

INTEGRATING INSURANCE INTO CLIMATE RISK MANAGEMENT

Conceptual Framework, Tools
and Guiding Questions:
Examples
from the Agricultural Sector

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

 Federal Ministry
for Economic Cooperation
and Development




ACRI



HOSTED BY
**UNITED NATIONS
UNIVERSITY
UNU-EHS**

Authors

Gaby Ramm (Munich Climate Insurance Initiative – MCII advisory group member)

Kehinde Balogun (Munich Climate Insurance Initiative – MCII)

Co-authors

Matthias Range (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH – GIZ)

Maxime Souvignet (MCII)

We thank our contributors for their strong partnership and dedication to provide in-depth feedback as Peer Reviewers to this document:

- Olu Ajayi (Technical Centre for Agricultural and Rural Cooperation – CTA)
- Florent Baarsch (International Fund for Agricultural Development – IFAD)
- Daniela Bohl (GIZ)
- Toon Bullens (Microinsurance Association Netherlands – MIAN)
- Emily Coleman (IFAD)
- Massimo Giovanola (IFAD)
- Michael Hamp (IFAD)
- Rachael Hansen (MCII)
- Jon Hellin (International Maize and Wheat Improvement Center – CIMMYT)
- Peter Hoeppe (MCII Chairman)
- Vilma Hossini (Bundesanstalt Technisches Hilfswerk – THW)
- Rhea Katsanakis (United Nations International Strategy for Disaster Reduction – UNISDR)
- Nina Koeksalan (Food and Agriculture Organization – FAO)
- Soenke Kreft (MCII)
- Thomas Loster (Munich Re Foundation)
- Jennifer Phillips (MCII)
- Sandra Schuster (GIZ)
- Mia Thom (Centre for Financial Regulation and Inclusion – CENFRI)
- Branko Wehnert (GIZ)
- Sebastian Wiegele (GIZ)
- Michael Zissener (MCII)
- Sabrina Zwick (MCII)

Abstract



Today, emerging new risks from climate change and increasing disaster impacts pose a looming threat towards societies in terms of exacerbating the severity, intensity and frequency of disaster risks. Every year, natural disasters cause the loss of thousands of lives and livelihoods, cost billions of dollars in humanitarian aid, disrupt commercial services, and destroy critical infrastructure. Approximately 2.5 billion people worldwide depend on the agricultural sector as the main source of their livelihoods. Between 2005 and 2014 the agricultural sector sustained losses and damages from natural disasters at a cost of \$93 billion. To manage these risks, a detailed risk analysis is required as a solid base to understand the complexities of climate and disaster risks. This generally helps to focus on identifying and implementing disaster risk reduction (DRR) measures. However, risk financing and transfer mechanisms such as insurance can address residual risks that cannot be prevented or prepared for. Climate risk insurance is one measure that can act as a viable transfer instrument to cushion people against the adverse impacts of climate-induced disasters. It can provide vulnerable communities with access to alternative coping strategies if integrated into the broader disaster risk management (DRM) strategy.

To facilitate this integration, the Munich Climate Insurance Initiative (MCII) and Deutsche Gesellschaft für Internationale Zusammenarbeit

GmbH (GIZ) have developed an Integrated Climate Risk Management (ICRM) approach. MCII and GIZ identified the disaster risk management cycle, also known as the PPRR approach – prevent, prepare, respond and recover – as a valuable way to: 1) systematically analyse and pinpoint where insurance can add value, 2) provide an overview to public authorities/government officials of the status of international political momentum, and 3) find synergies between the practical activities and policy of DRM and climate change adaptation (CCA).

Integrating Insurance into Climate Risk Management: Conceptual Framework, Tools and Guiding Questions: Examples from the Agricultural Sector aims to enable governments to enhance institutional support and capacity, and generate knowledge to attain the short-term objectives of disaster risk reduction and the longer-term objectives of adaptation to climate change. The document further provides end (technical) users with useful information on how to, for example, obtain data on extreme weather events and related damages to the agricultural sector from the past, in the present and in the future. It can therefore catalyse identification of gaps in the existing CCA and DRM measures, as well as facilitate the design of mechanisms to close the gaps in order to build more resilient systems.

Acknowledgements

This publication has been developed within Advancing Climate Risk Insurance Plus (ACRI+), a project implemented by Munich Climate Insurance Initiative and Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH. ACRI+ is part of the project Promoting Integrated Mechanisms for Climate Risk Management and Transfer, implemented by GIZ on behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), funded under BMU's International Climate Initiative (IKI). The aim of the project is to collaborate with the public authorities in Ghana, Morocco, China and Barbados to develop Integrated Climate Risk Management concepts for the agriculture, water, small and medium enterprise (SME), urban resilience, and renewable sectors respectively.

MCII and GIZ identified the DRM cycle as a valuable way to:

- Systematically analyse and pinpoint where insurance can add value.
- Provide an overview to public authorities/government officials of the status of international political momentum.
- Find synergies between the practical activities and policy of DRM and CCA.

The development of *Integrating Insurance into Climate Risk Management: Conceptual Framework, Tools and Guiding Questions: Examples from the Agricultural Sector* has been possible due to the valuable contribution of various experts from different organizations in all the phases of the DRM cycle. Following the initial draft, a one-day expert workshop was conducted to obtain inputs on how to further develop this publication on ICRM with a focus on the agricultural sector and insurance. This was followed by digital expert review sessions to gather international experts' suggestions on existing approaches along the cycle, now called the Integrated Climate Risk Management approach.

To ensure user acceptance and to test the applicability of the ICRM approach, the document was validated through a delegate workshop with government officials attending the 23rd session

of the Conference of the Parties (COP 23) to the United Nations Framework Convention on Climate Change (UNFCCC), hosted in Bonn. Additionally, two national workshops were conducted in Ghana. The validation process tested each phase of the ICRM approach, its major steps, guiding questions and suggested tools.

It is to this end that the authors would like to give special thanks to our workshop participants for their valuable input to shape and finalize this publication:

Samuel Abatey, Lorraine Abedi-Safo, Baba Adams, Charles Adams, Joseph Adingeya, Frank Aggrey, Eric Nana Agyemang-Prempeh, Ariku Martin Akudugu, Victor Algeria, Silley Alhassan, Kennedy Amankwa, Richard Amartey, Joseph Amikuzumo, Kingsley Amoako, Kenneth Amoateng, William Anamoo, Campos Angel, Stephen Abugri Anonyonde, Jerry Asamani, Kukwa Asamoah, William Asante, Daniel Asare-Kyei, Mawuli Asigbee, Millan Atam, Phillip Ayamba, Dzigbordi Azumah, Bernard Baatuuwue, Sebastian Bagina, Riad Balaghi, Nana Kojo Bartels, Jacqueline Begerow, Veronika Bertram-Huemmer, Fautina Boakye, Richard Boatey, Acquah Jnr Isaac Charles, Emily Coleman, Evelyn R. Debrah, Hendrik Doll, Edgar Drah, Mathieu Dubreuil, Susanne Feser, Rosemary Forest, Gyamfi Foster, Massimo Giovanola, Romanus Gyan, Michael Hamp, Dassah Henry, Ulrich Hess, Ekhoesehi Iyehen, George Johnson, Issac Kankam-Boadu, John Kantam, Agyei Emmanuel Kassi, Ali Muhammad Katu, Christine Kugler, Nicolas Lamade, Solomon Lansey, Nathanael Laryea, Asamoah Lydia-Kukwa, Sulemana Musah, Bernard My-Issah, Mahama Nashiru, Idy Niang, Daniel Ninson, Charlotte Norman, Ebenezer Nortey, Godfrey Nyelia, Selamawit Ogbachristos, Musah Osman, Aaron Oxley, Caroline te Pas, Tahiru Rafiu, Alexandra Rueth, Leslie Sackeyfio, Meyer Sigrun, Dyllis Sowah, Roland Steinmann, Swenja Surminski, Andrew Q. Tetteh, Jennifer Tollman, Elina Vaananen, Timm Walker, Paul Wooma, Alhassan Zakani, Mohammed Abdulai Mukasa Zoogah and Astrid Zwick.

Foreword

Climate change is contributing to a soaring increase in the frequency and intensity of disasters to unprecedented levels. Developing countries are the hardest hit by those risks and face the particular challenge of financial constraints that strongly impact the livelihoods of the poor and vulnerable, impeding the ability to respond and recover from extreme weather events. Many developing nations lack the financial capacity to effectively respond to climate-induced disasters, which hinders food security and long-term economic development. Climate-sensitive sectors, such as agriculture, are especially affected by extreme weather events. Therefore, the promotion of integrated mechanisms for climate risk management and transfer, such as insurance, are essential in building resilience.

Patricia Espinosa (Executive Secretary of United Nations Climate Change) emphasizes that improving “access to adaptation finance and affordable climate risk and disaster insurance” is essential in responding to the climate change challenge. Climate risk insurance can act as a viable risk transfer instrument to cushion people against the adverse impacts of climate-induced disasters. It provides poor and vulnerable communities with access to alternative coping strategies by enhancing financial inclusion and by empowering them to better cope with the risks of climate change.

The complexity of climate risk transfer in the agricultural sector underlines the necessity of an integrated climate and disaster risk management strategy that incorporates both ex ante financing as well as ex post financing. More precisely, a multi-dimensional disaster risk management strategy is essential for providing guidance on how to tackle disaster events before they occur, and thus reduce losses, when they occur and after they have occurred.

To promote these efforts, Advancing Climate Risk Insurance Plus (ACRI+) has developed this publication on climate risk transfer in the agricultural sector in order to offer a systematic approach, providing guidance to decision-makers, international organizations, development agencies and practitioners on how to incorporate insurance approaches as part of the disaster risk management cycle.

Peter Hoppe
(MCII, Chairman)

In the face of growing weather extremes and profound shifts in climate conditions, the need is greater than ever to support individuals and governments in finding effective strategies to manage external shocks in order to build resilience to climate-related impacts. The Integrated Climate Risk Management approach, developed by MCII and GIZ GmbH under the project ACRI+, is expanding the framework of classical disaster risk management by adding financial transfer products to cover the residual risks. However, the potential of those products, such as insurance, are not only the application of these means as such, but also their integrative capability and additional leverage on other strategies.

This publication is not providing a blueprint to apply an ICRM. Those always have to be tailor-made to crop, country, hazards, etc. But it does give you a comprehensive overview of the different stages of an ICRM, the most important steps to take, the involved stakeholders as well as the possible synergies and spill-over effects when planning to add insurance solutions. Most importantly, however, it lists the questions political key personnel have to ask stakeholders (including themselves) when implementing an ICRM, and also provides you with the tools you need to address those questions.

This publication has been developed for the agricultural sector in developing countries to help stakeholders transfer their risks involved in extreme weather events. The agricultural sector inhabits a special role for our partner countries, their GDPs and worldwide value chains. On the other side it is the backbone of most economies and is most relevant for issues such as unemployment and food security. Climate risks represent a significant challenge to farmers, who see their livelihoods impacted, or to governments which lack the financial and institutional capacity to respond immediately and effectively to a disaster.

I am very glad to see this publication on climate risk transfer in the agriculture sector available for our partners and peers. And I would like to extend my gratitude to all the other international organizations that brought in their experience and have supported the design of this publication.

Roland Gross
(GIZ, Head of Competence Center, Financial Systems Development and Insurance)

Table of Content

Abstract	3	Phase 2		Phase 4	
Acknowledgements	4	Retention and Transfer.....	57	Response	109
Foreword.....	5	A. Pre-Disaster Financing.....	58	A. Response – with Various Relief Programmes	110
Acronyms and Abbreviations.....	8	STEP 1: Analysing and Determining the Risk		STEP 1: Post-Disaster Needs Assessment.....	112
Introduction	11	Retention Capacity.....	60	STEP 2: Relief Programmes	
Our Approach.....	13	Step 2: Developing Disaster		and Alternative Livelihoods.....	114
Scope	14	Risk Financing Products at All Levels.....	63	STEP 3: Policy Adjustment of	
Target Audience	15	STEP 3: Establishing Integrated		Existing Legal Frameworks and Strategies....	116
Before Starting.....	16	Approaches – Linkages to Insurance.....	66	B. Post-Disaster Financing.....	119
Phase 1		A1. Insurance.....	69	STEP 1: Assessing Financial Demand and Need	121
Prevention	17	STEP 1: Analysing and Determining		STEP 2: Mobilizing Resources	122
A Risk Assessment.....	18	the Need for Insurance	71	STEP 3: Establishing Public	
STEP 1 Hazard Assessment	20	STEP 2: Developing an Insurance		Financial Management Systems	125
Step 2: Exposure Assessment.....	24	Strategy at all Levels.....	73	STEP 4: Establishing Financial Auditing and	
Step 3: Vulnerability Assessment.....	26	STEP 3: Developing Insurance		Monitoring Systems	126
B. Impact Analysis	30	Products at all Levels.....	77	Phase 5	
STEP 1: Preparation of Disaster		STEP 4: Building Insurance		Recovery.....	128
Impact Assessments	32	Capacity at all Levels	82	STEP1: Implementing Sector-Level	
STEP 2: Establishing Special Entities		Phase 3		Recovery Programmes.....	130
for Coordination	34	Preparedness	87	STEP 2: Regulating Institutional	
STEP 3: Data Collection.....	35	A. Risk Monitoring and Minimum		Frameworks and Mandates for Recovery	132
C. Performance Analysis of Existing		Preparedness Action.....	89	STEP 3: Establishing/Refining Effective	
Disaster Risk Management Mechanisms.....	38	STEP 1: Setting Up Early		Coordination and Communication Mechanisms	133
STEP 1: Preparation of the Analysis.....	40	Warning Systems	91	STEP 4: Developing Standard Implementation	
STEP 2: Stocktaking and Performance		STEP 2: Cross-Cutting Coordination	94	Procedures within the BBB Concept.....	134
Analysis of Current DRM Mechanisms	41	STEP 3: Cross-Cutting		STEP 5: Developing Monitoring and	
STEP 3: Identifying Gaps	43	Capacity Development	96	Evaluation Systems.....	136
STEP 4: Exploring DRM Solutions.....	44	B. Advanced Preparedness Action	100	Glossary of Terms	138
STEP 5: Developing a DRM Plan	46	STEP 1: Implementing APA Activities –		Annex 1	142
D. Integrating Preventive		Stockpiling and Storage Facilities.....	102	Annex 2	143
Measures into Policies.....	49	STEP 2: Developing		Annex 3	145
STEP 1: Deciding and Implementing		Contingency Planning.....	104	Annex 4.....	147
Prevention Mechanisms				Annex 5	148
by the Government at the Macro Level.....	51			Annex 6	149
STEP 2: Implementing Preventive				Bibliography	150
Mechanisms by Producers and the					
Private Agricultural					
Sector at the Micro Level	54				

Boxes

Box 1: Cost Calculation for Business Interruption Losses	26
Box 2: Definitions of DRM Assessment Criteria (World Bank, 2016)	38
Box 3: Examples of Financial Services for Individuals and SMEs	63
Box 4: Product Options on the Macro Level	64
Box 5: Examples of Integrated Approaches	67
Box 6: The Rural Resilience Initiative (R4)	74
Box 7: Micro, Meso and Macro Level Insurance Customers	74
Box 8: Product Options at all Levels	78
Box 9: Pitfalls in Insurance against Extreme Weather Events	84
Box 10: Illustration of Early Warning Systems for Drought, Excessive Rainfall and Temperature	91
Box 11: Livestock 'Early Warning – Early Action' System in Ethiopia (IFRC/WFP/FAO, 2014)	92
Box 12: Insurance Example: Extreme El Niño Insurance Product, La Positiva Seguros	92
Box 13: Key Actors of Emergency Response Preparedness	94
Box 14: Example of the Sub-Saharan Africa Regional Climate Outlook Forums	96
Box 15: National Drought Mitigation Centre: 10-Step Drought Planning Process for Response (Lesukat, 2012)	100
Box 16: Example of Emergency Food Security Reserve of Ethiopia	102
Box 17: General Contingency Activities	104
Box 18: Insurance Example: ARC Contingency Plan Principles	105
Box 19: Pacific Disaster Risk Finance and Insurance in Vanuatu (2015)	122
Box 20: General Steps of Recovery Programme-by-Programme Approach	130
Box 21: FAO Strategy of BBB in the Agricultural and Fishing Sectors	134
Box 21: Example of Cash Transfer (IFRC, 2012)	144



Acronyms and Abbreviations

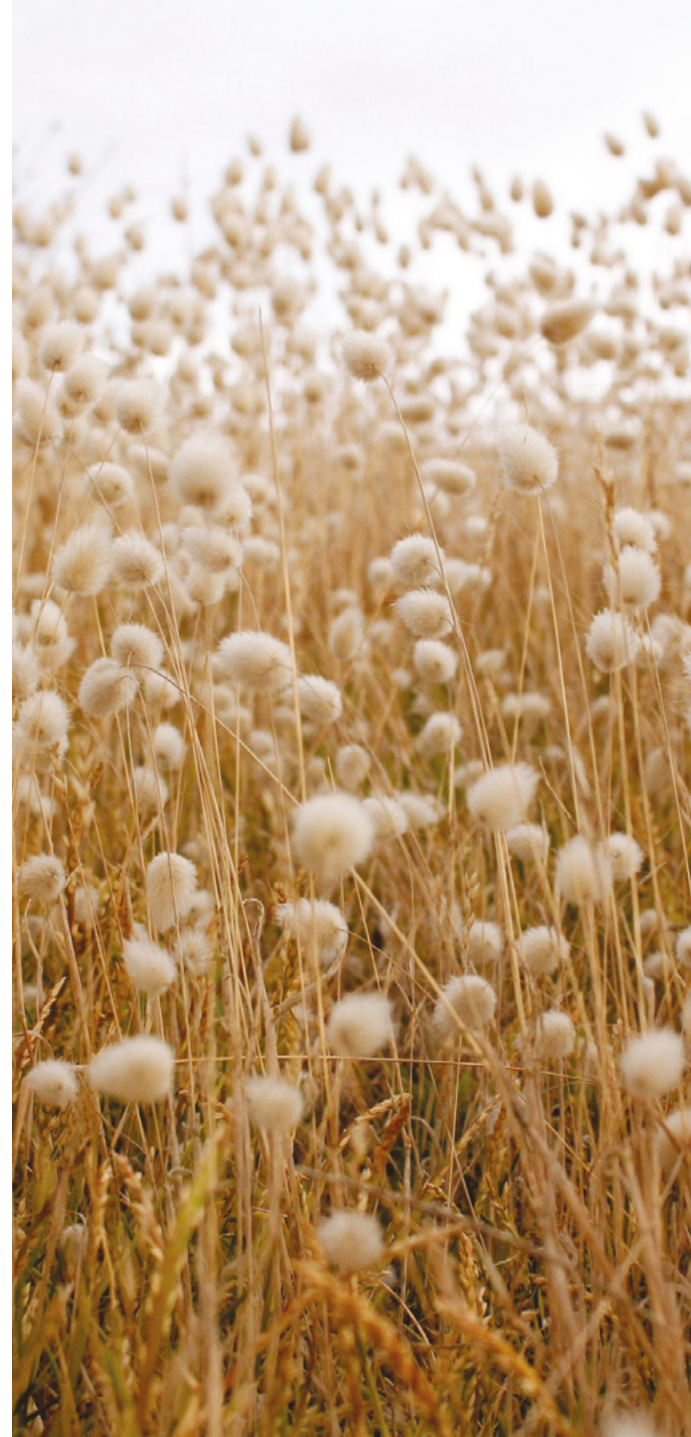
ACRE	Agriculture and Climate Risk Enterprise	DRF	Disaster Risk Finance
ACRI+	Advancing Climate Risk Insurance Plus	DRM	Disaster Risk Management
ACIAR	Australian Centre for International Agricultural Research	DRR	Disaster Risk Reduction
ADB	Asian Development Bank	ERP	Emergency Response Preparedness
APA	Advanced Preparedness Action	EU	European Union
ARC	African Risk Capacity	FAO	Food and Agriculture Organization of the United Nations
ART	Alternative Risk Transfer	FARM	Forum for Agricultural Risk Management in Development
A2ii	Access to Insurance Initiative	GEOSS	Global Earth Observation System of Systems
BBB	Build Back Better	GERICS	Climate Service Center Germany
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany)	GFDRR	Global Facility for Disaster Reduction and Recovery
BMZ	Federal Ministry for Economic Cooperation and Development (Germany)	GHCN	Global Historical Climatology Network
CCA	Climate Change Adaptation	GIIF	Global Index Insurance Facility
CCRIF	Caribbean Catastrophe Risk Insurance Facility	GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
CGAP	Consultative Group to Assist the Poor	GRIP	Global Risk Identification Program
CGIAR	Consultative Group for International Agricultural Research	IAIA	International Association for Impact Assessment
COP	Conference of the Parties	IAIS	International Association of Insurance Supervisors
CRED	Centre for Research in Epidemiology of Disasters	IASC	Inter-Agency Standing Committee
DPC	Direction de la Protection Civile	ICRM	Integrated Climate Risk Management

