named peril crop insurance for commercial crops, which is termed "natural disaster cover" and excludes pests and diseases.

Disaster risk management and finance: the legal framework

The Philippines National Disaster Risk Reduction and Management Council organises economic loss data into three categories: Infrastructure, Agriculture, and Private and Communication. Of the three categories, the highest loss incurred between 2006 and 2015 was attributed to the agricultural sector with a total of about PHP 74 billion or 56 per cent of total losses. Losses in the agricultural sector were highest in 2010 at more than PHP 12 billion or about 99.7 per cent of the losses for that year. For 2014 and 2015, the agricultural sector suffered the greatest losses.

Given the country's exposure to natural hazards, the government is taking a proactive approach to disaster risk management rather than focusing mainly on post-disaster response. The Disaster Risk Reduction and Management (DRRM) Act was approved in May 2010, establishing a complex and multi-level disaster risk management system. The law has been under scheduled review since 2015. As it stands, the Act establishes the National Disaster Risk Reduction and Management Council (NDRRMC) as the highest level "policy-making, coordination, integration, supervision, monitoring and evaluation" body.³⁷ The Office of Civil Defence (OCD) is tasked with administering the national civil defence and disaster risk reduction and management programme, including supporting sub-national councils. The law does not mention ASEAN or AADMER specifically, nor regional and international treaty obligations.

The Philippines system has a broad focus on DRM, but gives DRR special priority. The system aims to establish a whole-of-society approach to disaster risk governance, with the DRM system as the main vehicle. The system has a high degree of detail and a broad DRR mandate for DRM institutions across sectors, involving sub-national governments, civil society, and the private sector.

The DRRM Act (s.10) provides for regional and local councils, including Regional Disaster Risk Reduction and Management Councils (RDRRMCs) and Local Disaster Risk Reduction and Management Councils (LDRRCs). LDRRCs include provincial, city, municipal and Barangay local councils (although many Barangays do not yet have functioning councils). These are supported by the Local Disaster Risk Reduction and Management Offices (LDRRMOs) that the OCD's parallel administrative structures at sub-national level.

The budget for DRRM is governed by the DRRM Law and General Appropriations Act (GAA). The national budget for DRRM is appropriated under the annual General Appropriations Act (GAA) and is known as the National DRRM (NDRRM) Fund. Of the amount appropriated for the NDRRM Fund, 30 per cent is allocated as a Quick Response

³⁷ IFRC, (2017). *ASEAN Disaster Law Mapping – Implementing AADMER: ASEAN Country Profiles*.

Fund (QRF) as a standby fund for relief and recovery, and the remaining 70 per cent can be used for broader DRRM activities.

The DRRM Law also mandates local governments to establish Local DRRM Funds by setting aside five per cent of their estimated revenue from regular sources as the LDRRM Fund to support DRRM activities such as preparedness programmes, including training and the purchase of rescue equipment, as well as response activities. The LDRRM Fund can also be used explicitly for the premium payments for calamity insurance.³⁸ Of the five per cent lump sum allocation, 30 per cent is automatically allocated as QRF. The remaining 70 per cent can be used for pre-disaster measures. The OCD also receives an annual budget allocation, which is provided for in the Act.

Line ministries may also reallocate capital expenditure within the fiscal year a disaster occurs. The Philippine Department of Agriculture (DA) has regularly transferred funding from initiatives such as rice, corn and high-value crops programmes to support post-disaster recovery of the agricultural sector. Based on an analysis of these transfers over the previous five years, in 2008 the DA requested (but did not secure) the creation of a disaster standby fund of PHP 500 million (USD 11.3 million) to limit further reallocations from its development activities.

Of the more hazard-prone countries in the region, the Philippines arguably comes closest to having the basic structure of a strategy in place, with national and local calamity funds, a government-owned insurer providing cover for public assets, a publicly-supported crop insurance programme and, most recently, a contingency loan arrangement. However, the insurance programmes provide very limited coverage and existing arrangements include few risk transfer opportunities for farmers.

