Platform
for Agricultural
Risk Management

Managing risks
to improve farmers'
livelihoods

Knowledge Management

Agricultural risk management: practices and lessons learned for development

Publication
2017

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Cooperazione Italiana allo Sviluppo
Ministero degli Affari Esteri
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PARM

PLATFORM FOR
AGRICULTURAL RISK
MANAGEMENT

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December 2017

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Foreword

This publication benefited greatly from inputs from the members of an ad hoc technical committee: Federica Carfagna, African Risk Capacity (ARC); Ilaria Firmian, International Fund for Agricultural Development (IFAD); Alessandra Garbero, IFAD; Åsa Giertz, World Bank; Gideon Onumah, Natural Resources Institute (NRI)/ AGRINATURA; and Mariam Soumare, New Partnership for Africa's Development (NEPAD). Inputs from members of the PARM Secretariat, in particular from Carlos Arce, Massimo Giovanola, Michael Hamp and Ilaria Tedesco were also appreciated. Karima Cherif from the PARM Secretariat was instrumental in conceptualizing the publication and guiding the overall writing process. She was also responsible for graphic design in collaboration with Acosta Design Lab. The Platform for Agricultural Risk Management (PARM) is grateful to the project managers for the drafting of the case studies: Guilia Baldinelli, Rupsha Banerjee, Fabio Bedini, Federica Carfagna, Danush Dinesh, Ilaria Firmian, James W. Hansen, Ekhosuehi Iyahen, Desire Kagabo, Arun Khatri-Chhetri, Gideon Onumah, Norbert Tuyishime, Manoj Yadav, and Hijaba Ykhanbai.

The PARM Secretariat would also like to acknowledge the members of its Advisory and Steering Committees, as well as Jesús Antón (OECD), for their useful comments on the draft of this publication.

This publication represents the outcome of a workshop that took place at IFAD headquarters on 25 October 2017. The success of this event was a result of contributions from all participants; we would like to thank them for participating and sharing their experiences with such passion.

About the Platform for Agricultural Risk Management (PARM)

The Platform for Agricultural Risk Management is an outcome of the G8 and G20 discussions on food security and agricultural growth. PARM is a four-year multi-donor partnership between the European Commission (EC), the French Development Agency (AFD), the Directorate General for Development Cooperation of the Italian Ministry of Foreign Affairs (DGCS), the German Federal Ministry for Economic Cooperation and Development (BMZ/KfW) and IFAD, in strategic partnership with NEPAD and other development partners, to make risk management an integral part of policy planning and implementation in the agricultural sector.

PARM has as its overall mandate to contribute to sustainable agricultural growth, boost rural investment, reduce food insecurity, and improve resilience to climate and market shocks on the part of rural households, through improved management of risks. PARM plays the role of knowledge broker and facilitator, aimed at: enabling the integration of agricultural risk management (ARM) into policy planning and investment in the agricultural sector; enhancing national stakeholders' awareness and capacities for management of agricultural risks; improving generation, access and sharing of knowledge; strengthening synergies with partners on ARM-related issues; developing methodologies for risk analysis; and adoption of holistic risk management strategies.

Contents

Part III

Annex

List of acronyms

AFD	French Development Agency
AGRA	Alliance for a Green Revolution in Africa
AICI	Agriculture Insurance Company of India
ANGRAU	Acharya N. G. Ranga Agricultural University
ARC	African Risk Capacity
ARM	Agricultural risk management
ASAP	Adaptation for Smallholder Agriculture Programme
BMZ	German Federal Ministry for Economic Cooperation and Development
CCAFS	Climate Change, Agriculture and Food Security Research Programme
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CGIAR	Consortium of International Agricultural Research Centers
CIAT	International Centre for Tropical Agriculture
CIDA	Canadian International Development Agency
CIMA	Inter-African Conference on Insurance Markets
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CPF	Conféderation Paysanne du Faso
CSV	Climate-smart village
CTA	Technical Centre for Agricultural and Rural Cooperation
DFAP	Development Food Aid Programme
DFID	Department for International Development
EAFF	East Africa Farmers Federation
ENACTS	Enhancing National Climate Services
ESA	European Space Agency
FAO	Food and Agriculture Organization of the United Nations
FARMAF	Farm Risk Management for Africa
GCF	Green Climate Fund
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IBLI	Index-Based Livestock Insurance
ICRAF	World Agroforestry Centre
IFAD	International Fund for Agricultural Development
IFI	International financial institution
ILRI	International Livestock Research Institute
IRI	International Research Institute for Climate and Society
IRRI	International Rice Research Institute
KLIP	Kenya Livestock Insurance Programme
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries of Uganda
MVIWATA	Mtandao wa Vikundi vya Wakulima (National Networks of Farmers' Groups in Tanzania)
NEPAD	New Partnership for Africa's Development
NRI	Natural Resources Institute
OA	Oxfam America
OIC	Oromia Insurance Corporation

PAFO	Panafrican Farmers' Organisation
PARM	Platform for Agricultural Risk Management
PICSA	Participatory Integrated Climate Services for Agriculture
PRiSM	Philippine Rice Information System
PROPAC	Plateforme Régionale des Organisations Paysannes d'Afrique Centrale
PSTF	Premium Support Transition Facility
R4	Rural Resilience Initiative
RAB	Rwanda Agriculture Board
RIICE	Remote Sensing-based Information and Insurance for Crops in Emerging Economies
ROPPA	Réseau des organisations paysannes et de producteurs de l'Afrique de l'Ouest
SACAU	Southern African Confederation of Agricultural Unions
SDC	Swiss Agency for Development and Cooperation
SIDA	Swedish International Development Agency
TIA	Takaful Insurance of Africa
TNAU	Tamil Nadu Agricultural University
UN	United Nations
USAID	United States Agency for International Development
WFP	World Food Programme
WUR	Wageningen University & Research
ZNFU	Zambia National Farmers Union

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Executive summary

While the importance of managing risks in agriculture is now widely recognized, and several initiatives at different levels have recently been designed and implemented with the technical support of various stakeholders – including international financial institutions (IFIs) – there is a need to learn from those experiences. This publication aims at formalizing the lessons learned, identifying and improving strategies to cope with the risks, and sharing those lessons among ARM practitioners. It is based on the outcomes of a workshop held on 25 October 2017 at IFAD headquarters, and on the analysis of 10 case studies selected by a technical committee following an open call for proposals. The publication identifies basic criteria and guidelines for better design of ARM initiatives, based on a holistic approach, and proposes a collection of practices and lessons from selected case studies.

What makes for a good agricultural risk management initiative?
Key pillars for implementation of the holistic approach to agricultural risk management.

An agricultural risk is an uncertain event of any origin that results in loss or damage in agricultural production and productivity, and/or associated agricultural income[1]. Risks in agriculture stem from various sources, ranging from unpredictable extreme weather events to market disruptions, or unplanned policy or institutional changes. Agricultural stakeholders are often not ready to recover from such shocks. These shocks can be covariant (systemic) – that is, affecting whole countries and communities – or idiosyncratic, affecting individual farmers or businesses. The frequency and severity of risks determine the importance of various risk management strategies (risk mitigation, risk transfer and risk coping) and the roles played by the stakeholders in risk management. For instance, farmers can manage frequent but less severe risks, while the government is best equipped to deal with catastrophic risks. The holistic approach to agricultural risk management looks at all risks and their interactions to design comprehensive ARM strategies that contribute to resilience-building.

Although ARM is highly contextual, five key pillars can be applied when designing or implementing an initiative, so as to ensure sustained management of agricultural risks.

- **Risk assessment and prioritization.** Assessment and prioritization of risks is a key element at the inception of an ARM initiative. Risks should be identified, analysed and prioritized based on their severity and frequency, in consultation with the main players and stakeholders.
- **Tools identification and implementation.** A wide variety of tools can be used to manage risks. Identification of the appropriate tools should ensure that they correspond to the risks that have been prioritized, that responsibility for implementing them is clear, and that they are sustainable and accessible such that they can be effectively used at a reasonable price.
- **Access to information and capacity-building.** Access to information and capacity-building are two cross-cutting components to be integrated into all ARM initiatives. Information is crucial in order to plan ahead for making business decisions and designing risk management tools along agricultural value chains. However, timely, accurate and usable information is often not available to farmers, policymakers and service providers. Capacity-building for farmers, extension workers, transporters, aggregators, processors, off-takers, financial service providers and/or policymakers empowers them to choose in an informed manner the risk management options that are suitable for them from among those available.
- **Partnerships and policy integration.** Because agricultural risks are varied in nature, managing them requires multidisciplinary action at various levels. Partnerships between public- and private-sector actors are crucial for creating synergies and effectively managing risks. The integration of ARM into policies enables better coordination and sustainability.
- **Monitoring and evaluation.** . ARM is a continuous process, and instruments and strategies need to be constantly updated to fit the context. Monitoring and evaluation are therefore necessary to allow for this adaptation and learning.

1 An agricultural risk is differentiated from trends and constraints by its uncertainty.

Drawing lessons from the field: Promising practices for agricultural risk management

Ten promising practices have been selected by a technical committee composed of experts in ARM in order to showcase the diversity of agricultural risks and tools. They are being implemented in Africa and Asia by a wide variety of actors: research institutes, development partners, non-governmental organizations, farmers' associations and the African Union. They were designed in response to various types of risks, related to weather and climate, market and infrastructure or institutional and policy settings. Some are targeted to governments and others to farmers, reflecting the different levels of responsibility and capacity in managing risks

A short description is presented for each case study, and the project managers in charge of their design and/or implementation propose key lessons arising from them. In addition, good practices and issues to consider are put forward to enable learning and analysis. The case studies are grouped into five categories:

- Using information to reduce information asymmetry risks;
- Transferring risks: insurance for agricultural risk transfer
- Integrating smallholders within value chains so as to mitigate market and price risks;
- Creating appropriate institutional frameworks so as to reduce institutional risks;
- Integrating tools to manage weather risks.

Mainstreaming the holistic approach to ARM within policy and practices for better design and investment

It is necessary to mainstream the holistic approach within the policies and practices of governments, technical partners, donors and the private sector in order to create and sustain an environment in which investments contribute to the management of agricultural risks, and at the same time better management of risks triggers more and better investment in agriculture. Indeed, agricultural risk management should not be standalone, but rather integrated into the development of strategies and the implementation of activities linked to the agricultural sector, in order to achieve broader development objectives.

The integration of ARM into policies and practices requires a truly multidisciplinary approach, one that reaches across ministries or departments. Policy dialogue is essential in order to convey the needs and make use of the strengths of the variety of stakeholders involved in managing agricultural risks – whether they be from the public or the private sector. For successful partnerships, accountability and institutionalization of public–private cooperation are key elements to be considered. Integration of the holistic approach to ARM into the standard practices of donors and technical partners can also permit them to better achieve and sustain their development objectives.

For example, the Government of Uganda has started to apply the holistic approach to ARM, in partnership with the Platform for Agricultural Risk Management and the New Partnership for Africa's Development. It has integrated some elements linked to the management of agricultural risks into national policies, following a countrywide risk assessment and the identification of tools related to information systems and plant pests and diseases.

Background

The importance of managing risks in agriculture is now widely recognized. But while several initiatives have recently been designed and implemented at different levels, with technical support from various stakeholders that include international financial institutions, there is a need to learn from these experiences. In fact, few lessons have been formalized for the identification and improvement of strategies to cope with the risks. Most reviews and evaluations have been limited to specific risks or areas of intervention, and need to be shared among ARM practitioners.

Within this context, the Platform for Agricultural Risk Management, in collaboration with its partners, has raised the need to foster knowledge exchange and bring together the available experience on ARM in developing countries. This has as its objective the identification and development of practices and lessons learned as guidance to policymakers and rural development practitioners for strategically designing, implementing and mainstreaming ARM within their activities.

This publication was developed in conjunction with the workshop entitled "Agricultural risk management: Practices and lessons learned for development" held on 25 October 2017 at the headquarters of the International Fund for Agricultural Development. The purpose of the workshop was to bring together practitioners involved in designing, implementing or evaluating programmes and policies related to agricultural risk management, in order to define a set of methodological guidelines and measures for good ARM practices and to learn from the opportunities and challenges of the existing initiatives

The workshop was designed to foster a community of practice on the topic, and enable the good practices that have emerged to become part of a knowledge base for improved working practices on agricultural risk management. It brought together close to 70 professionals from United Nations agencies, international financial institutions, governments, research institutes, farmers' organizations, non-governmental organizations and the private sector. Since agricultural risk management brings together many activities, experts from varied technical backgrounds shared their experiences in designing and implementing different types of projects, from the promotion of traditional farming practices to the design of innovative insurance programmes or the mainstreaming of agricultural risk management within national policies.

This publication was developed with the objective of sharing knowledge on existing practices and guiding further investments, programmes and policies in this field. To this end, in early 2017 the PARM Secretariat developed a call for proposals that was widely circulated, to collect case studies from all interested parties. Forty proposals were received by 30 September 2017, the deadline indicated in the call. The initiatives were then assessed by a technical committee consisting of experts in agricultural risk management from leading institutions[2], using the following criteria: (1) the existence in the design of a risk assessment phase; (2) how appropriate the tools implemented are with regards to the risks identified; (3) an emphasis on capacity-building and access to information; (4) the strength of partnerships and the integration of activities into existing policies; (5) innovation; (6) the robustness of the monitoring/evaluation and knowledge management systems; and (7) the current potential/possibilities for scaling-up.

Based on this assessment, ten case studies were selected to be featured in this publication, due to demonstrating excellent design and/or impact in the field of agricultural risk management. During the workshop, participants worked on the case studies with their project managers/representatives, in order to analyse them and start defining key elements to take into account when designing ARM projects. The outcomes of these discussions were then consolidated by the PARM Secretariat and the technical committee and enriched through a review of the existing literature, in order to arrive at this publication.

2 The members of the technical committee were: Federica Carfagna, African Risk Capacity; Ilaria Firmian and Alessandra Garbero, IFAD; Åsa Giertz, World Bank; Gideon Onumah, Natural Resources Institute/AGRINATURA; and Mariam Soumare, NEPAD.

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This publication is intended to be neither exhaustive nor prescriptive, but rather illustrative, showcasing selected good practices to inform practitioners in the field of agricultural risk management. The tools presented here are used to identify the conditions and components of potential interventions in ARM for smallholders. The experiences and views expressed in the case studies are those of the authors, reflecting personal accounts of project implementation processes. The conclusions drawn from the case studies and the key pillars for the designing of ARM initiatives can and should be updated and refined when more experience on this topic is gathered and with the emergence of clearer lessons learned.

Approach to the publication

Farming is a risky business. Every day, farmers make decisions that are crucial for their activities, often facing uncertainty regarding weather conditions, access to markets, regulatory changes or even their own health. The risks farmers are exposed to also affect other stakeholders whose livelihoods depend on agriculture – among them traders, processors and financiers.

However, managing risks can bring about new opportunities and ensure the sustainability of investments in agriculture, with the development and implementation of appropriate risk management strategies and tools by governments and stakeholders in agricultural value chains. Agricultural risk management can play a key role in increasing the resilience of farmers, agricultural value chains and the agriculture sector as a whole.

There is a variety of ways to identify, design and implement agricultural risk management policies, strategies and tools; and this can be a very complex task. The holistic approach to agricultural risk management focuses not on specific risks or tools, but rather sees the management of agricultural risks as a system encompassing a wide range of risks and solutions for all stakeholders participating in agricultural supply chains. It puts a particular emphasis on the interactions between various risks, tools and government roles and responsibilities. Using this approach, a methodology has been developed to assess risks, develop adequate tools and integrate them within policies and strategies. When this is achieved, agricultural stakeholders are empowered to sustain and grow their incomes and livelihoods.

Application of the holistic approach to agricultural risk management requires that this conceptual framework be shared among all stakeholders involved, in following a systematic process understood and approved by all. Assessing and managing agricultural risks is indeed complex. Risks are present at different levels (macro, meso or micro) and thus should be handled by different actors. They can be correlated, which adds to the complexity in managing them. There exists a wide variety of sources of risks and of tools. Above all, managing agricultural risks is a highly context-specific endeavour, which makes it information- and knowledge-intensive. Moreover, to date there has been little knowledge gathering and transfer of capacity on this topic, thereby reducing the possibilities for learning from previous experiences.

This publication is intended for policymakers and practitioners to learn from ARM initiatives so as to guide their work on this topic. It aims to achieve two main objectives:

- Identify basic criteria and guidelines for better design of ARM initiatives, based on a holistic approach to ARM
- Develop a collection of practices and lessons coming from selected case studies, based on the ARM criteria identified.

The purpose of this publication is not to evaluate the merits of the different approaches implemented in the case studies, but rather to offer broad guidance on what criteria and guidelines may be useful and practical, based on PARM's holistic approach to risk management and the experiences available.

In the part I we will define what agricultural risks are, and how the holistic approach to agricultural risk management is defined in conceptual terms. We will then propose key pillars to guide the design of ARM initiatives. In part II, ten selected case studies are presented and analysed, to provide concrete examples of actions implemented by various actors. Lastly, part III focuses on the integration of ARM practices into policies and processes, which constitutes an essential step for the sustainability of agricultural risk management.