Acronyms and Abbreviations

IFA	Insurance for Assets	MPA	Minimum Preparedness Action
IFAD	International Fund for Agricultural Development of the United Nations	MSME	Micro Small and Medium Enterprise
IFRC	International Federation of Red Cross and Red Crescent Societies	NAP	National Adaptation Plan
IKI	International Climate Initiative	NGO	Non-Governmental Organization
ILO	International Labour Organization of the United Nations	OCHA	Office for the Coordination of Humanitarian Affairs
INGO	International Non-Governmental Organization	OECD	Organisation for Economic Co-operation and Development
IPCC	Intergovernmental Panel on Climate Change	PCIC	Philippine Crop Insurance Corporation
IRI	International Research Institute for Climate and Society	PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
ISDR	International Strategy for Disaster Reduction	PDNA	Post-Disaster Needs Assessment
JICA	Japan International Cooperation Agency	PFM	Public Financial Management
KfW Group	Kreditanstalt für Wiederaufbau	PIC	Pacific Island Country
LULC	Land Use/Land Cover	PPP	Public-Private Partnership
M&E	Monitoring and Evaluation	PRIS	Pacific Risk Information System
MCII	Munich Climate Insurance Initiative	R4	Rural Resilience Initiative
MFI	Micro-Finance Institution	SEI	Stockholm Environment Institute
MFW4A	Making Finance Work for Africa	SMEs	Small and Medium Enterprises
MoA	Ministry of Agriculture	SOPs	Standard Operational and Implementation Procedures
MoF	Ministry of Finance	UN	United Nations

Acronyms and Abbreviations

UNDAC	United Nations Disaster Assessment and Coordination
UNDP	United Nations Development Programme
UNEP	United Nations Environment
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations Office for Disaster Risk Reduction/UN International Strategy for DRR
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
WEF	World Economic Forum
WFP	United Nations World Food Programme
WMO	World Meteorological Organization



INTRODUCTION



According to the World Meteorological Organization (WMO), 2014, 2015, 2016 and 2017 were the four hottest years on record since 1880 (NOAA, 2018; WMO, 2018). Such rising temperatures are expected to affect agricultural systems significantly and also strain food production (WEF, 2018). It is critical for the 2.5 billion people worldwide depending on agriculture and its subsectors – i.e. crop, livestock, fisheries and forestry – as their main source of livelihoods (FAO, 2017). In 2017, in Nepal, Bangladesh and northeast India, over 6.3 million hectares of arable land were destroyed by heavy flooding and landslides (Singh, 2017). The resulting loss of harvest for subsistence farmers often means a loss of livelihoods with dramatic consequences (Singh, 2017; Gettleman, 2017). Recently, the Food and Agriculture Organization of the United Nations (FAO) published new figures showing \$93 billion-worth of accumulated losses for the agricultural sector and its subsectors between 2005

and 2014. In Kenya, drought occurrence between 2008 and 2011 accounted for 86 per cent of total livestock damage with losses for the period amounting to \$8.9 billion. In Pakistan, in the single year of 2010 floods caused two-thirds of crop losses, reaching \$4.5 billion in damage (FAO, 2017a). In addition, the cascading effect of negative impacts goes beyond economic losses. Indirect effects, such as unemployment for farm labourers, increased imports of food and agricultural commodities, and low food availability in local markets resulting in food-price inflation, are commonplace in developing countries. This occurred, for instance, in Burundi, Djibouti, Somalia, Ethiopia and Kenya between 2016 and 2017 due to the dry weather conditions. Approximately 24.3 million people were affected and local market systems were strongly impacted, particularly in Ethiopia, with food prices rising to up to 70 per cent higher than the previous year (FAO, 2017c).





As a response to increasing disaster impacts, the importance of risk transfer and financial instruments such as climate risk insurance were highlighted in key international policy agendas in 2015. The Agenda 2030 for sustainable development, the Sendai Framework, the Addis Ababa Action Agenda and the Paris Agreement all called for different actors to come together and rethink future adaptation finance, in order to determine what is at risk, how to reduce these risks, which financial instruments can address these risks and how best to prepare for extreme weather events. Failure to make adequate financial provisions against extreme weather events bear heavy costs for individual producers, agricultural enterprises and governments, as well as have longer-term economic consequences. This creates an opportunity to consider risk transfer instruments, during the early planning stages of disaster risk management and climate change adaptations, in order to build a resilient pathway.

At the same time, climate change impacts make some risks less likely to be insured. The effects of climate change are projected to be more severe in the future than in the past. This could lead to higher uncertainty in agricultural insurance. Consequently, insurers could have difficulties in pricing risks and may become unwilling to write insurance to cover particular risk areas. In addition, it could also lead to higher insurance premiums and deter farmers from purchasing the insurance (ClimateWise, 2014).

Insurers' ability to price risks and thus set insurance premiums provides a signal that can raise risk awareness and incentivize risk-reducing behaviour (Le Quesne and others, 2017). The R4

initiative in Africa, for instance, provided insurance coverage for cash-poor farmers with the opportunity to engage in community risk reduction activities such as soil management or improved irrigation (Schaefer and others, 2016). Designing an effective and forecast-based insurance scheme is paramount for the agricultural sector in developing countries. Indeed, it might allow farmers and agricultural enterprises to engage in higher-risk, higher-return activities that spur economic growth (WB, 2005; Le Quesne and others, 2017). Additional benefits of insurance relevant for the agricultural sector in developing countries are further discussed in this report.

Despite many potential benefits, to date suitable insurance coverage against losses and damages caused by extreme weather events and climate-related disasters is still widely unavailable. Even innovative approaches seeking to reduce underwriting and administrative costs, as well as payout delays related to traditional insurance schemes, face low penetration rates. As a consequence, only two per cent of weather-related losses incurred between 1980 and 2015 in developing countries were covered by insurance (Schaefer and others, 2016). Currently, 60 per cent of the world's population lives in these regions and faces increasing climate threats, continuing to suffer disproportionately (IMF, 2017). Hence, for the agricultural sector to foster food production and climate-resilient investment across its value chain effective agricultural risk management is needed to develop markets, policies and appropriate institutions.



Our Approach



Comprehensive climate risk management approaches are urgently needed to reduce, transfer and manage risks posed by climate change. As such, agricultural insurance is not a stand-alone solution and should build on existing measures and frameworks. Thus, the integrated climate risk management approach is a conceptual framework that advances the framework (BMZ, 2015) of the German Federal Ministry for Economic Cooperation and Development (BMZ). This ICRM approach offers a risk-oriented and comprehensive conceptual framework which incorporates climate change adaptation measures into disaster risk management policies in order to achieve national development goals.

Figure 1 shows the five phases of the ICRM approach (outer circle) and depicts the relationships of each phase (inner circle). It reflects that, in practice, the phases often overlap. For instance, pre-disaster financing occurs in the ‘retention and transfer’ phase as well as the ‘preparedness’ phase. Resilience in the centre indicates cross-cutting activities and interlinkages in all phases to create a systemic progress towards climate change adaptation goals and DRM targets over time (Le Quesne and others, 2017).

Figure 1: Integrated climate risk management approach

The pre-disaster and post-disaster financing in the figure are of particular significance in the ICRM approach. Examples of pre-disaster financing (also called ex ante financing) are accumulated reserves, savings, contingent credit and risk transfer approaches such as insurance, while examples of post-disaster financing (also referred to as ex post financing) are budget re-allocations, loan conversions and borrowing (Le Quesne and others, 2017). Without post-disaster financing, it can be difficult for people and governments to recover from a disaster. Long-term development prospects suffer if governments divert public funding from social and economic development programmes to fill the recovery gaps. Resilient reconstruction may be delayed or not take place at all due to a lack of resources. Nevertheless, it is important to recognize that the social, economic, financial, physical, institutional/political and environmental processes in a country evolve over time. Hence, the ICRM approach is a dynamic process presented as a cycle.



Scope



This publication addresses challenges faced by various actors by including climate insurance in their agricultural policies. It follows the five phases of the ICRM approach and offers guiding questions and a step-by-step approach. In addition, the document describes at least one tool linked with each guiding question. Hence, it informs the reader about what information is needed and what tools can be applied. It highlights insights into synergies between insurance and the different ICRM phases.

Nevertheless, this document should not be understood as a guideline, or a blueprint. Rather, it depicts different components and identifies the inter-linkages of activities within each phase. Although each phase suggests a step-by-step process to implement the phase, certain steps may be omitted based on existing structures and resources. For an overview of the phases and corresponding steps, see the *Summary Report on Integrating Insurance into Climate Risk Management*.

The publication elaborates on internationally accepted DRM activities within each phase. However, it categorises relevant DRM activities from an insurance perspective of the ICRM approach. This has already been done by other international organizations specifically dealing with these issues¹, but this document deals only with weather-related perils in the agricultural sector and does not consider other risks, such as market risks. The agricultural sector and its value chain have been used as an example, although with limited application. As the phases and components of the ICRM approach do not change, the document can be adapted to different sectors. Hence, this publication would be of value to risk managers in other sectors.

¹ For example, the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) is mandated to ensure better preparation for, as well as rapid and coherent response to, natural disasters and emergencies.



Target Audience



The primary target audience is government officials within developing countries interested in embarking on a systematic process to improve the agricultural sector. It is also targeted at officials who want to include insurance solutions to develop a comprehensive risk management approach.

The secondary target group is development organizations at the national and international levels engaged in assisting agricultural sectors to strengthen their national plans. It can be used by

practitioners, although several technical skills and competencies are required. Thus, insurance companies involved in raising awareness of risks and designing insurance-related programmes may also find the document useful.



Before Starting

Implementing the ICRM approach in the agricultural sector requires a general understanding about its potential to make the sector and related value chains more resilient to disaster risk and climate change impacts. Therefore, it is important to first study this document and identify entry points that suit your particular need. Attention should be given to the guiding questions and the associated tools. The tools are a list of references to different databases, websites and reports which would require expert knowledge and, in some cases, technical skills to understand the relevant information.

The ICRM process calls for a mix of stakeholder expertise covering a broad spectrum of private- and public-sector actors, including insurers, reinsurers, actors of the agricultural sector (farmers, suppliers, agricultural cooperatives, distribution channels), agricultural researchers, women associations, non-governmental organizations (NGOs) and policy-makers spanning all of the phases. Establishing a multi-stakeholder engagement through a working group is recommended to ensure cooperation, participation and interaction in all phases. Bringing diverse stakeholders together will help establish a communication channel, as well as address cross-cutting issues such as capacity development, coordination, monitoring, participation and gender perspective.

Therefore, a stakeholder workshop is ideally conducted at an early stage; such a workshop can be populated as follows:

Workshop objective:

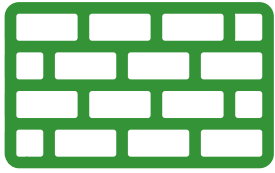
- To identify key stakeholders as well as facilitate a needs assessment with relevant government officials and all key stakeholders.

Workshop outcome:

- To create an initial understanding of the political landscape and agendas. An important process is the analysis of the existing capacity of key stakeholders, as this would be essential to identify which actors could contribute to the risk analysis (See Phase 1, below).
- Initial identification of risks/weather-related hazards affecting the different actors in the agricultural sector is ranked by geographical area or value chain and could form the basis for risk analysis in Phase 1.
- Tailor-made solutions such as literacy programmes or trainings to ensure that all stakeholders have sufficient awareness and understanding of insurance and weather-related risks.

It is fundamental to have representatives from women groups in the workshop, as women represent half or more of the agricultural labour force in developing countries (FAO, 2011). Furthermore, in sub-Saharan Africa women are often paid less than men for the same work (Le Quesne and others, 2017). Additional factors such as limited access to land, capital, assets and other productive resources further puts them at a disadvantage. This needs to be understood for appropriate policy intervention and programme targeting.





PHASE 1

Prevention

A
B
C
D

*Overarching questions
from an insurance perspective*

Prevention of weather-related events and natural disasters is a central part of DRM, consisting of various measures that avoid the potential adverse impacts of hazardous events. While certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure in such contexts (United Nations General Assembly, 2016).

The 'prevention' phase contains the following components:

- A Risk Assessment.**
- B Impact Analysis.**
- C DRM Performance Analysis.**
- D Integration of Preventive Measures into Policies.**

Brief Description

Prevention is a comprehensive phase at the beginning of the DRM cycle that starts with a risk assessment of weather-related hazards, and the exposure and vulnerability of geographic regions and the population. The impact analysis assesses the implications of extreme weather events on the state, agricultural private sector and individual producers.

For managing weather events and disasters, the practised DRM mechanisms are analysed (including cost-benefit assessments) and protection gaps identified. On the basis of this information, preventive measures can be selected and the demand for insurance identified. However, the inclusion of insurance can provide the government with an increased access to capital through, for example, increased access to credit, or green bond guarantees, to build preventive infrastructure such as dams and desalination or recycling plants to strengthen water resilience during droughts.

The four components aim at answering the following key questions:

- What have been the historical climate disaster risks for the agricultural sector and its value chain? What are the specific frequencies, intensities and impacts?
- Are there any production practices which tend to increase disaster risks in the agricultural sector?
- Are there any gaps in the DRM mechanism, and at what point can insurance solutions be more economical to fill the gap?
- Which risk reduction and preventive measures can reduce the impact of climate disasters on governments, the agricultural sectors (especially small and medium enterprises) and individual producers?
- In which way could the insurance industry design insurance products as a risk management instrument to reduce the magnitude of future disaster losses and vice versa – and how could the insurance industry and the insured benefit from loss prevention measures in the 'prevention' phase?



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Risk Assessment

STEP 1 Hazard Assessment

Guiding Questions
and Tools

-
-

STEP 2 Exposure Assessment

Guiding Questions
and Tools

STEP 3 Vulnerability Assessment

Guiding Questions
and Tools

-

*Expected Outputs
When Using the Tools*

A. Risk Assessment

Definition

(Disaster) risk assessment is a “qualitative or quantitative approach to determine the nature and extent of disaster risks by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend (United Nations General Assembly, 2016)”.

STEPS RISK ASSESSMENT CONTAINS THE FOLLOWING STEPS

1) Hazard Assessment (weather-related hazards).

2) Exposure Assessment.

3) Vulnerability Assessment.

Brief Description

The risk assessment examines weather-related hazards in relation to a society's exposure and vulnerability. It enables DRM decision-making and capacity-building to be tailored to local risk profiles, which is necessary for enhancing the awareness of extreme weather events and potential action for strengthening the resilience of all stakeholders in the agricultural value chain.

The risk assessment provides the basis for developing comprehensive DRM mechanisms for all agricultural actors of all levels:

- **Micro level:** At local level, the agricultural value chain includes production (farmers, herders), input supply (e.g. providers of seed, fertilizer, agricultural equipment), processing (e.g. small and medium enterprises involved in drying harvest, food processing), transport, and trading (e.g. direct sales, storage, packaging).
- **Meso level:** The regional level stakeholders consist of aggregators such as financial institutions or agricultural business associations (e.g. coffee boards and farmers' cooperatives at the district level).
- **Macro level:** The national level refers to the government or public authorities at the national through to the local levels. It is important to recognize that risk assessment of weather-related hazards can result in the prioritisation of other categories of risks such as livestock/crops pest and disease, market and price. Hence it is recommended to conduct a holistic risk assessment that is cognisant of geographical localization of weather-related risks and respective impacts on specific productions or value chain processes.





A. Risk Assessment

STEP 1 Hazard Assessment

Guiding Questions and Tools

-
-

STEP 2 Exposure Assessment

Guiding Questions and Tools

STEP 3 Vulnerability Assessment

Guiding Questions and Tools

-

Expected Outputs When Using the Tools

Involved Actors

The national government responsible for the agricultural sector of a given country needs to determine the potentially affected actors along its value chain. Preferably, the ministry of agriculture (MoA) takes the lead and coordinates with other relevant ministries such as finance, infrastructure, housing, energy and environment, including departments dealing with climate change adaptation and national emergency offices.

Conducting a risk assessment for weather-related events is extremely complex and requires specific technical expertise to be assigned by the MoA (e.g. geoscience experts² and meteorological agencies), which would also consult the affected stakeholders along the agricultural value chain (including communities and farmers). The government could benefit from data provided by the insurance industry. Especially large insurers and reinsurers, which need to understand the risks, use various approaches, methods and techniques, and could provide historical data.

SYNERGIES: INSURANCE AND RISK ASSESSMENT

Enhanced awareness of risks	Public authorities and insurance providers can collaborate to improve the availability, reliability and accessibility of disaster risk data: governments can use insurance data for quantifying loss and damage of extreme weather events and understanding how climate- and weather-related risks are affecting households, communities, businesses and governments. They can give risk a price and raise awareness. The governments know the local conditions and can provide information and data to the insurance industry (e.g. yield data, size of the population, economic data), which are of value when developing products for potential customer groups.
High-quality data for risk assessment	(Large) insurance providers publish regional and international data analyses. Governments could use insurance expertise for establishing data standards and accessing insurance-data repositories. This could enhance the speediness and quality of agricultural risk assessment.
Increasing demand for insurance	Increased risk awareness of governments could benefit the insurance industry as risk assessments show DRM requirements that may include insurance products.
Data for insurance product design	A comprehensive and sound risk assessment can provide hazard and agricultural-sector data in the selected country. This can help the insurance industry develop target-specific products.

² For example, the PCRAFI Risk Assessment report (2013) was supported by the World Bank and ADB and conducted by a number of organizations (e.g. Applied Geoscience & Technology Division [PC/SOPAC], GNS Science, Geoscience Australia, and AIR Worldwide).

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Risk Assessment



STEP 1 Hazard Assessment

Guiding Questions and Tools

-
-

STEP 2 Exposure Assessment

Guiding Questions and Tools

STEP 3 Vulnerability Assessment

Guiding Questions and Tools

-

Expected Outputs When Using the Tools

STEP 1: Hazard Assessment

Hazard in the current context is defined as “a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation (United Nations General Assembly, 2016)”.

Included are all weather-related hazards (e.g. drought, excessive rain, floods, temperature [heat/cold], or tropical storms) that pose a potential risk to the agricultural sector and its value chain. The analysis includes all identified weather-related events and cascading impacts in terms of frequency, severity, duration, location and probability. For insurance purposes, a minimum of 20-30 years of historical data is needed³. Obtaining an overview of hazards helps to:

- Identify the immediate causes and sources of hazards within the national territory or from across borders (e.g. excessive rain leading to floods also in distant river beds) that could impact the agricultural sector.
- Determine how these events might change in the short and medium terms as a result of climate variability.
- Identify the most important weather risks related to the agricultural value chain based on the probability of occurrence, the severity of losses and impact.