There is no scheme for financially compensating farmers for disaster losses. In-kind provision of seeds, fertilisers, and inputs may be provided post-disaster by local and central governments on an ad hoc basis. Emergency food and shelter may be supplied by the government or NGOs. Rescheduling of credit repayments or interest may be granted by financial institutions. Infrastructure rehabilitation (e.g. irrigation) is the responsibility of the government, and calamity funds or reallocations of other funds are applied to relief and rehabilitation measures.

The National Calamity Fund was established for rehabilitation (e.g. irrigation facilities). There is an extensive system for disaster management by government organisations under the umbrella of the National Disaster Coordinating Council (NDCC) and the Department of National Defence (DND). The Department of Budget and Management (DBM) is responsible for the budget for agricultural relief activities.

A catastrophe risk modelling exercise is underway in the Philippines to assess the risk to public assets and determine appropriate risk financing arrangements for the public sector. A similar initiative is underway to evaluate models for crop insurance to improve the public crop insurance scheme. In parallel, the Department of Finance, with the support of the World Bank, is elaborating a policy strategy to determine appropriate actions to reduce the country's overall fiscal and economic vulnerability.

³⁸ Ibid.

Recommendations

The national insurer may need to consider enhancing cover features for key crops, moving from production cost insurance to production guarantee or even income/revenue protection.³⁹

SINGAPORE

Overview

Singapore has relatively low exposure to natural catastrophes with flood being the greatest peril. This has been successfully managed through a land drainage programme that created a network of canals. This has limited economic damage from flooding to just USD 23.8 million since 2000. UN GAR has estimated that earthquakes contribute to an average annual loss of USD 2.02 million, which is minimal in comparison to other countries in the region and in relation to Singapore's GDP.

With a population of 5.6 million, Singapore is a wealthy, developed, and highly urbanised country. Local agricultural production accounts for less than one per cent of total land (200 hectares on land and 100 hectares at sea). Local farmers produce fish, vegetables, and poultry. Singapore depends almost entirely on imports to meet its food requirements. Local food farms, which totalled 220 in 2019, collectively produced 14 per cent of leafy vegetables, 26 per cent of eggs, and 10 per cent of the fish supply in the same year.

Agricultural insurance: the roles of stakeholders

According to publicly available information (September 2020), there are no special agricultural insurance programmes or products in the country. There is no data available on government support for agricultural insurance. At the same time, Singapore is the largest regional financial hub for reinsurance in Asia. Many international insurance and reinsurance companies manage their agricultural insurance programmes in Asian countries from their headquarters in Singapore.

Singapore is the most mature of the ASEAN non-life insurance markets, and the most developed in terms of premiums per capita. The mortgage market has been a significant driver of property insurance penetration. Around 90 per cent of households own their homes, and lenders require that borrowers have comprehensive building cover in place as a condition of lending. Almost all policies are extended to include catastrophe risks or include it automatically as part of a package. An estimated 95 per cent of property policies cover flood risk. The purchase of

³⁹ A very basic assessment of the Philippines' agricultural insurance programme was conducted, and further recommendations can be provided once additional information is received and an in-depth analysis of the programme is conducted.

property catastrophe risk insurance is not mandated by law, but low voluntary demand is bolstered by insurance requirements from lending institutions.

The non-life insurance market is competitive and fragmented with 45 direct general and six composite insurers registered as of August 2011. Another 61 captive insurers provide exclusive insurance services to businesses. NTUC Income (a composite insurer) is the largest non-life insurer in Singapore. Insurance for government assets is open to all companies operating in the Singapore insurance market on a competitive basis. Significant changes in the structure of the market are not expected given its maturity.

Disaster risk management and finance: the legal framework

In 2014, the Singapore Food Agency created the Agriculture Productivity Fund to support local farmers in their efforts to expand production capability, modernise, innovate and increase yields. It can also co-fund research and development and the testbedding of technologies. The APF is available for farms with a valid SFA farm licence. As of 30 September 2019, a total of 107 local farms have benefitted from a USD 63 million fund to boost yields and increase production capabilities. Vegetable, fish, hen egg, shrimp and bean sprout farms have all benefitted from the programme, as well as ComCrop's commercial urban rooftop farm in Woodlands.⁴⁰

The Government of Singapore makes no annual budgetary allocations for disaster response because disaster risks are low. In the event a disaster risk, the government's Operations Civil Emergency Plan is activated. This plan gives the Singapore Civil Defence Force the authority to direct all response forces under a unified command structure and pool the necessary resources.