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Part I

Part 1. What makes a good agricultural risk management initiative? Key pillars for better design

What are agricultural risks?

A risk is the probability of an event being harmful, involving exposure to danger or loss of something of value, potentially impeding achievement of the objectives of individuals or organizations. An agricultural risk is an uncertain event[3] of any origin that results in a loss or damage to agricultural production and productivity and/or its associated farm household income. Stakeholders in agricultural value chains also face constraints and trends, which are to be differentiated from risks. Constraints are known factors that restrict or limit the actions that can be undertaken and cause suboptimal performance in agriculture. On the other hand, trends refer to medium or long-term changes in an agricultural environment – whether irreversible or not – that can be analysed and anticipated. For example, bad roads leading to a market are a constraint for farmers, who may have to go to another location to sell their products, thereby losing time or missing out on business opportunities. In some countries a progressive reduction in precipitation due to climate change represents a trend, and farmers have to adapt their behaviour to this changing context by shifting cultivation patterns or diversifying their activity. However, a sudden fall in commodity prices constitutes a risk, since farmers cannot know in advance if or when it might happen, nor what its consequences will be. The concept of risk includes three elements: uncertainty, probability and potential to cause losses.

Risks in agriculture stem from various sources, from unpredictable extreme weather events to market disruption or unplanned policy or institutional changes. These risks may be covariant (systemic) – that is, affecting large population groups or regions – or they may affect individual farms or households (idiosyncratic). Moreover, risks do not have the same potential negative impacts, nor the same frequency. For each type of risk, a low-impact event is usually more frequent than one that has a large impact. Some risks like natural disasters have very low probabilities of materializing – but when they do, they have catastrophic consequences. These three district types of risks correspond to three layers of risk, each requiring appropriate action at a different level.

3 Given its uncertain nature, agricultural risk is differentiated in this context from trends, challenges and constraints.

Figure 1: List of risks by sources and types[4]

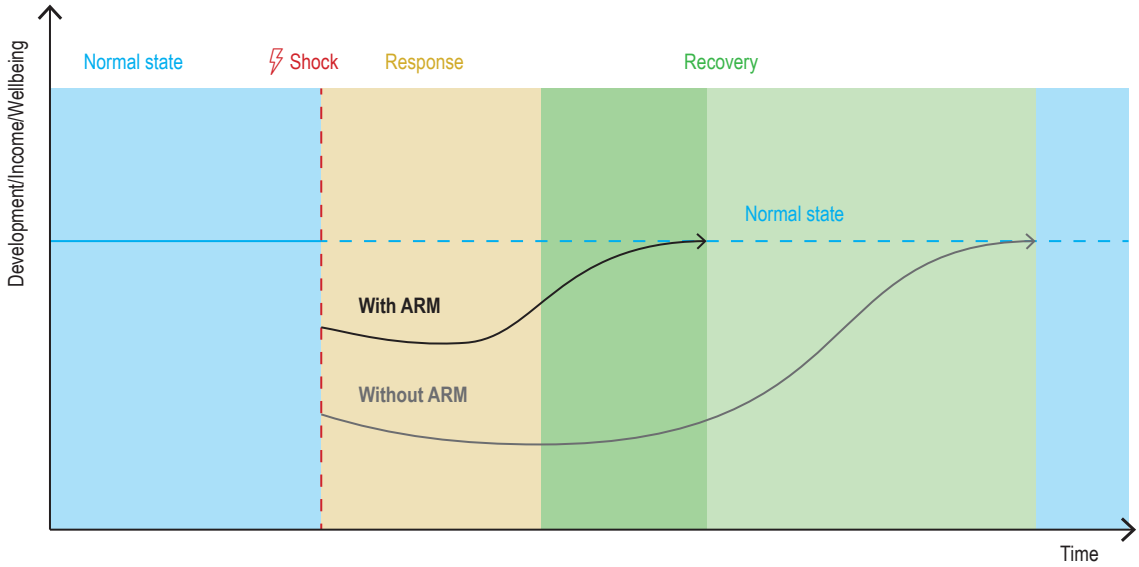
Risk	Factors	Examples
Weather risks	- Rainfall variability (a shortfall or excess) - Temperature variability	- Hailstorms - Strong winds - Floods - Droughts - Hurricanes - Typhoons - Wildfire
Natural disasters	- Extreme events	- Earthquakes - Volcanic activity - Wildfire - Landslides
Biological and environmental risks	- Outbreaks - Poor water sanitation - Poor safety and quality control for food	- Crop pests - Livestock diseases - Contamination
Market-related risks	- Change in supply/demand for inputs/outputs - Price variability of inputs/outputs - International market instability - Variability in production - Time delays - Changes in production standards and trade tariffs	- Price volatility - Market supply and demand volatility
Management and operational risks	- Absence or inadequacy of information and knowledge	- Poor management of farming practices and decisions - Inability to adapt to changes - Equipment breakdowns
Financial risks	- Uncertainty on financial markets - International market instability - Lender's willingness to provide funds	- Rising interest rates - Difficulty in debt repayment - Non-availability of credit
Policy and political risks	- National and local institutional instability - Policy changes affecting the value chain	- Political upheavals - Riots - Regulatory changes - Malfunction in market access
Infrastructure risks	- Absence or malfunctioning of infrastructures	- Difficulties in access to provision of services for transport, energy, communication networks, etc. - Physical disruption of infrastructure - Regulatory changes
Labour and health risks	- Changes in the context and ability to work of the household and farming workforce	- Illness - Injury - Divorce - Death

4 Source: Platform for Agricultural Risk Management. (unpublished). *Capacity Development Manual*.

Why and how should agricultural risks be managed? The holistic approach to ARM for increased resilience

Agricultural risk is the principal cause of transient food insecurity and disruption to agricultural value chains. Crop failure is often the biggest shock faced by rural households and perhaps also the origin of the biggest poverty trap. A lack of agricultural risk management capacities and plans lead to situations in which successive shocks progressively erode stakeholders' assets and capacities to recover and sustain their livelihoods, thereby reducing countries' abilities to plan sustainable development paths. ARM contributes to building the resilience of agricultural systems at the household, community and country levels. It strengthens the ability of stakeholders along agricultural value chains to anticipate risks and absorb or recover from them in a timely, efficient and sustainable manner, through advance planning of solutions that limit the negative consequences of shocks (figure 2). Effective ARM allows disturbance to be absorbed and activities reorganized following a shock. In that sense, ARM can be seen as one of the building blocks of resilience, addressed specifically to risks related to agriculture, empowering stakeholders to better plan for and address a variety of shocks.

Figure 2: Shock-recovery-shock cycles for agricultural value chain stakeholders, with and without ARM

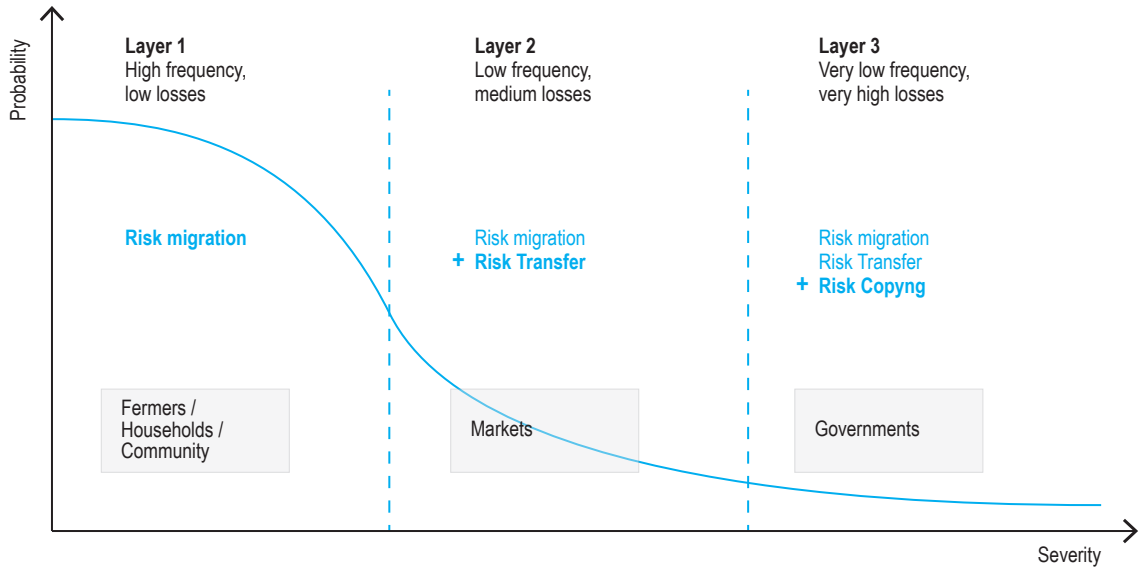


Moreover, agricultural risk management can – if well designed and implemented – improve women's livelihoods and lead to a reduction in gender inequality. In particular, women farmers are more vulnerable to agricultural risks than men, because they do not have access to the same options for dealing with shocks. In some cases, women's access is limited in relation to specific areas, markets and services (credit, information and extension services). They might not own any productive assets, or own less than their male counterparts, even when they are the primary agricultural worker of the household. In addition, because they are most frequently responsible for caring for and feeding the family, women have to put efficient coping strategies in place linked directly to their own and their family's health. Investing in women's agricultural risk management strategies is therefore crucial to strengthening the resilience of vulnerable households. However, while doing so the voices of women and their specific needs should be prioritized within their own context, to make sure that they have access to information, technology and markets. Moreover, the instruments put in place should not represent an additional burden or too much of an investment in time and resources, since women's agricultural labour is often already undervalued. In addition to the gender perspective, when analysing agricultural risk management options it is important to not consider farmers as a homogeneous group, but rather to take into account the specificities of individuals and households (age, size of farm, type of activities, etc.).

Effective risk management typically requires a combination of measures, some designed to remove underlying constraints and others designed to address the risk directly. The holistic approach to agricultural risk management does not look solely at ex post impact mitigation factors, but rather also at how to mitigate/prevent risks, minimize their impacts and deal with the consequences of the shocks. As such, a variety of tools and measures is available to complement the addressing of agricultural risks. The holistic ARM methodology can also easily be integrated into broader development interventions. Risk management practices should be planned in advance. They can be divided into three categories, according to the level of risks that they address, as illustrated in figure 3:

1. **Risk mitigation**strategies (ex ante) aim at reducing the impact of a risk or the severity of the losses. They can be undertaken directly by the farmers or at community level, and include climate-smart agriculture, income diversification and irrigation systems. Although these measures are implemented by farmers, their availability and accessibility might depend on support from governments as providers of public goods.
2. **Risk transfer** strategies (ex ante) are put in place for residual risks the effects of which cannot be completely mitigated. Risk transfer tools allow for transfer of the potential financial consequences of a risk to a willing third party, often for a fee, such as in the case of insurance. These strategies often require the intervention of private actors (banks and insurance companies) in their design and operation of programmes accessed by farmers and other actors within the agricultural value chains. Whether such programmes/services can be sustainably accessed by farmers and other vulnerable actors within the agricultural value chains is an important challenge to be taken into account.
3. **Risk coping** (ex post). For risks that cannot be mitigated or transferred, coping mechanisms are necessary in order to enable farmers to recover once the shock has taken place. These include social protection programmes and specific disaster compensations (cash or in kind). Although they are used once the risk has materialized, they need to be planned in advance. They are principally the responsibility of governments, which are increasingly aware of the need to design risk financing strategies to cope with unpredictable expenses caused by agricultural risks and natural disasters..

Figure 3: Risk layers and main management responsibilities[5]



5 Adapted from World Bank. (2016). *Agricultural sector risk assessment: Methodological guidance for practitioners.* Washington: World Bank Group.

A context-specific endeavour but with common elements: Key pillars for better design

When designing or implementing an ARM initiative, it is necessary to consider the specificities of the context. Any approach needs to be adapted to the particular circumstances of the country, supply chain, socio-economic context and geographical location. For example, strategies to reduce risks of post-harvest losses will be different according to the crops cultivated, the distance from the farmers' field to the market, the climate and the existing solutions – for example, according to whether community warehousing is practised or not.

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This publication proposes five key pillars that should be considered in either designing an initiative aiming to strengthen a holistic approach to ARM, or in integrating an ARM component into a project with broader development objectives. They are:

4. **Risk assessment and prioritization**;
5. **Tools identification and implementation of tools**;
6. **Access to information and capacity building**;
7. **Partnerships and policy integration**;
8. **Monitoring and evaluation**.

1. Risk assessment and prioritization

In order to design and implement an initiative to manage agricultural risks, risks need to be well identified and assessed. It is important in this process to distinguish the identification of risks from their analysis and evaluation.

The initial step is indeed to **identify the major risks** in the area of interest. They may be linked to (i) agricultural production (drought, floods, crop pests and diseases, livestock diseases); (ii) agricultural markets and trade (input/output prices, feed, counterparty risk, wages, rental of land); and (iii) policies, regulations, and logistics (trade policies, taxes, market reforms, disruptions of logistics). The frequency and impact of the various risks can be analysed at various levels – from the national level to that of smallholder farmers – depending on the objective of the risk assessment. The **risk analysis** involves understanding how the risks affect stakeholders' incomes and livelihoods and their sources, and – to the extent possible – estimating their impact and frequency for the various stakeholders participating in the agricultural supply chains. For smallholders, it is particularly important to take into account the characteristics of the households, and in particular the gender differences in facing and responding to risks. The identification of existing ARM policies, tools and strategies is equally important, along with assessment of the stakeholders' capacity to manage risks. This first step also highlights possible interactions between different tools – how they reinforce or crowd each other out – as well as institutional and policy gaps.

Once agricultural risks are identified and analysed – in conjunction with existing risk management strategies, **the risks should be prioritized**. This is crucial to enable rational evidence-based decision-making on priority investment areas and to identify which tools and policy instruments could be used to effectively improve ARM. Risks should be prioritized based on their frequency, their severity (and the potential impacts of a worst-case scenario) and on the stakeholders' capacity to manage them. This can be done by plotting

the identified risks in a risk prioritization matrix that shows different levels of (colour coded) risks influencing output and income volatility (figure 4). In addition, because risks change over time, this risk classification should be periodically updated. The identification, analysis and prioritization of risks should be undertaken in partnership with the main stakeholders targeted by the risk assessment.

Figure 4: The risk prioritization matrix, for use in risk assessment[6].

Frequency	Severity				
	Very High	High	Medium	Low	Very Low
Very High	🔴	🔴	🔴	🟡	🟡
High	🔴	🔴	🔴	🟡	🟡
Medium	🔴	🔴	🟡	🟡	🟢
Low	🔴	🟡	🟡	🟢	🟢
Very Low	🟡	🟡	🟢	🟢	🟢

Good practices

- Identifying all risks, even if only a certain type of risks will be analysed in depth.
- Identifying the stakeholders affected by these risks and understanding how the risks affect them, taking into account their characteristics (age, gender, etc.).
- Assessing the frequency and severity of risks at the level that the analysis is for (farm, supply chain, geographical area or sector).
- Assessing stakeholders' capacities to manage risks.
- Quantifying risks, using historical data over an extended period or, if not available, developing a qualitative analysis.
- Estimating the potential economic impact of the assessed risks by developing different scenarios (worst cases).
- Involving stakeholders in the risk assessment and prioritization, to ensure their engagement throughout the process (risk analysis, tools identification, etc.)
- Defining clear roles and responsibilities for managing the risks and tools prioritized at the macro, meso and micro levels.

Issues to consider

- The sources, quantity, quality and accuracy of data.
- The scale of aggregation of the risks being assessed: local, regional or national assessments will yield varying results, given that aggregation masks risks at lower levels of aggregation.
- The difference between risks, trends and constraints.
- Gender differences in the impact of and responses to shocks.
- Compounding factors that can exacerbate or mitigate the impact.
- The causation, interaction and correlation of risks.

6 Source: Platform for Agricultural Risk Management. (2015). *Terms of reference for the risk assessment studies*. Rome: Platform for Agricultural Risk Management.

2. Tools identification and implementation

Following identification and prioritization of the risks, appropriate strategies should be chosen to address them. Because agricultural risks are so diverse, various types of tools may be implemented. The applicable instruments for management of the risks depend on identification of their frequency and severity. Often a combination of tools is the best option, with capacity development and development of information systems – two cross-cutting ARM instruments – complemented by a third tool (or more) focused on the specific risk(s) prioritized. The tools may be grouped into three broad categories: risk mitigation, risk transfer and risk coping mechanisms[7].

Risk mitigation tools include on-farm and off-farm tools, such as climate-smart agriculture practices, vaccinations, irrigation, warehousing, production diversification, and asset and income diversification. These instruments aim at: retaining risk at the farm/business level by limiting the negative impacts of shocks; reducing some underlying risk management constraints; and – in some cases – preventing the risks themselves. Governments play an important role in the provision of public goods to assist in mitigating risks for smallholder farmers, particularly in the form of research and extension services, weather and price information systems, vaccination campaigns and – importantly – in development of capacity.