³ If adequate data are not available, advanced technologies such as improved satellite data and/or qualitative analysis of weather events can complement historic meteorological data collected from farmers and the private agricultural sector to be discussed with national actors.

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Risk Assessment



STEP 1 Hazard Assessment

□ Guiding Questions and Tools

-
-

STEP 2 Exposure Assessment

Guiding Questions and Tools

STEP 3 Vulnerability Assessment

Guiding Questions and Tools

-

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

Guiding questions	Complexity ⁴
How to conduct a risk assessment (hazard, exposure, vulnerability)?	
FAO (2007): <i>Climate variability and change: adaptation to drought in Bangladesh – A resource book and training guide</i> (at community level) http://www.fao.org/3/a-a1247e.pdf	3
World Bank (2016): <i>Agricultural Sector Risk Assessment – Methodological Guidance for Practitioners</i> . Agriculture Global Practice Discussion Paper 10 http://documents.worldbank.org/curated/en/586561467994685817/pdf/100320-WP-P147595-Box394840B-PUBLIC-01132016.pdf	2
UNISDR (2017 Consultative version): <i>National Disaster Risk Assessment – Governance System, Methodologies, and Use of Results</i> https://www.unisdr.org/files/52828_nationaldisasterriskassessmentpart1.pdf	
FAO (2016): <i>Gender-responsive approach to disaster risk reduction (DRR) planning in the agricultural sector</i> http://www.fao.org/3/a-i6531e.pdf	1
Case study	
WB-GFDRR-EU (2017): <i>South West Indian Ocean Risk Assessment and Financing Initiative (SWIO-RAFI)</i> https://reliefweb.int/sites/reliefweb.int/files/resources/116342-WP-PUBLIC-52p-SWIO-RAFI-Summary-Report-2017-Publish-Version.pdf	
Guiding questions⁵	
Which weather-related events affect the agricultural sector and its value chain in your country?	
What kind of data do you need and where is this data available?	
Are there nationally agreed methodologies for data consolidation, classification and analysis of multi-hazard risk and vulnerability information for all actors in the agricultural value chain?	
Global databases	
Global databases of all natural hazards and extreme weather events, e.g.:	
World Meteorological Organization: <i>Global Framework for Climate Services (GFCS): Provision of climate information (e.g. climate predictions) and services</i> http://www.specs-fp7.eu/About%20SPECS	3

⁴ According to the testing in Ghana, 1 means very complex, skills required, 2 medium complex, 3 low complexity and easy to use. 0 means that the tool was not tested. The ranked tools listed on top were considered to be most relevant.

⁵ The tools below are relevant for all three guiding questions.



**Definition
STEPS
Brief Description**

**Involved Actors
SYNERGIES**

A. Risk Assessment



**STEP 1
Hazard Assessment**

**Guiding Questions
and Tools**

- ●
-

**STEP 2
Exposure Assessment**

**Guiding Questions
and Tools**

**STEP 3
Vulnerability Assessment**

**Guiding Questions
and Tools**

-

**Expected Outputs
When Using the Tools**

**Global
databases**

Forum for Agricultural Risk Management in Development (FARM): Geospatial Data and Weather Risk Mapping for Agriculture Risk Management http://www.agriskmanagementforum.org/	3
GFDRR hazard page ThinkHazard!: General view of hazards for a given location providing guidance on how to reduce the impact of the hazards and where to find more information http://thinkhazard.org/en/	2
Munich Re, NatCatSERVICE: Information on all types of natural hazards and extreme weather events and losses (insured and non-insured) http://natcatservice.munichre.com/	Only EU
Munich Re's NATHAN Risk Suite (Natural Hazards Assessment Network) https://www.munichre.com/en/reinsurance/business/non-life/nathan/index.html	
Swiss Re, web-based tool for historical data on catastrophes, including level of insured and uninsured losses http://www.sigma-explorer.com/ and https://goo.gl/uEy4eg	
WorldClim: Interpolates climate layers from major climate databases compiled by e.g. the Global Historical Climatology Network (GHCN), FAO, WMO, International Center for Tropical Agriculture (CIATCIAT), R-Hydronet, and SRTM elevation database http://worldclim.org/current	
NatureServe: One-stop access to the status and location of ecosystems, tools that support data use, and analysis of biodiversity and land-use assessments and planning http://www.natureserve.org/conservation-tools/data-maps-tools	
GERICS Climate Service Centre: standardized weather data bank developed in cooperation with e.g. BMZ, GIZ, KfW https://www.gerics.de	
Forum for Agricultural Risk Management in Development (FARM): Geospatial Data and Weather Risk Mapping for Agriculture Risk Management https://www.agriskmanagementforum.org/	
GeoNetwork: web interface to search geospatial data across multiple catalogues http://geonetwork-opensource.org/	



**Definition
STEPS
Brief Description**

**Involved Actors
SYNERGIES**

A. Risk Assessment



**STEP 1
Hazard Assessment**

**Guiding Questions
and Tools**

- ●

**STEP 2
Exposure Assessment**

**Guiding Questions
and Tools**

**STEP 3
Vulnerability Assessment**

**Guiding Questions
and Tools**

-

**Expected Outputs
When Using the Tools**

Guidelines	OECD (2012): Disaster risk assessment and risk financing – A G20/OECD Methodological Framework http://www.oecd.org/gov/risk/G20disasterriskmanagement.pdf	2
	World Bank – GFDRR (2014): Understanding risks in an evolving world – Emerging Best Practices in Natural Disaster Risk Assessment https://www.gfdrr.org/sites/gfdrr/files/publication/Understanding_Risk-Web_Version-rev_1.8.0.pdf Further tools under ‘vulnerability assessment’, below.	
Various maps, e.g.	Land Use/Land Cover (LULC) maps for estimating wind speed at surface generated by tropical cyclones and the amount of precipitation runoff.	2
	Topographic maps for earthquake and tropical cyclones measure hazard-triggering rainfall events, provide inputs into climate and land-surface models offering information into e.g. agricultural productivity https://pmm.nasa.gov/data-access	
Guiding questions	Bathymetry maps needed for the computation of tsunami-induced waves and of storm surge due to tropical cyclones.	
Handbook	What is the quality of data? UNDP (2013): A comparative review of country-level and regional disaster loss and damage databases (quality assessment of the global and regional databases) http://www.sasparm.ps/en/Uploads/file/Disaster%20Loss%20and%20Damage%20Database.pdf	2
Guiding questions	Following a multi-hazard approach, which are the most relevant weather-related events for the agricultural sector?	
Tools	Preliminary priority setting based on frequency, occurrence, the severity of losses, the impacts, costs and period of restoration after a disaster, and the demand for adaptation from the government (private sector and communities) through the following tools:	3
	Focus group discussions with farmers and cooperatives, interviews with representatives of agricultural entrepreneurs along the agricultural value chain. Semi-structured interviews with government officials from the relevant ministries (e.g. agriculture, finance, transport, trade and industry, and disaster management offices).	



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Risk Assessment

STEP 1 Hazard Assessment

Guiding Questions
and Tools

-
-



STEP 2 Exposure Assessment

Guiding Questions
and Tools

STEP 3 Vulnerability Assessment

Guiding Questions
and Tools

-

*Expected Outputs
When Using the Tools*

STEP 2: Exposure Assessment

Exposure is defined as “the situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas (United Nations General Assembly, 2016)”.

On the basis of the selected priority weather-related risks for the agricultural sector, the exposure assessment will be conducted in spatial (geographic areas) and temporal terms (frequency, magnitude and duration of disasters)⁶ at national, regional and local levels:

- **Physical dimensions** – include persons, buildings and (public) infrastructure, crops/fields/livestock, goods and productive assets such as equipment, shops/workshops/storerooms.
- **Economic dimensions** – are considered capital stock/savings, the projected loss of income, productivity or growth (example for calculating replacement costs, see [Annex 1](#)).
- **Environmental dimensions** – consist of natural resources such as water, soil quality, forest, agricultural and pastoral land.
- **Social dimensions** – are socially marginalized groups (including age and gender inequality), health, migration and displacement, education and skills, and social networks.
- **Institutional dimensions** – for example, the government (e.g. ministries of agriculture, finance, transport, relief and emergency, and the respective service providers such as agricultural extension services), financial institutions and insurance providers, private sector institutions (e.g. trade and business organizations, input providers, production and sales), the media and civil society.

⁶ There are various approaches; some define exposure as a part of vulnerability (e.g. OECD, 2012; Turner, 2003; Birkmann, 2006a), while others consider it as a hybrid between vulnerability and hazard (e.g. MOVE approach by the EU), or as an own separate factor (IPCC, 2012). The publication uses the IPCC framework.

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Risk Assessment

**STEP 1
Hazard Assessment**

**Guiding Questions
and Tools**

-
-



**STEP 2
Exposure Assessment**

**Guiding Questions
and Tools**

**STEP 3
Vulnerability Assessment**

**Guiding Questions
and Tools**

-

**Expected Outputs
When Using the Tools**

GUIDING QUESTIONS AND TOOLS

	Guiding questions	Complexity
	<p>Which are the factors that expose the agricultural sector sector in terms of physical dimensions, economic dimensions environmental dimensions, social dimensions, and institutional dimensions?</p> <p>What kind of data is relevant for exposure assessment in order to set priorities?</p> <p>Are data openly available and what is the cost of obtaining the data?</p> <p>Where are these data available? Are they of high quality? (see criteria under ‘hazard assessment’)?</p>	
	<p>General data from (local) governments including statistical offices (e.g. census data, household surveys, investment and business listings, employment figures).</p>	3
	<p>Specific data from e.g. Land Use/Land Cover geo-database regarding:</p> <ul style="list-style-type: none"> Buildings (e.g. field surveys, satellite images of building roofs). Crop exposure including their location, types, and replacement costs (e.g. inventory of major cash crops, digital elevation/slope maps). Land surface characteristics (including land suitability maps, agriculture and vegetation maps). 	3
	<p>PREVIEW Global Risk Data Platform, developed by UNEP, UNISDR, GRID and others: Spatial data information on global risks from extreme weather events and natural hazards, including human and economical hazard exposure</p> <p>http://preview.grid.unep.ch/</p>	2
	<p>Global Exposure Database (GED4GEM), developed for the Global Assessment Report on DRR: Homogenized database of the global building stock and population distribution</p> <p>http://www.globalquakemodel.org/openquake/about/</p>	1
	<p>World Bank/ADB/SPCCPS (2013): PCRAFI – Better Risk Information for Smarter Investments – Catastrophe risk assessment methodology</p> <p>http://siteresources.worldbank.org/EXTDISASTER/Resources/8308420-1342531265657/PCRAFI_REPORT_WEB_Final.pdf</p>	2
	<p>World Bank – GFDRR (2014): <i>Understanding risks in an evolving world – Emerging Best Practices in Natural Disaster Risk Assessment</i></p> <p>https://www.gfdr.org/sites/gfdr/files/publication/Understanding_Risk-Web_Version-rev_1.8.0.pdf</p> <p>More guidelines under ‘vulnerability assessment’, below.</p>	
	<p>Semi-structured interviews with government officials, agricultural business associations and entrepreneurs, producers, and civil society organizations (e.g. farmer associations), especially on social and institutional dimensions.</p>	3



A. Risk Assessment**STEP 1
Hazard Assessment****Guiding Questions
and Tools**

-
-

**STEP 2
Exposure Assessment****Guiding Questions
and Tools****STEP 3
Vulnerability Assessment****Guiding Questions
and Tools**

-

**Expected Outputs
When Using the Tools**

STEP 3: Vulnerability Assessment

The vulnerability can be defined as “conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets and/or systems to the impacts of hazards (United Nations General Assembly, 2016)”.

The vulnerability assessment uses the same categories as the ‘exposure assessment’ (see Step 2). The analysis is based on the selection of prioritized weather-related risks and the exposure assessment. It encompasses a variety of concepts and elements, with various international methods developed to include variant factors such as:

- **Physical dimensions** – refer generally to the quality and strength of physical structures (and affected human beings). This includes buildings, productive assets (e.g. equipment, stock), and infrastructure relevant to the agricultural value chain (e.g. roads, dams, flood defences).
- **Economic dimensions** – refer at the micro level to livelihood patterns of house-holds at risk (e.g. source of income which may incur higher losses) and the private sector dependency, such as business interruption of SMEs (see Box 1, below). At the macro level, they refer to the vulnerability of an economic system and its capacity to absorb and deal with a specific damage or loss. Overall, impacts on all levels affect the gross domestic product, level of income/tax revenues, and general access to external finance, which is crucial after an event.

Box 1: Cost Calculation for Business Interruption Losses

The total cost per hectare is useful as a proxy for assessing business interruption losses, especially for fruit trees and permanent plantations affected by disasters. To quantify the importance of each crop for the agricultural sector, information on production value for all the crops needs to be collected. These average costs are not representative of subsistence farmers that use fewer inputs, and therefore have fewer production costs, or commercial farmers that use inputs intensively and obtain higher prices when selling their products on the export markets. Respective margins have to be added or deducted (World Bank/ADB/SPCCPS, 2013).

- **Environmental dimensions** – refer to the disruption of livelihoods and other societal processes due to degradation of environmental services and function (e.g. the effect of deforestation causing higher ground temperatures, potentially resulting in drought). They further refer to the role of regulating ecosystems services for people exposed to disaster risks and climate change.
- **Institutional dimensions** – refer to ‘systems’ and governance structures, including an enabling environment, and the capacity of (formal) institutions to manage risks and adapt to challenges (e.g. early warning systems). In addition, decision-making processes such as participation, responsiveness, transparency, and interactions between governmental and NGOs (especially those involved in DRM, CCA and sustainable agricultural development).
- **Social dimensions** – refer to factors that make responding to a hazard event easier or more difficult such as initial well-being (e.g. nutritional status, health), livelihood and resilience (e.g. education, qualification, poverty and access to social-protection), self-protection (e.g. capability and awareness), social networks and institutions (e.g. farmers’ organizations). They also include discrimination on the basis of gender, ethnicity and age, and migration and displacement.

The analysis also includes assessing the spillover of weather-related impact on agricultural sectors e.g. flood damages on transport infrastructure that disrupts the supply of agricultural products in distant regions.

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Risk Assessment

**STEP 1
Hazard Assessment**

**Guiding Questions
and Tools**

-
-

**STEP 2
Exposure Assessment**

**Guiding Questions
and Tools**



**STEP 3
Vulnerability Assessment**

- **Guiding Questions
and Tools**

-

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

		Complexity
Guiding questions	How vulnerable is the agricultural sector in terms of physical dimensions, economic dimensions, environmental dimensions, social dimensions and institutional dimensions?	
	What kind of data do you need – according to the priorities set under ‘exposure’?	
	Where is this data available? Are they of high quality? (see criteria under ‘hazard assessment’)	
	Are data openly available? What is the cost of obtaining the data?	
Tools	General data from bureaux of statistics of national governments, government reports and others including academia and sector reports.	3
	Specific data (bases): see under ‘exposure’, above.	
Data-replacement costs	FAO: Online tool for reconstruction cost calculations of roads (\$ per km) http://www.fao.org/docrep/t0579e/t0579e06.htm	2
	Remote sensing techniques, GIS-based data, Defence Imagery and Geospatial Organisation (DIGO) data.	2
	Field visits and manual inspection of publicly available satellite imagery (e.g. Google Earth).	1
	Information issued by academia (reports, publications, maps and forms), public databases, disaster reconnaissance reports and proprietary data.	2



**Definition
STEPS
Brief Description**

**Involved Actors
SYNERGIES**

A. Risk Assessment

**STEP 1
Hazard Assessment**

**Guiding Questions
and Tools**

-
-

**STEP 2
Exposure Assessment**

**Guiding Questions
and Tools**



**STEP 3
Vulnerability Assessment**

**Guiding Questions
and Tools**

- ●

**Expected Outputs
When Using the Tools**

Guidelines

GIZ (2014): *The Vulnerability Sourcebook – Concept and guidelines for standardised vulnerability assessments*
<https://www.adelphi.de/en/publication/vulnerability-sourcebook-concept-and-guidelines-standardised-vulnerability-assessments>

1

UN University – UNU (2013): Birkmann, Jörn (ed): *Measuring Vulnerability to Natural Hazards – Towards disaster resilient societies*
<http://collections.unu.edu/view/UNU:2880>

2

World Bank (2016): *Agricultural Sector Risk Assessment – Methodological Guidance for Practitioners.*
 Agriculture Global Practice Discussion Paper 10

1

<http://documents.worldbank.org/curated/en/586561467994685817/pdf/100320-WP-P147595-Box394840B-PUBLIC-01132016.pdf>

FAO (2015): *The impact of disasters on agriculture and food security*

1

<http://www.fao.org/3/a-i5128e.pdf>

World Bank/ADB/SPCCPS (2013): PCRAFI – Better Risk Information for Smarter Investments – Catastrophe risk assessment methodology

1

http://siteresources.worldbank.org/EXTDISASTER/Resources/8308420-1342531265657/PCRAFI_REPORT_WEB_Final.pdf

World Bank – GFDRR (2014): *Understanding risks in an evolving world – Emerging Best Practices in Natural Disaster Risk Assessment*
https://www.gfdr.org/sites/gfdr/files/publication/Understanding_Risk-Web_Version-rev_1.8.0.pdf

Online tool: https://github.com/davidnbresch/climada/blob/master/docs/climada_manual.pdf

Global databases

FAO-GIEWS (Global Information and Early Warning System): combines information on weather hazards, crop production, prices and vegetation conditions

3

<http://www.fao.org/es/giews/english/about.htm> and

http://www.fao.org/giews/earthobservation/asis/index_1.jsp?lang=en

Global Information Platform (GRIPWEB), supported by USAID: ‘Meta’ platform for integrating and sharing risk information, providing access to around 50 databases.

2

NatCatSERVICE, Munich Re <https://www.munichre.com/en/reinsurance/business/non-life/natcatservice/index.html>

Sigma databank, Swiss Re <http://www.swissre.com/sigma/>

Semi-structured interviews with government officials, agricultural business associations and entrepreneurs, producers and civil society organizations (e.g. farmer associations), especially on social and institutional dimensions.

3



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Risk Assessment

**STEP 1
Hazard Assessment**

Guiding Questions
and Tools

-
-

**STEP 2
Exposure Assessment**

Guiding Questions
and Tools

**STEP 3
Vulnerability Assessment**

Guiding Questions
and Tools

-



*Expected Outputs
When Using the Tools*

Expected Outputs When Using the Tools

- ✓ Regular risk assessment of the agricultural sector provides important information to policy-makers for mainstreaming the respective DRM mechanisms into agricultural development policies and other climate change adaptation strategies.
- ✓ Risk assessment enhances the knowledge on extreme weather risks, enabling the government to take preventive measures for protecting food security and creating incentives for investment.
- ✓ The risk profiles of all agricultural actors can be used by the government to prioritize its support to specific vulnerable groups and set policy priorities.
- ✓ The government could use information on the hazard, exposure and vulnerability assessment to support agricultural producers and SMEs to reduce agricultural losses by enhancing their resilience and reducing the cost of emergency credits for producers and SMEs.
- ✓ Insurance-related outputs (see page 19 'Synergies: Insurance and Risk Assessment').





Definition
Brief Description

Involved Actors
SYNERGIES

B. Impact Analysis

STEP 1 Preparation of Disaster Impact Assessments

Guiding Questions
and Tools



STEP 2 Establishing Special Entities for Coordination

Guiding Questions
and Tools

STEP 3 Data Collection

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

B. Impact Analysis

Definition

The term 'impact' in the current context is used to refer to the effects of weather-related events and natural disasters on lives, ecosystems and economies, including livelihoods, institutions, services and physical infrastructure. The impacts of climate change on geophysical systems, including floods, droughts and sea-level rise, are a subset of impacts (IPCC, 2014).