The Nanyang Technological University's Institute of Catastrophe Risk Management (NTU-ICRM) in Singapore, launched in 2010, focuses on catastrophe-related reinsurance risks, sovereign risk, societal risk, and other non-traditional risks in Asia. With support from the industry and the government, the NTU-ICRM embarked on two key projects on flood and seismic risk assessments. The ICRM is also part of the Global Earthquake Model (GEM) Project, a collaborative effort to develop and deploy tools and resources for earthquake risk assessment worldwide. NTU-ICRM is a key institution in the ASEAN region to implement the ADRFI phase 2 (ADRFI-2) programme to adopt an open architecture structure to support global collaboration with stakeholders, including policymakers, governments, multilateral development banks, international organisations, and the private sector.

The Monetary Authority of Singapore (MAS) prepares the industry for disasters by issuing guidelines on business continuity management (BCM) and conducting supervisory inspections based on these guidelines. The MAS also regularly organises industry-wide exercises (IWE) involving banks, insurers, capital market firms, and financial market infrastructure. The objectives are to enhance the resilience of the financial sector and provide an opportunity for financial institutions and infrastructures to test their business continuity and communication processes, as well as enhance coordination between private industry and public authorities. The scenarios developed for these exercises consider the prevailing risks and concerns of the financial industry and the MAS. For example, IWE I

⁴⁰ Ng, M., (28 November 2019). ["Over 100 local farms benefit from fund to help them modernise, innovate and increase yield"](#). *The Straits Times*.

(2006) focused on terrorist attacks in the Central Business District, while IWE II (2008) was based on the outbreak of a flu pandemic.

The main legislation supporting emergency preparedness and disaster management in Singapore includes the Civil Defence Act, Fire Safety Act, and the Infectious Disease Act. The Civil Defence Act was adopted in 1986 and is regularly amended (the latest in 2019). Several laws have also been enacted to empower respective government ministries and their agencies to prevent and manage crises (AIPA Report 2011). Singapore's Civil Emergency Plan is a national contingency plan for managing large-scale civil and natural disasters. Disaster risk management in Singapore follows a Whole-of-Government Integrated Risk Management (WOG-IRM) policy framework. There is no reference to AADMER⁴¹ in the legislation, although the Minister may deploy the Singapore Civil Defence Force in support of other countries if assistance is requested.

The regulatory framework governing Special Purpose Reinsurance Vehicles (SPRVs) was introduced in Singapore in 2008 to facilitate the establishment of insurance securitisation as an alternative risk management tool to reinsurance. This allows insurers to transfer their risk portfolio directly to international capital markets.

Recommendations

Due to the small size of the agricultural sector, there is no need to develop special risk solutions for agriculture. It would be best to target agricultural production risks through existing disaster risk management arrangements.

THAILAND

Overview

Thailand faces significant flood risk around its major economic zone. Fifty major flood events are reported to have taken place in Thailand since 2000, killing 2,300 people and causing more than USD 50 billion in damage. The 2011 floods triggered by tropical storm Nock-ten and a heavy monsoon season were the most damaging floods in living memory. According to ReliefWeb, rainfall in Northern Thailand was 344 per cent above the mean with 65 of Thailand's 76 provinces declared flood disaster zones. The flood waters persisted from late July 2011 to January 2012 in some areas, causing 815 deaths and affecting 13.6 million people. The World Bank estimated that of the more than USD 50 billion in damages, only USD 16.76 billion was insured against flooding.

Agriculture contributes 12 per cent of GDP, with 58 per cent of the population involved in agriculture. About 75 per cent of arable lands depend on rainfall, leaving farmers extremely exposed to flood and drought risk.

