

Global Knowledge Exchange on Disaster Risk Financing for Agriculture

FACT SHEET #1 Climate and Disaster Risk Financing for Agriculture: Policy, Legal and Institutional Considerations



Introduction

Low- and middle-income countries face challenges in managing the financial impact from disaster and climate risks to agriculture. Government’s agriculture related post-disaster support efforts often rely on limited domestic resources and short-term international aid. Agricultural households and firms lack access to suitable and affordable climate risk financing and insurance products. Establishing appropriate risk financing strategies can help address these challenges and build resilience for governments, agricultural households and businesses.

Building on the successes of the last two global knowledge exchange series on disaster risk finance for agriculture (DRFA) held by the World Bank’s Disaster Risk Financing and Insurance Program (DRFIP) in 2022 and 2023, the third global webinar series is held in partnership with ASEAN+3¹ DRF Initiative, ASEAN Secretariat, Southeast Asia Disaster Risk Insurance Facility (SEADRIF) and other global partners in response to requests for DRFA knowledge exchange. The knowledge sharing events are enabled with generous support from the SEADRIF Multi-Donor Trust Fund with financial contributions from Japan Ministry of Finance.

This knowledge exchange series on DRFA aims to (i) increase the understanding and capacity of participants to design and implement DRFA programs by filling in the knowledge gap and enhancing knowledge exchange among participants and (ii) foster collaboration among ASEAN+3 member countries and beyond by exploring potential regional and country level solutions to address DRF challenges in member countries.

Overview

The four webinars in the series (and corresponding fact sheets) address four key aspects of DRFA:

SESSION 1

Frameworks for DRFA: Policy, legal, institutional consideration

SESSION 2

DRFA Instruments: Government-supported programs

SESSION 3

DRFA Instruments: Public private partnership and market-based instruments

SESSION 4

Data analytics and technology for DRFA

1 Association of Southeast Asian Nations plus China, Japan and the Republic of Korea.

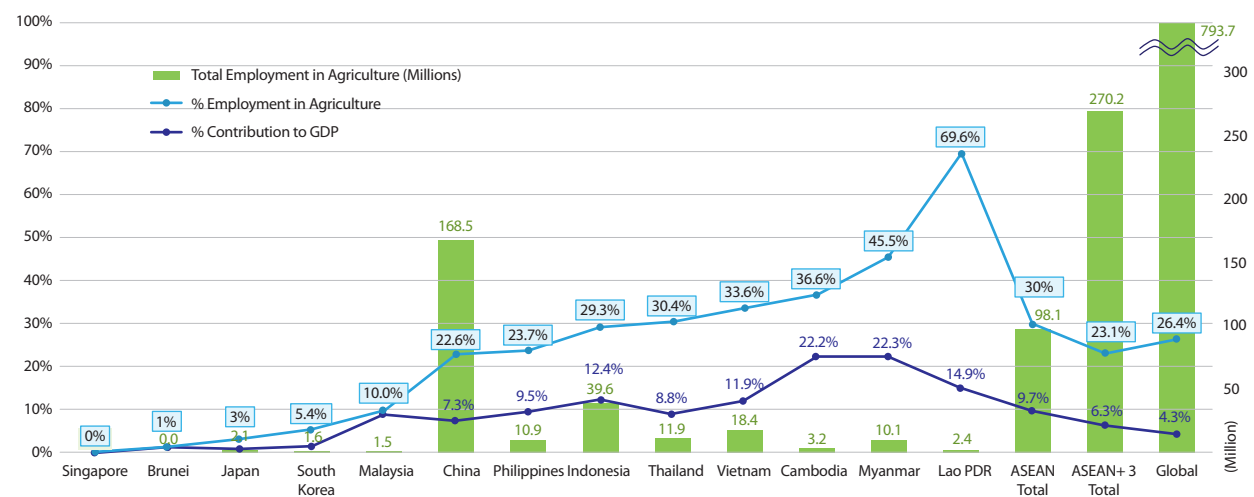
SESSION 1: Climate and Disaster Risk Financing for Agriculture: Policy, Legal, and Institutional Considerations

Impact of Disasters and Climate Shocks on Agriculture and Rural Livelihoods

Agriculture plays an important role in most economies. The sector provides a source of livelihood for over 2.5 billion people worldwide and is a significant contributor to national gross domestic product (GDP). In the ASEAN+3 region, agriculture accounts for 23.1% of total employment and 6.3% of total regional GDP (Figure 1). Agriculture is critical for food security by providing food and stabilizing food prices and supplies. Key agriculture products such as rice, coffee, etc. have also been strategic commodities in international trade.