Risk transfer tools mostly involve market-based financial tools. Contract farming, commodity exchanges and futures markets are examples of market-based ARM tools, using the market structure (contracts) to transfer potential liabilities from one party to another, thereby providing stability and certainty regarding the stakeholders' expected incomes. Agricultural insurance – whether peril-based or index-based – enables farmers to transfer a portion of their risks to a third party, in exchange for a fee. However, in order for risk transfer tools to be fully effective, the necessary risk mitigation measures must be put in place, since they should only cover residual risks. If this is not the case, risk transfer mechanisms do not function, since the frequency of risks that have not been mitigated – higher than if risks are mitigated – leads to an increase in the costs of risk transfer tools, making them difficult to access for most farmers.

Risk coping strategies are the measures undertaken to absorb the impact of shocks. The first strategy put in place by stakeholders is to utilize their savings or sell their own assets to cushion the effects of the shocks. In the event that they had been unable to build up savings previously, they often resort to borrowing, selling their labour, migration and, ultimately, reducing consumption. From among these behaviours, the latter are typical signs of falling into a poverty trap. Governments play a key role in setting up coping mechanisms to prevent vulnerable households from falling into poverty. Public food grain reserves, disaster assistance programmes, social protection and scalable safety nets are all tools that can be used and/or reinforced in case of a shock. For such public-sector coping mechanisms to work, governments need to design risk financing strategies.

Standardizing a process for the identification and prioritizing of solutions is not as easy and straightforward as identifying and prioritizing risks. If risks depend on the context, their solutions and the decision-making processes leading to the adoption of one set of tools over another also depend on institutional strengths, financial constraints and policies. However, risk management does not start from scratch, since all stakeholders are already involved in agricultural risk management. Implementing a holistic agricultural risk management strategy requires the identification of gaps in current interventions and the design of a coherent bundle of solutions addressing the main underlying causes of risk.

One important factor to be considered is therefore that of the context and applicability of tools. For example, income diversification will be easier to achieve if the local economy is to some extent diversified and offers other livelihood opportunities besides farming. In some countries, community warehousing is already used extensively, and therefore represents a good tool for empowering farmers to reduce post-harvest losses and access credit using their warehousing receipts, as the practice is already accepted and known by the communities. The role of local and national authorities in creating an enabling environment is crucial, since policy choices influence what tools are accessible and favoured by which stakeholders, with significant variability depending on various factors such as geographic location, size of the farm or business, type of agricultural activities undertaken, gender, age and other social characteristics.

7 Source: Platform for Agricultural Risk Management. (unpublished). *Capacity development manual*.

Moreover, the level and type of risk will determine the roles played by the public and private sectors. While it is necessary for the government to handle catastrophic level risks, which have very large impacts that go far beyond farmers or communities' abilities to mitigate, transfer or cope with them, more frequent but less severe shocks can be either managed by the stakeholders themselves or through the market, by mitigating or transferring the risks.

In addition, the level and type of risk will determine the roles played by the public and private sectors. It is necessary for the government to handle risks at catastrophic level, which have very large impacts that go far beyond farmers' or communities' abilities to mitigate, transfer or cope with them. But more frequent if less severe shocks can be managed either by the stakeholders themselves or through the market, by mitigating or transferring the risks.

Finally, tools should be subjected to a cost-benefit analysis in order to truly understand how their impact in terms of risk management compares to the costs borne either by stakeholders, or in the case for example of government-subsidized tools. This is crucial, as it determines the choices made by the stakeholders with finite resources in investing in ARM, and the take-up and effective use of the tools by farmers and other stakeholders (especially the private sector), which also produces impacts on the sustainability of the tools and overall strategy put in place. The interaction between the selected tools should also be taken into account, to foster synergies and coherence while limiting redundancies.

Figure 5: List of tools based on their objectives and implementation level[8].

	Farm level	Community level (sharing risk)	Government level
Risk mitigation (ex-ante)	- Diversification of production and income sources - Climat-smart agriculture - Irrigation - Prevention of pests and diseases	- Food crop sharing - Common property resources - Social reciprocity - Rotating savings/credit - Water resource management	- Agricultural policies - Disaster prevention - Agricultural innovation systems - Agricultural information systems - Physical food reserves - Price guarantee stabilization funds - Input subsidies
Risk transfer (ex-ante)	- Insurance - Contract farming - Financial hedging tools (options)	- Insurance and risk pooling - Contract farming - Commodity exchange and warehousing	- Insurance and risk pooling - Social protection - Public insurance
Shock			
Risk coping (ex-post)	- Food buffer stocks - Sales of assets - Reallocation of labour, off-farm labour - Borrowing - Migration	- Rotating savings/ credit	- Disaster relief - Cash transfers - Food aid

8 Source: Platform for Agricultural Risk Management. (2016). *Agricultural risk management tools: Resource for the e-learning curriculum course on "Agricultural Risk Assessment and Management for Food Security in Developing Countries"*. Rome. This graph is not intended to be exhaustive, but rather to show the diversity of tools available at various levels.

Good practices

- Taking the context into consideration
- Strengthening existing tools that have proven to be successful
- Checking the applicability of new tools in the context and their acceptance by stakeholders, to ensure their uptake by stakeholders and their sustainability
- Doing a cost/benefit analysis of the potential tools
- Monitoring the implementation and the functioning of each tool

Issues to consider

- Validating the conditions for replicability
- When possible, designing clear indicators to measure the results of each individual tool, to better understand the results of the combination of tools implemented
- Factoring in the planned and unplanned costs of the tools' implementation

3. Access to information and capacity-building

In managing risks, timely access to information and capacity-building is essential for agricultural stakeholders and for extension workers or policymakers, for them to be able to make informed decisions and progressively enhance their skills and agricultural risk management techniques. Regardless of the tools being put in place, these should be considered key cross-cutting requirements.

Timely access to information – whether linked to weather events, market prices or policy decisions – is crucial for people involved in agricultural value chains to plan their activities. Information has to be considered an input that is as important for making farming activities profitable as are physical inputs like seeds and fertilizers. It can be varied in nature, related to production, weather, inputs, prices, pests or diseases, access to/cost of finance, etc. Because information sources are diverse, their accuracy, accessibility and cost vary tremendously, which means that attention should be paid to ensuring which kinds of information are usable and in what way, and that the costs of acquiring the information are not higher than the potential costs incurred in not accessing it.

Information can be collected by the stakeholders themselves, in relation to their own farm/business, in order to understand and review past decisions and their outcomes. However this information often needs to supplemented by other types of information going beyond the farm, accessed through farmers' organizations, value chain actors, extension services, the media (newspapers or radios) and dedicated systems such as specialized websites or mobile-based applications. Yet even in a scenario where all stakeholders have perfect access to useful information, by their very nature risks are uncertain; sudden changes or shocks cannot be predicted. Having access to information can nevertheless help plan mitigation and responses to shocks.

Another essential cross-cutting feature of agricultural risk management is capacity development to improve the knowledge and capacity for management of agricultural risks among producers, value chain stakeholders and governments. Capacity development should be undertaken after a thorough needs assessment, targeted to its audience, and if needed in partnership with local, national or international research centres or universities, and non-governmental or international organizations involved in training activities. Since various stakeholders are involved in ARM, from farmers themselves to private- and public-sector representatives, capacity development may be targeted to different groups of actors. First, stakeholders along the supply chains themselves (farmers, processors, input providers, financial intermediaries and exporters), plus community members and farmer organization representatives, should constitute a key target audience, since they are directly responsible for implementing risk management strategies. Second, service providers, extension workers, or non-governmental organizations and civil society actors represent key secondary target audiences, since they are in direct contact with stakeholders and provide them with advice on how to design their ARM strategies – and in some cases, on specific services or products for doing so. Third, policymakers and government officials can gain from learning about ARM, in order to be able to integrate it into policies, or to implement existing policies while bearing the holistic approach to ARM in mind.

Good practices

- Identifying existing information systems and areas for possible cooperation and/or integration
- Assessing the quality of available data
- Identifying stakeholders' data needs and obstacles to accessing this data
- Identifying the key stakeholders for capacity development
- Assessing the capacity development needs of each target group
- Adapting the material taught to the specific needs and role of the various stakeholders
- Linking theoretical knowledge with practical experiences and know-how

Issues to consider

- Knowing what types of data are being collected and can be collected, and who is collecting them
- Determining the price that stakeholders are willing to pay for information, in comparison to the costs of setting up or strengthening an information system
- Keeping in mind that information is strategic: there might be specific reasons why information is not shared by farmers, governments or private-sector actors
- Integrating the high turnover rate of government officials and international staff into capacity development strategies
- Assessing possible synergies, but also consistency with other training activities available in a particular area, to make sure that the target audience has incentives to participate in the activities and that time is utilized effectively
- Planning for follow-up and application of the concepts learned during capacity development

4. Partnerships and policy integration

Holistic agricultural risk management is not a specific topic for action, but rather a way of thinking about and of conceptualizing synergies and partnerships across various sectors. Partnerships are therefore a central element of an ARM system, and the role of the government is also essential – particularly in the integration of ARM into policies – as it can provide the right framework for ensuring sustainability and can send a positive signal to investors and private-sector actors.

Partnerships enable the coordination of actors who might be looking at different types of risks, or developing tools or policies to achieve broader development objectives. They can enable the pooling of resources and the design of activities that are better adapted to existing frameworks and activities, while avoiding duplication of work – or worse, the implementation of contradictory instruments. This is particularly important since agricultural risk management often requires coordinated action at different levels, by stakeholders with differing objectives and operating methods – such as governments and local authorities, farmers' organizations, extension services, financial institutions and market actors, research centres and universities, and development partners.

The integration of ARM into national policies is a key element for the sustainability of activities and for building strong and efficient partnerships. This integration should ensure that sector policies do not contradict or have negative impacts on one another, and that policy coherence is achieved. Moreover, the process of integrating ARM into policies raises the awareness of decision makers on issues affecting stakeholders, thereby contributing to shaping the political agenda in favour of agricultural, trade and environmental policies that enable effective agricultural risk management, in a virtuous circle. At the same time, the mainstreaming of ARM within these sector policies can make them more sustainable, by integrating risk management thinking into new operations and guiding actions from the private sector and development partners.

Good practices

- Identifying local actors already engaged in ARM and determining their needs and possible complementarities with their work
- Building partnerships with different types of actors for enhanced effectiveness and sustainability
- Working with various ministries or with an inter-ministerial body and positioning ARM as a cross-cutting issue
- Finding a key resource person with successful experience in implementing ARM, to promote it within the country or specific context
- Synchronizing ARM proposals with government budgeting and planning

Issues to consider

- Clearly defining the roles and responsibilities within partnerships
- Ensuring coherence at different levels and between the action of different actors (government and development partners)

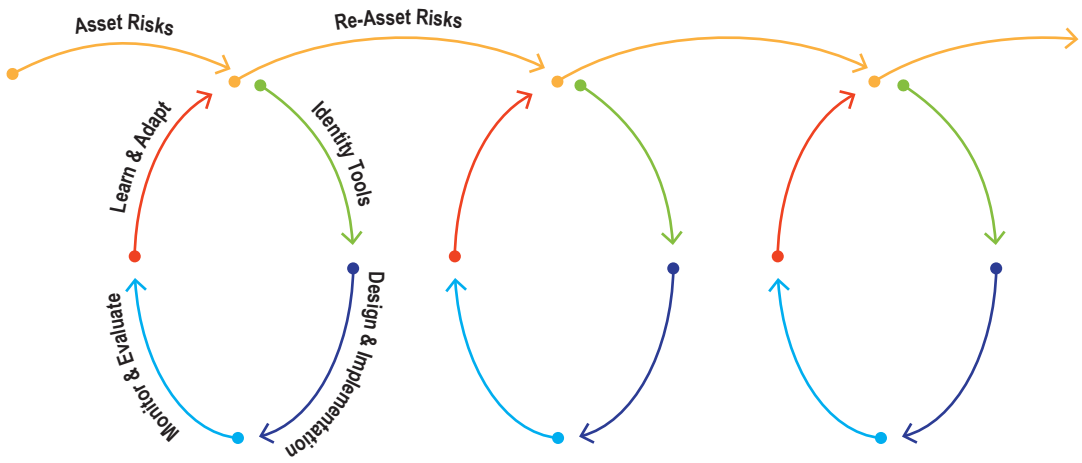
5. Monitoring and evaluation

Unlike in the case of other types of interventions, it is not easy to establish the direct results or impacts of ARM tools, since it is difficult to know how stakeholders would have addressed a shock without ARM in place. In addition, managing risks should be a continuous process, informed by the knowledge gathered about the exposure and resilience on the ground to the specific risk during shocks, about previous shocks and the existing mitigation, transfer and coping mechanisms. Monitoring and evaluation are therefore very important for learning and adapting strategies and instruments. The definition of clear indicators, backed up by solid information, is crucial.

Monitoring the implementation of tools should ensure that they are accessible, effective and implemented by the right stakeholders. It should also enable adaptation in the event of changes in the context, or if the results of the risk assessment get updated. For the efficiency of an ARM strategy, it is essential to continue to monitor the risks and to ensure that information derived from the risk assessment and tool implementation is adequately reported and updated. For example, if pests and disease emerged as major risks, and pesticides are used at farm level, farmers should monitor how useful and effective the pesticides are on the crops under cultivation, and redefine the risk prioritization decisions for pests and disease in the event that this risk changes. In addition, longer-term trends or changes in the context can impede farmers' ability to use the existing resources, and may increase their vulnerability. This process requires regular reporting and clear performance indicators set at the time when the ARM strategy is designed.

The evaluation of an ARM strategy – whether immediately ex post or looking at the longer-term impacts – aims at determining whether the intervention has succeeded in strengthening the ARM capacities of agricultural value chain stakeholders. This evaluation is important, as it enables progress to be measured and potentially a comparison made between several ARM initiatives, based on their costs and benefits. The evaluation of public policies related to agricultural risk management is also necessary in order to guide government action.

Figure 6: Intervention cycle for ARM



Good practices

- Building an M&E system from the inception of the initiative (identifying the baseline): definition of clear indicators, timing and responsibility for data collection
- Collecting age- and sex-disaggregated data in order to assess the effectiveness of the tool(s) for different groups
- Raising awareness of stakeholders as to the importance of record keeping and monitoring
- Considering external factors in order to contextualize impact
- Repeating risk assessments in order to compare with previous results and adjust strategies and tools

Issues to consider

- Developing a qualitative approach for certain activities that are difficult to monitor quantitatively (for example, capacity-building)

Five key pillars have been defined, through a collaborative process coming out of the experiences of PARM and its partners: risk assessment and prioritization; tool identification and implementation; access to information and capacity-building; partnerships and policy integration; and monitoring and evaluation. The next part of this publication will show the application of these pillars to selected case studies.

PARM

PLATFORM FOR
AGRICULTURAL RISK
MANAGEMENT

Part II

Part II. Drawing lessons from the field: promising practices for agricultural risk management

Although the conceptual framework of agricultural risk management and the need for capacity strengthening in this field have been well defined, so far there has not been any attempt to gather insights in a structured manner from past and present initiatives. That is what this part aims to achieve. Through this collection of promising practices, readers will be able to learn from field experiences and better understand the key criteria for better design of agricultural risk management initiatives.

The 10 case studies were selected by a group of experts in the field in order to showcase a wide diversity of agricultural risks and agricultural risk management tools. Following an open call for proposals by the PARM Secretariat, this group of experts – the Technical Committee[9] – assessed the 40 proposals received on the basis of the following criteria, linked to the key pillars for agricultural risk management:

1. Risk assessment: How has the risk been identified? Have frequency and severity of the risk been assessed?
2. Tool identification and implementation: Do the tools in place seem adequate to address the risk(s) identified? Access to information and capacity building: Is access to information part of the initiative?
3. Access to information and capacity-building: Is access to information part of the initiative?Innovation: How innovative is the initiative? Is it ground-breaking or are there benchmarks available to assess it against?
4. Partnership and policy integration: Does the initiative promote partnerships for ARM? Is ARM integrated into policy or does it use existing policies to strengthen its impact?
5. Innovation: How innovative is the initiative? Is it groundbreaking, or are there benchmarks available to assess it against?
6. M&E and knowledge management component: How does the initiative currently measure, or plan to measure, the level of its results? How does it document its results and impact?
7. Current potential, possibility for scale-up and sustainability: Could the initiative be applied on a larger scale? Would the tools require significant changes in order to be applied on a different scale? Would the accessibility or cost-efficiency of the initiative be diminished if it were implemented on a larger scale?
8. General assessment of ARM potential/impact: How would you assess the overall effectiveness of the initiative and its potential impact? If the initiative is risk-specific, is it or could it be easily integrated into a holistic framework? If the initiative takes a holistic approach, are there risks that it fails to take into account?

The initiatives are being implemented in Africa and Asia by a wide variety of actors: research institutes, development partners, non-governmental organizations, farmers' associations and the African Union. They were designed in reaction to various types of risks, related to weather and climate, market and infrastructure, or institutional and policy settings. Some are targeted to governments and others to farmers, demonstrating the different levels of responsibility and capacity in managing risks.