STEPS

The impact analysis contains the following steps:

- 1) **Preparation of disaster impact assessment.**
- 2) **Establishing special entities for coordination.**
- 3) **Data collection.**

Brief Description

Impact analysis should take place prior to and after a disaster occurs. The pre-disaster impact estimate should be conducted as an instrument for proactively developing a comprehensive DRM strategy. The post-disaster impact analysis provides actual data for 1) defining the financial requirements for response and resilient recovery, and also for 2) updating databases used for the assessment and quantification of weather-related risk in the pre-disaster phase.

The distinction between direct or indirect impacts helps clarify the roles and responsibilities of different actors, especially between the government and the private sector. Direct impacts on farming households are, for instance, loss of harvest, and damage to buildings and other productive assets. Indirect impacts refer to workers temporarily not available or 'flow effects' arising, for example from reduced system function due to damage to government and financial services.

Definition
Brief Description



Involved Actors
SYNERGIES

B. Impact Analysis

STEP 1
Preparation of Disaster
Impact Assessments
Guiding Questions
and Tools

STEP 2
Establishing Special
Entities for Coordination
Guiding Questions
and Tools

STEP 3
Data Collection

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

Involved Actors

Pre-disaster impact estimates are related to the results of the risk assessment and require similar expertise, led by the minister for the agricultural sector and including technical agricultural specialists. Post-disaster impact analysis requires sector-specific assessments. This would mean the Ministry of Agriculture (MoA) cooperates with other ministries such as finance, infrastructure and rural development, often supported by international organizations such as the World Bank or United Nations.

SYNERGIES: INSURANCE AND IMPACT ANALYSIS

<p>Loss and damage data from insurers enable governments to identify needs and take action</p>	<p>Assessing loss and damage due to extreme weather events, as done by the insurance industry, is a prerequisite for identifying needs and policy priorities in the agricultural sector. Quantifying loss and damage caused by extreme weather events enables the government to plan ahead, and take necessary action that could lead to the reduced impact of extreme weather events.</p>
<p>Improved quality of risk assessment – private sector</p>	<p>If the insurance industry shares aggregate loss data, the private sector would benefit as it could improve the quality of its risk assessments, resulting in better DRM planning.</p>
<p>Data for potentially insurable losses</p>	<p>The insurance industry benefits from the impact analysis, providing information on potentially insurable losses and damages, which is a precondition for underwriting and product pricing.</p>

INTRODUCTION

PHASE 1

PHASE 2

PHASE 3

PHASE 4

PHASE 5



Definition
Brief Description

Involved Actors
SYNERGIES

B. Impact Analysis



**STEP 1
Preparation of Disaster
Impact Assessments**

□ **Guiding Questions
and Tools**

-

**STEP 2
Establishing Special
Entities for Coordination**
Guiding Questions
and Tools

**STEP 3
Data Collection**

**Guiding Questions
and Tools**

**Expected Outputs
When Using the Tools**

STEP 1: Preparation of Disaster Impact Assessments

A major component of disaster impact assessments is loss and damage databases that track impacts of hazards over time. This usually covers parameters such as deaths, economic losses, physical damages and losses in the agricultural sector, its sub-sectors and value chain.

Numerous loss and damage databases have been developed over the last several decades which systematically collect and maintain data at global, regional, national and sub-national levels. Hence, it is important to select the most suitable sources, and methodologies, that suits the respective needs. For example, developing guidelines for disaster impact assessments will ensure consistency in reporting in the country and up-to-date monitoring.

GUIDING QUESTIONS AND TOOLS⁷

Guiding questions	How to conduct impact analysis?	Complexity
	<p>FAO (2015): The impact of disasters on agriculture and food security http://www.fao.org/3/a-i5128e.pdf</p>	
	<p>CARE/Benfield Hazard Research Centre, University College London (2015): Guidelines for rapid environmental impact assessment in disasters http://www.livestock-emergency.net/userfiles/file/assessment-review/Benfield-Hazard-Research-Centre-CARE-2005.pdf</p>	2
Guidelines	<p>International Association for Impact Assessment (IAIA), S. Sangalang for IAIA (2015): Framework for natural disaster impact assessment: Indicators of resilience, risk, and vulnerability in victims of Typhoon Haiyan http://conferences.iaia.org/2015/Final-Papers/Sangalang,%20Stephanie%20-%20Framework%20for%20natural%20disaster%20impact%20assessment.pdf</p>	3
	<p>Australian Institute for Disaster Resilience (2002): Disaster Loss Assessment Guidelines https://trove.nla.gov.au/work/17436788?q&versionId=20447483</p>	
	<p>OECD (2012): Sustainability in Impact Assessments http://www.oecd.org/gov/regulatory-policy/Sustainability%20in%20impact%20assessment%20SG-SD(2011)6-FINAL.pdf</p>	

⁷ Several questions mentioned under risk analysis can be used in addition for the impact analysis and are not repeated. Further description of the tools is provided in the annexes.



Definition
Brief Description

Involved Actors
SYNERGIES

B. Impact Analysis



STEP 1
Preparation of Disaster
Impact Assessments
Guiding Questions
and Tools

- ●

STEP 2
Establishing Special
Entities for Coordination
Guiding Questions
and Tools

STEP 3
Data Collection

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

Guiding questions	Are standardized formats, methodologies and reporting templates for the impact analysis available?	
Guiding questions	Are those formats and methodologies in line with international standards? If so, which standards are used?	
Global database	Global Earth Observation System of Systems (GEOSS) by GEO members ⁸ : Single access ‘meta’ platform that links GEOSS resources across multiple areas, e.g. food security, sustainable agriculture, disaster resilience http://www.earthobservations.org/geoss.php	2
Guiding questions	Which databases are most suitable for the selected purpose in a given country?	
Global database	UNDP Global Risk Identification Programme (GRIP) (2013): A Comparative Review of Country-Level and Regional Disaster Loss and Damage Databases http://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/loss-and-damage-database.html	3
Network	International Association for Impact Assessment (IAIS) www.iaia.org IAIS conference information (2015) http://conferences.iaia.org/2015/final_papers.php	

⁸ EU and other > 100 nations, 95 international organizations.



Definition
Brief Description

Involved Actors
SYNERGIES

B. Impact Analysis

**STEP 1
Preparation of Disaster
Impact Assessments**

Guiding Questions
and Tools



**STEP 2
Establishing Special
Entities for Coordination**

□ Guiding Questions
and Tools

**STEP 3
Data Collection**

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*



STEP 2: Establishing Special Entities for Coordination

Establishing special entities to coordinate data collection from governments at the national level to help smooth cooperation and streamline data collection and analysis:

- Harmonization of various sets of data requires in-depth cooperation between different governmental agencies at the national and local levels. The ministry of agriculture should collaborate with the ministry of finance (MoF) to lead the process and seek support from other relevant ministries (e.g. trade and industry, infrastructure, energy, rural development, emergency agencies).
- Data collection should include assistance from civil society organizations that contribute not only to DRR but also to disaster response and recovery.
- Research and academic institutions, and private actors from industries such as insurance, should be included to contribute to the data collection.

GUIDING QUESTIONS AND TOOLS

	Who is responsible for conducting the impact analysis?	Complexity
Guiding questions	Is there a special entity established that coordinates data collection between governmental agencies and other sources such as academics, business associations and civil society? If so, who is in charge?	
Guidelines	World Bank – GFDRR (2014): <i>Understanding Risk in an Evolving World – Emerging Best Practices in Natural Disaster Risk Assessment</i> , International Bank for Reconstruction and Development https://www.gfdr.org/sites/gfdr/files/publication/Understanding_Risk-Web_Version-rev_1.8.0.pdf FAO MOSAICC (Modelling System for Agricultural Impacts of Climate Change): Platform with training materials of impact analysis http://www.fao.org/climatechange/mosaicc/67270/en/	



Definition
Brief Description

Involved Actors
SYNERGIES

B. Impact Analysis

STEP 1
Preparation of Disaster
Impact Assessments

Guiding Questions
and Tools

-

STEP 2
Establishing Special
Entities for Coordination

Guiding Questions
and Tools



STEP 3
Data Collection

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

STEP 3: Data Collection

Impact data in the agricultural value chain are usually interconnected with impact data from other sectors. For example, damage to transport infrastructure affects sectors beyond agriculture. This can make it difficult to distinguish data from the general disaster impact assessment and the impact assessment for the agricultural sector.

Nevertheless, direct and indirect impact data that are categorized under ‘exposure and vulnerability assessment’ should be collected. This includes damage to crops/livestock, productive assets, storage facilities and stock, shops and infrastructure. Furthermore, the analysis should be conducted on the insured and uninsured financial losses of agricultural producers, food processors and trade entrepreneurs, as well as the related ministries such as trade and industry.

The collection should include data of ‘potential amplifiers’ – factors that can accelerate, intensify or spread impacts. For example, small and medium-sized enterprises (SMEs) will incur income losses due to damaged critical infrastructure and services, such as disruption of energy or water supply, transport or agricultural inputs.

In addition, data collection implies information regarding ‘potential interdependencies and spill-over effects’. For example, agricultural producers can be affected by increased food prices after disasters and temporary dysfunctional networks (e.g. covariant shocks affect neighbours, causing restraints on borrowing within the community), while perishable agricultural products become rotten due to damaged cooling facilities/warehouses, leading to loss of income.



Definition
Brief Description

Involved Actors
SYNERGIES

B. Impact Analysis

**STEP 1
Preparation of Disaster
Impact Assessments**

**Guiding Questions
and Tools**

-

**STEP 2
Establishing Special
Entities for Coordination**

**Guiding Questions
and Tools**



**STEP 3
Data Collection**

□ **Guiding Questions
and Tools**

**Expected Outputs
When Using the Tools**

GUIDING QUESTIONS AND TOOLS

	Guiding questions	Complexity
	What are the impacts of extreme weather events on agricultural production (e.g. farmers/herders), the agricultural value chain (e.g. processing, transport, trade), and the government?	
	What are the direct and indirect disaster impacts to take into account?	
	FAO Statistical Database on food and agriculture (FAOSTAT): Quantitative assessment of production losses by analysing yields and production time series at the country level http://faostat.fao.org/	3
	MunichRe NatCatSERVICE, including loss and damage assessment https://www.munichre.com/en/reinsurance/business/non-life/natcatservice/index.html	2
	Global databases	
	FAO MOSAICC (Modelling System for Agricultural Impacts of Climate Change): System of models and utilities designed to carry out inter-disciplinary climate change impact assessment on agriculture through simulations http://www.fao.org/climatechange/mosaicc/en/	2
	EM-DAT/CRED: Data on the occurrence, losses and effects of over 18,000 mass disasters from 1900 to present http://www.emdat.be/database	2
	UN Disaster Information Management System (Desinventar): Online platform hosted by UNISDR on e.g. economic, financial and insured losses https://www.desinventar.net/	2
	Sigma from Swiss Re http://media.swissre.com/documents/sigma1_2014_en.pdf	
	Guideline	
	World Bank (2015): <i>Agricultural Risk Management in the Face of Climate Change. Discussion Paper 09</i> https://openknowledge.worldbank.org/bitstream/handle/10986/22897/Agricultural0r0ce0of0climate0change.pdf?sequence=1&isAllowed=y	2
	Guiding question	
	How to analyse data?	
	Australian Institute for Disaster Resilience (2002): <i>Disaster Loss Assessment Guidelines</i> https://trove.nla.gov.au/work/17436788?q&versionId=20447483	2
	EU online platform with guidelines for impact assessment (last update 2015) http://ec.europa.eu/smart-regulation/guidelines/ug_chap3_en.htm	
	World Bank (2017): <i>Unbreakable – Building the Resilience of the Poor in the Face of Natural Disasters</i> https://openknowledge.worldbank.org/handle/10986/25335	



Definition
Brief Description

Involved Actors
SYNERGIES

B. Impact Analysis

STEP 1
**Preparation of Disaster
Impact Assessments**
Guiding Questions
and Tools



STEP 2
**Establishing Special
Entities for Coordination**
Guiding Questions
and Tools

STEP 3
Data Collection

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

Expected Outputs When Using the Tools

- ✓ Impact reports quantify exposed direct and indirect losses of governments, agricultural entrepreneurs (SMEs), and the affected agricultural population – occasionally also financial institutions.
- ✓ Based on the loss and damage data the government can review the appropriateness of its DRM strategies.
- ✓ Data from the impact assessment provides valuable information for the next step when analysing the performance of applied DRM mechanisms and identifying protection gaps.
- ✓ Insurance-related outputs (see page 31 ‘Synergies: Insurance and DRM Analysis’).





Definition
Brief Description

Involved Actors
SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1
Preparation of the Analysis
Guiding Questions and Tools

STEP 2
Stocktaking and Performance Analysis of Current DRM Mechanisms
Guiding Questions and Tools

Guiding Questions and Tools

STEP 3
Identifying Gaps
Guiding Questions and Tools

STEP 4
Exploring DRM Solutions
Guiding Questions and Tools



STEP 5
Developing a DRM Plan
Guiding Questions and Tools

-

Expected Outputs When Using the Tools

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

Definition

Disaster risk management is the application of DRR policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses (United Nations General Assembly, 2016).

Steps

The DRM analysis contains the following steps:

- 1) Preparation of the DRM assessment.
- 2) Stocktaking and analysis of the current DRM mechanisms.
- 3) Identifying protection gaps.
- 4) Exploring DRM solutions.
- 5) Developing a DRM plan.

Brief Description

The DRM performance analysis is most effective after the risk and impact assessments have been carried out. The latter provides data on the most important weather-related risk and its impacts, which is needed to manage and evaluate the DRM mechanisms. The analysis determines the effectiveness, affordability, feasibility, applicability, scalability and sustainability of applied DRM mechanisms defined (see box 2). The outcome identifies protection gaps and selects the most suitable DRM solutions, formulates policies and contingency plans, sets priorities for vulnerability reduction, and identifies key governmental and other stakeholders.

Effectiveness is the degree by which the risk of a disaster or weather-related event was reduced. It also refers to the timeline of a sector or society to recovery and return to its status and functions as before the event.

Affordability refers to the amount of finance needed for the activities to overcome the effects of the extreme weather events, especially when compared with the amount to be spent when coping with the shock of deriving to a position to restart/continue the business (is the proposed solution to put into action affordable?).

Feasibility is the degree to which the proposed DRM solution(s) are easy to implement in the short-to-medium term.

Applicability can be divided between the public and the private sectors. The following questions need answering: is the proposed solution in line with existing agricultural policy and programmes and priorities (public sector)? Is the proposed solution in line with current and existing business objectives (private sector)?

Scalability of implementation refers to the easiness of the proposed solution to scale up and make the solution available to an increased number of users.

Sustainability of the proposed solution in the long term.

Box 2: Definitions of DRM Assessment Criteria (World Bank, 2016)



Definition
Brief Description



Involved Actors
SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

- STEP 1
Preparation of the Analysis
Guiding Questions and Tools
 - STEP 2
Stocktaking and Performance Analysis of Current DRM Mechanisms
Guiding Questions and Tools
 - STEP 3
Identifying Gaps
Guiding Questions and Tools
 - STEP 4
Exploring DRM Solutions
Guiding Questions and Tools
 -
 - STEP 5
Developing a DRM Plan
Guiding Questions and Tools
 -
- Expected Outputs When Using the Tools*

Involved Actors

At the national level, governments should conduct the analysis, led by the MoA for the agricultural sector and involving the Ministry of Finance and other relevant government agencies such as transport, energy, and rural development, and departments dealing with climate change adaptation, response and recovery. At the local level the respective local government is involved to gather information from farming households, SMEs and their member organizations (e.g. business associations), and NGOs or international development organizations.

SYNERGIES: INSURANCE AND DRM ANALYSIS

Calculating economic benefits of used DRM mechanisms (including insurance products)	Governments, and the private sector, have a decision-making tool at hand for cost-benefit assessments of existing DRM mechanisms and to calculate potential economic advantages for buying insurance compared to costs spent for prevention, preparedness and post-disaster response and recovery.
Gaps identification for potential insurance products	The DRM analysis provides information on protection gaps that may be closed by insurance solutions. It helps identify insurance products for extreme weather events that cannot be prevented or prepared for.
Integrating insurance into comprehensive DRM	The DRM analysis shows how insurance, if it is an option, could be most suitably integrated into a DRM cycle for strengthening resilience.





Definition
Brief Description

Involved Actors
SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms



STEP 1
Preparation of the Analysis
Guiding Questions and Tools

STEP 2
Stocktaking and Performance Analysis of Current DRM Mechanisms

Guiding Questions and Tools

STEP 3
Identifying Gaps
Guiding Questions and Tools

STEP 4
Exploring DRM Solutions
Guiding Questions and Tools

STEP 5
Developing a DRM Plan
Guiding Questions and Tools

Expected Outputs When Using the Tools

STEP 1: Preparation of the Analysis

The analysis of all existing DRM mechanisms can be time-consuming and expensive. However, simple methods can be used. It is therefore essential to clearly select the mechanisms to be analysed and the depth of the assessment:

- Decide on the scope of the analysis by moving from a general approach to an in-depth analysis using prioritization criteria for a detailed cost-benefit analysis. When conducting the assessment of several options, the costs and time may exceed the original plan. Therefore, countries with budget constraints could use expert judgements prior to deciding on the scope of analysis.
- It is also possible to use prioritization filters discussed by relevant stakeholders' workshops. The World Bank guide (2016) recommends using an inclusive stakeholder workshop to arrive at a set of DRM solutions to enhanced ownership. The number of stakeholders will differ based on the level of analysis and target group.

GUIDING QUESTIONS AND TOOLS

	Guiding questions	Complexity
	How to conduct a DRM analysis?	
	What is the scope of the DRM performance analysis?	
	World Bank (2016): <i>Agricultural Sector Risk Assessment – Methodological Guidance for Practitioners. Agriculture Global Practice Discussion Paper 10</i>	3
	http://documents.worldbank.org/curated/en/586561467994685817/pdf/100320-WP-P147595-Box394840B-PUBLIC-01132016.pdf	
	FAO (2007): <i>Climate variability and change: adaptation to drought in Bangladesh – A resource book and training guide</i>	2
	http://www.fao.org/3/a-a1247e.pdf	
	OECD (2012): <i>Disaster Risk Assessment and Risk Financing – A G20/OECD Methodological Framework</i>	
	http://www.oecd.org/gov/risk/G20disasterriskmanagement.pdf	
	FAO (2016): <i>A gender-responsive approach to disaster risk reduction (DRR) planning in the agricultural sector</i>	
	http://www.fao.org/3/a-i6531e.pdf	
	GERICS Climate Service Center (2016): <i>How to read a Climate-Fact-Sheet</i>	
	https://www.climate-service-center.de/products_and_publications/fact_sheets/climate_fact_sheets/index.php.en	
	Stockholm Environment Institute (SEI): <i>Climate risk screening and assessment tools are available (e.g. software tool NAPAssess, for identifying vulnerable populations and potential adaptation initiatives)</i>	
	https://www.sei.org/projects-and-tools/tools/	
	Workshops and/or semi-structured focus group interviews with government officials, agricultural business associations and entrepreneurs, producers and civil society organizations (e.g. farmer associations).	3



Definition
Brief Description

Involved Actors
SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1
Preparation of the Analysis

Guiding Questions and Tools

STEP 2
Stocktaking and Performance Analysis of Current DRM Mechanisms

Guiding Questions and Tools

STEP 3
Identifying Gaps
Guiding Questions and Tools

STEP 4
Exploring DRM Solutions
Guiding Questions and Tools

●

STEP 5
Developing a DRM Plan
Guiding Questions and Tools

●

Expected Outputs When Using the Tools

STEP 2: Stocktaking and Performance Analysis of Current DRM Mechanisms

For policy and strategy decisions, the government (ministry of agriculture) needs to map identified risks and the selected DRM mechanisms to manage these risks. To maximize the value of the analysis, the entire agricultural sector and its value chain need assessing. The different actors, such as the government and the agricultural private sector, can apply the same analytical steps.