FIGURE 1. Employment and Economic Contribution of Agricultural Sector Globally and in ASEAN+3 Countries



Source: World Bank staff estimation based on data from ILO and the World Bank

Factsheet 1 was prepared by Hang Thu Vu (Senior Financial Sector Specialist), Miho Ito and Thao Tran (both Disaster Risk Finance Consultants) from the World Bank's Disaster Risk Finance and Insurance Program. Design and layout were provided by Hoang Hai Vuong.

The agriculture sector is highly vulnerable to disaster and climate risks, including droughts, floods, storms, earthquakes, tsunamis, heatwaves, amongst others. The Food and Agriculture Organization (FAO) reports that between 2008 and 2018 natural disasters alone cost developing economies US\$108.5 billion in crops and livestock and production losses, with total agricultural losses reaching US\$280 billion globally. The Asia region alone accounts for 74% of global agricultural losses. See Figure 2.

Farmers and agribusinesses are often the first to bear the brunt of losses from disasters. Direct losses to farmers include damage to crops, livestock, and production inputs, while reduced yields and higher costs create financial strain, leading to increased debt or investment in the next season’s crop.

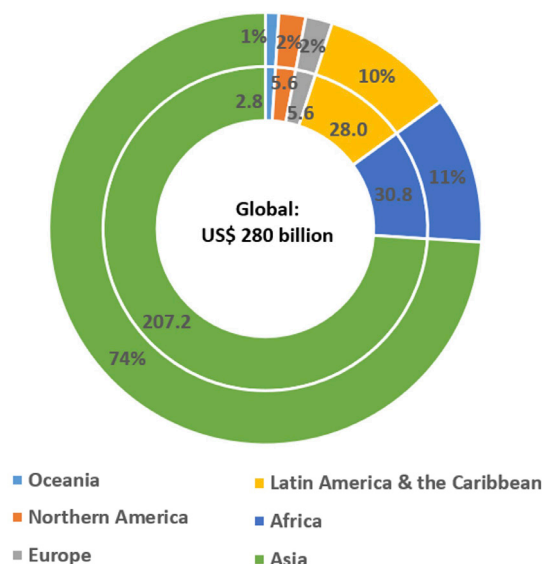
Impacts from climate and disaster risks can ripple across all stages of the entire agricultural value chain from production and processing to distribution and consumption. These impacts include direct losses and indirect losses, for example, labor shortages, reduced processing, supply chain disruptions. These losses ultimately increase price volatility and destabilize markets.

Disasters and climate shocks have an impact on food security and availability. Shortages caused by production and supply chain disruptions can lead to food scarcity, affecting affordability and accessibility, especially for low-income populations.

Disasters can have a significant impact on employment. Agriculture and its supporting industries employ millions of people locally and globally, particularly in rural areas. Disaster impacts can lead to reduced hours, wage cuts, or layoffs, increasing vulnerability in affected communities.

The agriculture sector’s vulnerabilities to disaster and climate risks are a primary source of contingent liabilities for governments. These may include explicit governments’ commitment to provide post-disaster support to affected farmers and agribusinesses and implicit liabilities arising from expectations on governments to provide relief. These impact governments’ fiscal position through potential increases in post-disaster spending and reduced revenues due to agricultural losses and disruptions.

FIGURE 2. Losses to Agricultural Production² by Region, 2008-2018 (US\$ billion)



Source: Food and Agriculture Organization of the United Nation

2 Declines in the volume of crop, livestock (and also forestry, aquaculture and fisheries) production resulting from a disaster, as compared to pre-disaster expectations

Overview of Disaster Risk Financing for Agriculture

What is Disaster Risk Financing for Agriculture (DRFA)?

DRFA is an approach to managing financial impacts on agriculture from disasters and climate shocks through employing a mix of policy, technical, and financial instruments. It helps governments, households, and businesses arrange a suite of financing mechanisms before disasters happen for improved planning and certainty.

DRFA needs to be part of a country's comprehensive disaster risk finance approach that addresses multiple financial protection priorities and must be embedded into broader policies and frameworks for agriculture risk management, disaster risk reduction, climate change adaptation and mitigation, social protection, fiscal risk management and financial sector development.