In this section, the case studies are grouped according to the type of tool(s) that they implement to manage agricultural risks, in the following five sections:

- Using information to reduce information asymmetry risks
- Transferring risks: Insurance for agricultural risk transfer
- Integrating smallholders into value chains in order to mitigate market and price risks
- Creating appropriate institutional frameworks in order to reduce institutional risks
- Integrating tools to manage weather risks

9 The members of the Technical Committee were: Federica Carfagna, African Risk Capacity; Ilaria Firmian and Alessandra Garbero, International Fund for Agricultural Development; Åsa Giertz, World Bank; Gideon Onumah, Natural Resources Institute/AGRINATURA; and Mariam Soumare, New Partnership for Africa's Development.

Using information to reduce information asymmetry risks

Information is one of the main raw materials for agricultural risk management. Without it, it is very difficult to assess the likelihood and severity of different risks, prepare for shocks, improve resilience, or manage the risk or transfer it to others. Information is necessary that comes from different sources, on markets, climate and weather, diseases, inputs and technologies for managing risks. In addition, information systems play a broader role – for agriculture, good business practices, improving livelihoods, increasing productivity and ensuring efficient value chains. Risk management is among the most information-intensive aspects of agriculture, because of the deep information needs in terms of spatial disaggregation and development and changes over time.

There has been significant development of information systems in terms of the type and amount of information that is being and can be gathered, but also in terms of who collects and hosts the information and who can access it. New forms of data collection – such as satellite, sensor and geospatial – and increased access through mobile devices, make it easier than ever to gather data and inform inhabitants of remote places, many of whom are smallholder farmers. This information now has to be used: by the insurance industry to develop new products and fill information gaps; by financial institutions to manage the risks from the agricultural sector; by farmers to improve their resilience and enhance their investments in the farm and in the household; and ultimately by governments to improve the design of policies.

The two case studies demonstrate the power of information for managing risks, and propose ways in which information may be brought directly to farmers, through partnerships at the local level. With this information at hand, farmers are empowered to manage their agricultural risks.

Adaptation for the Smallholder Agriculture Programme: Harnessing climate information in Mali and Rwanda

Danush Dinesh, Global Policy Engagement Manager, Consortium of International Agricultural Research Centres (CGIAR) Research Programme on Climate Change, Agriculture and Food Security (CCAFS) and Ilaria Firmian, Environment and Climate Knowledge Officer, IFAD.

Quick facts

Risks addressed

- **Weather and climate-related** risks, including droughts, floods and rainfall variability.
- **Market risks**, including access to inputs, quality of inputs and output prices.
- **Access to finance.**
- **Infrastructure risks,** including post-harvest losses and storage risks.

Tools used

- Climate-smart agriculture
- Crop and enterprise diversification
- Asset- and income-based strategies
- Access to climate, production and market information
- Farm business advice
- Capacity-building and sharing of experience

Location

Global. As of 30 September 2017, the programme had a portfolio of 42 projects approved in 41 countries. This case study focused on programmes in **Mali** and **Rwanda**.

Number of people benefiting

Height million poor smallholder household members, to see their climate resilience increased by 2020

- In Rwanda: 155,000.
- In Mali: 78,750.

Expected results

- **Mali**: The project increases the capacity of smallholder farmers to collect, analyse and disseminate climate information through access to seasonal weather forecasts in partnership with Mali Météo
- **Rwanda**: The project facilitates a better understanding of how changing agro-climatic conditions affect harvest and post-harvest operations in Rwanda, in order to ensure the resilience of the rural infrastructure and related investments, in collaboration with sister government institutions such as the Rwanda Meteorology Agency and the Rwanda Agriculture Board, to deliver the planned intervention activities in climate services.

Timeframe

- Programme d'amélioration de la productivité agricole in Mali: 2014-2018 (mid-term review in 2016)
- Climate-resilient Post-Harvest and Agribusiness Support Project in Rwanda: 2014 to March 2019 (mid-term review in March 2017).

Implemented by

- In Mali by Mali Météo, with local radio stations to disseminate climate information
- In Rwanda by the Rwanda Climate Services for Agriculture project and the Rwanda Agriculture Board

Funded by

IFAD.

- The Adaptation for Smallholder Agriculture Programme (ASAP) is a global programme of the International Fund for Agricultural Development that invests in climate resilience among small-scale farmers. Since 2015 it has established a learning alliance with the CGIAR Research Programme on Climate Change, Agriculture and Food Security, to support the knowledge needs of the Adaptation for Smallholder Agriculture Programme, and to gather lessons of relevance to the wider community involved in agriculture for development.

- As part of the Adaptation for Smallholder Agriculture Programme, several projects focus on reducing climate risks through climate information. In Rwanda – as part of the Climate Resilient Post-Harvest and Agribusiness Support Project – farmers are provided with climate information that reduces post-harvest risks and losses. The project also enhances the capacity of organizations to access funding from commercial lenders for integrating climate-smart features into warehouse construction and other post-harvest infrastructure. The identification and promotion of crop and forage varieties that mature earlier and are more tolerant to floods is another activity that helps reduce risks. In Mali, the Programme d'amélioration de la productivité agricole provides climate information and supports smallholder farmers in accessing information, tools, training and technologies, thus helping build resilience to climate change.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	The risk assessments were differentiated by regions, undertaken through document review and working groups; this was a participatory process.	Initially only climate-related risks were considered and assessed, but the focus was then adjusted to include market-related risks.
2. **Identification and implementation of tools**	Information systems were identified as a cross-cutting tool because of the existing actions and partnerships	–
3. **Access to information and capacity-building**	–	The usability for farmers has to be improved, both in terms of packaging of information and of the dissemination methods
4. **Partnerships and policy integration**	The projects were designed to strengthen existing partnerships, in collaboration with local specialized meteorological bodies.	–
5. **Monitoring and evaluation**	Combines standard procedures for M&E with innovative research and knowledge management (KM), through studies on the results of the CGIAR partnership.	–

Key lessons

1. **Focus on practical solutions related to climate constraints so as to improve support to farmers.**

2. **Provide information in formats that are appropriate for each audience.** In Rwanda, Météo Rwanda (in collaboration with the Rwanda Climate Services for Agriculture project) is producing web-based agro-climatic information that is used for decision-making at institutional and technical level; however, the information has not yet been repackaged for improved rural farmer usability.

3. **Provide greater emphasis on capacity-building and training**. In Mali, women were not involved in the collection of weather information. There is a need to train women and provide them with the necessary equipment so that they can better participate in and benefit from this activity. It appeared that male farmers also needed more training on interpreting weather information for use in agricultural calendar adjustment.

4. **Create new and complementary products and services** as part of project activities. In Mali, this would include: synchronizing local radio stations with national radio for weather information broadcast, as well as translating the information into all major local languages. In addition, the timing of the broadcast should be adjusted to better suit farmers' schedules (7 o'clock in the morning and 7 in the evening, when farmers come from the fields. Currently the use of mobile telephony is limited to calling a local radio or meteorological station and extension agents for data transmission by farmers in charge of rain gauges – and this is not a free call. A "green line" should be established to improve the dissemination and accessibility of this information.

What next?

All of the climate information activities in Mali and Rwanda are conducted in close partnership with the national meteorological services, thus strengthening their capacity with a view to ensuring the sustainability of the activities at the end of the projects. Minimizing the costs incurred by national meteorological services is an important condition for scaling up. The creation of complementary services engaging private-sector partners such as telephone companies would help to ensure the sustainability of the initiative. It is also important in the long term to invest in the capacity-building of farmers – including for the maintenance of rain gauges – and to look at opportunities for the training of trainers.

Learn more

- about the Programme d'amélioration de la productivité agricole, Mali:
  https://www.ifad.org/documents/10180/bff22a3a-e88f-4293-a05d-8fff17356964
- about the Climate Resilient Post-Harvest and Agribusiness Support Project, Rwanda:
  https://www.ifad.org/documents/10180/9b8e5ec4-afbf-4b6d-bf6a-006a01160445
  https://cgspace.cgiar.org/bitstream/handle/10568/80178/CCAFS_WP193.pdf

Climate services for agricultural risk management: Training and access to information-sharing for increased resilience in Rwanda

James W. Hansen, Ph.D., Climate Services and Safety Nets Flagship Leader, CGIAR Research Programme on Climate Change, Agriculture and Food Security, and Desire Kagabo, Ph.D., Project Manager, International Centre for Tropical Agriculture (CIAT), Rwanda

Quick facts

Risks

- **Weather and climate risks**, including droughts and rainfall variability.

Tools used

- Training and participatory processes for reviewing existing farm and livelihood strategies in light of local climate risks, and adapting farm management based on seasonal climate forecasts
- Agricultural drought risk analysis and early warning system
- Access to climate information

Location

Rwanda (nationwide).

Number of people benefiting

Objective: **750,000 people**. Midway through the project, 52,776 farmers have been trained and it is estimated that each trained farmer shares information with more than ten community members.

Expected results

Sustained capacity and governance to provide climate services that improve risk management for Rwanda's farmers and agricultural sector institutions.

Timeframe

March 2016 to September 2019.

Implemented by

International Centre for Tropical Agriculture (CIAT), Rwanda Meteorology Agency (Météo-Rwanda) and Rwanda Agriculture Board (RAB), in partnership with international technical partners: International Research Institute for Climate and Society (IRI); International Livestock Research Institute (ILRI); World Agroforestry Centre (ICRAF); and the University of Reading. National partners include the Ministries of Agriculture, Environment and Local Government, and a number of media companies, non-governmental development organizations and community-based organizations Coordinated by the CGIAR Research Programme on Climate Change, Agriculture and Food Security

Funded by

Rwanda Mission of the United States Agency for International Development (USAID/Rwanda)

The CGIAR Research Program on Climate Change, Agriculture and Food Security is working with partners to develop methods and capacity to provide climate services that enable farmers, government and institutional decision makers to understand, anticipate and manage climate-related risks in Rwanda. Within the national government, the development of new climate information products and tools is intended to support early warning and management of drought risk, along with planning (for example of seed procurement and distribution) and recommendations related to the onset of the two rainy seasons and the timing of planting. At farm level, the range of risk management decisions includes: seasonal adjustments in the choice of crops, cultivars and production technology; the timing of planting and other field operations; management of livestock feeding and health; and, in a few cases, fundamental changes in household livelihood strategy in response to increased understanding of the local climate and its associated risks. The capacity to deliver climate services to rural communities and support their use is being developed through training agricultural extension staff, the development of non-governmental organizations and volunteer farmer promoters to adapt and apply the PICSA approach (Participatory Integrated Climate Services for Agriculture), developed by the University of Reading – as one of several communications channels. Work with the national meteorological service (Météo-Rwanda) builds on the ENACTS initiative (Enhancing National Climate Services, led by the International Research Institute for Climate and Society), and involves the development of high-quality merged gridded historical data sets and an expanding suite of derived online "maproom" products. The initiative is partnering with the UN Global Framework for Climate Services to develop sustained climate services governance.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	Reconstructing historical climate data enables an objective risk analysis. Perceived risks were incorporated into the household baseline survey.	Initially, only climate-related risks were considered and assessed, but the focus was then adjusted to include market-related risks

2. **Identification and implementation of tools**	Extended existing tools to enable provision of climate information, and to support rural communities in understanding and using information.	–
3. **Access to information and capacity-building**	Research may offer innovations that increase capacity to provide useful services without over-taxing human resources.	Institutional and policy buy-in are crucial for the sustainability of the investments in capacity development.
4. **Partnerships and policy integration**	–	Effective climate services require formalized cross-agency partnerships and an enabling policy.
5. **Monitoring and evaluation**	Well-designed baseline survey enables progress to be monitored.	–

Key lessons

1. Developing climate services that support agricultural risk management requires substantial investment in capacity in three key areas:
   - Supply side: National meteorological service capacity to provide locally relevant information tailored to the needs of farmers, often addressing gaps in historical data
   - Demand side: National agricultural research and extension system capacity to translate, communicate and build farmers' capacity to understand and act on climate information
   - Institutional and governance arrangements to sustain co-development of services beyond a project's lifespan.
2. Involving applied climate and agricultural research institutions that are well-grounded in climate services improves the prospects of finding scalable solutions to supply- and demand-side capacity challenges.
3. Climate research provides viable options for filling data gaps and generating locally relevant information without overextending the limited human resources.
4. Climate services for farmers benefit from a mix of delivery channels that include participatory communications facilitated by trained intermediaries.
5. Mainstreaming climate services within agriculture requires strong partnership between agricultural and meteorological agencies and their associated ministries, plus enabling governance.
6. Getting high-level political buy-in early is important for ensuring sustainability at the conclusion of a project.

What next?

In order to develop the policy and governance arrangements needed to sustain climate services after project funding ends, the initiative is partnering with the World Meteorological Organization-led Global Framework for Climate Services to facilitate development of a national climate services framework and action plan.

A major focus of the initiative is on the development of sustained institutional capacity. This includes supporting education at the M.Sc. level for six staff members from Météo-Rwanda and three from the Rwanda Agriculture Board. With the training provided, development of a high-resolution merged gridded historical database and the degree of automation, Météo-Rwanda is expected to be able to maintain with its existing human resources the provision of a greatly expanded suite of online information products, tailored to the needs of the agriculture sector. While the initiative has trained close to a thousand intermediaries in participatory climate information communication and planning processes, we anticipate that sustainability will require a policy change to formalize climate services within the mandate of Rwanda's agricultural extension service. More generally, sustained provision of climate services that are useful to the country's agriculture sector will require policy support and enabling institutional arrangements across several line ministries (Agriculture and Animal Resources, Environment, Local Government, Disaster Management and Refugee Affairs). It will also require allocation of financial resources. Support for the national climate services framework process led by the Global Framework for Climate Services aims to achieve the policy support and institutional arrangements needed to sustain agricultural climate services at scale.

Learn more

- **https://ccafs.cgiar.org**/building-climate-services-capacity-rwanda

Transferring risks: insurance for agricultural risk transfer

Agricultural risks are characterized by their frequency and severity – that is, by how often a shock might occur and how much damage it might cause. In general the most frequent risks along the agricultural value chain lead to low losses and therefore can be dealt through risk mitigation practices such as climate-smart agriculture or income diversification. For less frequent and more damaging risks, mitigation strategies are insufficient. This is where risk transfer strategies become relevant and options such as agricultural insurance should be explored.

While agricultural insurance products are widely available and used in North American and European countries, this has not been the case in developing countries – particularly in Africa. This is due to several reasons, ranging from the amount of information required at all stages of delivery (from avoiding adverse selection and moral hazard, to estimating losses and pay-outs), to the technical complexity associated with developing new insurance products and the lack of awareness and understanding on the part of potential end users as to how insurance works.

However, many pilots have been successful, and agricultural insurance – whether indemnity-based or index-based – is now increasingly being offered in developing countries. It can range from products offered by private companies to insurance schemes implemented by governments. These tools are one component in the development of an agricultural risk management strategy within the agricultural value chain, be it at the micro, small farmer, cooperative or sovereign state level.

The three case studies that were selected display a diversity of risk transfer approaches, with a focus on insurance. While they all rely on collecting quality information – using a combination of different techniques, including remote sensing – these three initiatives have very different objectives and targets. These range from insuring governments against catastrophic losses, to providing information for farmers integrated within national insurance schemes and developing innovative indexes for the design of new insurance products. These innovative insurance initiatives demonstrate the dynamism required in development of risk transfer mechanisms matching the needs in developing countries.

African Risk Capacity: Insuring African governments against natural disasters

Federica Carfagna, acting R&D Manager and Vulnerability Analyst, African Risk Capacity and Ekhosuehi Iyahen, Director, Policy and Technical Services, African Risk Capacity

Quick facts

Risks

Weather risks, including droughts, floods, rainfall variability and tropical cyclones

Tools

Early Warning through Africa RiskView, ARC's foremost modelling tool; financing through weather-index insurance; contingency planning and capacity building

Location

African Union (AU) member states, of which 33 are signatories of the ARC Establishment Treaty

Number of beneficiaries

Approximately **10 million** Africans, through indirect sovereign-state-level insurance coverage (2014–2017).

Expected results

ARC has set out to provide insurance coverage to 22 countries by 2020.

Timeframe

–

Implemented by

- governments (through in-country technical working groups, premiums, and implementation of pay-outs when triggered),
- donors who provided the risk capital for the insurance company and have supported the capacity-building work undertaken by the ARC Agency with its Member States;
- local and International NGOs and international organizations, often actively involved in the in-country technical working groups and/or as implementing partners when pay-outs are triggered and response activities rolled out; and
- the private sector, through reinsurance capacity provided to the ARC Insurance Company on an annual basis

Funded by

Premiums from member states, donor funding from DFID, KfW, USAID, Rockefeller Foundation, AFD, CIDA, SIDA (Swedish International Development Agency) and SDC

The ARC concept is based on the fundamental rationale that responding to a disaster before it develops into a crisis is financially efficient, more economical, and saves lives and livelihoods, since US$1 spent on early intervention through ARC saves nearly US$4.5 spent after a crisis is allowed to develop. Such an approach is critical in building the resilience of countries and communities and is integral to the development of effective and efficient risk management systems. The ARC approach involves linking early warning systems (through its risk modelling platform Africa RiskView) with contingency planning, supported by modern financial mechanisms (specifically insurance) to enable governments to provide targeted responses to disasters in a more timely, cost-effective, objective, and transparent manner, linked to action on the ground.