It is recommended that the assessment should be done in all the DRM phases:

- **Preventive measures used:** Mapping and analysing actions applied to reduce the likelihood of weather risk or to reduce the severity of losses and avoid adverse impacts of extreme weather events (examples are given in [Phase 1.D Integrating Preventive Measures into Policies](#)).
- **Measures to address residual risks used:** Mapping and analysing actions that retain risks combined with the adoption of a financing strategy (see [pre-disaster risk financing](#) in the 'residual risk' phase). Both measures ensure that funds are available that will lessen or limit the adverse impacts (examples are given in Phase 2 Retention and Transfer).
- **Preparedness measures used:** Mapping and analysing capacities in place for effective response and recovery at all levels (examples are given in Phase 3 Preparedness).
- **Response and resilient recovery measures in place:** Mapping and analysing ex post actions that will help the affected stakeholders to cope with the loss (examples are given in Phase 4 Response and Phase 5 Recovery).



Definition
Brief Description

Involved Actors
SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1
Preparation of the Analysis
Guiding Questions and Tools

STEP 2
Stocktaking and Performance Analysis of Current DRM Mechanisms



Guiding Questions and Tools

STEP 3
Identifying Gaps
Guiding Questions and Tools

STEP 4
Exploring DRM Solutions
Guiding Questions and Tools



STEP 5
Developing a DRM Plan
Guiding Questions and Tools



Expected Outputs When Using the Tools

GUIDING QUESTIONS AND TOOLS

	Guiding questions	Complexity
	Which DRM mechanisms are used by the government (segregated by population groups e.g. farmers, SME entrepreneurs along the agricultural value chain)?	
	How to determine the agricultural ‘value chain’ and apply DRM analysis?	
Tools	USAID (2012) toolkit: Pathways out of Poverty – Tools for Value Chain Development Practitioners, for value chain selection and value chain analysis throughout the project cycle https://www.microlinks.org/sites/microlinks/files/resource/files/PoP_Tools_Value_Chain_Practitioners.pdf	2
	FAO Tool for designing, monitoring and evaluating land administration programmes, contains e.g. various fact sheets and tools for Fiscal, Financial and Economic Analysis (FFEA) including cost-benefit analysis (CBA) http://www.fao.org/in-action/herramienta-administracion-tierras/module-5/practical-evaluation-guide/introduction-cba/en/	
	Semi-structured interviews with government officials, agricultural business associations, and entrepreneurs, producers and civil society organizations (e.g. farmer associations), especially on social and institutional dimensions.	3
	How effective, affordable, feasible, applicable, sustainable and scalable are the applied DRM mechanisms for the government?	
Global database	Climada open-source tool for assessing the economics of climate adaptation by UNISDR Prevention https://github.com/davidnbresch/climada/blob/master/docs/climada_manual.pdf and http://www.preventionweb.net/educational/view/42020	2
	GIZ tool <i>Climate Expert</i> for private sector entrepreneurs using results of the cost-benefit analysis and focus group discussions (can be used for the agricultural value chain) http://www.climate-expert.org/en/home/	2
Guidelines	EU tool <i>KULTURisk</i> evaluates social and economic benefits of different risk prevention initiatives (including early warning systems, insurance) http://www.kulturisk.eu/	2
	World Bank (2016): <i>Agricultural Sector Risk Assessment – Methodological Guidance for Practitioners. Agriculture Global Practice Discussion Paper 10</i> http://documents.worldbank.org/curated/en/586561467994685817/pdf/100320-WP-P147595-Box394840B-PUBLIC-01132016.pdf	
	GERICS-CSC (2013): <i>Statistical methods for the analysis of simulated and observed climate data – Applied in projects and institutions dealing with climate change impact and adaptation</i> http://epub.sub.uni-hamburg.de/epub/volltexte/2013/23973/pdf/csc_report13_englisch_final_mit_umschlag.pdf	



Definition
Brief Description

Involved Actors
SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1
Preparation of the Analysis

Guiding Questions and Tools

STEP 2
Stocktaking and Performance Analysis of Current DRM Mechanisms

Guiding Questions and Tools

STEP 3
Identifying Gaps
Guiding Questions and Tools



STEP 4
Exploring DRM Solutions
Guiding Questions and Tools

-

STEP 5
Developing a DRM Plan
Guiding Questions and Tools

-

Expected Outputs When Using the Tools

STEP 3: Identifying Gaps

The risk assessment and the results of the DRM performance analysis provide the basis for identifying protection gaps that need to be filled by appropriate DRM mechanisms. Insurance solutions can add value to close these gaps. The following would be available at the end of the assessment and gap identification:

- Inventory of all identified agricultural-related DRM mechanisms and strategies.
- Description of the scope and characteristics of each mechanism.
- Analysis of the performance and matching of existing risks.

GUIDING QUESTIONS AND TOOLS

Guiding questions	Complexity
What gaps have been identified for the government as well as producers and agricultural SMEs, entrepreneurs?	
Tools	
FAO (2016): <i>A gender-responsive approach to disaster risk reduction (DRR) planning in the agricultural sector</i> http://www.fao.org/3/a-i6531e.pdf	
Semi-structured interviews with government officials, agricultural business associations, and entrepreneurs, producers and civil society organizations (e.g. farmer associations).	3



Definition Brief Description

Involved Actors SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1 Preparation of the Analysis

Guiding Questions and Tools

STEP 2 Stocktaking and Performance Analysis of Current DRM Mechanisms

Guiding Questions and Tools

STEP 3 Identifying Gaps Guiding Questions and Tools

STEP 4 Exploring DRM Solutions Guiding Questions and Tools

STEP 5 Developing a DRM Plan Guiding Questions and Tools

Expected Outputs When Using the Tools



STEP 4: Exploring DRM Solutions

Exploring the most suitable DRM measures on strategic actions, objectives and institutional implications should be based on the previous steps. The measures should be an integral part of the agricultural sector's development strategy across all stakeholders. This is especially important for insurance solutions as they are most successful when complementing other DRM mechanisms.

In line with the criteria applied for the DRM performance analysis, the following decision filter can be used for selecting the DRM mechanisms with the largest scope of use, and the largest potential to respond to the selected weather-related events (World Bank, 2016). If agricultural producers and/or SMEs undergo this process, their options would be limited in scope. Nevertheless, using the most appropriate combination of DRM mechanisms complemented by policy action by the government strengthens their resilience.

GUIDING QUESTIONS AND TOOLS

Guiding questions	What are the most suitable DRM solutions that complement each other towards a consistent, comprehensive DRM strategy (according to the DRM performance analysis criteria)?	Complexity
Global databases	World Bank – GRDRR's Open Data for Resilience Initiative (OpenDRI) platform, includes > 1,000 risk datasets and tools for reducing vulnerability and strengthening resilience. An additional field guide instructs how to manage and use open risk data https://opendri.org/	2
	World Bank/GFDRR Climate Change Knowledge Portal (CCKP): Central hub of information, data and reports about climate change around the world (can also be used for the agricultural value chain) http://sdwebx.worldbank.org/climateportal/	3
	CADRI (Capacity for Disaster Reduction Initiative): Global partnership of 14 UN and non-UN organizations: Tool for strengthening countries' capacities to prevent, manage and recover from the impact of disasters http://www.cadri.net/	3
	World Bank Assessment and Design for Adaptation to climate change (ADAPT): Software-based approach integrating climate databases for risk assessment at the planning and design stage with an emphasis on agriculture, irrigation and bio-diversity http://sdwebx.worldbank.org/climateportal/	3
	EU Copernicus Climate Services: Climate analysis and projections for deciding on mitigation strategies in various sectors (including agriculture and insurance) https://climate.copernicus.eu/ ; and https://climate.copernicus.eu/all-content?search_api_fulltext=insurance+sector ; and https://climate.copernicus.eu/secteur ; and https://climate.copernicus.eu/all-content?search_api_fulltext=agriculture	





Definition Brief Description

Involved Actors SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1 Preparation of the Analysis

Guiding Questions and Tools

STEP 2 Stocktaking and Performance Analysis of Current DRM Mechanisms

Guiding Questions and Tools

STEP 3 Identifying Gaps Guiding Questions and Tools

STEP 4 Exploring DRM Solutions Guiding Questions and Tools

- ●

STEP 5 Developing a DRM Plan Guiding Questions and Tools

-

Expected Outputs When Using the Tools

Guidelines

OECD (2012): *Disaster Risk Assessment and Risk Financing – A G20/OECD Methodological Framework*

<http://www.oecd.org/risk/G20disasterriskmanagement.pdf>

2

FAO (2007): *Climate variability and change: adaptation to drought in Bangladesh – A resource book and training guide*
(at community level)

<http://www.fao.org/3/a-a1247e.pdf>

2

World Bank (2016): *Agricultural Sector Risk Assessment – Methodological Guidance for Practitioners. Agriculture Global Practice Discussion Paper 10*

<http://documents.worldbank.org/curated/en/586561467994685817/pdf/100320-WP-P147595-Box394840B-PUBLIC-01132016.pdf>

World Bank (2015): *Agricultural Risk Management in the Face of Climate Change. Discussion Paper 09*

<https://openknowledge.worldbank.org/bitstream/handle/10986/22897/Agricultural0r0ce0of0climate0change.pdf?sequence=1&isAllowed=y>

2

World Bank (2017): *Gender and Agricultural Risk – A Gendered Approach to Agricultural Risk Assessments and Management Strategies*

<http://documents.worldbank.org/curated/en/159951492518078437/pdf/114272-WP-PUBLIC-gendered-approach-ADD-SERIES.pdf>

Adaptation Wizard a UK Climate Impacts Programme: 5-step process to assess vulnerability to climate change and identify options to address climate risks

www.ukcip.org.uk/wizard/

FAO (2016): *Gender-responsive approach to disaster risk reduction (DRR) planning in the agricultural sector*

<http://www.fao.org/3/a-i6531e.pdf>



Definition Brief Description

Involved Actors SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1 Preparation of the Analysis

Guiding Questions and Tools

STEP 2 Stocktaking and Performance Analysis of Current DRM Mechanisms

Guiding Questions and Tools

STEP 3 Identifying Gaps Guiding Questions and Tools

STEP 4 Exploring DRM Solutions Guiding Questions and Tools

-

STEP 5 Developing a DRM Plan

Guiding Questions and Tools

-

Expected Outputs When Using the Tools

STEP 5: Developing a DRM Plan

A systematic approach would culminate in a (national) DRM plan that would follow a risk-informed DRR strategy with an all-inclusive approach (UNISDR, 2017 Consultative version). The following are core activities to consider:

- Build upon the risk assessment (Phase 1) and, if needed, carry out an in-depth review of prioritized hazards, their frequency and potential impact on fiscal and macroeconomic, long-term sector trends and repercussions, as well as poverty and food security implications.
- Analyse the relevant regulatory and institutional frameworks for the agricultural sector, including the main limitations that prevent local institutions (public and private) from performing effectively in the selected areas (for insurance, see Phase 2 Retention and Transfer).
- Building upon the DRM performance analysis, identify DRM options for specific areas to address the risk management problem and its scope – short to medium term. Highlight linkages with current public policy framework and consider government interventions as well as the potential for market-driven solutions.
- Share the findings with all relevant stakeholders and jointly prepare a comprehensive plan of action, including the following information: activities (including capacity development), responsible institutions, estimated cost, resources needed and timescale. If insurance solutions have been identified to be a part of the DRM plan, it is recommended to include the insurance industry in the DRM performance analysis.

GUIDING QUESTIONS AND TOOLS

	How to develop a (national) DRM plan for the government (including measures protecting population groups [e.g. farmers] and SMEs along the agricultural value chain)?	Complexity
Guiding questions	Which key responsible person(s) and/or institution(s) need to be involved?	
	CADRI (Capacity for Disaster Reduction Initiative) global partnership of 14 UN and non-UN organizations: Tool for prioritization of DRR capacity development actions to develop national DRR plans and strategies (of the Sendai Framework) http://www.cadri.net/en/what-we-do/cadri-services	2
Global databases and tools	World Bank/GFDRR Climate Change Knowledge Portal (CCKP): Central hub of information to learn about and evaluate climate-related vulnerabilities and risks for decision-making on policies and for managing climate impacts http://sdwebx.worldbank.org/climateportal/	2
	UNISDR: 2017 Global Platform for Disaster Risk Reduction: Global forum for strategic advice, coordination, and the review of progress in the implementation of international instruments on disaster risk reduction http://www.unisdr.org/conferences/2017/globalplatform/en/about	1



Definition Brief Description

Involved Actors SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1 Preparation of the Analysis

Guiding Questions and Tools

STEP 2 Stocktaking and Performance Analysis of Current DRM Mechanisms

Guiding Questions and Tools

STEP 3 Identifying Gaps

Guiding Questions and Tools

STEP 4 Exploring DRM Solutions

Guiding Questions and Tools

-

STEP 5 Developing a DRM Plan

Guiding Questions and Tools

- ●

Expected Outputs When Using the Tools



Guidelines

IFRC/UNDP (2015): *The Handbook on Law and Disaster Risk Reduction*

<http://www.ifrc.org/Global/Photos/Secretariat/201511/Handbook%20on%20law%20and%20DRR%20LR.pdf>

1

World Bank (2016): *Agricultural Sector Risk Assessment – Methodological Guidance for Practitioners*. Agriculture Global Practice Discussion Paper 10

2

<http://documents.worldbank.org/curated/en/586561467994685817/pdf/100320-WP-P147595-Box394840B-PUBLIC-01132016.pdf>

GERICS Climate Service Center (2014): *Adapting to Climate Change – Methods and Tools for Climate Risk Management*.

CSC Report 17

2

http://www.climate-service-center.de/imperia/md/content/csc/csc_report17.pdf

UNISDR (2017 Consultative version): *National Disaster Risk Assessment – Governance System, Methodologies, and Use of Results*

https://www.unisdr.org/files/globalplatform/591f213cf2f5e52828_wordsintoactionguideline.nationaldi.pdf

IFRC/UNDP (2015): *The Checklist on Law and Disaster Risk Reduction – An annotated outline*

<http://www.ifrc.org/Global/Publications/IDRL/Publications/The%20Checklist%20on%20law%20and%20DRR%20Oct2015%20EN%20v4.pdf>

International Research Institute for Climate and Society (IRI), Columbia University: Agriculture information related to climate change and extreme weather events

<https://iri.columbia.edu/resources/>

FAO (2016): *Gender-responsive approach to disaster risk reduction (DRR) planning in the agricultural sector*

<http://www.fao.org/3/a-i6531e.pdf>

IFRC (2010): *A practical guide to Gender-sensitive Approaches for Disaster Management*

<http://www.ifrc.org/PageFiles/96532/A%20Guide%20for%20Gender-sensitive%20approach%20to%20DM.pdf>

UK Climate Impacts Programme *Adaptation Wizard* tool: 5-step process to assess vulnerability to climate change and identify options to address climate risks

www.ukcip.org.uk/wizard/

Guiding question

Is there a capacity development plan in place that covers the concept of integrated DRM (including insurance)? If so, for whom are the programmes conceptualized?

Tools and Reference

Multi-/bilateral organizations and (I)NGOs:

Several guidelines mentioned under 'Tools' in the respective sections, e.g. World Bank (2016): *Agricultural sector risk assessment – methodological guidance for practitioners*.

1

Insurance-related capacity development is mentioned in **Phase 2.A.1 Insurance**.





Definition
Brief Description

Involved Actors
SYNERGIES

C. Performance Analysis of Existing Disaster Risk Management Mechanisms

STEP 1
Preparation of the Analysis
Guiding Questions and Tools

STEP 2
Stocktaking and Performance Analysis of Current DRM Mechanisms
Guiding Questions and Tools

STEP 3
Identifying Gaps
Guiding Questions and Tools

STEP 4
Exploring DRM Solutions
Guiding Questions and Tools

STEP 5
Developing a DRM Plan
Guiding Questions and Tools



Expected Outputs When Using the Tools

Expected Outputs When Using the Tools

- ✓ The inventory of key weather-related events and the related DRM mechanisms provide a systematic overview of the DRM practices of the various actors.
- ✓ The cost-benefit analysis (or at least estimations) of the applied DRM mechanisms will enable the government to identify the most suitable DRM mechanisms.
- ✓ The list of identified protection gaps enables the government to select the most suitable DRM mechanisms complementing the DRM strategy and indicate a potential demand for insurance.
- ✓ A DRM plan is the basis for developing and implementing the most suitable prevention and preparedness measures, disaster risk financing and insurance products as well as response and recovery mechanisms for enhancing resilience of the population, the agricultural private sector and the government.
- ✓ Insurance-related outputs (see page 39 'Synergies: Insurance and DRM Analysis').





Definition
Brief Description
Involved Actors

SYNERGIES

D. Integrating Preventive Measures into Policies

STEP 1 Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level

Guiding Questions and Tools

-

STEP 2 Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level

Guiding Questions and Tools

Expected Outputs When Using the Tools

D. Integrating Preventive Measures into Policies

Definition

Prevention actions against extreme weather events are information, activities and measures to avoid existing and new extreme weather events (United Nations General Assembly, 2016), strengthening the resilience of potentially affected producers, the private sector (SMEs) and the government. It is a central part of DRM.

STEPS

Implementing preventive measures broadly contains the following steps:

- 1) Deciding and implementing prevention mechanisms by the government at the macro level.**
- 2) Implementing preventive mechanisms by producers and the private agricultural sector at the micro level.**

Brief Description

Appropriate preventive mechanisms should be implemented based on the risk assessment and the DRM analysis conducted. According to the Sendai Framework for Disaster Risk Reduction 2015-2030, risk reduction practices should be multi-hazard and multi-sectoral, inclusive and accessible in order to be efficient and effective. They have to be linked at different levels: for example, low-income rural households may have no alternative but to farm on degraded or drought-prone land. Under these circumstances, a stand-alone preventive measure at the micro level may be sufficient; however, integration to the overall government policy framework is important, especially with regards to insurance solutions.

Involved Actors

Recognizing the importance of policy-making and the role of coordination, national and local governments should engage with relevant stakeholders, including women, the community of practitioners, and academics, from the beginning of the design of policies and standards. This ensures locally driven design and ownership at a high level of agricultural innovation.

As prevention in the agricultural value chain is highly complex, the leading ministry (for the agricultural sector, the MoA) requires coordination with many line ministries (e.g. rural development, transport, industry, housing, finance). If the DRM analysis identifies the demand for insurance, the insurance industry should be included in the dialogue for enhancing prevention.

Definition
Brief Description
Involved Actors



SYNERGIES

D. Integrating Preventive Measures into Policies

**STEP 1
Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level**

Guiding Questions and Tools

-

**STEP 2
Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level**

Guiding Questions and Tools

Expected Outputs When Using the Tools

SYNERGIES: INSURANCE AND PREVENTIVE MEASURES

Positive effect on basis risk

Reduction of losses is not only essential for indemnity products but is also important for index insurance (see Phase 2 Retention and Transfer). Due to the basis risk⁹, the insured can suffer a loss without triggering a payout. In these circumstances, prevention and adaptation measures are key to sustaining the livelihood of those impacted by weather-related disasters.

Linking preventive public works programmes to insurance

Linking preventive public works programmes for the construction of resilient infrastructure with insurance would not only strengthen resilience and benefit the poor (via cash transfer) but also enable them to pay insurance premiums (e.g. [R4 insurance in Africa](#)).

Lower insurance premiums

Prevention could lead to lower insurance premiums because pricing indemnity products include factors such as the projections of potential losses for compensation. Indemnity insurance products would be more affordable, potentially serving as an incentive to invest in prevention measures. Insurance practice at the micro level is varied but national-level products with large-scale prevention measures implemented by the government could be more successful.

Higher acceptance of insurance products

The acceptance of index products can be enhanced by combining insurance with preventive services such as drought-resistant seeds, agricultural training and advisory services through agricultural extension services, and access to storage facilities, etc. (more details in [Phase 2.A.1 Insurance](#)).