Why Disaster Risk Financing for Agriculture?

Countries invest in DRFA to manage the immediate impacts of disasters and to build resilience, support economic stability, and protect livelihoods. DRFA helps **ensure pre- and post-disaster funding** for agricultural activities and livelihoods, enhancing sector resilience through improved risk management and reduced shock impact. DRFA **protects rural households from large-scale disasters**, preventing harmful coping strategies such as asset sales or migration. Unlike often-delayed government relief efforts, it offers timely support, safeguarding family welfare. It also fosters **agricultural growth and innovation** by providing a financial safety net, enabling farmers and businesses to invest confidently, improve productivity, and recover more quickly from crises.

How Households, Micro, Small and Medium Enterprises and Government Manage Agriculture Related Climate and Disaster Risks?

Households, micro, small and medium enterprises (MSMEs) and governments have used a range of structural and non-structural risk management mechanisms to manage the financial impacts on agriculture arising from disasters and climate shocks. For low to moderate and frequent risks, households and MSMEs often manage and retain the losses themselves or through community-based support mechanisms. For moderate to high and less frequent risks, governments step in to provide direct relief and other types of financing mechanisms through financial intermediaries. See Table 1.



Photo credit: Yves-Bernardi/Pixabay

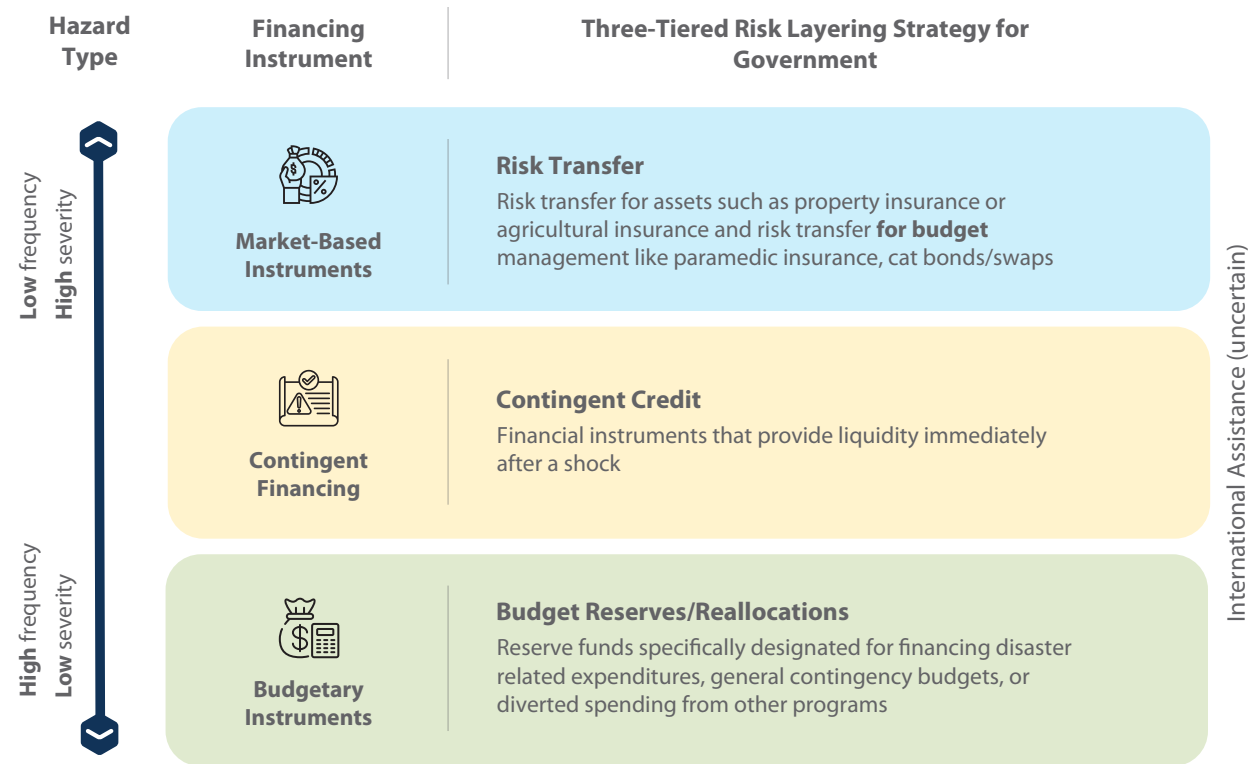
TABLE 1. An Overview of Risk Management Mechanisms in Agriculture