⁴¹ ASEAN Agreement on Disaster Management and Emergency Response

Agriculture insurance: the roles of stakeholders

Thailand has a developed insurance market – the fifth largest in Asia. General insurance premiums annually total USD 7.2 billion with a market penetration ratio of 1.42 per cent.⁴² There is intense competition in the non-life insurance market with 53 companies (48 local insurers and five local branches of foreign insurers), which drives down premium rates. Unlike other ASEAN countries, insurers have significant interest in agricultural insurance with 21 companies participating in the country's crop insurance programme.

The Thai Government commissioned the General Insurance Association (GIA) to study and implement a national rice insurance scheme in 2011. Today, the programme continues to expand to include new crops. The programme was a calamity-based insurance scheme for the main rice seasons based on the existing government calamity scheme. Payouts for the Government Disaster Relief Payment Scheme were made for total losses as inspected by the government in declared calamity areas. The programme has helped to build the resilience of about two million (of a total 7.7 million) farmers in Thailand and protected their livelihoods in a timely manner. An important feature of the programme is that it covers key calamities at the farm level with lean distribution costs by using the Bank of Agriculture and Agricultural Cooperatives' (BAAC) extensive client outreach.

Initially, the rice insurance programme was offered to rice farmers through eight local insurance companies and nine reinsurance companies. Currently, over 20 insurance companies are involved in providing insurance cover to farmers. The perils covered include flood, drought, frost, windstorm, fire, and hail. Damage due to pests and diseases, as well as damage by elephants, has a sublimit of 50 per cent of the sum insured. In 2019 coverage was extended to maize. The sum insured is based on cost of production (28 per cent of estimated production costs) at USD 246 per hectare for rice and USD 391 for maize. Another 25 per cent of production costs are covered by the government relief programme. The government perceives the National Rice Insurance programme as a better budget management tool.

To assist farmers, the Thai Government compensates 60 per cent of the sum of the insurance premium (a subsidy) and the farmer pays the remaining amount. An additional 40 per cent subsidy is available to BAAC loan customers, which makes the insurance free for borrowers. Farmers without loans still bear 40 per cent of the premium cost.

The key challenges of the current programme are: (i) low coverage (28 per cent of the total production cost), and (ii) the claim to be triggered when the government declares a disaster.

In 2019, around 1.9 million farmers took out insurance for the year ending June 30, covering 4.512 million hectares (30 million rai) of agricultural land, up from 4.42 million hectares in the previous year. Of the 30 million rai, rice crop insurance makes up 27 million, which accounts for the country's total rice plantation area of 45.3 million rai. Premiums increased to THB 2.58 billion (USD 836 million) from THB 2.48 billion (USD 804 million) in the previous year (2018).

⁴² In 2018, according to Thai General Insurers Association.

Crop insurance premiums are likely to increase in 2020, with the claims loss ratio hitting 200 per cent in 2019 as a result of natural disasters throughout the year. Total claims for crop insurance of THB 3 billion were paid in 2019 with a loss ratio of 150 per cent, according to Thai General Insurance Association (TGIA). The 150 per cent claim ratio in crop insurance was the highest it had been in recent years, excluding the 2011 flood disaster when the loss ratio was as high as 700 per cent.

The Thai Cabinet has recently approved a maize insurance project estimated to cost THB 313.98 million (USD 9.8 million) that would cover a target area of three million rai (480,000 hectares) to mitigate the effects of natural disasters. The Cabinet has assigned the Office of Insurance Commission (OIC) to oversee the maize insurance policy in accordance with its resolution. Seventeen insurance companies are participating in the project, which was planned to run from 12–31 May 2020 and from 1 October 2020 to 15 January 2021. The maize insurance project follows a rice insurance scheme for the 2020 season, approved by the National Rice Policy Committee to be worth THB 2.91 billion and aiming to cover 44.7 million rai of farmland in total.

According to publicly available information, BAAC is looking to expand its crop insurance scheme to fruit and dairy farmers to meet rising demand for protection against natural disasters. The bank is expected to expand insurance coverage to cassava since production area is about 9 million rai and there is an interest among farmers to insure this crop.