Financing is provided through weather-index insurance. Its specific purpose is to finance early response to specific disasters once policies have been triggered. For **contingency planning**, ARC works with its Member States to develop contingency plans that are linked to predefined financing (insurance) to aid in a response to disasters that is more effective and timelier. This approach is focused on: (i) identifying already existing response programmes in line with the ARC contingency planning eligibility criteria; and (ii) identifying opportunities for strengthening and scaling up national-level disaster response programmes and safety net schemes. Given the AU mandate to the institutions, ARC actively provides platforms for exchanges on its three work streams for **capacity-building and experience sharing**. These exchanges are facilitated: (i) within countries, through the establishment of in-country technical working groups composed of governmental and non-governmental stakeholders; (ii) between countries, through workshops, in-country visits/exchanges and through regional platforms as facilitated by the Regional Economic Communities (RECs); (iii) in continental exchanges, through the annual ARC Conference of Parties, AU summits, etc. and (iv) through international exchanges with other risk management and pooling initiatives, such as the Caribbean Catastrophe Risk Insurance Facility (CCRIF).

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	Climate risks (and more specifically drought) were chosen because of their impact on African countries and their potential impacts linked to the structure of their economies.	–
2. **Tools identification and implementation**	–	- Basis risk - Large amount of information and analysis for the development of models and adaptation to national contexts.
3. **Access to information and capacity-building**	The capacity-building of governments is included in the intervention.	–

4. **Partnerships and policy integration**	As an AU specialized agency with a very specific mandate, the ARC: defines the institutional governance structure and administration framework for implementation in pursuit of its goals; builds consensus on priorities for the institution; and establishes a platform for accountability through providing opportunities for reporting and exchanges between Member States. The ARC also actively engages continental, international and regional economic communities on issues of risk, as evidenced by MoUs with the AfDB, ECOWAS, Inter-African Conference of Insurance Markets (CIMA), etc.	ARC recognizes the importance of partnership and policy integration and has made efforts to build out this component. Through policy, ARC is clarifying the misconception that ARC insurance will cover all of the risk associated with disasters, and that it is not mutually exclusive with other investments to be made in terms of managing risk.
5. **Monitoring and evaluation**	Monthly monitoring with countries and partners for implementation; in-county process evaluation to assess pre-developed contingency plans; process and financial audits also conducted after a pay-out. Annual beneficiary assessments and donor reviews.	Given the novelty of the mechanism and the time it takes for insurance benefits to be seen, ARC is undergoing a 10-year evaluation process with DFID to tease out the contribution of the ARC mechanism to improved risk management in its Member States.

Key lessons

Although not an exhaustive list, some broad lessons to be learned from implementation of the ARC mechanism include the following:

1. Member-state ownership is essential to driving awareness, demand and political support for engagement around risk management and insurance. There is a need to integrate ARC into national frameworks and strategies for sustainability.
2. A facility such as ARC requires considerable investment in capacity-building, development of analytical tools, education and awareness-raising, commitment of risk capital, multidisciplinary human resources, and rolling research and development on new products and tools to address the differences between Member States.
3. Continued shared analysis and inclusive dialogue around risk are highly important.
4. Expectation management as to what needs for disaster risk financing can be met through insurance.
5. There is increased appetite in the public and private sectors for contextually appropriate risk management products and tools.
6. More robust monitoring and evaluation processes internally and for the governments' systems.
7. Measures are imperative to address the premium financing challenge facing African countries.

What next?

Owing to demand from ARC Member States, ARC recognises the need for the development of other perils insurance products, namely river floods, tropical cyclones, excessive rainfall, outbreaks & epidemics and extreme climate.

Furthermore, despite the recognition of the value of the ARC-led insurance mechanism, there remain significant challenges hindering country participation. Traditionally, international humanitarian actors both finance and execute assistance. The cost of natural disaster risk, in both direct losses and impact on economic development, is thus not factored into national budgets. Efforts at achieving this by government officials is further halted by issues such as Fiscal Constraints, Political Instability, Shifting Priorities etc. These realities have led to ARC developing a Premium Support Transition Facility (PSTF) with its Member states and development partners, to provide premium financing through soft loans and grants over a period of 5 years as countries build premium into budgets and strengthen their national public risk management systems. The precedence for such transition support exists, in the Caribbean, Central America, Asia and the Pacific where premium financing was provided to ensure the consistent engagement of governments in the risk pools as premium was built into the natural budgeting processes.

Learn more

- **http://www.africanriskcapacity.org**

Index-based livestock insurance: An innovative response to droughts in Kenya and Ethiopia

Rupsha Banerjee, Ph.D., Scientist – Institutions and Innovations, International Livestock Research Institute (ILRI), Nairobi, Kenya.

Quick facts

Risks

Weather risks, specifically droughts.

Tools used

- Climate-smart agriculture
- Asset- and income-based strategies
- Weather index insurance
- Social protection and productive safety nets
- Access to climate, production and market information
- Capacity-building and experience sharing

Location

Arid and semi-arid lands in **Kenya** and **Ethiopia**.

Number of people benefiting

Over **20,000 pastoralist households**: 12,000 in Kenya and 8,000 in Ethiopia.

Expected results

- Reduction in distress sales of livestock during drought situations.
- Access to other essential services such as feed, vaccinations, fodder and water and other financial services.
- Improved nutritional status of individuals at household level.
- Better herd management.
- Sustainable scaling of the project beyond the current sites, within a public-private partnership.

Timeframe

Phase I: 2011-2012, Phase II: 2012-2016, Phase III: 2017 and beyond.

Implemented by

Takaful Insurance of Africa (TIA), APA Insurance, State Department of Livestock of the Government of Kenya and Oromia Insurance Corporation (OIC).

Funded by

World Bank, Technical Centre for Agricultural and Rural Cooperation (CTA), University of California (Davis), World Food Programme and USAID Feed the Future. Funded in the past by: European Union, DFID, World Bank, Development Food Aid Programme (DFAP), Kenya Markets Trust, 3ie and USAID.

The Index-Based Livestock Insurance (IBLI) programme works towards improving the resilience of pastoralists to drought-related losses in their key productive asset – livestock. The design of the product relies on low-cost, accessible and reliable data on pasture availability, through satellite imagery of the earth's surface. It evaluates the state of pasture and applies it to the design of an insurance product targeting drought-vulnerable pastoralists in Northern Kenya and the Borena region in Southern Ethiopia. The initiative has heavily invested in: building markets, capacity and standardized extension manuals and tools; designing marketing campaigns; and developing mobile-based sales transaction platforms for increased cost-efficiency and improved knowledge management. Most of the research in this project is demand-driven and based on the needs of the private sector underwriting this product. So far Index-Based Livestock Insurance has been adopted by the Kenyan Government as the Kenya Livestock Insurance Programme (KLIP). The International Livestock Research Institute is currently leading development of a concept note to guide the Ethiopian government's investments in agricultural financial solutions beyond the Borena region. In Kenya, the government was encouraged to launch the Kenya Livestock Insurance Programme and support the scaling-up of Index-Based Livestock Insurance, due to the research by the International Livestock Research Institute demonstrating a range of positive impacts at household level and increased value-for-money for government. The model of sustainability thus rests on the development of institutional public–private partnerships that support smart subsidies, promote private investment and work towards informed demand and an increased efficiency of service delivery.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	Based on primary and secondary data collection, prioritized on drought because of the potential catalytic effect on other risks.	Availability of reliable secondary data is usually a challenge requiring extensive studies and research – which can be both capital-and human-intensive.
2. **Identification and implementation of tools**	Innovative insurance based on geographic context: a vast area with sparse population.	The issue of basis risk will always persist; it is therefore important to keep in mind in designing the contract the different agro-ecological features and methods of ground-truthing.
3. **Access to information and capacity-building**	Coupling of research and capacity building activities.	A high level of illiteracy makes penetration and capacity-building challenging. High transaction costs for extension and education.
4. **Partnerships and policy integration**	Integration of Index-Based Livestock Insurance into national Kenyan policies.	In most cases there are issues of competing expectations as to what the product can do and what the commercial underwriters expect. One should therefore choose partners who are aware of and aligned with the vision of such a product and the target clients.
5. **Monitoring and evaluation**	Analysis of sales data and having mechanisms in place to get feedback from clients through evaluation studies.	It is not always possible to carry out extensive ex ante and ex post impact assessments, because of the costs attached to such exercises. Therefore, innovative methods using digital technologies such as text messaging and interactive voice responses can be used to inform as to demand among the clients.

Key lessons

Key lessons for delivering technologies or services through a public – private partnership and scaling up in pastoral regions:

1. Selecting and managing partners from different backgrounds who are willing to recognize and adapt to the challenges that come as part of working in pastoral areas.
2. Identifying new research questions that support the uptake of the technology, and packaging the research and its findings in a manner that excites and maintains the interest of market/development partners.
3. Folding the research questions that arise during the implementation of the project back into its research pipeline.
4. Developing non-traditional skill sets within the project team that range from pure science/technical researchers to action/participatory researchers and development practitioners as bridging agents between research and implementation.
5. Creating a project structure that couples research, implementation, testing, trouble shooting, market and capacity development and fostering a culture that enables innovation and creativity.
6. For every technology that is to be adopted, there is a need for institutional and process innovation throughout the technology's life cycle.

What next?

Index-Based Livestock Insurance's exit strategy is through a public–private partnership model for scaling up, with the International Livestock Research Institute as a technical support. This has already started happening, with the insurance companies now branding Index-Based Livestock Insurance as their product and the government partnering with the private sector to implement this product. Ethiopia also seems promising, with the government being very interested in taking up this product at a national level. For scaling-up and replicability, there needs to be an understanding of the local agro-ecological, socio-economic and institutional environment, in order to customize the tools and contracts looking to implementation. Index-Based Livestock Insurance is set to expand into the Afar and Somali regions in Ethiopia and has been commissioned to carry out an initial feasibility study in Uganda. As well, it is expected that by 2020 the Kenya Livestock Insurance Programme will be scaling up to 100,000 households over 14 counties. There is considerable interest from other regions beyond East Africa in implementing this model of insurance, both within the African continent and also from South Asia. The objective is now to improve the supply chain for the product through institutional and process innovations, as part of expanding beyond the existing project sites.

Learn more

- **https://ibli.ilri.org**

Remote Sensing-based Information and Insurance for Crops in Emerging Economies (RIICE): Providing information to strengthen private and public insurance schemes

Manoj Yadav, Project Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Quick facts

Risks

- **Weather and climate risks**, including droughts and floods.
- **Agriculture portfolio risk management** for governments and insurance companies.

Tools used

Generation of crop production information (area and yield).

Location

Cambodia, **India** (Tamil Nadu, Odisha and Andhra Pradesh), Philippines (Philippine Rice Information System -PRiSM), **Thailand**, **Vietnam**, and **Indonesia**. Please note that the information provided in the rest of the document document relates to the state of Tamil Nadu, India, where the project has been operational since 2012.

Number of people benefiting

During the 2016–2017 main cropping season, 22,547 farmers have had claims paid out by the Agriculture Insurance Company of India Limited (AICI), a project partner institution, due to having been prevented from sowing.

Expected results

Governments and other stakeholders use the system of crop/yield information in agricultural and disaster-risk management policies, strategies and action plans to strengthen food security and transfer risks to the insurance sector.

Timeframe

Phase I: 2012–2015; Phase II: 2015–2017; Phase III: 2017–2019

Implemented by

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), Tamil Nadu Agricultural University (TNAU), AICI, Swiss Re, Department of Agriculture, Odisha, and Acharya N. G. Ranga Agricultural University (ANGRAU), Guntur, Andhra Pradesh.

Funded by

Swiss Agency for Development and Cooperation (SDC) and German Federal Ministry for Economic Cooperation and Development (BMZ). The Odisha and Andhra Pradesh state governments funded the development and implementation of a remote sensing-based rice monitoring system.

Rice is one of the most widely grown crops in India; its availability is equated with food security. Agriculture insurance as a means to achieve food security has shown considerable promise. However it is beset with several challenges that revolve mostly around the availability of transparent and timely information regarding several aspects of production – like area under cultivation and yield in a particular administrative unit.

Remote Sensing-based Information and Insurance for Crops in Emerging economies is a public-private partnership between the GIZ, the Swiss Agency for Development and Cooperation, the RRI, Sarmap and Swiss Re, supporting crop insurance coverage for smallholder rice farmers in Cambodia, India, Indonesia, Thailand and Vietnam. Initiated in 2012 in Tamil Nadu, India, the initiative actively collaborates with the state government, local technical partner institutions and insurers, with the aim of establishing technology-based insurance solutions. To reduce the vulnerability of smallholder farmers engaged in rice production if using crop insurance, this initiative makes use of satellite data to generate information that includes rice area statistics, mid-season rice yield forecasts and end-of-season yield estimates down to village level. Insurance companies use these forecasts to be able to respond considerably more transparently and quickly, thereby securing the livelihoods of smallholder rice farmers. Sustained engagement with the government is aimed at the creation of an enabling policy environment that allows the project-based deliverables to be used by insurers in portfolio monitoring and claim administration, in the event of imminent losses.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	Data collection by the project partner, a local agricultural university with sound knowledge of local agronomic conditions and field presence.	Based on data starting in 2013 and continuing to date.
2. **Identification and implementation of tools**	An Effective remote sensing-based information system for crop insurance requires rigorous ground-truthing and validation. The corresponding processes and protocols must be carefully designed, bearing in mind the local ecological conditions.	Limited to rice only. A focus on exploring other crops that are amenable to remote sensing and development of similar solutions for the crops identified.
3. **Access to information and capacity building**	Satellite data from the European Space Agency (ESA), made available free of charge, and data acquisition over the project areas, have been assured until 2030. The development of in-country capacity to make use of remote sensing data is critical to the sustainability of the initiative. This has been achieved through extensive training and a knowledge transfer mechanism as part of the project.	The procurement of high resolution satellite imagery comes at high cost and some degree of uncertainty regarding acquisition. In-country capacity-building should be among the key objectives of the project.

4. **Partnerships and policy integration**	It is important to include all stakeholders – the government as well as the insurance sector – during project design and implementation.	Stakeholder engagement requires time and hence should be embedded into the project from its inception.
5. **Monitoring and evaluation**	The project has an outcome monitoring process in place that captures the progress of the project on its stated outputs and indicators, on a quarterly basis. The results are regularly communicated to the donors to meet the reporting commitment and maintain up to date communication.	–

Key lessons

1. Technology must be tried and tested as to its accuracy, consistency and suitability in providing reliable and timely information, before it can be presented to the government and users for application. The engagement with the Department of Agriculture of the Government of Tamil Nadu began in late 2015. In the following year it led to piloting the technology in the 2016/17 crop season and its extension in the 2017/18 season.
2. Effective stakeholder engagement is critical, so that the dialogue is not lost in the scientific complexities but rather caters to the needs and requirements of both policymakers and farmers in order to benefit them the most.
3. In addition to effective stakeholder engagement, the priorities and (economic) interests of the various stakeholders – including farmers, insurers and the government – must be in harmony and addressed effectively so that farmers benefit in the long run.
4. The provision of know-how transfer and technical advice to decision makers is key to technology adoption through capacity-building.

What next?

The current phase of the project (Phase III) aims at integrating the project deliverables into the existing crop insurance architecture. This entails a shift in the donor-funded technology application to a market- or government-financed operational model, which is expected to be achieved by the end of 2019.

The project's outcomes are readily scalable and replicable, as demonstrated by its uptake by two other state governments in India (Odisha and Andhra Pradesh), along with its development in other countries where the initiative is operational. Once the initial ground-truthing and validation are carried out, and if the results meet the quality standards, the information generated can be easily applied in the context of crop insurance. This holds true for the rice crop, as it has been the focus crop since project inception.

Learn more

- **https://www.asean-agrifood.org**/projects/riice/

Integrating smallholders into value chains to mitigate market and price risks

The market can be a source of risks, coming from price variations, information asymmetry between buyers and sellers, and physical barriers preventing access by farmers – especially smallholder farmers, who do not always manage to sell their produce at a price that enables them to sustain their livelihood. A farm may be highly productive, but if the farmer is not able to market the produce as efficiently as possible by getting remunerative prices and minimizing or mitigating potential market risks, it will not achieve financial success in the long run.

Market tools are available that can significantly improve the risk management capacities of agricultural value chain stakeholders, enabling them to secure access to the market and get the best possible price, with minimum risk. Three types of tools clearly stand out: contract farming (which may involve production or marketing contracts); commodity exchanges; and warehouse receipt systems.

There are several types of contractual arrangements between small-scale producers and commercial stakeholders, such as marketing or production contracts and out-grower schemes, or collective marketing practices. They enable farmers to be sure that they will be able to sell their produce – in some cases at a specific price that is agreed upon beforehand.