Degree of Risks	HOUSEHOLD	MSME	MARKET	GOVERNMENT
Risk Avoidance or Treatment	<ul style="list-style-type: none"> • Avoiding exposure to risk • Sharecropping • Using farmer self-help groups 	<ul style="list-style-type: none"> • Digital solutions and resource diversification • Limited investments in risk reduction, adaptation or mitigation 	<ul style="list-style-type: none"> • New technology • Improved seeds 	<ul style="list-style-type: none"> • Irrigation infrastructure • Agriculture research and extension • Early warning systems • Weather data system • Policy, regulatory and fiscal incentives
LOW	<ul style="list-style-type: none"> • Household savings • Self-Insurance • Informal saving and lending • Crop and livestock 	<ul style="list-style-type: none"> • Business savings and cash reserves • Diversification of products and services 	<ul style="list-style-type: none"> • Formal savings • Formal credit 	
MODERATE	<ul style="list-style-type: none"> • Savings • Informal lending • Risk pooling (peers, family members) • Income diversification 	<ul style="list-style-type: none"> • Contingency funds • Working capital credit • Insurance & risk sharing within supply chain 	<ul style="list-style-type: none"> • Formal credit • Risk sharing (input suppliers, wholesalers) 	<ul style="list-style-type: none"> • State-sponsored lending • Contingent credit • Credit guarantee schemes • Risk sharing facilities • Shock-responsive social protection
HIGH	<ul style="list-style-type: none"> • Reduce consumption • Remove children from school • Sell productive assets • Default on loans • Plan for migration • Do nothing 	<ul style="list-style-type: none"> • Insurance • Guarantee • Supply chain financing • Digital • Other hedging strategies 	<ul style="list-style-type: none"> • Insurance (indemnity and index) • Guarantee 	<ul style="list-style-type: none"> • State relief or compensation scheme • State-sponsored lending • State-sponsored insurance • Catastrophe bonds • Credit guarantee schemes • Risk sharing facilities • Shock-responsive social protection

Source: The World Bank Group Disaster Risk Financing and Insurance Program

DRFA employs various financial instruments based on risk layering, matching them against the frequency and severity of the expected disaster events. This approach includes risk transfer for low-frequency, high-severity events (e.g., insurance), contingent financing for medium-frequency, medium-severity events, and budgetary instruments for high-frequency, low-severity events, as shown below. An example of sovereign risk layering is shown in Figure 3.

FIGURE 3. Simplified Risk Layering Approach



Source: The World Bank Group Disaster Risk Financing and Insurance Program



Designing DRFA Frameworks: Key Considerations

Effective policy, legal and institutional frameworks are essential for successful implementation of DRFA. These frameworks are critical to creating an enabling environment for DRFA, making agricultural systems more resilient to shocks, reducing fiscal burdens on governments, and improving overall food security and stability in the sector.

Policy Framework for DRFA

In designing a policy framework for DRFA, several important factors must be considered to ensure that it effectively manages the financial impact, enhances resilience, and is accessible and sustainable for stakeholders across the agricultural sector, as indicated below.

1

Understanding Risk

- **Identification of key risks:** Determine the specific risks that affect agriculture, such as droughts, floods, earthquakes, etc. and understand the frequency and severity of these risks across the economy.
- **Sector-wide risk assessment:** Conduct detailed risk profiling at different levels (households, MSMEs, cooperatives, agribusinesses, sovereigns, etc.) to understand vulnerabilities and exposure, which will inform the formulation of policy priorities.

2

Defining policy objectives and priorities

- **Clarification of key objectives and priorities from the beginning.** Define, for example, who will be protected, what perils will be protected against, what level of protection will be provided, where funding for protection will come from, etc.
- **Risk financing vs risk reduction:** Leverage risk financing to incentivize risk reduction behaviors and climate resilient agriculture practices.
- **Inclusivity, gender and socioeconomic sensitivity:** Address variations and diversity in risk financing needs across farm scales, gender and socio-demographic groups to ensure equitable access to financing and support.
- **Financial inclusion and awareness:** Consider the level of financial inclusion and literacy among farmers and MSMEs. Programs aimed at improving financial inclusion and awareness of available risk financing options are essential for effective policy uptake.