Sompo Insurance has launched a longan crop insurance scheme with a crop insurance premium of THB 299 per rai. Insurance policies are being sold through the BAAC's Chiang Mai branch. The company's longan crop insurance provides protection for damage caused by drought, which is detected by satellites. If drought is found and meets the predetermined conditions, the company will pay damage claims to longan farmers automatically. Longan insurance is offered by private insurance companies because the fruit does not fall within any government-supported crop insurance project. Apart from Sompo Insurance Thailand, a few other Thai insurance firms offer microinsurance schemes for farmers and fisheries. No performance results for this pilot programme are publicly available.

Disaster risk management and finance: the legal framework

As of the end of May 2020, subsidies worth THB 35.51 billion⁴³ had been transferred to 7.1 million farmers as the government's financial aid for producers affected by COVID-19. In summer 2020, the government also approved USD 300 million in aid for drought-stricken sugarcane farmers, covering 300,000 producers.⁴⁴

Since the 2011 floods, Thailand has been proactive in managing and reducing disaster risk. The National Disaster Risk Management Plan focusses on four key strategies: disaster risk reduction, integration of an emergency management system, strengthening sustainable recovery, and the promotion of international cooperation on

⁴³ National News Bureau of Thailand, (8 June 2020). "[Seven million Thai farmers receive 5000-baht subsidies](#)". *Thailand Business News*.

⁴⁴ Reuters Staff, (9 June 2020). "[Thailand approves \\$300 million aid for drought-stricken sugarcane farmers](#)". *Reuters*.

disaster risk management. The government has also drawn up a USD 9.4 billion plan to manage flood risk along the Chao Phraya river. Considerable funds will go into tree planting, wetland restoration, reservoir construction, and land use planning.

Thailand's Disaster Risk Management System covers a wide range of risk management activities: some elements of DRR, prevention, preparedness, early warning, mitigation, emergency management/response, and early recovery. The system establishes specialist national institutions for DRM coordination and at least some local level.

The Disaster Prevention and Mitigation Act 2007 established the National Disaster Prevention and Mitigation Committee (NDPMC) and designates the Department of Disaster Prevention and Mitigation (DDPM) as the primary state agency for disaster risk management. Disaster Management Command Centers are established by law at different government levels. During emergencies, these become emergency operations centres. The National Disaster Warning Center (NDWC) also falls under the DDPM.

The Ministry of Defence also has a key role as it operates military disaster response under the Defence Organizational Act 2008. Of relevance to regional cooperation, the Ministry of Foreign Affairs is responsible for international assistance in coordination with the DDPM.

Under the DPM Act, local mandates are conferred on provincial governors who are required to establish committees to advise on a Provincial Disaster Prevention and Mitigation Plan, which has a provision for a Bangkok committee. Local administrators serve as DRM managers in their areas. Governors also appoint sub-national command centres, which are established at different government levels to execute disaster management responsibilities. Notably, these also include private sector representatives and community heads.

In the event of an emergency, a disaster declaration can be proclaimed for an affected area by the authorities permitted under the Ministry of Finance, Regulations on Disaster Relief Contingency Fund for Affected People Assistance 2003 (and the addendum). The DPM Act requires that the relevant national or provincial level agency in charge of the planning process identifies funding for the activities planned.

The concept of DRR has not been adopted and administered in some productive sectors. Agricultural production has taken DRR into account, but other sectors do not have a systematic approach or procedures for DRR in their business operations. The Government Central Fund (a discretionary fund for specific purposes) is under the control of the Ministry of Funding, including an emergency reserve fund for a range of purposes, including disaster relief and early recovery.

The Government of Thailand offered tax relief to businesses, together with soft loans, to support recovery from the 2004 tsunami. Following the 2010 floods, the affected firms were permitted to delay VAT, stamp duty, and tax payments for several months and were granted an import duty exemption on machinery until December 2011.

In Thailand, when a disaster occurs, the Office of Insurance Commission (OIC) collects data directly from all insurance companies. The OIC regularly updates this data and follows up on the process of submitted claims. Since the National Catastrophe Insurance Fund (NCIF) was established in 2012, the NCIF has collected this data and it

can be requested subject to certain limitations.