Commodity exchanges provide platforms for multiple buyers and sellers to trade commodity-linked contracts on the basis of rules and procedures set by the exchange. This leads to more accurate and transparent pricing, as well as efficient marketing. More advanced commodity exchanges include trade in futures contracts, allowing farmers to transfer part of their price risks to willing third parties.

A warehouse receipt system often involves a formal agreement between a storage facility operator and a named depositor for storage of a specified commodity. The agreement specifies the quality and quantity of the commodity held in a secure storage environment. The document, called the warehouse receipt or silo certificate, is a certificate of deposit and ownership of the stored commodity. It can then be used by the depositor as collateral to obtain financing from a lending institution or input supplier.

The two case studies presented in this section show how the power of the market can be harnessed to benefit farmers, either through an aggregation platform led by a farmers' organization, or through a combination of markets, financial tools and information systems.

eGranary: A virtual aggregation platform to empower East African farmers

Norbert Tuyishime, East Africa Farmers Federation.

Quick facts

Risks

- **Weather risks,** including droughts, floods and rainfall variability
- **Market risks,** including access to inputs, quality of inputs and output prices
- **Infrastructure-related risks,** including post-harvest losses, transportation and storage

Tools used

- Climate-smart agriculture
- Crop and enterprise diversification
- Agricultural insurance
- Weather index insurance
- Agricultural finance and microfinance
- Contract farming
- Access to climate, production and market information
- Farm business advice
- Capacity-building and information sharing

Location

Kenya and **Uganda**: to be expanded to **Rwanda** and **Tanzania**.

Number of people benefiting

Over **27,000 farmers** are registered on the platform in Kenya.

Expected results

More than 100,000 farmers are empowered through the use of technology, market access and access to affordable financial services.

Timeframe

Started in 2016.

Implemented and funded by

East Africa Farmers Federation (EAFF), in partnership with the Alliance for a Green Revolution in Africa (AGRA), the Food and Agriculture Organization of the United Nations (FAO) and Mobile Decisioning Holdings Ltd (a FinTech company).

eGranary is a virtual aggregation platform that provides the following five services in a package: access to markets; access to certified seed and fertilizer; affordable credit; agriculture insurance; and extension services. It seeks to make agriculture data available on time for decision-making at the farmer level and investor level, and to influence policy, as well as to make farmers more bankable by de-risking their operating environment and building their capacity.

The EAFF has signed a supply contract and subcontracted to its members, providing a floor price linked to the cost of production. Farmers have an incentive to get into the programme, which provides a predictable market and predictable prices. They receive certified inputs and advice on when to plant, and benefit from weather and multi-peril crop insurance that is bundled with the in-kind loan of inputs, to be repaid in instalments. The East Africa Farmers Federation monitors the crops and provides drying services and a place to store harvested crops. A post-harvest loan is also available for farmers, and after final evaluation by the off-taker, farmers are paid via mobile money.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	The process involved several meetings with the leadership and the chief executive officers of the various member organizations.	The extent to which farmers are vulnerable to the risks Existing solutions.
2. **Identification and implementation of tools**	Inevitably it was necessary to embrace mobile technology for the purposes of achieving aggregation of farmers in order to access the services (markets, financial services such as credit and insurance, and agriculture extension services). There was a need to ensure that the platform was robust enough to be used by small-scale farmers.	Mobile telephone penetration, ease of use; simplicity of the questions asked; tailor-made for the target value chain; cost to access and utilize the tool; revenue streams and potential for sustainability.
3. **Access to information and capacity-building**	The initiative enhances the capacity of farmers in financial literacy, agronomy and structured trade, so that through the eGranary they can access loans and simultaneously access the market through collective marketing. The system has a call centre that enables farmers to get responses to all inquiries. In addition, it has built-in text messaging features that enable us to send farmers information of relevance for the current stage of the season.	High cost of reaching individual farmers through conventional training events. Willingness to pay for the information.
4. **Partnerships and policy integration**	Link to private sector as service providers, with the East Africa Farmers Federation bringing collective bargaining power to farmers.	Managing expectations of each partner. How to use the analytics from the data collected for policy lobbying.
5. **Monitoring and evaluation**	Monitoring on a quarterly basis based on the number of registered farmers, the number of loans given and the rate of repayment.	Cost of verification of data accuracy by a third party. Overlapping cropping cycles.

Key lessons

1. The East Africa Farmers Federation safeguards individual farmers and provides them with bargaining power in relation to large corporations.
2. The bundling of insurance with other services means that the initiative is able to insure farmers that would have been reticent to get insurance on their own. The information and communications technology component of the initiative allows for good penetration and ease of use by the farmers.

3. The lack of a complete transaction history (both financial and production-related, from planting to harvest) constitutes a major impediment for financial institutions to be able to make decisions on the creditworthiness of the farmers. Most farmers don't keep accurate up to date records of their farming activities, which means that there is a need to concentrate on going through a complete production cycle with farmers and keeping the corresponding records.
4. The terms and conditions of contracts with the insurance providers need to be very clear for all parties involved. The insurance premiums need to be paid immediately following planting and an assessment done so that the underwriter will not refuse to cover the crop.

What next?

1. Bringing in more financial partners so that more farmers can be reached.
2. Continuous training of farmers on record keeping at individual and group levels, on topics that include good post-harvest practices.
3. Creating loan accounts for the farmers and developing credit scores as the precondition for accessing a post-harvest loan.
4. Improving and restructuring the platform to integrate payment via mobile, data archiving per crop season, generating reports in different formats, etc.
5. Rolling-out eGranary in Kenya and Uganda, with possible expansion to Tanzania and Rwanda.

Learn more

- **http://www.eaffu.org**/index.php?option=com_content&view=article&id=154&Itemid=727

The Farm Risk Management for Africa (FARMAF) Project: Promoting market-based tools for agricultural risk management

Gideon Onumah, Ph.D., Agricultural Economist/Rural Finance Specialist, Natural Resources Institute.

Quick facts

Risks

- **Weather risks**, including droughts and rainfall variability
- **Market risks**, including access to inputs and output prices
- **Access to finance**
- **Infrastructure risks**, including post-harvest losses and storage

Tools used

- Agricultural insurance (both indemnity-based and weather-index insurance)
- Agricultural finance and microfinance
- Collective marketing
- Reliable market information systems (providing access to climate, production and market information)

- Commodity exchange
- Warehouse receipt systems
- Public food grain reserves

Location

Burkina Faso, **Tanzania** and **Zambia**.

Number of people benefiting

Approximately **175,000 farmers** directly benefited in the three target countries; however, as the tools promoted are being scaled up to national level, it is possible that over three million farmers will be impacted over the medium term (the next five years).

Expected results

- Existing identified ARM tools (as listed above) improved and scaled up to enhance access.
- Development of the ARM tools that are missing and/or may be complementary to the existing ones
- Building the capacity of farmers' organizations and national stakeholders for the purposes of implementing actionsactions.
- Creation and maintenance of an enabling policy and regulatory environment for the tools, through effective policy advocacy by empowered farmers

Timeframe

2012-2016

Implemented by

- Farmers' organizations: Panafrican Farmers' Organisation (PAFO, continental organization); East Africa Farmers Federation (EAFF); Réseau des Organisations Paysannes et Professionnelles Agricoles (Network of Farmers' Organizations and Agricultural Producers of Western Africa – ROPPA, West Africa); Plateforme sous-Régionale des Organisations Paysannes d'Afrique Centrale (PROPAC, Central Africa); Southern African Confederation of Agricultural Unions (SACAU); Conféderation Paysanne du Faso (CPF) of Burkina Faso; Mtandao wa Vikundi vya Wakulima (MVIWATA) of Tanzania; and Zambia National Farmers Union (ZNFU) of Zambia.
- Agrinatura institutes: Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) of France; Natural Resources Institute, University of Greenwich (NRI) of the United Kingdom; and Wageningen University & Research (WUR) of the Netherlands.

Funded by

European Union, Agrinatura

The FARMAF Project promoted: the scaling-up and/or development of market-based agricultural risk management tools, including crop insurance, interlocked with production financing schemes; reliable and more informative market information systems; and structured output marketing systems, including warehouse receipt systems on different scales (commercial operations in Tanzania and Zambia and small-scale inventory credit or warrantage in Burkina Faso) and exchange-based trading systems.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment and prioritization**	The prioritization of risks and selection of tools to be promoted were led by the participating national farmers' organizations.	The prioritization was based on farmers' perceptions and not a robust risk assessment.
2. **Identification and implementation of tools**	A menu of identified ARM tools (listed above) was produced through action research by the Agrinatura institutes. In consultation with national stakeholders, the national farmers' organizations prioritized tools to promote the taking into account of the national context. Implementation was led by the national farmers' organizations and involved participation by government and private service providers. The implementation strategy involved building on existing tools (improving and scaling-up, as well as developing complementary tools) rather than duplicating them. Private-sector service provision was prioritized in order to ensure sustainability.	The role of government was of strategic importance, especially in creating and maintaining an enabling policy and regulatory environment. However, this was quite often difficult to secure.
3. **Access to information and capacity-building**	The interactive action research and capacity-building helped empower farmers' organizations while also creating space for further innovations with the promoted tools.	Building the capacity to drive implementation can be time-consuming.
4. **Partnerships and policy integration**	Strong partnerships between farmers' organizations and research centres, as well as engagement with both public agencies and the private sector (as service providers) yielded significant gains for all parties.	A multiplicity of partnerships can create management challenges.
5. **Monitoring and evaluation**	Agrinatura and the regional farmers' organizations led in monitoring implementation of actions, complemented by annual peer review sessions and a robust impact assessment, in particular in Burkina Faso.	Attribution can be a challenge when multiple tools are being assessed.

Key lessons

1. 1.Market-based farm risk management tools can be developed and made accessible to smallholder farmers in developing countries. These tools include: crop insurance; warehouse receipt systems; structured contract-based marketing systems; enhanced market information systems; and even commodity exchanges
2. Smallholder farmers and others gain optimum benefits from these tools, including better access to pre-harvest finance at competitive interest rates, if the tools are developed as part of a package of complementary tools rather than as totally bespoke initiatives. Differences in the national context need to be factored into the design and implementation of ARM development projects.
3. Building on existing initiatives made it possible to bring about important innovations, including: introducing a trade-friendly quality assurance system in the operation of warrantage in Burkina Faso, which enabled smallholder farmers to sell directly to major buyers in quality-sensitive market segments and earn significant incremental income. It was also demonstrated that grain storage can bring about benefits beyond household food security, including increased household income gained through investing in livestock fattening and in cash crop production from financing secured with stored grains.
4. To the extent possible, one should prioritize financially viable private service provision rather than project-tied and subsidized delivery. This is also beneficial to private service providers, since they gain from available technical capacity to innovate, which they may not have – and/or not be incentivized to invest in – because of the free rider problem.
5. Partnerships between farmers' organizations and research organizations need to be fostered to facilitate demand-driven research-to-use solutions. Giving a lead role to farmers' organizations is crucial in assuring ownership, which makes it possible for them to embed ARM development programmes in their agenda. The active involvement of governments, private actors and civil society organizations in the design and implementation of ARM development projects can be crucial.
6. It is important to recognize variability in the technical capacity of key stakeholders for undertaking project activities. This has to be addressed through effective capacity-building. For example, private service providers often lack internal research and development capacity and therefore require assistance in innovating in response to context-specific challenges.
7. Policy and regulatory challenges can significantly impede the sustainable development of ARM tools; they need to be prioritized. However, addressing them often takes a long time.

Two planned results that could not be attained in full were:

- Promoting viable commodity exchanges trading futures contracts in Tanzania and Zambia; this failed to occur because the supportive policy actions delayed implementation of the required actions; and
- Significantly scaling up the use of warehouse receipts systems for grain marketing and financing in Tanzania, to match the scale for export crops like coffee and cashews. Disenabling policy actions, such as the ad hoc imposition of restrictions on exports to regional markets, undermined the business case for private uptake of this option.

What next?

As service provision is primarily private sector-led, there is potential for sustainability beyond the life of the project in the three target countries. However, to ensure that actions implemented under the pilots are taken forward in all three countries, the national farmers' organizations have incorporated the ARM development programmes within their strategic development plans. There are also efforts by the

national farmers' organizations to incorporate the lessons in ARM development programmes initiated by national governments (as is the case in Burkina Faso and Zambia) and to actively pursue policy and regulatory reforms that can improve the effectiveness and access by smallholder farmers to the ARM tools being promoted (as is happening in Tanzania and Zambia).

The participating national farmers' organizations continue to collaborate with governments and donors in scaling up the tools that have been promoted in the three target countries. Regional farmers' organizations and the Panafrican Farmers' Organisation are also involved at different levels in encouraging replication of this approach. It is recognized, however, that the national context has to be taken into account in any attempt to replicate it.

Learn more

- **http://www.farmaf.org/en/**

Creating appropriate institutional frameworks to reduce institutional risks

In addition to climate- or market-related risks, stakeholders along agricultural value chains live and work in a given region, country, town or village, and face constraints and risks related to their institutional and political contexts. Policy risks refer to regulatory and operational decisions by governments or government entities, as well as salient changes to actors or institutions for political reasons. They may: curtail supply chain participation and disrupt physical, financial or information flows; unexpectedly alter the "rules of the game" for supply chain entry and activity; or create uncertainties about the sustainability of supply chain activities, due to political variables.

For example, a government can unexpectedly decide to cut subsidies for a particular type of fertilizer or insurance, to alter the conditions of eligibility for social protection schemes, or to shift funding away from extension services. Facing these risks, measures can be taken to reinforce laws or policies to ensure continuity in government action despite political changes, or to develop stable value chains and information systems.

The case study presented in this section shows how negotiations promoted by community leaders can lead to new institutional arrangements to face specific risks and constraints.

JASIL: Community-based natural resource management for Mongolia's herders

Hijaba Ykhanbai, JASIL Mongolia and Guilia Baldinelli, International Land Coalition.

Quick facts

Risks

- **Weather risks**, including extreme climate events, rainfall variability and soil degradation.
- **Policy and institutional risks**, including land policies.

Tools

- Community-based natural resources management
- Access to climate, production and market information
- Farm business advice
- Capacity-building and experience-shareding programme

Location

Mongolia.

Number of people benefiting

Fifty-four community leaders have signed co-management contracts **at the district level**, while **42 community leaders and 2,830 community members** have established agreements **at the local level**.

Expected results

- Co-management is an effective strategy for overcoming the "tragedy of the commons" when all the stakeholders support can receive both short-term and longer-term results.
- Co-management supports sustainable livelihood opportunities for local communities.
- Community-based co-management is important for adaptation to climate change and for reducing natural resource degradation.
- Collaborative learning has contributed significantly to building the capacity of stakeholders at all levels.
- Implementation of participatory action research stimulates the interest of local stakeholders in carrying out joint learning activities with the integration of local and indigenous knowledge.
- Co-management allows for the building of stronger links and trust between the local people and government organizations.

Timeframe

2000-2011, weather forecast data support at present.

Implemented by

JASIL.

Funded by

–

The 200,000 herder households of Mongolia – representing more than 20% of the population – manage more than 45 million head of livestock. Most of these nomadic and semi-nomadic herders move on a seasonal basis in pursuit of pasture land. Pasture land is owned by the state, but herders can access it and its resources as a public good. The Land Law of Mongolia, approved in 2002 and amended in 2004, only allows herders to use pasture land and does not permit its allocation or long-term lease. However, public land is overused and degraded.

In order to curb this resource degradation and to strengthen the traditional production system of the pastoralists, JASIL – along with a wide diversity of stakeholders – developed and implemented a novel approach for community-based natural resource management of the pasture lands. Herding families enter into negotiations with the community leader and local government for definition of science-based contracts for the seasonal use and management of pasture land, which include guidelines on the carrying capacity of the plots, which are demarcated in a participatory way. This management tool is inclusive

and empowers all stakeholders to actively participate in ecosystem management, together with the local authorities. In addition, when implemented at large scale it can be an effective approach for adaptation to climate change and reduction of natural resource degradation.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	The risk assessments undertaken through the project evaluation document as a participatory process.	During implementation only economic and climate-related risks were considered, but now there is also a need to focus on political and legal changes to include possible risks.
2. **Identification and implementation of tools**	The tool was identified based on good practices implemented in other contexts and on the specificities of the context (land ownership rules).	Under the ongoing legal and policy changes in order to ensure coherence at different levels and between the actions of different actors (government, local communities, etc.)
3. **Access to information and capacity-building**	The training improved capacity at all levels. Access to information improved; more actions are needed.	A future need for community members to access all socio-economic information, and on the other hand a need to fill the gap in information and data on pastoralism.
4. **Partnerships and policy integration**	The partnership approach, which led to revisions to the land, pasture and forest laws to include community-based natural resource management	Integrated pasture and forest management at all levels
5. **Monitoring and evaluation**	Planning, monitoring and evaluation are practised.	Land monitoring indicators

Key lessons

1. It was possible to inject scientific innovations and experiences from other countries into traditional pasture land management methods. This process led to the formalization of traditional rights and to a significant increase in herders' incomes.
2. The government is and remains an important stakeholder in the co-management of pasture land, since success of the co-management depends greatly on a supportive legal framework and policies and the actions of the state.
3. In creating co-management contracts, it is important to include all stakeholders: the local governments, the communities, and the individual community members. While decision-making around pasture land is often conflictual – because many stakeholders are involved and both individual and collective interests are at stake – co-management strengthens the links and trust between the local people and the decentralized governmental administration.