3

Arranging Products and Solutions

- **Breadth and depth of solutions:** Allow for a range of instruments suited to varying levels of risk and different beneficiary groups.
- **Affordability and accessibility:** Ensure that products are affordable and accessible for smallholders and MSMEs, as high costs can limit uptake.
- **Scalability:** Support scalable instruments that can expand to cover larger populations over time, including the use of technology to improve accessibility.
- **Flexibility:** Allow for mechanisms to adjust solutions or develop new ones based on evolving climate data and analytics as risk financing landscapes change.

4

Modalities for funding

- **Sustainable funding models:** Identify long-term funding sources, e.g., public funds, international donor support, to ensure policy sustainability.
- **Crowding-in the private sector:** Design frameworks that attract private sector players to participate in risk-sharing, which can enhance capacity and reduce the fiscal burden on governments. Provide incentives for private sector participation in risk management initiatives, such as tax breaks, subsidies, or guarantee funds.

5 Stakeholder Coordination and Capacity Building

- **Multi-stakeholder engagement:** Engage various stakeholders across sectors, i.e. government, private sector, farmer groups, civil society, in the development of policies that address practical needs and build sustainable DRFA mechanisms.
- **Capacity building and knowledge sharing:** Train local institutions, such as cooperatives and farmer organizations, to effectively manage and promote risk financing products and build local capacity for data collection, risk assessment, and claims management.

6 Monitoring, Evaluation, and Feedback Mechanisms

- **Performance metrics:** Define metrics to evaluate policies' impact on financial stability, income protection, uptake rates, and resilience-building in the agriculture sector.
- **Monitor and evaluation:** Regularly monitor and evaluate the policies with pre-defined metrics to enhance the impacts.
- **Continuous feedback loops:** Establish feedback mechanisms to gather insights from farmers, cooperatives and private sector players. This will help identify gaps and areas for improvement, allowing for periodic adjustments to the framework.

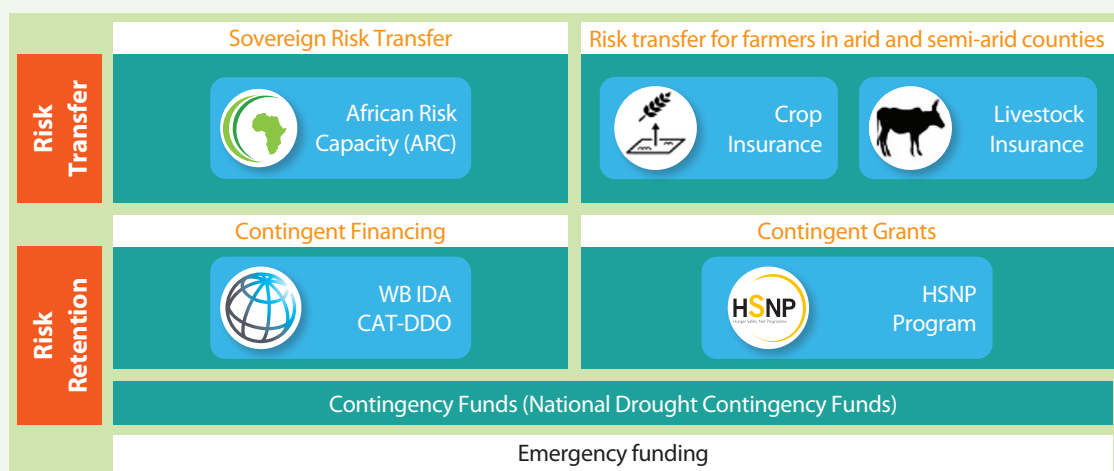
7 Coordination and alignment

- **Alignment of policies and programs:** Align risk financing frameworks with other policies that promote food security, resilience to climate change and disasters, development of an inclusive and resilient financial sector, sustainable fiscal management, adaptive social protection and sustainable land management, creating a holistic approach to effective DRFA.

Case Study - Kenya

Kenya's National Disaster Risk Finance Strategy is a successful example of **fitting different programs together effectively under clear policy priorities** (i.e., coordinated approach, increased financing capacity, protection of the vulnerable, empowerment of ministries and counties) **and alignment with the overarching national development goals**. The strategy employs risk retention and risk transfer instruments as part of the disaster-laying framework, as shown in Figure 4.