The Thai insurance sector offers property insurance for fire and business interruption to cover against losses arising from natural disasters. It also offers natural disaster coverage under automobile insurance, life and personal accident insurance, and crop insurance. Affordability issues with private flood insurance coverage recently led the government to establish the National Catastrophe Insurance Fund (NCIF).

Risk assessments at national and local levels are carried out by experienced national agencies: the Department of Mineral Resources (DMR) for geo-hazards; Royal Irrigation Department (RID) and Department of Water Resource (DWR) for water-related hazards; Thai Meteorological Department (TMD) for weather and earthquake monitoring; and the National Disaster Warning System (NDWC) for tsunami monitoring and warning. However, hazard maps for disaster are not available for all regions, and no standard mapping for risk-prone areas was reported.

Recommendations

1. Revise the coverage structure under the ongoing rice insurance programme to move from production cost insurance to yield insurance.
2. Technical assistance may be needed to revise the coverage structure of the current rice insurance programme. Arrange capacity building and technical assistance to build the technical skills of insurance companies and government agencies.
3. Consider a CAT-level weather index programme to offset CAT-risks more efficiently while also increasing coverage for farmers under future insurance programmes.

VIETNAM

Overview

Around 20 per cent of Vietnam's economic output comes from the agricultural sector, which is highly exposed to natural hazards, including tropical cyclones (typhoons), tornadoes, landslides, and droughts. After investing heavily in improving irrigation, pest and disease control and flood defences, the Government of Vietnam decided in 2011 to implement an agricultural insurance scheme starting with a subsidised pilot programme. The programme provided cover for rice, livestock, and aquaculture farming against storm, flood, drought, cold, frost, tsunami, and other perils. It also provided cover against named pests, diseases, and epidemics specific to rice, livestock, and aquaculture. During the pilot, the programme is being implemented in 20 provinces throughout Vietnam. The rice insurance scheme was index-based and the livestock and aquaculture schemes were indemnity-based.

Agricultural insurance: the roles of stakeholders

The Ministry of Finance and the Ministry of Agriculture and Rural Development (MARD) provided guidance and support for the implementation of the programme. The Vietnam National Reinsurance Corporation, Vina Re, and Vietnam's two largest insurers, Bao Viet and Bao Minh, were appointed by the Ministry of Finance to participate in the design and implementation of the pilot programme. Swiss Re was asked to provide actuarial services to calculate insurance premium rates as well as reinsurance capacity.⁴⁵

The government subsidised 100 per cent of insurance premiums for poor households, 90 per cent for near-poor households, 60 per cent for other households, and 20 per cent for agricultural production organisations. The insurance products were designed in consultation with MARD and the insurance industry, and the Ministry of Finance determined the wording of the details and set premium rates for rice, livestock, and aquaculture insurance products.

Households, farmer associations, and agribusinesses within the pilot areas were selected as beneficiaries of the agricultural insurance policy. Seven provinces participated in the rice pilot programme, including 21 districts with 481 communes. Livestock insurance was piloted in nine provinces with 27 districts and 180 communes. The aquaculture insurance pilot programme was offered in five provinces in the Mekong Delta, including 21 districts and 84 communes.

For the 2011–13 pilot programme, 304,017 farmers purchased insurance policies (76.8 per cent poor; 15.1 per cent near poor; 8.1 per cent others). Premiums amounted to VND 394 billion (USD 18 million). Government supports amounted to VND 304 billion or 77 per cent of the total premium. The insurers paid out VND 712.9 billion resulting in a 235 per cent loss ratio, which made programme unattractive to insurers and reinsurers. At the same time, the rice insurance pilot programme was operated profitably. 236,397 farmers were covered by insurance (76.5 per cent poor; 16.8 per cent near poor; 6.7 per cent others). Total rice premiums amounted to VND 91.9 billion (USD 4 million) with the government paying VND 86 billion (93.6 per cent) as a premium subsidy. The claim payments amounted to VND 17.4 billion, which resulted in a 19 per cent of loss ratio. The programme has been suspended for the past six years and was under revision.