Increased acceptance of high-risk clients by insurance providers

In disaster-prone areas with frequent and severe extreme weather events, insurance companies may reject potential customers due to their high risk. If applicants apply preventive measures, access to insurance may be granted. For example, partnerships between the government, the insurance industry and construction firms could foster ‘build back better’ building codes for resilient houses.

Easier access to finance for DRR activities

Insurance can increase access to capital or guarantee green bonds for building resilient infrastructure (prevention).

⁹ Basis risk can be understood as the risk that insurance claims do not adequately reflect the losses incurred. Consequently, the insured who suffer a loss may not always receive a payout (or get funding without any losses incurred).



Definition
Brief Description
Involved Actors

SYNERGIES

D. Integrating Preventive Measures into Policies



STEP 1 Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level

Guiding Questions and Tools

-

STEP 2 Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level

Guiding Questions and Tools

Expected Outputs When Using the Tools

STEP 1: Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level

It is the national government's responsibility to implement preventive measures; for example, irrigation projects, afforestation programmes or mangrove protection, improved public infrastructure, increased storage facilities (also for emergency purposes), provision of high-quality data, high-quality agricultural extension services, agricultural research for enhancing climate change resilience, building codes, zoning and land-use planning.

In order to achieve optimal results, these national measures would complement preventive activities initiated by agricultural producers, the local communities and the enterprises along the agricultural value chain.

Social safety nets integrated with livelihood enhancement, food security and nutrition programmes, housing and education, towards the eradication of poverty, can be effective solutions to empower and assist people disproportionately affected by weather-related disasters.

Definition
Brief Description
Involved Actors

SYNERGIES

D. Integrating Preventive Measures into Policies

STEP 1
Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level



Guiding Questions and Tools

-

STEP 2
Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level

Guiding Questions and Tools

Expected Outputs When Using the Tools

GUIDING QUESTIONS AND TOOLS

		Complexity
Guiding questions	Are there hazard and sector-specific prevention measures and policies in place that strengthen the resilience against weather-related events and climate change at all levels (for the government, the agricultural private sector and producers)?	
	Are they regularly monitored and evaluated for improvement?	
	Are there linkages between social protection (particularly public works programmes) and national disaster management departments that are being used for the construction of climate-resilient agriculture and infrastructure along the agricultural value chain?	
Global databases	FAO Statistical Database on food and agriculture (FAOSTAT): Information on production, investment, trade, agri-environmental indicators, food security, prices, land use, forestry, amount of land planted in hectares http://www.fao.org/faostat/en/#home	1
	EU Copernicus Climate Services: Up-to-date information on e.g. agriculture, forestry, fisheries, environment protection, local planning, transport, sustainable development, and societal challenges esp. for policy-makers https://climate.copernicus.eu/	1
	UN/Stockholm Environment Institute (SEI): Software tool <i>NAPAssess</i> for identifying vulnerable populations and potential adaptation initiatives (e.g. overview of available climate risk screening and assessment tools) http://sei-us.org/projects/id/37	1
Tools	EU tool <i>KULTURisk</i> evaluates social and economic benefits of different risk prevention initiatives (including early warning systems, insurance) http://www.kulturisk.eu/	1
	FAO (2017): <i>Benefits of farm level disaster risk reduction practices in agriculture</i> – Preliminary findings http://www.fao.org/3/a-i7319e.pdf	
Guidelines	World Bank (2017): <i>Unbreakable – Building the Resilience of the Poor in the Face of Natural Disasters</i> https://openknowledge.worldbank.org/handle/10986/25335	
	Multi-/bilateral organizations (e.g. FAO, GIZ, IFAD, UNISDR, World Bank) and international development banks (e.g. Inter-American Development Bank, Asian Development Bank, African Development Bank).	
Source of information	Websites and reports/studies analysing the agricultural sector with a focus on macro- or sector-wide policies and constraints and value chain analysis.	
	Regional or territorial development issues, or specific selected topics (e.g. grain reserves, food security, commodity exchanges)	



Definition
Brief Description
Involved Actors

SYNERGIES

D. Integrating Preventive Measures into Policies

STEP 1
Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level



Guiding Questions and Tools

-

STEP 2
Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level

Guiding Questions and Tools

Expected Outputs When Using the Tools

Guiding questions	Does the government systematically cooperate with institutions relevant for risk reduction? If so, with which?	
	What kind of support is given by the government to strengthen academic research for resilience building (e.g. drought-prone seeds, low-cost storm-resistant buildings)?	
	Which role does insurance play in disaster risk prevention?	
Guidelines	Semi-structured interviews with government officials, academics, agricultural business associations and entrepreneurs, and civil society organizations (e.g. farmer associations).	3
	Research organizations and networks on the agricultural sector, e.g. the Consultative Group for International Agricultural Research (CGIAR)	
Source of information	http://www.cgiar.org/about-us/research-centers/	
	International Rice Research Institute (IRRI)	
	http://irri.org/our-work/locations/philippines	
	Australian Centre for International Agricultural Research (ACIAR)	
	http://aciarc.gov.au/page/aid-program-initiatives;	
	http://aciarc.gov.au/	
	Tools related to insurance are mentioned in Phase 2.A.1 Insurance.	
Guiding question	Does the government keep track of public expenditures on disaster risk reduction investments and losses caused by weather-related events?	
Guidelines	Government information and reports on policies and implementation in areas such as sustainable agriculture and agricultural infrastructure, land-use planning, green economy growth, pro-poor livelihood growth, resilience strategies by, for example, the ministries of finance and agriculture, and agriculture-related agencies including agricultural commodity boards and agricultural extension services.	3



Definition
Brief Description
Involved Actors

SYNERGIES

D. Integrating Preventive Measures into Policies

STEP 1 Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level

Guiding Questions and Tools

-

STEP 2 Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level

Guiding Questions and Tools

Expected Outputs When Using the Tools

STEP 2: Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level

At the micro level, individual producers and private entrepreneurs (SMEs) can enhance their resilience through the following preventive measures driven by the concept of sustainable and climate-smart agricultural practices:

Private sector: examples include setting up storage facilities, upgrading food processing sites/shops, provision of agricultural inputs (e.g. appropriate high-quality seeds, vaccination of livestock), training for improved agricultural and management practices, and use of appropriate/green technology.

Farmers: examples include improving soil moisture retention, planting nitrogen-fixing plants to promote soil generation, water conservation, using appropriate agricultural practices (e.g. drought-resistant seeds, fertilizer/compost, heat-resistant chickens), and land-use planning in drought-prone regions.



Definition
Brief Description
Involved Actors

SYNERGIES

D. Integrating Preventive Measures into Policies

STEP 1
Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level

Guiding Questions and Tools

-

STEP 2
Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level

□ Guiding Questions and Tools

Expected Outputs When Using the Tools



GUIDING QUESTIONS AND TOOLS

Guiding questions	Does the government have any policy in place for incentivizing the private sector and farmers to introduce disaster risk reduction and climate adaptation measures? If so, in which ways?	Complexity
	Are there any priorities (e.g. subsistence farmers, commercial export-related agriculture)?	
Guideline	FAO (2017): <i>Benefits of farm level disaster risk reduction practices in agriculture</i> – Preliminary findings http://www.fao.org/3/a-i7319e.pdf	
Source of information	The R4 Rural Resilience Initiative (R4) is a comprehensive risk management approach (including insurance) to help communities be more resilient to climate variability and shocks https://www.wfp.org/climate-change/initiatives/r4-rural-resilience-initiative	
Tools	Semi-structured interviews with the private sector and producers: Information on preventive mechanisms can be obtained primarily through interviews with members of business associations and cooperatives, and individuals.	3



Definition
Brief Description
Involved Actors

SYNERGIES

D. Integrating Preventive Measures into Policies

**STEP 1
Deciding and Implementing Prevention Mechanisms by the Government at the Macro Level**

Guiding Questions and Tools

-

**STEP 2
Implementing Preventive Mechanisms by Producers and the Private Agricultural Sector at the Micro Level**

Guiding Questions and Tools



Expected Outputs When Using the Tools

Expected Outputs When Using the Tools

- ✓ Implementation of sector-specific prevention measures enable the government to reduce weather-related risks and enhance the resilience of the government, the agricultural private sector and producers. This will result in a range of positive implications for economic development and government income (e.g. no disruption of taxes paid by agricultural entrepreneurs, lower cost for food aid after extreme weather events).
- ✓ Investment in prevention measures is more effective and efficient than spending funds on ex post coping strategies.
- ✓ Better planning, e.g. pertaining to sustainable agricultural and green-growth policies, and National Adaptation Plans, including enhanced building codes according to the 'build back better'¹⁰ concept, zoning and land-use plans.
- ✓ Using social protection programmes, especially public works, for preventive measures and resilience building.
- ✓ Insurance-related outputs (see page 50 'Insurance and Preventive Measures').

¹⁰ Definition of Build Back Better (United Nations General Assembly, 2016): "The use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment."





PHASE 2

Retention and Transfer

A A1

*Overarching questions
from an insurance perspective*

Definition

The risk 'retention and transfer' phase refers to the fact that, even when all the necessary steps have been taken to reduce risk in the 'prevention' phase, there is some risk that remains unmanaged. This is sometimes referred to as residual risk and it is the unmanaged weather-related risk that remains even when effective adaptation and "risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained (United Nations General Assembly, 2016)". Risk transfer can be defined as a process of shifting the financial burden of weather-related risk in the agricultural sector, or responsibility for risk financing, to another party – for example from farmers, producers and the government to agricultural cooperatives, insurers and multilateral banks. Insurance is a well-known form of risk transfer, while other forms include reinsurance contracts, catastrophe bonds, contingent credit facilities and reserve funds. While in this context, risk retention can be defined as the decision to bear the financial consequences of risk rather than transfer the risk to another party. It implies setting aside certain funds to provide for any losses that may occur.

Addressing the risk retention and transfer requires the following component and subcomponent:

A Pre-disaster financing (post-disaster financing is presented under Phase 4 Response).

A1 Insurance.

Brief Description

Pre-disaster financial programmes for residual risk can meet several needs. They can provide quick liquidity to governments for relief and resilient recovery of damaged government properties and infrastructure, and offer insurance to farm-land owners, agricultural businesses and agricultural actors to mitigate the financial impact of the weather-related event. It implies a constant need to develop and support capacities for effective preparedness, response and recovery, through applying a risk retention and transfer instrument as part of a holistic approach.

The two components aim at answering the following key questions

- How can governments, agricultural businesses and producers identify means for meeting the costs of weather-related events while minimizing the threats to well-being, fiscal stability or development?
- What disaster risk financing mechanisms are available to mitigate the adverse impact of extreme weather events?
- How can DRF instruments best complement insurance solutions in mitigating adverse impacts on the agricultural sector and its value chain?
- What is the level of insurance interest existing among the governments, agricultural businesses, smallholders and individual farmers to use insurance as a risk financing mechanism?



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention Capacity

Guiding Questions
and Tools

-

STEP 2
Developing Disaster Risk
Financing Products at
all Levels

-

Guiding Questions
and Tools

STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance

-

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

A. Pre-Disaster Financing

Definition

Risk financing in this context defines an approach to financially plan for risk that cannot be reduced or avoided practically or cost-effectively. It involves the retention of risk combined with the adoption of a financing strategy to ensure that adequate funds are available to meet financial needs in the event of a weather-related disaster (Poole, 2014).

STEPS

Pre-disaster financing contains the following steps:

- 1) **Analysing and determining the risk retention capacity.**
- 2) **Developing disaster risk financing products at all levels.**
- 3) **Establishing integrated approaches – linkages to insurance.**

Brief Description

Failure to make adequate financial provisions against extreme weather events may bear heavy costs for the individual producer, agricultural enterprise and government, and have longer-term economic consequences. Countries can increase their financial resilience against extreme weather events by implementing sustainable and cost-effective financial protection strategies. The level of fiscal resilience to extreme weather events is a decision based on economic and social considerations and builds upon the risk assessment, impact assessment and DRM analysis.

Risk retention analysis is particularly relevant for governments, as they need sufficient funds for response and resilient recovery.



A. Pre disaster Financing

STEP 1 Analysing and Determining the Risk Retention Capacity

Guiding Questions and Tools



STEP 2 Developing Disaster Risk Financing Products at all Levels



Guiding Questions and Tools

STEP 3 Establishing Integrated Approaches – Linkages to Insurance



Guiding Questions and Tools

Expected Outputs When Using the Tools

Involved Actors

The Ministry of Finance will take the lead in cooperation with the Ministry of Agriculture and related ministries in charge of relief and recovery, infrastructure and social protection. Other ministries responsible for economic development and environment may be consulted.

Private sector involvement such as financial institutions and the insurance industry are key stakeholders. Civil society organizations (e.g. micro-finance institutions, producer cooperatives) know their members and could provide essential inputs when formulating a DRF strategy at the regional and local levels.

SYNERGIES: INSURANCE AND PRE-DISASTER FINANCING

Risk selection to be transferred to insurance industry

Risk retention analysis, by segmentation of weather risks according to frequency and severity, enables the government to define which weather risks should be transferred to a third party (e.g. (re)insurance industry).

Targeted mix of DRF and insurance (complementarity of mechanisms)

The “risk layering” approach shows how DRF and insurance complement each other with suitable products and enable the government to develop a DRF strategy with more affordable financial products, compared to ad hoc ex post financing.

(This applies also to individual producers and the private sector, which is better equipped to avoid negative coping strategies such as selling productive assets after a disaster).

Potentially better credit rating by credit rating agencies (if insured – macro level)

National-level insurance against extreme weather events could result in better credit ratings by international credit rating agencies to access funding in international bond markets and to attract foreign investment (Standard & Poor's 2015).

Access to credit through (credit portfolio) insurance

Local-level insurance could lead to easier access to credit for smallholder producers and small entrepreneurs.

At the regional level, by insuring the credit portfolio, rather than a farmer, the financial institutions could reduce their credit portfolio risk, potentially resulting in an easing of access to credit for smallholder producers and SMEs.

A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention CapacityGuiding Questions
and ToolsSTEP 2
Developing Disaster Risk
Financing Products at
all LevelsGuiding Questions
and ToolsSTEP 3
Establishing Integrated
Approaches – Linkages to
InsuranceGuiding Questions
and Tools*Expected Outputs
When Using the Tools*

STEP 1: Analysing and Determining the Risk Retention Capacity

Financial protection can be established internally through the accumulation of funds set aside for future use or obtained externally through pre-arranged credit facilities. In addition, the banking sector, capital markets and international lending institutions are sources of risk financing.

For assessing the financial demand, consideration must be given to how much funding will be needed to match the capacity to disburse required funds:

- **Analyse and determine the risk retention capacity of individual producers and SMEs:** Informal mechanisms such as borrowing are usually used by individuals and SMEs, although covariant shocks pose challenges to the lenders, who are equally affected by the disaster impact. In addition, SMEs need financial services for recovery of their businesses according to BBB standards.
- **Analyse the financing capacity of aggregators, particularly financial institutions:** Financial institutions' capital and capacity should be assessed in terms of their ability to offer support and respond after an extreme weather event. Prior to disasters, financial institutions are important actors for stimulating SME investments and securing the livelihoods of producers. This vital role for (rural) financing should be considered when designing a sustainable financial strategy.
- **Analyse and determine the risk retention capacity of the government:** The risk and impact analyses of extreme weather events provide data pertaining to the required amounts for response and resilient recovery. This needs to be set in relation to the current and projected budgets of the government to identify the financial gaps that need to be closed by developing a financial strategy plan.
- **Develop a disaster risk financing plan:** All results of the risk retention assessments are to be incorporated into the DRF plan. This includes a gap analysis, financing options for developing and implementing an inclusive finance policy that benefits individual smallholder farmers and SMEs, as well as regulatory issues.

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Pre disaster Financing



STEP 1
Analysing and
Determining the Risk
Retention Capacity

□ Guiding Questions
and Tools



STEP 2
Developing Disaster Risk
Financing Products at
all Levels



Guiding Questions
and Tools

STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance



Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

Guiding questions	How to conduct disaster risk financing analyses?	Complexity ¹¹
Guidelines	KfW/M. Souvignat (2016): Economics of Climate Adaptation (ECA) – Guidebook for Practitioners https://www.kfw-entwicklungsbank.de/PDF/Download-Center/Materialien/2016_No6_Guidebook_Economics-of-Climate-Adaptation_EN.pdf	3
Guidelines	World Bank/F. Ghesquiere/O. Mahul (2010): Financial Protection of the State Against Natural Disasters: A Primer. World Bank Policy Research Working Papers #5429 http://documents.worldbank.org/curated/en/227011468175734792/pdf/WPS5429.pdf	2
Case study	WB-GFDRR-EU (2017): South West Indian Ocean Risk Assessment and Financing Initiative (SWIO-RAFI) https://reliefweb.int/sites/reliefweb.int/files/resources/116342-WP-PUBLIC-52p-SWIO-RAFI-Summary-Report-2017-Publish-Version.pdf	2
Guiding questions	What is the financial gap for covering potential damages and losses of extreme weather events that cannot be managed by preventive measures and preparedness programmes?	
Guiding questions	What is the main focus (e.g. low frequency – high impact events, high frequency – low impact events, or medium frequency events of medium magnitude)?	
Guiding questions	If the government has ex ante DRF mechanisms in place, are they risk-based? Do they include risk-relevant data, clear triggers, actions and responsible institutions to implement those actions?	
Guidelines	WB/GFDRR/UKaid (2016): Disaster risk finance as a tool for development https://www.gfdrr.org/sites/default/files/publication/DisasterRisk.pdf	
Guidelines	World Bank/J.D. Cummins/O. Mahul (2009): Catastrophe Risk Financing in Developing Countries: Principles for Public Intervention http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/CATRISKbook.pdf	2

¹¹ According to the testing in Ghana 1 means very complex, skills required, 2 medium complex, 3 low complexity and easy to use. 0 means that the tool was not tested. The ranked tools listed on top were considered to be most relevant.



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Pre disaster Financing



STEP 1
Analysing and
Determining the Risk
Retention Capacity

Guiding Questions
and Tools

- ●

STEP 2
Developing Disaster Risk
Financing Products at
all Levels

-

Guiding Questions
and Tools

STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance

-

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

Guiding questions	Does the government know the financial impact for the agricultural private sector businesses and individual producers? How are they assessed?	
	Semi-structured interviews with members of business associations relevant for the agricultural sector, cooperatives and representatives of individual producers.	2
Tools	Financial statistics and interviews with financial institutions.	
	National databases (see Phase 1.A Risk Assessment).	2
	Post-disaster impact assessments and post-disaster needs assessments (PDNAs) of the affected country, especially sector analysis as a part of the PDNA process.	3
Guiding questions	Does the government know the financial requirements for financial institutions after an extreme weather event when demand for (emergency) loans is high? How are they assessed?	
	Financial statements of banks and microfinance institutions.	1
Tools	Fund disbursement statistics for emergency loans via local financial institutions (after disasters).	1
	Semi-structured interviews with the private sector, including members from business associations, cooperatives and individual producers.	2
Guiding questions	Is there an inclusive disaster risk financing strategy available, including a DRF plan?	
	Does the strategy/DRF plan specify the time dimension of funding for 1) immediate relief and 2) later resilient reconstruction?	
Guidelines	Does the government have any policies and laws regarding disaster finance in place? (e.g. the Philippines has to invest five per cent of budget into DRR)	
	World Bank/GFDRR guideline (2016): <i>Fiscal Disaster Risk Assessment and Risk Financing Options</i> (Sri Lanka) https://www.gfdr.org/sites/default/files/publication/fiscal-disaster-risk-assessment-financing-options.pdf	3
	Standard and Poor's (2015): <i>RatingsDirect, Storm Alert: Natural disasters can damage creditworthiness – Sovereign Ratings Criteria for Natural Catastrophe-Related Rating Actions</i> http://unepfi.org/pdc/wp-content/uploads/StormAlert.pdf	2



A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention CapacityGuiding Questions
and ToolsSTEP 2
Developing Disaster Risk
Financing Products at
all LevelsGuiding Questions
and ToolsSTEP 3
Establishing Integrated
Approaches – Linkages to
InsuranceGuiding Questions
and ToolsExpected Outputs
When Using the Tools

Step 2: Developing Disaster Risk Financing Products at All Levels

While the DRF analysis includes all types of disaster financing instruments, the following section focuses on those that are considered to be most effective:

- **Developing micro level DRF products for farming households and agricultural SMEs:** In practice, frequent risks do not imply large losses and are typically managed by the producers and SMEs. Although it is essential for farmers and SMEs to have suitable financial strategies for their needs, it is governments' responsibility to support financial inclusion for poor and vulnerable persons and SMEs (see Box 3, below). This includes governments' investment in safety nets to help protect against risks that exceed people's coping capacities, which is essential for the vulnerable and particularly poor.