4. More reviews and corrections need to be undertaken for legalizing co-management of natural resources in special protected areas, and to take into account the migration of herders from one area to the other during episodes of severe winter weather.

The expected results were fully implemented for community-based forest and natural resource use and protection. However, the expected results for community-based pasture land use will require more time, because the effort to improve legal and regulatory support for the formalizing of co-management contracts at national level has not yet achieved full scale.

What next?

JASIL, in collaboration with other stakeholders in the country, is working to create more favourable legal support for community-based pasture management in the country, by approving the draft Pasture Law or related articles in the Land Law. JASIL is also testing how information and communications technology can improve the effectiveness of community-based natural resource management in environmental and economic terms – for example by disseminating weather forecast data.

These experiences are now applicable to other regions and provinces of Mongolia, as well as to countries where pasture land is state-owned and nomadic and semi-nomadic pastoralist agriculture is practised.

Learn more

- **http://www.landcoalition.org**/en/regions/asia/member/jasil

Integrating tools to manage weather risks

The holistic approach to agricultural risk management sees these risks as a system. This integrated approach looks at all risks present and prioritizes them. Once the main risks are identified, the design of an integrated risk management strategy is possible, with the use of several complementary tools to address them.

While previous examples have demonstrated risk management initiatives that focused on a particular risk, this section aims to present examples that are closer to a holistic approach to ARM, through better design by integrating the key pillars: identification of risks, implementation of tools; access to information and capacity-building; partnerships and policy integration; and monitoring and evaluation.

The two case studies in this section present the integration of several tools to manage climate risks. From farming practices to insurance to diversification, these case studies demonstrate the power of using an integrated approach to tackling agricultural risks, plus the impact of strong partnerships and of the engagement of local stakeholders, which account for a large part of the success of the initiatives.

The climate-smart village approach: Framework for an integrative strategy for scaling up adaptation options in agriculture

Arun Khatri-Chhetri, Ph.D., Agri-System Economist, CGIAR Research Program on Climate Change, Agriculture and Food Security.

Quick facts

Risks

- **Weather risks**, including droughts, floods and rainfall variability;
- **Biological and environmental risks**, including livestock diseases and plant pests and diseases;
- **Market risks**, including access to inputs, quality of inputs and output prices;
- **Access to finance**.

Tools used

- Climate-smart agriculture
- Crop and enterprise diversification
- Asset- and income-based strategies
- Agricultural insurance
- Weather-index insurance
- Agricultural finance and microfinance
- Access to climate, production and market information
- Farm business advice
- Capacity-building and experience sharing

Location

India, **Nepal** and **Bangladesh**.

Number of people benefiting

A total of **17,695 households**, a number that will increase greatly as national and state governments – as well as a private company, ITC Limited – implement climate-smart village approaches across Nepal and various Indian states (Haryana, Bihar, Maharashtra, Madhya Pradesh, Rajasthan, Uttar Pradesh and Punjab).

Expected results

- Twenty-nine climate-smart agriculture technologies implemented through the climate-smart village approach; among these, 15 technologies have greenhouse gas mitigation potential and 18 technologies can provide benefits to women farmers.
- Multiple climate-smart agriculture technologies and practices have been adopted by 17,695 households in three countries (India, Nepal and Bangladesh) in the pilot climate-smart villages.
- Currently the government of Haryana in India is implementing the results in 500 villages, with a focus on resource-conserving machinery plus sensors for optimizing fertilizer use and reducing greenhouse gas emissions. The state governments of Bihar, Maharashtra, Madhya Pradesh and Telangana in India have also proposed to finance the use of this approach for building resilience in agricultural systems in thousands of villages. ITC Limited, a multi-business private Indian company, is also implementing this approach to help agriculture-dependent communities in its outreach areas. ITC Limited is developing 2000 climate-smart villages in six Indian states (Madhya Pradesh, Maharashtra, Rajasthan, Bihar, Uttar Pradesh and Punjab).

- Similarly, the Government of Nepal has started implementing the climate-smart village approach as a part of the climate adaptation program in 14 highly climatically vulnerable districts in seven states (two districts in each state). Regular communication and engagement with national- and subnational-level policymakers and implementers, policy dialogues and workshops, and periodic visits to climate-smart village sites have created awareness about this approach in the region.

Timeframe

Started in 2012.

Implemented and funded by

CGIAR Research Programme on Climate Change, Agriculture and Food Security (CCAFS), national and subnational governments, farmers and farmer groups and the private sector.

The climate-smart village (CSV) is an approach to agriculture research for development that tests technological and institutional options for dealing with climatic variability and climate change in agriculture with the use of participatory methods. It aims to scale up and scale out the appropriate options and draw out lessons for policymakers from local to global level. The approach incorporates evaluation of climate-smart technologies, practices, services and processes of relevance for local climatic risk management, and identifies opportunities for maximizing adaptation gains from synergies across different interventions while recognizing potential maladaptation and trade-offs. It ensures that these are aligned with local knowledge and link into development plans. This approach is under implementation in Asia, Africa and Latin America, in diverse agro-ecological settings. It incorporates climate-smart technologies, practices, services and processes that are relevant for local climatic risk management and aligned with current adaptation policies/plans and village development programmes. The focus is generally on a basket of synergistic options rather than individual technologies. Major initiatives include:

- Strategic design of land use options, including priority crops, technologies and practices, based on agro-ecological analysis and typologies of farmers
- Promoting climate-smart technologies and maximizing synergies between interventions
- Providing value-added weather information services to farmers, including weather insurance
- Facilitating community partnership for knowledge sharing and implementation of climate-smart agriculture
- Scaling-out through outreach activities like farmers' fairs and videos
- Scaling-up through ongoing government schemes, policies, and programmes and private corporate social responsibility programmes

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	Participatory, through baseline surveys and working groups with farmers, extension workers, and private-sector and civil society organizations. Backed up by historical climate data. Participatory prioritization of climate-smart interventions, based on crop and cropping system.	Observed historical climate data at the very local level are not available for every location.

2. **Tools identification and implementation of tools**	Using existing, context-specific tools for climate change adaptation and mitigation	–
3. **Access to information and capacity-building**	Important focus on evidence generation and research for development	–
4. **Partnerships and policy integration**	Work to generate greater evidence of climate-smart agriculture effectiveness in a real-life setting, and facilitating co-development of scaling mechanisms towards landscapes at subnational and national levels.	Consolidation and convergence between the governments' programmes at local level
5. **Monitoring and evaluation**	Based on economic, environmental, social, institutional and "human well-being" criteria	–

Key lessons

1. Integration of global and local knowledge through the climate-smart villages approach can have a large positive impact on adaptation and mitigation of climate change in agriculture with better targets.
2. This approach promotes strong partnership at local level between government, private sector, research organizations and farming communities, which can facilitate integration and convergence of adaptation and mitigation programmes.
3. This approach also promotes synergies between climate-smart technologies, practices and services.
4. Although this approach generates a strong evidence base for climate change adaptation and mitigation, through its collaborative and participatory research, it is a knowledge-intensive approach that requires considerable efforts to design and implement, including in capacity-building.

What next?

The climate-smart village approach aims at scaling-up through policy and institutional change/reform at national, subnational and local levels, and through the development of business and institutional models for the climate-smart village approach that are applicable to government and private sectors. The next steps therefore include engagement with policymakers at different scales and the development of schemes for climate-smart village scaling-out in collaboration with key stakeholders.

Learn more

- **https://ccafs.cgiar.org**/climate-smart-villages#.WehdBa3pNE4

The R4 Rural Resilience Initiative: Linking interventions against climate risks

Fabio Bedini, Coordinator, R4 Rural Resilience Initiative, World Food Programme.

Quick facts

Risks

- **Climate-related shocks** and stresses affecting smallholder agriculture.

Tools used

Asset creation and improved resource management (risk reduction); microinsurance (risk transfer); livelihood diversification and microcredit (prudent risk-taking); and savings (risk reserves)

Location

Ethiopia, **Kenya**, **Malawi**, **Senegal**, **Zambia** and **Zimbabwe**.

Number of people benefiting

55,000 in five countries **in 2017**; target of **500,000** in 10 to 15 countries **in 2020**.

Expected results

- Vulnerable smallholder farmers improve their food security and livelihood resilience to climate-related shocks and stresses, through an integrated risk management approach that includes market-based instruments to mitigate vulnerability.
- Governments and partners include integrated risk management approaches in their strategies and programmes to better address the challenges related to climate change.
- Sustainable commercial markets for insurance and rural finance products are strengthened.

Timeframe

2009–2022.

Implemented by

Global strategic partnership between Oxfam America and the World Food Programme; implemented at the local level by governments and non-governmental organizations, as well as private-sector actors

Funded by

- Past partners: USAID, Swiss Re, Cargill and Rockefeller Foundations, Ministry of Foreign Affairs of France
- Current partners: SDC, Sweden, Norway and ELMA relief foundation
- Expected new partners in 2018: CIDA, the KFW development bank and Green Climate Fund (GCF)

The initiative: Risk assessment, tools identification and design

The World Food Programme (WFP) and Oxfam America (OA) officially launched the R4 Rural Resilience Initiative (R4) in 2011 to enable vulnerable rural households to increase their food and income security in the face of increasing climate risks, through a combination of four risk management strategies: improved resource management through asset creation (risk reduction); insurance (risk transfer); livelihood diversification and microcredit (prudent risk-taking); and savings (risk reserves). The strength of this initiative is in creating bridges that reinforce the impact of actions to build resilience and better manage climate and agricultural risks.

The R4 Rural Resilience Initiative has broken new ground in the field of integrated climate risk management by enabling the poorest farmers to receive crop insurance in exchange for investing in asset creation and improved resource management, building into existing government social safety nets, the WFP's Food Assistance for Assets programme or the FAO's Conservation Agriculture programme. Aimed at ensuring long-term sustainability, the initiative contributes to the creation of rural financial markets by building local capacity and gradually transitioning farmers to payment of insurance in cash. In addition, it builds synergies with other relevant resilience-oriented tools and programmes, such as the WFP's Purchase for Progress, which supports access to markets by smallholder farmers. In some countries the R4 Rural Resilience Initiative is also incorporating climate services for agriculture, offering farmers real-time weather information to help them take more informed decisions.

Key pillars	Good practices/Strengths	Issues to consider/Challenges
1. **Risk assessment**	A major criterion for selecting implementation countries was the existence of recurrent droughts or extensive dry spells during critical crop development stages, preventing large numbers of rural households from escaping food insecurity. Risks are then identified and prioritized at national and subnational levels, before more local risk assessments are carried out for the design of insurance products.	National capacity for disaster risk reduction Availability of data (climate shocks)
2. **Identification and implementation of tools**	Existing tools, programmes and systems are reviewed in each country before new tools and partnerships are explored.	Scalability of tools; localized initiatives; capacity of local partners.
3. **Access to information and capacity-building**	The World Food Programme is a trusted and delivery-oriented partner with recognized expertise in operating at scale and building the capacity of governments.	Lack and/or bad quality of information on climate and other risks at country level. Local skills to develop and manage climate risk management tools.
4. **Partnerships and policy integration**	Blending of public and private interests for increased sustainability and the support of national systems	Time to build ownership by local stakeholders

5. **Monitoring and evaluation**	Process efficiency and participants' satisfaction are regularly monitored through short surveys. Overall progress is measured through socio-economic and food security indicators. Measures of resilience have been tested in Malawi and Kenya with satisfactory/promising results. A specific monitoring system with dedicated indicators has also been put in place for the microinsurance component.	Local data collection and analysis capacity

Key lessons

1. Insurance is not a one-size-fits-all solution. It has to be contextualized and bundled with other risk reduction tools and services. Its added value lies in the rapid transfer of resources to farmers affected by a shock and in its potential to unlock investment that provides opportunities for growth in non-shock years. In order to keep the insurance premium at affordable levels, it is essential to focus on the worst events and manage the more frequent risks with other tools.
2. Achieving a systematic transition process from vulnerable and food-insecure to resilient and productive households requires a clear exit strategy and multi-year resources. It also requires a systematic process to transfer capacity and responsibility to local public and private stakeholders.
3. In order to offer an incremental path to developing commercial services, the value proposition is a set of adapted and integrated interventions impacting positively on the capacity of households and the community to address shocks.
4. This approach requires a high initial investment; the complexity of the components calls for strong coordination mechanisms.
5. Understanding contextual success factors and bottlenecks to scaling-up is leading to more realistic plans for expansion.

What next?

The R4 Rural Resilience Initiative is considering expanding to areas where other risks – including floods and/or excess rain – affect the food security of a large number of people. The Initiative aims to reach half a million people by 2020, in 10 to 15 countries. There is a two-pronged exit strategy. First, farmers are eventually able to pay for their insurance premiums in full out of their returns. Second, governments may choose to integrate microinsurance into their national social protection strategies for building shock-responsive safety nets.

Learn more

- **http://www.landcoalition.org/**en/regions/asia/member/jasil

Lessons learned

Rather than constituting a topic, the holistic approach to agricultural risk management is a way of thinking about sustained livelihood enhancement for agricultural value chain stakeholders, taking into consideration the risks, trends and constraints that characterize specific environments. While the initiatives featured in this publication have not been designed or implemented specifically following this approach, they all bring some insights on particular preconditions for holistic agricultural risk management. Some of the initiatives develop very precise and scientific risk assessments or modelling, while others focus on developing capacities and use participatory approaches to identifying risks and tools to manage them. Some harness the power of technology and innovation, while others emphasize the linkages between actors, interventions and programmes.

Yet even though these initiatives are implemented in different contexts to address varied risks through an array of tools, the good practices and issues to be considered that they highlight are for the most part similar. Project managers underline the importance of participatory processes, partnerships between different types of actors (from the public and private sectors), contextual analysis of risks, tools and policies, and capacity development. They also provide advice and point to challenges related to the availability and quality of accessible and timely information – one of the key components of any ARM strategy – and to the time required to build and formalize it. In addition, they emphasize the importance of looking at the context and risks that lie beyond the intervention's scope to ensure, and of conducting a cost–benefit analysis of the tools envisioned so as to ensure the sustainability of ARM strategies.

These lessons show the relevance of the five pillars described in part I of this publication: risk assessment and prioritization; identification and implementation of tools; access to information and capacity-building; partnerships and policy integration; and monitoring and evaluation. Out of these, the importance of policy and the role of governments in promoting the holistic approach stand out as important preconditions for encouraging investments in the agricultural sector. In addition, the need for more evidence to guide practices and foster learning – another common point in the lessons learned - points to the need for more dissemination of information and the results of ARM initiatives. These topics will be addressed in part III of this publication.

PARM

PLATFORM FOR
AGRICULTURAL RISK
MANAGEMENT

Knowledge Management

Part III

Part III. Mainstreaming the holistic approach to ARM into policy and practices for better design and investment

Mainstreaming the holistic approach within the policies and practices of governments, technical partners, donors and the private sector is needed in order to create and sustain an environment in which investments contribute to the management of agricultural risks and – at the same time – better management of risks triggers more and better investment in agriculture. Indeed, agricultural risk management should not be standalone, but rather integrated into the development of strategies and the implementation of activities linked to the development of the agricultural sector, in order to achieve broader development objectives.

Through efficient mainstreaming of ARM within policies, whether at regional, national or local level, broader development objectives will be easier to achieve and sustain, and investments in the agricultural sector – whether private or public – will not be lost. However, the management of agricultural risks is a highly contextual process, and cannot be achieved through a single intervention. This means that the involvement of governments and their partners should be continuous, so as to adapt strategies and ensure that risks are managed. In this situation, governments take responsibility for managing the residual risks that individual stakeholders cannot manage, through disaster management plans and dedicated budgets, while empowering farmers and market actors to manage less severe risks, through an enabling environment with clear regulations and policies that support the development of ARM tools and guide investments.

For the successful integration of ARM within policies, it is important that it be truly seen as a multi-sector issue and that it be integrated not only in policies of the Ministry of Agriculture, but also in sector policies related to trade, environment, finance, disaster risk reduction, social protection, etc. This can be achieved through formal cooperation at high level, between ministers, but also through the creation of multidisciplinary, inter-ministry working groups in which technical staff can work on the content and coherence of specific interventions.

Policy dialogue is essential from the risk assessment phase to that of implementation, to ensure that all of the stakeholders that are needed to achieve cooperation and results for ARM are aware of its benefits, and have incentives to participate in the process. Here, identifying a national champion for promoting ARM, in or close to the government, is crucial for putting and keeping the issue on the political and technical agenda for policymaking. Capacity strengthening is essential for both high- and middle-level government officials in order to achieve this engagement, effectively include ARM within policies and make the opportunities of an ARM approach tangible.