In June 2019, the government issued a decision to allocate more funds for localities to implement the agricultural insurance programme, which covers rice plants, buffalo, cattle, black tiger prawn, and white-legged shrimp. An individual who works in agriculture and is from a poor or near-poor household will receive up to 90 per cent support for their agricultural insurance premium from the government. Others who are not from poor or near-poor households will receive assistance of 20 per cent. Organisations engaged in agricultural production will be offered 20 per cent of fees if they meet certain requirements.

Insurance programme support was planned to be valid from 26 June 2019 until the end of 2020. However, there is no public information that the programme has been launched as planned. According to provincial representatives,

⁴⁵ Information provided by the Swiss Re Centre for Global Dialogue: http://cgd.swissre.com/features/Agricultural_reinsurance_in_Vietnam.html.

local authorities have found it difficult to implement the new decision. Although the government offered high rates of financial assistance to poor farmers, most poor households in the province did not have land to plant rice. The decision has demonstrated good will on the part of the government, but it would be difficult to implement due to farmers' hesitation to apply for insurance given the distance they would have to travel, lack of knowledge about the insurance companies' conditions, and complicated procedures.

Disaster risk management and finance: the legal framework

In April 2018, the government adopted Decree No. 58/2018/ND-CP on agricultural insurance, which took effect on 5 June 2018. This legal document sets forth a stable and transparent framework to facilitate the implementation of agricultural insurance on a voluntary basis with no limitations on the class of the insured, subject matter of insurance, risks, or geographical scope. The Decree provides a framework for implementing agricultural insurance with financial support from the state.

According to the Decree, based on agricultural development objectives and state budget capacity, the government will provide guidance on the implementation of agricultural insurance support for each period. There is a plan to introduce insurance products to provide insurance coverage for rice, rubber, pepper, cashew nut, coffee, fruits, and vegetables. The programme will also offer insurance for livestock (buffalo, cow, pig, poultry) and aquaculture (tiger prawn, white-leg shrimp, pangasius catfish). Individuals who work in agriculture and belong to poor households and near-poor households (in line with Decision No. 59/2015/QD-TTG) are to be compensated up to 90 per cent for agricultural insurance premiums. Those who do not belong to poor or near-poor households are to be assisted with 20 per cent of the premium. Agricultural companies may be supported with 20 per cent of the premium if they are established in accordance with the Law on Enterprises or the Law on Cooperatives, and fulfil other requirements regarding agricultural production, consumption, food quality, and safety. The future programme is to be offered in key production regions with most perils (natural disasters) to be insured against (19 types and pests plus diseases for livestock).

Certain activities are to be conducted by government agencies, including:

Ministry of Finance (MOF)

- Submission of the PM's Decision draft, pending the PM's consideration;
- Review and approval of insurance products submitted by insurers; and
- Budget estimate, pending government and National Assembly approval.

Ministry of Agriculture and Rural Development (MARD)

- Issuance of guidelines for proclaiming and verifying natural disasters, epidemics and pests; and procedures, best practices, and technical standards for agricultural production.

Local government

- Well prepared for implementation (material, technical, financial, and human resources)

Insurers

- Meeting capital, solvency requirements; well prepared for implementation.

As of September 2020, government agencies were still in the process of developing the implementation guidelines and procedures for the new agricultural insurance programme. The technical working group and a steering committee were set up to provide guidelines for programme implementation.

Vietnam has a medium-sized insurance market with premiums totalling USD 3.982 million a year and a penetration ratio of 1.94 per cent. There has been consistent premium growth in recent years, above 15 per cent in 2015 and 2016, partly due to high GDP growth rates and a growing middle class. The non-life market makes up only 31 per cent of the overall market, indicating there may be opportunities for growth in property protection from flood risk. Insurance companies need technical assistance to develop their knowledge, skills, and technical capacity to underwrite the agricultural insurance programme proposed by the Government.