Box 3: Examples of Financial Services for Individuals and SMEs

*Financial inclusion is particularly important for **poor and vulnerable households**. It promotes "a state in which all working-age adults have effective access to credit, savings, payments, (and insurance) from formal providers (CGAP 2011)".*

This includes financial instruments e.g. designed savings products, credit and emergency loans, or remittances that help to smooth household consumption. Financial inclusion could be improved by identity cards or mobile money (e.g. M-Pesa, Kenya).

Financial support for SMEs includes loan restructuring and refinancing guarantees for SMEs through cooperatives and (micro) finance institutions.

Government support is essential, especially after natural disasters (e.g. Home Emergency Loan Program [HELP], time-bound Enterprise Rehabilitation Financing Program [ERFP] to support the recovery of Micro Small and Medium Enterprises [MSMEs] in the Philippines).

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention Capacity

Guiding Questions
and Tools

-

STEP 2
Developing Disaster Risk
Financing Products at
all Levels



- ●

Guiding Questions
and Tools

STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance

-

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

Box 4: Product Options on the Macro Level

Reserve funds or calamity funds

The national government appropriates an annually defined reserve for risk management, though it takes years to attain the critical size and needs strict monitoring so it is not used for other purposes.

Contingent credit lines are pre-negotiated credit arrangements that can provide rapid access to funding at sometimes preferential interest rates to governments in the event of crises.

Debt restructuring for catastrophe-prone countries (e.g. \$21.6 million debt redirecting for climate resilient ocean conservation programmes 'debt for nature' swap, Seychelles [Damanaki, 2016]).

Complex DRF products

Alternative Risk Transfer (ART): Catastrophe bonds are a mechanism for transferring insurance risk to capital markets. Investors receive a return on their investment, with the understanding that in the occurrence of a pre-defined event, part or all of their investment will be transferred to the insurance company to meet the cost of disaster losses. Payments may be calibrated against parametric triggers (e.g. MultiCat catastrophe bond programme, Mexico; Disaster Risk Management Development Policy Loan – CAT-DDO 2, Philippines). (World Bank, 2012; OECD, 2014)

Temporary tax relief: In the interest of reducing personal and enterprise debt, and to reduce the uncertainty of locally-generated revenues, the national government could provide time-bound resource transfers to local governments. This would enable them to provide temporary tax holidays to affected households and enterprises, while simultaneously providing certainty of income to the local governments (e.g. Philippines after Typhoon Yolanda, 2014).

DRF restructuring combined with DRR: The Seychelles Government has set up a public-private trust, the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT), which purchases and restructures debt for e.g. advancing marine and coastal conservation, including strategies for ecosystem-based climate adaptation and DRR.

- **Developing meso level DRF products for aggregators:** The current risk financing policies do not yet systematically target meso level stakeholders, instead targeting mechanisms that benefit individuals and states (Poole, 2014). This gap has to be addressed as financial institutions require liquidity for emergencies (e.g. index insurance, government portfolio guarantees and emergency programmes), provided by the government for affected households and SMEs.
- **Developing macro level DRF products for the government:** As post-disaster funding is unpredictable in terms of time or sufficiency, in order to meet relief and reconstruction needs the government has to establish risk-financing strategies in advance to increase financial capacity to respond (see Box 4, above). This also contributes to the protection of long-term fiscal balances and stimulates economic recovery.

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention Capacity

Guiding Questions
and Tools

-



STEP 2
Developing Disaster Risk
Financing Products at
all Levels

-

□ Guiding Questions
and Tools

STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance

-

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

Guiding questions	How to develop the most suitable financing products for the selected extreme weather events, considering their frequency and severity?	Complexity
	How can the government design DRF products that incentivize prevention?	
Guide-lines	World Bank/A. De Janvry (2015): <i>Quantifying Through Ex-post Assessments the Micro level Impacts of Sovereign Disaster Risk Financing and Insurance Programs</i>	2
	https://openknowledge.worldbank.org/bitstream/handle/10986/22239/Quantifying0th0d0insurance0programs.pdf	
Source of information	Networks that provide tools:	
	Making Finance Work for Africa (MFW4A)	2
	www.mfw4a.org	
Guiding questions	At what level does the government target its product development (e.g. based on demands and requirements of vulnerable populations, agricultural sector)?	
	Are financial products available to cover the poor and vulnerable groups in the agricultural sector? If not, what are suitable measures for reducing their financial vulnerability?	
Guidelines	World Bank/GFDRR guideline (2016): <i>Fiscal Disaster Risk Assessment and Risk Financing Options</i> (Sri Lanka)	2
	https://www.gfdr.org/sites/default/files/publication/fiscal-disaster-risk-assessment-financing-options.pdf	
	GIZ/DFID (2013): <i>Promoting women's financial inclusion – A toolkit</i>	
	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213907/promoting-womens-financial-inclusion-toolkit.pdf	



A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention Capacity

Guiding Questions
and Tools

-

STEP 2
Developing Disaster Risk
Financing Products at
all Levels

-

Guiding Questions
and Tools



STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance

-

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

STEP 3: Establishing Integrated Approaches – Linkages to Insurance

Establishing a risk financing plan implies residual risks are segmented according to their potential frequency and severity while considering different stakeholders and their roles to finance the potential losses. This implies developing a combination of DRF and insurance products (see Figure 2).

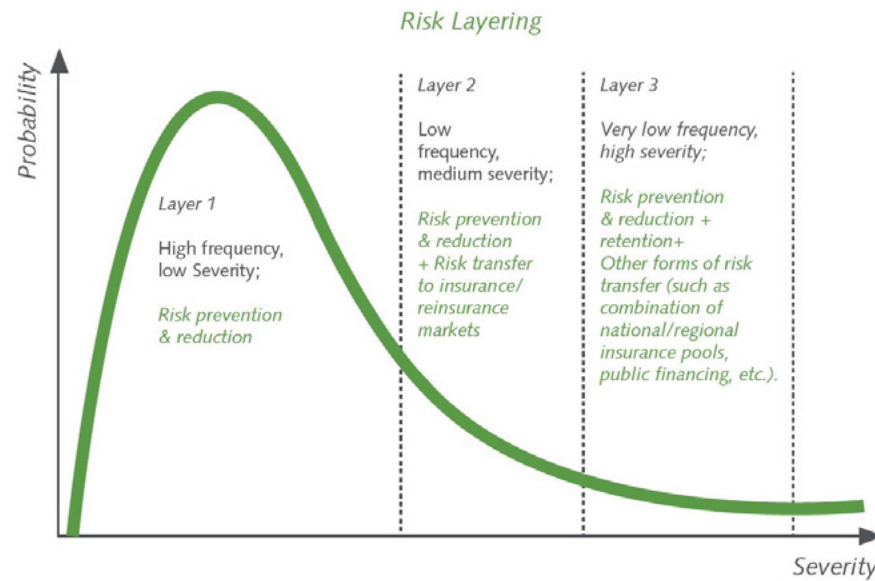


Figure 2: Risk layering approach.
Source: World Bank Agricultural Risk
Assessment Guideline, 2016

- **LAYER 1:** Risks that are frequent but less severe are usually managed by the producers and SMEs, or at the government level through regular annual budget allocations. However, the paramount objective should be to prioritize preventing human and economic losses through various DRM measures.
- **LAYERS 2 and 3:** Risks of low-to-moderate frequency and moderate-to-high severity that can be managed:
 - At the national level, by the government via pre-disaster financial plans and indemnity and/or index insurance solutions that enable the government to better manage extreme weather events.
 - At the regional level, by aggregators (e.g. financial institutions) via own capital and/or insurance (index products and/or indemnity products).
 - At the local level, by producers and SMEs through a mix of DRM strategies including suitable insurance solutions (particularly index products).
- **LAYER 4:** Risks of low frequency but high severity causing large damages should be transferred to third parties (insurance and reinsurance, catastrophe bonds and pan-national insurance pools), which complement various coping strategies, including international assistance and social protection programmes (see examples in Box 5, below).



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention Capacity

Guiding Questions
and Tools

-

STEP 2
Developing Disaster Risk
Financing Products at
all Levels

-

Guiding Questions
and Tools

STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance

- •

□ Guiding Questions
and Tools

Expected Outputs
When Using the Tools



Box 5: Examples of Integrated Approaches

Combination of catastrophe bonds with insurance and post-disaster transfer payments, such as the Disaster Risk Management Development Policy Loan – CAT-DDO 2, Philippines

<http://documents.worldbank.org/curated/en/943071467993518783/Philippines-Disaster-Risk-Management-Development-Policy-Loan-with-a-Catastrophe-Deferred-Drawdown-Option-CAT-DDO>

A three-level approach combining catastrophe bonds with insurance and post-disaster transfer payments (e.g. Disaster Risk Management Development Policy Loan – CAT-DDO 2, Philippines)

<http://projects.worldbank.org/P155656?lang=en> and
<http://documents.worldbank.org/curated/en/809321491482465145/pdf/ISR-Disclosable-P155656-04-06-2017-1491482456910.pdf>

GUIDING QUESTIONS AND TOOLS

Guiding questions	Complexity
Are the financial products appropriately divided according to their potential hazard frequency and severity? Do the products consider the different stakeholders and their roles to finance the potential losses?	Complexity
Do DRF products complement insurance products? If so, in which way?	
Handout (+ platform) World Bank /GFDRR Disaster Risk Financing and Insurance Program (DRFIP): Supports governments in designing financial protection strategies and instruments to respond to natural disasters (including sovereign disaster risk financing, agricultural insurance, property catastrophe risk insurance, social protection programmes) https://www.gfdr.org/sites/default/files/publication/thematic-note-diaster-risk-financing-and-insurance-program.pdf	1
World Bank/D. J. Clarke/O. Mahul, and others (2016): <i>Evaluating Sovereign Disaster Risk Finance Strategies: A Framework</i> http://documents.worldbank.org/curated/en/430111468184437717/pdf/WPS7721.pdf	2
GIZ/DFID (2013): <i>Promoting women’s financial inclusion – A toolkit</i> http://documents.worldbank.org/curated/en/430111468184437717/pdf/WPS7721.pdf	3
Guidelines OECD/L. Poole (2014): <i>A Calculated Risk – How Donors Should Engage with Risk Financing and Transfer Mechanisms</i> https://www.oecd.org/dac/A%20calculated%20risk.pdf	
World Bank 2012: <i>Advancing Disaster Risk Financing and Insurance in ASEAN Member States – Framework and Options for Implementation</i> https://www.gfdr.org/sites/gfdr/files/publication/DRFI_ASEAN_REPORT_June12.pdf	
PCRAFI (2015): <i>Pacific Disaster Risk Finance and Insurance in Vanuatu – Post-disaster budget execution guidelines</i> , Secretariat of the Pacific Community. ACP-EU Natural Disaster Risk Reduction Programme, World Bank Group/GFDRR.	



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

A. Pre disaster Financing

STEP 1
Analysing and
Determining the Risk
Retention Capacity

Guiding Questions
and Tools

-

STEP 2
Developing Disaster Risk
Financing Products at
all Levels

-

Guiding Questions
and Tools

STEP 3
Establishing Integrated
Approaches – Linkages to
Insurance

-

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

Expected Outputs When Using the Tools

- ✓ An effective combination of DRF tools ensures the availability of funds for post-disaster response and resilient recovery, related to the scale and frequency of anticipated risks.
- ✓ Ex ante DRF reduces governments' liquidity gaps after extreme weather events and relaxes ad hoc budget reallocation that could have a distortive effect on the development plans of the state.
- ✓ DRF increases financial resilience of the agricultural sector value chain against extreme weather events and disaster impacts in the future.
- ✓ Insurance-related outputs (see page 59 'Synergies: Insurance and Pre-Disaster Financing').



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels



Guiding Questions
and Tools



STEP 3
Developing Insurance
Products at all Levels



Guiding Questions
and Tools



STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

A1. Insurance

Definition:

Insurance against extreme weather events can be defined as a mechanism which provides financial security against loss of assets and livelihoods by ensuring effective post-disaster relief on an individual, community, national, regional and local level (BMZ, 2015).

STEPS

Insurance can be divided into the following steps:

- 1) **Analysing and determining the need for insurance.**
- 2) **Developing an insurance strategy, by the government.**
- 3) **Developing insurance products and schemes.**
- 4) **Building insurance capacity for implementing insurance.**

Brief Description

Insurance coverage helps governments, individual producers and private enterprises along the agricultural value chain to manage extreme weather impacts. If embedded into an agricultural risk management plan, insurance can contribute to resilience building in the sector and its value chain, and facilitate the use of better production techniques. Insurance products for extreme weather risks can be distinguished into two categories:

- *Direct insurance* approaches are those in which the insured customers benefit directly from transferring risk to a risk-taking entity (such as an insurer) in the event that the insurance agreement is triggered. The insured beneficiary receives the insurance payout (direct transfer).
- *Indirect insurance* approaches are those where the final intended customers benefit indirectly from payments. This is usually intermediated by an insured government, or follows from the customer being a member or client of an institution that has insurance cover (MCII, 2016).

Definition
STEPS
Brief Description



Involved Actors

A1. Insurance

STEP 1 Analysing and Determining the Need for Insurance

Guiding Questions and Tools

STEP 2 Developing an Insurance Strategy at all Levels

-

Guiding Questions and Tools

-

STEP 3 Developing Insurance Products at all Levels

-
-

Guiding Questions and Tools

-

STEP 4 Building Insurance Capacity at all Levels

Guiding Questions and Tools

-
-

*Expected Outputs
When Using the Tools*

Involved Actors

The government is the initiator at the national level, usually the Ministry of Agriculture in coordination with the Ministry of Finance. Other relevant ministries or departments of authority, such as social protection, which cooperate with meteorological offices for data provision should be involved. The actual insurance product development process should be led by the (re)insurance provider in a participatory manner, and in partnership with the insurance regulator and supervisor for product approval.

At the regional level, financial institutions and/or producers' cooperatives are to be involved. At the local level, additional actors such as NGOs, business associations and technology providers are needed, to act as delivery channels to potential customers. In practice, international development agencies often support the processes of product design and capacity development.

A1. Insurance

STEP 1
Analysing and
Determining the
Need for InsuranceGuiding Questions
and ToolsSTEP 2
Developing an Insurance
Strategy at all LevelsGuiding Questions
and ToolsSTEP 3
Developing Insurance
Products at all LevelsGuiding Questions
and ToolsSTEP 4
Building Insurance Capacity
at all LevelsGuiding Questions
and ToolsExpected Outputs
When Using the Tools

STEP 1: Analysing and Determining the Need for Insurance

Regardless of the product development, insurance has to be affordable, meet the particular needs of the different groups and add value. Conducting a demand or feasibility analysis helps to identify these needs. The general outline for insurance demand studies includes the following components:

- **Weather risk assessment¹²:** When identifying the most important weather risks, consider the results of the risk assessment (see Phase 1). If this analysis was not conducted, it has to be done at this stage. Governments will require a comprehensive overview for deciding on macro level products and should know whether these weather risks are equally relevant for producers and agricultural enterprises. Accessibility and quality of risk data are essential.
- **Priority setting for insurance products:** The potential insurance customers (at all levels) need to select their priorities for insurance products. The selection builds upon the DRM gap analysis (see Phase 1.C). If this analysis was not conducted, it has to be done at this stage according to the priorities of the government (especially the MoA). Insurance demand by producers and SMEs may differ from that defined by the government and an analysis has to be done separately. Affordability of insurance products and willingness to pay by all potential customers is an essential component at this stage.
- **Supply analysis:** Analyse the existing insurance products, social protection schemes and emergency programmes for affected populations. The analysis of the latter is needed, as the designed or revised insurance products should not be in competition with but rather complement social protection and emergency programmes.
- **Analysis of potential delivery channels (intermediaries):** Delivery channels (e.g. organizations such as farmer cooperatives, micro-finance institutions [MFIs], technology providers) are analysed by their capacity to reach potential customers (beneficiaries). This includes the trust they have established with potential insurance beneficiaries, their existing information on the insurance market, and their effectiveness and efficiency to manage insurance administration, as well as the access opportunities they can bring to other agricultural services.
- **Assessment of relevant public policies and regulation:** Inclusive climate risk insurance that addresses the needs of low-income customers at the micro and meso levels is primarily delivered through non-traditional delivery channels, which are not always regulated. In many countries, index or parametric products are not categorized as insurance and require special approval from the regulator. The regulatory assessment reveals the particular conditions under which these insurance products can be sold. Other related policies such as social protection or agricultural policies for smallholders are to be assessed, for example, by their suitability for integrating market-based or subsidized products.
- **Analysis of insurance knowledge at all levels:** At the macro level, governments' assessments include knowledge on integrated DRM and the role of insurance, and familiarity with inclusive insurance. It is also important to assess the role of the insurance industry (e.g. participatory product design, new delivery channels), and regulatory challenges that may cause hindrance. At the micro level, the customers' knowledge implies the assessment of their awareness of risk pooling and financial/insurance literacy.

¹² The agricultural value chain actors face a number of different risks. As the publication focuses on extreme weather events and natural hazards, only those are being considered.



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance



STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels



Guiding Questions
and Tools



STEP 3
Developing Insurance
Products at all Levels



Guiding Questions
and Tools



STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

	Guiding questions	Complexity ¹³
	How to conduct a demand study or insurance needs assessment?	
Guidelines	a2ii/Cenfri (2010): Toolkit No.1 – <i>MicroInsurance Country Diagnostic Studies: Analytical Framework and Methodology</i> https://a2ii.org/sites/default/files/field/uploads/2011_10_12_toolkit_1_01.pdf	3
	USAID (2006): <i>Guidelines for Market Research on the Demand for Microinsurance</i> http://www.microinsurancenetw.org/groups/guidelines-market-research-demand-microinsurance	3
Guiding questions	What are the identified gaps that cannot be managed by preventive measures, preparedness programmes and DRF products, and how can insurance cover potential damages and losses of extreme weather events for the government, the agricultural private sector and farmers?	
	What are the most suitable insurance products for the selected extreme weather events, considering their frequency and severity?	
Guidelines	World Bank/A. De Janvry (2015): <i>Quantifying Through Ex-post Assessments the Micro level Impacts of Sovereign Disaster Risk Financing and Insurance Programmes</i> https://openknowledge.worldbank.org/bitstream/handle/10986/22239/Quantifying0th0d0insurance0programs.pdf?sequence=1&isAllowed=y	
	For more tools see Phase 2.A Pre-Disaster Financing, Step 2 Developing Disaster Risk Financing Products at all Levels.	
Agricultural feasibility studies	World Bank (2013): <i>Feasibility Study for the Design and Implementation of Cotton Index Insurance – Chaco Province, Argentina</i> http://www.microinsurancenetw.org/groups/feasibility-study-cotton-and-livestock-index-insurance-argentina	
	World Bank (2013): <i>Papua New Guinea – Agricultural Insurance Pre-Feasibility Study</i> http://www.microinsurancenetw.org/groups/feasibility-study-crop-and-livestock-index-insurance-papua-new-guinea	
Tools	Semi-structured interviews with the private sector including members from business associations, cooperatives and individual producers usually in the context of demand or feasibility studies – often assisted by member organizations such as NGOs, business associations or international development organizations.	2

¹³ According to the testing in Ghana 1 means very complex, skills required, 2 medium complex, 3 low complexity and easy to use. 0 means that the tool was not tested. The ranked tools listed on top were considered to be most relevant.