FIGURE 4. Kenya's National Disaster Risk Financing Strategy for Agriculture Strategy Including for Agriculture



Source: The World Bank Group Disaster Risk Financing and Insurance Program

Legal and Regulatory Frameworks

Legal and regulatory frameworks for DRFA are critical in supporting resilience against climate and disaster-related risks. These frameworks provide structures and enforce standards that enable governments, financial institutions including insurers and related stakeholders to develop and deploy financial tools, safeguard farmers' livelihoods, and manage risks sustainably, as described below.

1

Legislation on public financial management

- **Management of agriculture related disaster contingent liabilities:** Legislation frameworks could set out key requirements for systematic management of agriculture related contingent liabilities arising from disasters and climate shocks. These may include regular quantification of potential contingent liabilities, disclosure of related fiscal risks and defining measures to address residual risks.
- **Public finance related measures:** Legal frameworks often establish fiscal support measures including budget related measures, reserve funds, tax incentives, and public support such as subsidies for market-based instruments including insurance, local or regional risk pooling, catastrophe bonds or contingent loans.

2

Legislation on financial sector

- **Insurance regulations:** Frameworks outline requirements for agricultural insurance, including eligibility, risk assessment, and coverage. Reinsurance regulations help insurers transfer risk to local and international companies, enhancing market stability and reducing financial burdens.
- **Risk-based supervision and prudential standards:** Regulators set capital adequacy requirements for insurers and financial institutions to ensure they can meet obligations even after major disasters and risk management standards to strengthen insurers and financial institutions' resilience and protect policyholders.
- **Regulations for innovative financial instruments:** Legal frameworks can be open to allow for innovation in financial products to allow governments, households and MSMEs to access liquidity post-disasters.
- **Policyholder rights and education:** Regulatory frameworks may include provisions for the fair treatment of policyholders, including clear information about coverage, claim processes and dispute resolution.
- **Awareness raising:** Governments and agencies are often mandated to increase awareness and financial literacy among farmers, helping them understand the importance of DRF tools and how to access them.

3

Public-Private Partnerships (PPPs)

- **Incentives for private sector participation:** Governments may offer incentives like tax breaks or subsidies to encourage private insurers to enter the agricultural insurance market.
- **Government-supported programs:** Legislation may allow for or require government co-financing or subsidization of premiums to make insurance more affordable for farmers, especially smallholders.

4

Data Collection, Reporting, and Transparency

- **Agricultural and climate data standards:** Frameworks may require standardized data collection on agricultural production, climate risks, and past disaster impacts to facilitate better risk assessment and insurance pricing.
- **Reporting obligations:** Insurers and financial institutions are often required to report on their risk exposures, policies issued, and claims paid, promoting transparency and improving accountability.

Case Study - Japan

In Japan, the government supports the development of agricultural insurance by providing a comprehensive legal and regulatory framework for the stakeholders (farmers, cooperatives, insurance companies, etc.) as shown below:

Legislation

Established through the 1929 and 1938 Livestock Insurance Act and Agriculture Insurance Act, in 1947, it was consolidated and established as the Agricultural Disaster Compensation Act, which was later updated and renamed to the Agricultural Insurance Act in 2018.

Financial support

The government subsidizes part of agricultural mutual associations' expenses and all expenses of agricultural federations. The support extends to forest and fisheries insurance mutual associations, creating a comprehensive rural insurance mechanism.

Tax deduction policy

Provides tax exemptions for agricultural cooperatives.

Reinsurance support

The Ministry of Agriculture, Forestry and Fisheries opens reinsurance accounts and accepts all reinsurance from county mutual associations on behalf of the state, including both proportional reinsurance and excess-of-loss reinsurance.

Source: China Financial Stability Report; Yang; Japan Ministry of Agriculture, Forestry and Fisheries

Institutional Arrangement

An institutional framework for DRFA provides the structural foundation needed to design, coordinate, implement and monitor risk management strategies effectively. This framework organizes roles, responsibilities, and processes across government entities, the private sector, and communities, fostering collaboration and ensuring that resources are mobilized swiftly to address agricultural losses, as described below.