Vietnam has a well-developed natural disaster management system and post-disaster emergency relief and reconstruction scheme that is funded in part by central government and local government bodies (provincial and district-level governments). Under the State Budget Law of 2002, central and local governments are required to allocate between two and five per cent of their total planned budget for capital and recurrent expenditures to a contingency budget to fund the prevention, response, and recovery from natural disasters (e.g. typhoon, flood, landslide, drought). In 2008, the total central and local contingency budgets were VND 9 050 billion (USD 650 million). Following major typhoon and flood events, farmers receive compensation payments usually in the form of seeds and fertiliser or small animals to replace lost livestock.

In November 2007, the government approved the National Strategy for Disaster Prevention, Response, and Mitigation to 2020, which lays out the country's primary DRM objectives with an emphasis on managing hydro-meteorological risks. Vietnam's national disaster risk management agency, the Committee for Flood and Storm Control (CCFSC), is chaired by the Minister of MARD. The HFA Focal Point is MARD. Vietnam has central, provincial, district, and commune-level emergency response plans for storms and floods that are reviewed and updated annually.

The Law on Natural Disaster Prevention and Control 2013 assigns responsibility across a range of ministries and at all levels of government, including:

- Central Steering Committee for Natural Disaster Prevention and Control (more commonly known as the National Flood and Storm Control Committee);
- Ministry of Agriculture and Rural Development, which was newly established on 18 August 2017 as the Vietnam Disaster Management Authority (VNDMA); and
- Department of Community Based Disaster Management (formerly the Disaster Management Centre), assigned to implement the CBDRM Programme in the country, undertaking policy development and providing strategic planning advice and support.

Each Ministry-level agency and People's Committee (at all levels of government) is required to set up a disaster committee. The law does not mention ASEAN, AADMER, or the AHA Centre. The DNDPC shares responsibility for different types of international cooperation, but it is the key disaster response agency in coordination with the Ministry of Foreign Affairs.⁴⁶

The NDPC Law does not establish new sub-national structures for DRM, and the existing local flood and storm control committees have continued their roles. The Law gives a broad mandate to all ministries and levels of government, including local-level People's Committees. It also covers the national programme for community-based DRM (CBDRM) managed by the Department of Community Based Disaster Management. Financial sources for natural disaster prevention and control come from the state budget fund, natural disaster prevention and control funds, and voluntary contributions from organisations and individuals (Law on NDPC, Art. 8–11).

Recommendations

1. Enhance technical assistance for the government and insurers to strengthen capacity to develop and manage agricultural insurance programmes.
2. Consider a rice yield guarantee or yield insurance covers to enhance future programmes.

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Annex 3: List of interviewees

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ASEAN	Dr Anja Erlbeck	Director, Agriculture Finance	GIZ	anja.erlbeck@giz.de	Friday, 9 October 2020
Cambodia	Mr. Channa Samorn	Technical Advisor	GIZ	channa.samorn@giz.de	Thursday, 15 October 2020
Indonesia	Akiko Aikawa	Agricultural Insurance Project Coordinator	JICA	akiko.aikawa@gmail.com	Friday, 16 October 2020
	Jakub Nugraha	Department Head	ACA Insurance	nugraha.jakub@gmail.com	Monday, 19 October 2020
Myanmar	Armin Hofmann	Head of Program	Financial Sector Development in Myanmar	armin.hofmann@giz.de	Wednesday, 14 October 2020
	Dr. Khin Myo Nyein	Staff Officer	Project Steering member/Focal point, Department of Agriculture	khinmyonn@gmail.com	Wednesday, 21 October 2020
Philippines	Manuel J. Cortina	Officer-In- Charge	Business Development and Marketing Department, Philippine Crop Insurance Corporation (PCIC)	bdmd@pcic.gov.ph	Friday, 23 October 2020
Vietnam	Nguyen Hong Ninh	RIICE Project Manager	SDC / EDA	ninh.nguyen@eda.admin.ch	Friday, 6 November 2020
	Walker, Timm GIZ VN	Technical Advisor	The Mekong Delta Climate Resilience Programme (MCRP)	tim.walker@giz.de	Wednesday, 21 October 2020
	Nguyen Thanh Binh	Senior Project Officer	GIZ-Green Innovation Centre	binh.nguyen@giz.de	Monday, 9 November 2020



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