Engagement of the private sector is also a key element of agricultural risk management, as private- and public-sector actors play complementary roles in ensuring the implementation and sustainability of tools and of stakeholders' strategies. The deliberate integration of ARM within policies can send a positive signal and create an enabling environment for attracting the private sector. Further investments – guided by policies and investment plans – will then reinforce agricultural risk management across the country.

At least two key elements are required for building successful partnerships between public and private actors. The first is **accountability,** both from the private sector towards the government and from the government towards the private sector. It is indeed crucial that businesses engage in the process led by the government and invest in the countries' priority development areas, but governments should also be relied upon to deliver on their commitments regarding the provision of certain services, the building of infrastructure or the maintaining of a stable policy and regulatory framework. A second element for success is the **institutionalization of public–private cooperation**, through the development of dedicated channels for communication and work. Regular meetings between government and private-sector representatives, as well as the creation of business associations, can enhance coordination and allow for planned action and a better investment climate.

In the process of strengthening agricultural risk management, donors and technical partners also play a key role. They can provide information and technical expertise on existing risks, possible tools and lessons from intervention in similar contexts, and – through their financial support – can strengthen government action, pool resources and thereby facilitate further investments.

Finally, the development of a more thorough risk analysis at the project design inception and throughout the implementation of initiatives undertaken by donors and technical partners – through the mainstreaming of the holistic approach to ARM within the design and implementation principles – can also lead to sustained success and attainment of broader development objectives. Indeed, by implementing "agricultural-risk-proofed" projects, development partners ensure that their action is rooted in the local context, adaptive to changes and contributing to the strengthening of ARM capacities, both in the field and within their institution.

In practice: mainstreaming the holistic approach to ARM into policies in Uganda[10].

Applying this integrated approach is not easy, but some recent experiences offer insights as to potential paths for the mainstreaming of agricultural risk management within policies, with Uganda case being one. Although the policies are too recent for an evaluation of their implementation to be conducted, the integration of ARM within policies – following holistic risk assessment and the identification of appropriate tools – opens new possibilities for sustainable investment that will truly benefit farmers and increase the resilience of the agricultural sector.

The Government of Uganda, through the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), has been actively engaged since at least 2011 in a process for mainstreaming agricultural risk management within its policy framework and for developing investment plans for its stakeholders. PARM, in partnership with the New Partnership for Africa's Development (NEPAD) and other development actors, has supported the Government since 2014 in strengthening this ARM process through a holistic approach. Following a thorough risk assessment study undertaken in the country, the Government of Uganda has integrated ARM policies into its Agriculture Sector Development Plan. Coming out of the risk assessment, crop pests and diseases were found to be the main source of losses, with very high average severity and frequency, and potential large losses in the case of an extreme scenario. Post-harvest losses and price risk followed as the main risks in terms of their quantitative impact.

The Centre for Agriculture and Biosciences International, a leading institution regarding plant health and development, has thus developed a comprehensive five-year US$24 million Plant Health Investment Plan for Uganda, aimed at upgrading the Uganda plant pest management system. This plan involves building cost-efficient information systems to detect and monitor plant pests and diseases, improving access to pest management services and strengthening the capacity of the government, to monitor, analyse and combat the threat of plant pests and diseases. In addition, an innovative public–private partnership to enhance access to information and risk analysis for farmers and their service providers was developed by FIT Uganda (as a private agri-business consultant and developer) and AgriRiskAnalyser (as developer of a risk assessment software solution). The proposal is called Financial Information and Risk Management. It foresees complementing a private information system for financial institutions, service providers and farmers, to provide risk profiles of farmers in a holistic manner, combining farmer business information with information about climate, market and disease risk exposure. Finally, a partnership was developed around ARM capacity-building with Makerere University and the extension services of the Ministry of Agriculture, Animal Industry and Fisheries to gather a pool of knowledge and expertise and provide training on holistic ARM, in particular for the extension services and service providers.

This process was developed following the key pillars for agricultural risk management. It was possible due to the high level of engagement of the government, and is leading the way for more investments to further strengthen ARM in the country. Once the policies are implemented, evaluation of their results and impacts will enable the strengthening of ARM strategies and the redefining of policies to contribute further to the resilience-building of farmers.

10 Source: Platform for Agricultural Risk Management. (2017). *Uganda Final Report*. Rome: Platform for Agricultural Risk Management.

Conclusion

This publication set out to identify basic criteria and guidelines for better design of ARM initiatives, based on the holistic approach to ARM, and to develop a collection of practices and lessons from selected case studies. Part I outlined the conceptual basis of the holistic approach to ARM, looking not only at individual risks or stakeholders, but rather at all risks – and their interactions – and all stakeholders involved in agricultural value chains, from farmers to service providers to policymakers. In order to operationalize this approach and guide either the design of ARM initiatives or the integration of ARM as part of programmes with broader development objectives, five key pillars were developed, through a collaborative approach that built on the experiences of PARM, its partners and the participants at the workshop held on this topic on 25 October 2017. These pillars are as follows: risk assessment and prioritization; identification and implementation of tools; access to information and capacity-building; partnerships and policy integration; and monitoring and evaluation.

Although this publication introduced this set of pillars for the first time, the analysis of a wide range of promising practices (part II) clearly highlights the relevance of these guidelines for analysing and designing initiatives to strengthen the risk management capacities of agricultural value chain stakeholders. The integration of ARM within policies and standard operating practices would seem to be an important area for ensuring sustainability and further strengthening ARM capacities, as was described in part III. Developing this integration and the partnerships necessary to pursue long-term, coordinated action for ARM will require considerable investment – in terms of financial resources but also in terms of time and political commitment. However, the example of Uganda shows how ARM can be integrated into national policies in line with the holistic approach. The next step –implementation of these policies – will be crucial for effective risk management throughout the country.

Agricultural risk management represents a promising approach to the improvement of the livelihoods of all actors involved in agricultural value chains, while contributing to achieving broader development objectives – connecting the dots between individual interventions. It is hoped that this publication represents one of many future attempts at gathering and disseminating knowledge on agricultural risk management practices.

Main takeaways

- The need for agricultural risk management is now widely agreed-upon, but its operationalization does not yet follow a systematic approach.
- Five pillars for the better design of ARM initiatives emerge from experiences undertaken in the field so far:
    - Risk assessment and prioritization;
    - Identification and implementation of tools;
    - Access to information and capacity-building;
    - Partnerships and policy integration;
    - Monitoring and evaluation.
- Mainstreaming ARM within policies and practices is a key element for the sustainability of ARM interventions and to channel more investments into the agricultural sector. However, implementation of such policies is complex, since ARM is a multi-sector endeavour requiring coordination of various stakeholders.

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PARM

PLATFORM FOR
AGRICULTURAL RISK
MANAGEMENT

Annex

A. A mapping of ARM initiatives

Given that an agricultural risk management framework comprises many different types of interventions, a large number of programmes and initiatives include components related to ARM or contribute to building resilience of agricultural value chains. The initiatives presented below were selected by the PARM Secretariat after an open call for proposals. This list is therefore not meant to be exhaustive, but rather to showcase the diversity of initiatives and approaches currently being implemented.

Using information to reduce information asymmetry risks

Agromet tools
Food and Agriculture Organization of the United Nations

The increasing availability and accessibility of weather and agro-meteorological information allows farmers to prepare for variability in weather, time their planting and harvesting, and better understand their cropping systems. The purpose of this project is to present this information in the most user-friendly way possible, and combine weather data with country- and region-specific crop data to make useful and specific recommendations. The close collaboration with national agencies and services in Africa and Macedonia facilitates the involvement of a great number of farmers, within the vision of a country-driven approach. In Rwanda and Senegal, a weather and agro-meteorology smartphone application and a text messaging system have been developed. In Macedonia, a website has been developed with weather/climate information and agro-meteorological information such as on crop disease, soil water and irrigation.

Digital inclusion
Food and Agriculture Organization of the United Nations

This initiative focuses on the development of four apps that will help to improve agricultural services and the availability of local content. It will make useful data, information and statistics available and accessible as digital services to the rural poor. It has initially been developed for use in two countries in sub-Saharan Africa (Senegal and Rwanda). The applications are entitled: "Cure and feed your livestock", "e-Nutrifood", "Weather and crop calendar" and "AgriMarketplace".

EMPRES Global Animal Disease Information System
Food and Agriculture Organization of the United Nations

The EMPRES Global Animal Disease Information System (EMPRES-i) is a web-based application designed to support veterinary services by facilitating the organization of and access to regional and global disease information. Timely and reliable disease information enhances early warning and response to transboundary and high-impact animal diseases, including emergent zoonoses, and supports prevention, improved management and a progressive approach to disease control. EMA-i is a mobile app that allows for transmission of data directly from the field to the EMPRES-i database.

Plantwise
Centre for Agriculture and Biosciences International (CABI)

Plantwise works to help farmers lose less of what they grow to plant health problems. Working closely with national agricultural advisory services, the centre establishes and supports sustainable networks of plant clinics, run by trained plant doctors, where farmers can find practical plant health advice. Plant clinics are reinforced by the Plantwise Knowledge Bank, a gateway to practical online and offline plant health information, including diagnostic resources, best-practice pest management advice and plant clinic data analysis for targeted crop protection.

Transferring risks:Insurance for agricultural risk transfer

Agricultural index insurance
Feed the Future Innovation Lab for Assets & Market Access

Innovation Lab for Assets & Market Access (IL) has piloted a number of index insurance products, including most notably the Index-Based Livestock Insurance project in Kenya and Ethiopia, but also area yield insurance for cotton farmers in Mali and Burkina Faso and insurance bundled with improved maize seed for farmers in Mozambique and Tanzania. Innovation Lab for Assets & Market Access is primarily a research activity, focused on developing innovations in index insurance and understanding farmers' barriers to on-farm investment. The IL documents and shares lessons learned, to assist project developers and policymakers in designing high-quality insurance products that protect farmers and increase resilience.

Bima Maono Climate and agro-insurance
KfW and VisionFund International

VisionFund International's climate and agro-insurance scheme, Bima Maono, consists in crop (and limited livestock) insurance and is part of an integrated agricultural development and financing programme, supported by KfW's InsuResilience Investment Fund. Starting in Tanzania, Bima Maono will be rolled out to at least seven African countries. Crop insurance is extended based on agricultural lending (usually input loans) and is supported by advisory services on improved farming techniques. The insurance scheme, developed by ACRE Africa (Agriculture and Climate Risk Enterprise Ltd.), is a hybrid of weather index and multi-peril crop insurance (against floods, drought, pests and disease) – the former up to the germination phase, the latter up to harvesting and based on the shortfall against expected yield (actual versus expected yield as determined by agronomists). In addition, VisionFund is implementing a portfolio-level climate index natural catastrophe scheme called ARDIS, in five African and two Asian countries, to provide a funding mechanism to maintain the supply of credit to communities affected by disasters.

CADENA
A programme of the Mexican government

CADENA (Componente de Atencion a Desastres Naturales en el Sector Agropecuario y Pesquero) is a Mexican government programme that offers macro-level crop and livestock catastrophe insurance programmes to small-scale vulnerable farmers, through a public–private collaboration mechanism. It is operated by the Mexican Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food. The CADENA programme contains two main components: (i) the catastrophic agricultural insurance programmes for farmers, livestock producers, aquaculture farmers and fishermen, and (ii) in states where catastrophic agricultural insurance is not provided, continued direct support that involves compensation payments to farmers affected by climatic disasters.

Picture-based insurance
IFPRI

Picture-based insurance is an innovative crop insurance product currently being piloted in the states of Punjab and Haryana in India. Using a smartphone app, insured farmers periodically take pictures of the same section of their insured plots, from land preparation to harvest. These geo-referenced pictures are uploaded to the cloud to serve as input for loss assessment. In the pilot phase, insurance pay-outs were determined by agronomic experts. Combining the data from these loss assessments with objectively measured yields and self-reported damage, algorithms are currently developed that estimate indices of crop damage based on geo-referenced pictures, for low-cost automated loss assessment for insurance purposes.

Replanting guarantee
ACRE Africa

The Replanting Guarantee Product is an input replacement insurance product that covers the risk of adverse weather conditions like insufficient rainfall at the sensitive germination phase. In the event of occurrence of the insured event (drought or insufficient rains), compensation is sent to the registered farmers via their mobile money wallets. This enables farmers to purchase another bag of input – for example, seed – to salvage a season.

Weather Risk Management Facility
World Food Programme International Fund for Agricultural Development

Since 2008 the International Fund for Agricultural Development has partnered with the World Food Programme in the joint Weather Risk Management Facility. Through this partnership it has built up experience in design and implementation of agricultural index insurance and has engaged in research, knowledge management and capacity enhancement. The Weather Risk Management Facility sees agricultural insurance as a tool to both protect and promote smallholder agricultural production and rural livelihoods.

Integrating smallholders in value chains to mitigate market and price risks

Commodity exchange trading in Ethiopia
Agricultural Transformation Agency

By creating certainty regarding the quality, quantity and location of commodities to be traded, commodity exchange trading reduces transaction costs, which may occur in sourcing produce for traders and processors and in the cost for farmers of accessing markets, especially for premium quality produce. Exchange trading improves the collection and dissemination of market information to all players. The warehouse receipt system – which may be developed to underpin commodity exchange trading (as a delivery mechanism) – ensures that agricultural produce is stored in well-run facilities, thereby reducing post-harvest losses. This system also makes it possible for those producers who so desire to defer sale during the harvest season when prices are low and gain from seasonal price increases. It also allows smallholder farmers to aggregate – sometimes facilitated by inventory finance – and to sell directly to processors and large traders, rather than through intermediaries.

Integrated grain value chain lending and insurance
Feed the Future Senegal

Since 2012, the National Agricultural Credit Fund of Senegal (CNCAS), the National Agricultural Insurance Company, small-scale farmer unions and local rice mills have been implementing an integrated lending mechanism that links in-kind farmer loan reimbursements of lines of credit extended by millers, by use of grain collateral management mechanisms. The farmer's loan performance is also secured through the bundling of an agriculture insurance product. The system rests on IT-based inventory and farmer tracking tools, the development of adapted insurance products, improvement in the quality of the rice, the introduction of quality testing protocols at farm level, the mainstreaming of certified seed and best practices, etc.

Creating appropriate institutional frameworks to reduce institutional risks

Disaster risk management support
African Development Bank

The disaster risk management support initiative aims to enhance the resilience and response to climate shocks in Burkina Faso, Chad, The Gambia, Mali, Mauritania, Madagascar, Niger and Senegal, by improving the management of natural disaster risk and adaptation to climate change. More specifically, the initiative strengthens the technical capacity of the eight countries to evaluate climate-related risks and costs, and to develop subsequent mitigation measures at both national and subnational levels. It also develops specialized financing mechanisms within each country for use in planning, preparation and rapid response (including disbursement of emergency funds) to address climate disasters at national and local levels.

Integrating tools to manage weather risks

ANADIA: Climate Change Adaptation, Disaster Prevention and Agricultural Development for Food Safety
IBIMET

ANADIA is a project for training and research for development, implemented in Niger since 2013 and funded by the Italian Agency for Development Cooperation. The objective of ANADIA is to contribute to sustainable agriculture in Niger, adapted to climate change and less vulnerable to climatic extremes. ANADIA aims to strengthen the capacity of stakeholders at national, regional and local level to mainstream climate change adaptation and disaster risk reduction in decision-making from national to farm scale.

Assisted natural regeneration
International Fund for Agricultural Development

Assisted natural regeneration is a simple, low-cost forest restoration method that can effectively convert deforested lands with degraded vegetation to more productive forests. The method aims to accelerate (rather than replace) natural successional processes, by removing or reducing barriers to natural forest regeneration such as soil degradation, competition from weedy species and recurring disturbances (such as fire, grazing and wood harvesting). Within the framework of support from the Global Environment Facility to implement a programmatic approach to sustainable land management, assisted natural regeneration was one of the initiatives put in place in the rural areas of the Maradi region in Niger.

Farming with indigenous microorganisms
South Asia Rural Reconstruction Association

Over the generations, many traditional farming communities and indigenous peoples have developed agricultural systems that are productive and environmentally sustainable. Such traditional farmers domesticated thousands of crop species and millions of plant varieties, mostly grown without agrochemicals. While traditional agricultural knowledge and practice has in many places been lost or has atrophied, such small diversified farming systems offer promising models for promoting biodiversity, conserving natural resources and sustaining yield without agrochemicals – providing ecological services and lessons for resilience in the face of environmental and economic change. The initiative blends indigenous microorganism technologies with Indian traditional farming practice to increase the resilience of farmers.

Hydroponic grass – MAVIM

In Maharashtra in India, the regions of Marathwada and Vidarbha had been facing severe drought conditions for three to four years. The scarcity of green fodder affected animal health and milk production, resulting in the distress sale of cattle. To prevent this, MAVIM introduced hydroponic grass and azolla cultivation among farmers under the Micro-Livelihood Plan as part of the Tejaswini Rural Women Empowerment Programme. Due to the availability of hydroponic grass and azolla, the fat ratio in the milk was maintained and milk production increased. Micro-Livelihood Plan members were able to hold onto their animals.

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