- 1. Clear Definition of Institutional Roles**
 - **Mandates and responsibilities:** Clear roles for ministries (e.g., Agriculture, Finance, Environment) and agencies responsible for disaster risk financing and operational preparedness should be established.
- 2. Coordination Mechanisms**
 - **Establishing inter-agency councils or committees** to coordinate DRF strategies, facilitate data sharing, and align policy goals across sectors enhances collaboration and effectiveness.
- 3. Oversight and Accountability Mechanisms**
 - **Monitoring:** Institutional frameworks should include mechanisms for regular monitoring, performance reviews, and impact assessments of DRF programs.
 - **Transparency and reporting:** Regular reporting on funds allocated, premiums collected, and claims paid promotes transparency and accountability.
 - **Feedback and grievance redressal:** Channels for farmers and stakeholders to provide feedback or report issues to help refine DRF products and policies and increase stakeholder engagement.

Key Institutions and their responsibilities in DRFA are contextually defined for each country. Some key principles can be portrayed below.

Key Institutions	Major Responsibilities in DRFA
Ministry of Finance	Ministry of Finance assesses climate and disaster-related fiscal risks, manages budgets for emergency response, contingent liabilities, and financial support schemes (e.g. direct fiscal support, tax, subsidized insurance and credit schemes) and oversees disaster-related funds (e.g. contingency reserves, sovereign insurance pools). It ensures post-disaster financing while promoting private sector participation through PPPs in agricultural insurance and credit programs.
Ministry of Agriculture (MOA)	MOA collects and analyzes agricultural and climate risk data on crop production, pest outbreaks, livestock health and climate risks, which informs insurance product design. Through extension services, it educates farmers on DRF options and climate-resilient practices, while administering subsidies to support smallholder access.
Local Government and Community-Based Organizations (CBOs)	Local authorities assess community-level risks to identify specific vulnerabilities and risk factors in the agricultural sector, implement warning systems, and coordinate disaster relief. CBOs and cooperatives aggregate farmer need and provide a channel for disseminating DRF information on DRF products and emergency support.
Insurance Regulatory Authority	This body ensures that insurance products offered to farmers meet regulatory standards, including adequate solvency, consumer protection, and transparency. It approves and supervises the development of new insurance products, such as parametric insurance, to ensure they meet the needs of the agricultural sector and are financially sustainable. It also monitors complaints, enforces fair treatment of policyholders, and provides mechanisms for dispute resolution.
Public-Private Partnerships (PPPs) and Insurance Companies	PPPs in DRF create shared financial mechanisms, such as sovereign risk pools or reinsurance facilities, allowing governments and private insurers to manage large-scale risks collectively. Insurance companies, often working in collaboration with the government, design agricultural insurance products (e.g., weather index insurance, crop insurance) tailored to local risks.
International Development Partners and Donors	International partners provide expertise, tools, and capacity-building resources for developing DRF systems. Donors and multilateral development banks can fund pilot programs, initial capital for insurance pools, or infrastructure for data collection and monitoring, reducing the financial burden on governments. They also foster knowledge exchange between countries, providing insights into DRF best practices.
Data and Research Institutions	Institutions such as national meteorological agencies, agricultural research bodies, and academic institutions provide critical data and research. They develop risk models that assess the probability and impact of disasters, helping insurers and governments design better-targeted DRF products and policies. Institutions also play a role in monitoring the effectiveness of DRF programs, providing insights into the benefits, areas for improvement, and lessons learned.
Technology and Innovation	Technological innovations, such as mobile platforms, can make DRF products more accessible, particularly for smallholder farmers in remote areas. Technology hubs often collaborate on developing early warning systems, which are crucial for reducing agricultural losses and improving resilience.

Case Study - India

India's Pradhan Mantri Fasal Bima Yojana (PMFBY) demonstrates how key DRFA framework considerations can be effectively implemented in practice:

Policy Framework	Legal and Regulatory Framework	Institutional Arrangement
<ul style="list-style-type: none"> • Comprehensive risk coverage across the entire cropping cycle • Government-subsidized premiums to ensure affordability and accessibility • Promote climate and disaster resilient cropping practices • Focus on financial literacy and awareness building • Employ technology for fast claims assessment • Mandatory credit-linked insurance to expand coverage 	<ul style="list-style-type: none"> • Formalized public-private partnership structure for insurance delivery • Established legislation for premium subsidies • Clear guidelines for technology adoption in claims assessment • Mandatory linkage with agricultural credit 	<ul style="list-style-type: none"> • Multi-level governance structure involving central and state governments • Coordinated roles between public and private insurance providers • Structured channels for financial education and awareness campaigns • Engage with technology enablers for fast claims assessment

Source: Pradhan Mantri Fasal Bima Yojana, Ministry of Agriculture and Farmers Welfare, Government of India



Conclusion

Comprehensive policy, legal and institutional frameworks for agriculture risk finance are fundamental to building agricultural sector resilience against climate and disaster risks. These frameworks create a cohesive system that brings government bodies, farmers, agribusinesses, financial institutions, insurers and communities together to address both immediate and long-term agricultural challenges.

One size does not fit all. Different segments of farmers need different solutions. To ensure effective DRFA frameworks, it is essential to understand the specific needs of farmers to be targeted by a program. Farmers can be segmented based on their existing vulnerabilities and access to financial services.

A key element of effective frameworks is **policy coherence and alignment**, which integrates agricultural risk finance with broader policy objectives such as food security, climate resilience, poverty reduction, financial inclusion, fiscal sustainability.

Clear legal structures underpin successful risk finance systems by defining stakeholder roles and mandating essential requirements such as risk assessments, capital adequacy and reinsurance for insurance companies, safeguarding policyholders and promoting a stable insurance market. These structures ensure consumer protection and enable innovative products, maintaining high standards of reliability and fairness in the market.

Institutional frameworks coordinate the execution of these programs through various ministries handling agriculture, finance, and disaster management. Public-private partnerships play a crucial role in making insurance products accessible, particularly to smallholder farmers, by combining private sector innovation with public sector support.

Data infrastructure and risk assessment provides important analytical underpinning for policy formulation. Investments in agricultural data systems, early warning mechanisms and risk modeling as well as data sharing will not only improve governments' decision making but also help private sector develop new value added products and services.

Together, these frameworks foster an environment where stakeholders can effectively collaborate, innovate, and protect agricultural communities, ultimately supporting sector resilience, economic stability, and sustainable growth.

References

Food and Agriculture Organization of the United Nation. (2016). *Increasing the resilience of agricultural livelihoods*. Retrieved from <https://openknowledge.fao.org/server/api/core/bitstreams/39e74ba2-e33d-45bc-a199-1668d92d908f/content>

Food and Agriculture Organization of the United Nation. (2021). *The impact of disasters and crises on agriculture and food security*. Retrieved from openknowledge.fao.org/server/api/core/bitstreams/30c0d98d-1c21-48ef-b5d9-8d988e6fa6f2/content

International Labour Organization. (n.d.). *Employment by sex and age*. [Data]. ILOSTAT: Labour Force Statistics database. Retrieved August 2024 from <https://ilostat.ilo.org/>

Japan Ministry of Agriculture, Forestry and Fisheries. (n.d.). *Nosakubutu Kyosai Seido no Hensen [Historical Evolution of the Agricultural Crop Insurance System]*. Ministry of Agriculture, Forestry and Fisheries (Japan). <https://www.maff.go.jp/j/keiei/nogyohoken/nogyokyosai/attach/pdf/index-152.pdf>

People's Bank of China. (2007). *China financial stability report: International experience in agricultural insurance and its implications*. <https://www.pbc.gov.cn/english/130736/2882924/2015090811223531574.pdf>

World Bank Group. (n.d.). *% Employment in Agriculture* [Data]. World Development Indicators. Retrieved August 2024 from <https://databank.worldbank.org/source/world-development-indicators/>

World Bank Group. (n.d.). *Structure of value added (GDP, Agriculture, forestry, and fishing (% of GDP))* [Data]. World Development Indicators. Retrieved August 2024 from <http://wdi.worldbank.org/table/4.2>

World Bank Group, Disaster Risk Financing and Insurance Program. (2023). *Knowledge Series: Disaster Risk Financing Solutions for Climate-resilient Livelihoods in the Agricultural Sector* [Factsheets]. Financial Protection Forum. <https://www.financialprotectionforum.org/knowledge-series-disaster-risk-financing-solutions-for-climate-resilient-livelihoods-in-the-agricultural-sector>

World Bank Group, Disaster Risk Financing and Insurance Program. (2021-2022). *Strengthening Financial Resilience in Agriculture Knowledge Series* [Factsheets]. Financial Protection Forum. <https://www.financialprotectionforum.org/knowledge-series-strengthening-financial-resilience-in-agriculture>

Yang, M. (2017). *Explore government support measures and implications of crop insurance from international experience*. International Journal of Economics, Commerce & Management, 5 (5), 307-317. <https://ijecm.co.uk/wp-content/uploads/2017/05/5520.pdf>