A1. Insurance

STEP 1
Analysing and
Determining the
Need for InsuranceGuiding Questions
and ToolsSTEP 2
Developing an Insurance
Strategy at all LevelsGuiding Questions
and ToolsSTEP 3
Developing Insurance
Products at all LevelsGuiding Questions
and ToolsSTEP 4
Building Insurance Capacity
at all LevelsGuiding Questions
and ToolsExpected Outputs
When Using the Tools

STEP 2: Developing an Insurance Strategy at all Levels

Based on the insurance demand study, the government could support the following activities for promoting insurance against extreme weather events:

- **Creating an enabling policy, legal and regulatory environment:** Insurance policies include incentives for the insurance industry (e.g. tax waivers on inclusive insurance products). Insurance regulation is particularly important as many countries lack a legal index and inclusive insurance framework. In these cases, consumer protection policies addressing client value are of special relevance for scaling-up insurance. Funding strategies consider premium subsidies for the vulnerable and extreme poor under social protection policies.
- **Investing in measures that promote insurance and increase affordability:** Investments in infrastructure and technology (e.g. weather and yield data, weather stations/satellite data), promoting awareness campaigns and insurance/financial literacy, developing public-private partnerships (PPPs) with the insurance industry – including dialogue programmes with civil society – and supporting DRR and climate change adaptation programmes can reduce the costs for insurers when setting up insurance systems.
- **Deciding for whom and at which level insurance products should be developed:** The risk layering process conducted in the context of DRF (Phase 2.A Step 3) provides the information on segmentation of weather risks and which weather events are to be transferred to the insurance industry. Low-frequency/medium-loss events, and particularly very-low-frequency/high-loss events, need to be insured, especially as the latter extreme events cannot be mitigated by individual producers and SMEs and fall under the responsibility of the state, while low-frequency/medium-loss events may be managed by medium-size enterprises.

The government, particularly the ministries of finance, agriculture and social protection, have to take strategic decisions as to whom to protect and in which way. At the macro level, indirect insurance enables the government to provide payout benefits to the vulnerable and (extremely) poor is a type of social protection or emergency aid after extreme weather events. Direct insurance products at the micro level can be supported through public funding, either by paying market-based insurance premiums to the insurance provider for the (extreme) poor (e.g. PPPs) or by 'smart' subsidies for increasing the affordability of products. Though small farmers have the least means for managing extreme weather events, suitable insurance products for affected larger farmers are also lacking in many countries. A successful combination of insurance and other DRM mechanisms for the poor is described in Box 6, page 74.

Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools



STEP 2
Developing an Insurance
Strategy at all Levels

- ●

Guiding Questions
and Tools

-

STEP 3
Developing Insurance
Products at all Levels

-
-

Guiding Questions
and Tools

-

STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools

-
-

Expected Outputs
When Using the Tools

Box 6: The Rural Resilience Initiative (R4)

The R4 initiative is a comprehensive risk management approach to help communities be more resilient to climate variability and shocks (R4, 2018):

Risk transfer: R4 enables the poorest farmers to purchase weather index insurance against drought.

Risk reduction: Farmers can pay insurance premiums in cash or through insurance for assets (IFA) schemes that engage them in risk reduction activities. IFA schemes are built into government safety-net programmes or World Food Programme food assistance for assets initiatives.

Prudent risk-taking: With a stronger asset base, R4 farmers can increase their savings and stocks, using them along with insurance to obtain credit. They can use the money for investing in productive assets such as seeds, fertilizers and new technologies that increase productivity.

Risk reserves: Individual or group savings enable farmers to build a financial base. Providing a self-insurance for communities, group savings can be loaned to individual members with particular needs

A neglected issue is the vulnerability of the agricultural private sector, especially micro and small enterprises. They suffer losses which often lead to business interruption and negative coping strategies (e.g. selling productive assets). In addition, there are hardly any appropriate and affordable insurance products available. It is important to develop public strategies for this sector that link insurance to other measures (bundled products). For instance, under pro-poor growth policies, national adaptation plans or sustainable agriculture strategies, the government could combine incentivizing preventive measures, providing credit guarantee programmes or interest-free housing loans for resilient reconstruction.

Box 7: Micro, Meso and Macro Level Insurance Customers

Micro level

Policyholders are individuals, e.g. farmers, market vendors or fishers, who hold policies and receive payouts directly. These policies are often sold at the local level and delivered through a variety of channels, including microfinance institutions, farmers' cooperatives, NGOs and retailers. Premiums are either paid in full by clients, subsidized by the government, or a combination of both, or premiums can be covered/shared by value chain actors (e.g. agricultural input providers) or financial institutions as part of a business strategy.

Meso level

Policyholders are risk aggregators such as business associations or financial institutions, whereby a (re)insurer makes payments to the risk aggregators who then provide services to individuals. The meso level institution chooses how its individual customers or members may or may not receive benefits from the insurance coverage.

Macro level

Policies are held by governments or other national agencies within the international/regional (re)insurance market. Payouts can be used to manage liquidity gaps e.g. for financing post-disaster programmes for predefined target groups that can include individuals (indirect beneficiaries). These schemes can be operationalized through regional/pan-national risk pools.



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools



STEP 2
Developing an Insurance
Strategy at all Levels

□ Guiding Questions
and Tools

STEP 3
Developing Insurance
Products at all Levels

Guiding Questions
and Tools

STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

GUIDING QUESTIONS AND TOOLS

	Which strategies and policies for agricultural/climate risk insurance are in place?	Complexity
Guiding questions	Are the development plans for the agricultural/climate risk insurance in line with general development policies of the country and international standards?	
	Which insurance approach is most suitable for reaching the poor and vulnerable: direct or indirect insurance? Which insurance approach is most suitable for protecting the business of value chain actors? Which insurance approach is most suitable for enabling the government to manage extreme weather events and natural hazards?	
	Does the insurance strategy contribute to poverty reduction and reach the Sustainable Development Goals?	
	How will the products contribute to poverty reduction and enhancing resilience?	
Guidelines	MCII (2016): <i>Climate Risk Insurance for the Poor & Vulnerable: How to Effectively Implement the Pro-Poor Focus of InsuResilience</i> http://collections.unu.edu/eserv/UNU:5956/MCII_CRI_for_the_Poor_and_Vulnerable_meta.pdf	3
	World Bank/ GFDRR/JICA (2015): Pacific Catastrophe Risk Insurance Pilot Report – From Design to Implementation. Some Lessons Learned https://www.gfdr.org/sites/default/files/publication/Pacific_Catastrophe_Risk_Insurance-Pilot_Report_140715%281%29.pdf	3
	a2ii/Cenfri (2010): Toolkit No.2 – Country Process Guidelines for Microinsurance Market Development https://a2ii.org/sites/default/files/field/uploads/2011_10_12_toolkit_2_0.pdf	3
	World Bank/GFDRR (2014): Financial Protection Against Natural Disasters – From Products to Comprehensive Strategies: An Operational Framework for Disaster Risk Financing and Insurance http://documents.worldbank.org/curated/en/523011468129274796/pdf/949880WP0Box380st0Natural0Disasters.pdf	
	IFAD (2010): <i>The Potential for Scale and Sustainability in Weather Index Insurance for Agriculture and Rural Livelihoods</i> https://www.ifad.org/documents/38714170/40239486/The+potential+for+scale+and+sustainability+in+weather+index+insurance+for+agriculture+and+rural+livelihoods.pdf/7a8247c7-d7be-4a1b-9088-37edee6717ca	
	a2ii (2017): Proportionality in practice: Distribution https://a2ii.org/en/report/thematic-reports-latin-america-brasil-peru-inclusive-insurance-regulation-consumer-protection	
	The Willis Research Network (More than 50 international research institutions): A collaboration between science and the financial/insurance sector in the areas of, e.g. economic capital and enterprise risk management and natural hazards.	
Network		



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools



STEP 2
Developing an Insurance
Strategy at all Levels

-

Guiding Questions
and Tools

- ●

STEP 3
Developing Insurance
Products at all Levels

-
-

Guiding Questions
and Tools

-

STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools

-
-

*Expected Outputs
When Using the Tools*

Guiding questions	Is a suitable regulatory framework for agricultural insurance in place (especially index products)?	
	Is a suitable regulatory framework for inclusive insurance in place (including supervision of intermediaries and mobile technology)?	
Manuals	GIZ/IFC, et.al (2017): <i>Mainstreaming Gender and Targeting Women in Inclusive Insurance: Perspectives and Emerging Lessons, A Compendium of Technical Notes and Case Studies</i>	
	https://www.ifc.org/wps/wcm/connect/da895c64-2bc0-4a64-8206-9f9057b2dbd2/Full+Women+%26+Inclusive+Insurance+BMZ_Web.pdf?MOD=AJPERES	
Source of information	IAIS/a2ii (2013): <i>Self-assessment and Peer Review on Regulation and Supervision supporting Inclusive Insurance Markets</i>	
	https://a2ii.org/sites/default/files/field/uploads/toolkit_3_-_self-assessment_and_peer_review_process_0_0.pdf	
	International Association of Insurance Supervisors (IAIS)	2
Guiding question	What type of support has been provided for promoting agriculture or climate risk insurance in terms of:	
	Financial support (e.g. 'smart' subsidies)?	
	Technical support (e.g. provision of data, awareness campaigns) and otherwise (e.g. research, conducive policy conditions)?	
Source of information	Multi-/bilateral organizations (e.g. World Bank-GIIF, ILO Impact Insurance, IFAD, WFP, FAO, ADB, GIZ) and INGOs (e.g. Mercy Corps, Planet Guarantee, Oxfam), e.g. Risk transfer concepts, insurance case studies and lessons learned, information on insurance development projects, delivery of insurance, etc.	2
	Universities/research institutions , e.g. International Research Institute for Climate and Society, Columbia University	
	https://iri.columbia.edu/ ; PROVENTION http://www.proventionconsortium.net/ Insurance impact assessments, insurance projects linked to research, climate change research, insurance linked to DRM, research on index and agricultural insurance, etc.	
	Further tools mentioned under the respective insurance sections.	



A1. Insurance

STEP 1
Analysing and
Determining the
Need for InsuranceGuiding Questions
and ToolsSTEP 2
Developing an Insurance
Strategy at all LevelsGuiding Questions
and ToolsSTEP 3
Developing Insurance
Products at all LevelsGuiding Questions
and ToolsSTEP 4
Building Insurance Capacity
at all LevelsGuiding Questions
and ToolsExpected Outputs
When Using the Tools

STEP 3: Developing Insurance Products at all Levels

Insurance against extreme weather events can be broadly distinguished between indemnity and index products. While indemnity products relate directly to damages and need claim verification, index or parametric products do not correlate with the losses: the payout is based on pre-defined triggers, either weather indexes (e.g. rainfall, wind speed, temperature) or area yield index (e.g. when realized county or province yield falls below a specified critical yield amount). Once the catastrophic event exceeds, for example, the defined wind speed, all insured persons receive a payout regardless of their losses.

Both product types have advantages and limitations, e.g.:

- *Indemnity-based products* compensate for all or parts of the damage or loss of the insured items as defined in the insurance policy. Claim verification after extreme weather events often takes a long time and can result in late payouts. While this may be acceptable for large commercial farmers and medium-scale enterprises, individual claim verification for smallholders and small businesses is administratively hardly feasible, extremely expensive and would result in un-affordable premiums.
- *Index or Parametric products* have the advantages of avoiding moral hazard, and expensive and time-consuming loss verification – especially when infrastructure is damaged after an extreme weather event – when it is challenged by the basis risk. This implies that insurance claims do not adequately reflect the losses incurred (explained below). However, for smallholders and small enterprises index products are the most feasible option because individual claim verification would not be manageable and affordable.

Key processes for product development at all levels, based on the demand study, contain the following:

- **Developing and pre-testing a product ‘prototype’:** A ‘prototype’ product needs to be developed with close cooperation between the insurance provider and potential customers, as well as delivery channels, and with the government (e.g. public meteorological institutes for access to national and international data, and MoA for harvest data when designing yield index).
- **Refining the prototype and rolling out the final product** under considerations of client value: due to the basis risk, the acceptance of index products can be enhanced by combining insurance with other services such as access to credit, suitable agricultural inputs (e.g. drought-resistant seeds, animal care packages and vaccines) and training/advisory services for enhanced agricultural practices along the value chain (information on market prices, early warning, or detailed weather forecasts).
- **Selecting distribution channels:** The demand or feasibility study identified suitable distribution channels, not only for inclusive insurance but also for indirect macro level products, as MoAs often lack the required institutional payout structures. If (the extremely) poor are beneficiaries, the social-safety-net structure of the ministry of social affairs could be used (assuming it works effectively). Voucher-based systems, as often used by social assistance programmes, could be further explored.



Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels

Guiding Questions
and Tools

STEP 3
Developing Insurance
Products at all Levels

Guiding Questions
and Tools

STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools

Expected Outputs
When Using the Tools



-
-

-
-

Box 8: Product Options at all Levels

Micro level: Households and SMEs

For households, examples of products include agricultural insurance to protect against drought or excessive rain (trigger: defined rainfall – for both products), products against typhoons (trigger: wind speed and precipitation).

Others include bundled products, in cooperation with agricultural input suppliers – whereby farmers receive insurance upfront in exchange for a percentage of the harvest at the end of the season. This product can be tied to access to credit.

EXAMPLE: PepsiCo India offers weather index insurance as part of its contract farming programme through the ICICI Lombard General Insurance Company. Farmers are insured against Late Blight Disease caused by high moisture resulting in severe losses of the potato crop. The premium for the index insurance is three to five per cent of the sum insured and the product is structured to ensure the coverage of losses of above 40 per cent of the total yield. Up to this point, farmers are enabled to cover losses through various DRM mechanisms. In addition, PepsiCo offers price incentives to the insured farmers e.g. on pesticides and fertilizers (MCII, 2016).

SMEs demand risk coverage, ranging from business interruption caused by late supply delivery or customer accidents to natural disasters, as well as suitable property and equipment products.

Meso level: Aggregators

Index loan portfolio products reduce liquidity problems and enable MFIs to continue their lending business, which is particularly important after disasters when the credit demand increases significantly.

EXAMPLE: The for-profit company Agriculture and Climate Risk Enterprise Ltd. (ACRE) Africa is a service provider working with local insurers and other stakeholders in the agricultural insurance value chain. The Lending Institution Portfolio Cover insures the value of the entire financial institution's agricultural portfolio against non-repayment from weather-related events. It covers loans to farmers and operators like processors, agri-transporters and traders in the agricultural value chain. Key benefits for financial institutions include reduced losses due to default, reduced provisions for bad debts, increased lending and re-enforced risk management (MCII, 2016).

Index products for harvest portfolios of business associations (e.g. coffee boards), or mixing index products with indemnity-based payouts to members of business associations (minimizing the basis risk).



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels

-

Guiding Questions
and Tools

-



STEP 3
Developing Insurance
Products at all Levels

-
- ●

Guiding Questions
and Tools

-

STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools

-
-

Expected Outputs
When Using the Tools

Macro level: Governments

Sovereign index insurance reduces liquidity problems and enables governments to quickly start relief activities and promote resilient recovery (e.g. CCRIF, PCRAFI). If combined with contingency plans, the extreme poor will benefit from this indirect insurance (e.g. African Risk Capacity [ARC]).

Public or semi-public insurance providers can play an important role, such as the government-owned insurer Philippine Crop Insurance Corporation (PCIC) that operates with a market-based and social mandate to provide weather-related insurance coverage for various agricultural producers, including subsidized crop and livestock products for subsistence farmers and market-based agricultural SMEs.

Indemnity products for covering damaged public infrastructure and assets (buildings): though the example of the Indonesian Maipark (re)insurer is not related to agriculture, it illustrates how governments can support insurance coverage against extreme weather events in a way that could be expanded to other sectors such as agriculture.

EXAMPLE: The Indonesian Ministry of Finance in collaboration with the General Insurance Association of Indonesia established Maipark, the Indonesia Earthquake Reinsurance Pool, to provide affordable insurance products (e.g. by setting price benchmarks for the earthquake products of local insurers) for houses, offices, shops, factories, communication towers and schools against earthquakes, volcanic eruptions, tsunamis and business disturbances. Maipark catastrophe reinsurance provides obligatory reinsurance for all non-life insurers and offers voluntary catastrophe insurance to e.g. municipalities.

Reinsurance is crucial for extreme weather events causing high losses. It can reduce the costs of agricultural risk insurance products. Reinsurance provided through the government can encourage insurers to enter the market.



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels



Guiding Questions
and Tools



STEP 3
Developing Insurance
Products at all Levels



□ Guiding Questions
and Tools



STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*



GUIDING QUESTIONS AND TOOLS

	How can suitable insurance products that create client value be developed?	Complexity
Guiding questions	Is relevant historical and other socioeconomic and loss data available (e.g. weather data ideally of 20-30 years, yield data, information on farmers and agricultural private sector value chain)?	
	IFAD/WFP (2011): <i>Weather Index-based Insurance in Agricultural Development – A Technical Guide</i> https://documents.wfp.org/stellent/groups/public/documents/communications/wfp242409.pdf?_ga=2.256510345.360573724.1538472411-755957090.1535634836	3
Guidelines	World Bank (2011): <i>Weather Index Insurance for Agriculture: Guidance for Development Practitioners</i> http://documents.worldbank.org/curated/en/590721468155130451/Weather-index-insurance-for-agriculture-guidance-for-development-practitioners	3
	IFAD (2017): <i>Remote sensing for index insurance – Findings and lessons learned for smallholder agriculture</i> https://www.ifad.org/documents/38714170/39144386/RemoteSensing_LongGuide_2017.pdf/f2d22adb-c3b0-4fe3-9cbb-c25054d756fe	
Source of information	Macro level pan-national insurance pools for information and advice: African Risk Capacity http://www.africanriskcapacity.org/	3
	The Caribbean Catastrophe Risk Insurance Facility (CCRIF) http://www.ccrif.org/ Pacific Catastrophe Risk Assessment & Financing Initiative (PCRAFI) http://pcrafi.spc.int/	
Platforms	Global Index Insurance Facility (GIIF): Multi-donor trust fund supporting the development and growth of local markets for weather and disaster index insurance in developing countries https://www.indexinsuranceforum.org/	3
	'Climate Insurance' database jointly operated by GIIF, GIZ and Munich Climate Insurance Initiative: experiences of numerous international organizations on risk transfer and insurance solutions to climate risk management https://indexinsuranceforum.org/climate-insurance Munich Re's agriculture and weather risk transfer solutions https://www.munichre.com/en/reinsurance/business/non-life/agro/index.html	3
	Munich Re's NATHAN Risk Suite (Natural Hazards Assessment Network) e.g. enables precise pricing of products, enhances portfolio management and claims management https://www.munichre.com/en/reinsurance/business/non-life/nathan/index.html Microinsurance Network http://www.microinsurancenet.org/	



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels

Guiding Questions
and Tools



STEP 3
Developing Insurance
Products at all Levels

Guiding Questions
and Tools



STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

Tools	PACE tool for measuring client value (ILO Impact insurance)	2
	http://www.impactinsurance.org/tools/PACE	
	Key Performance & Social Indicators (KPI)	
Guiding questions	http://www.microfact.org/microinsurance-tools/	
	Does the selected insurance product or scheme address the most severe risks for farmers or other poor people, including the needs of women (e.g. low-frequency/high-severity events, or high-frequency/low-severity events)?	
	What is the target market for the insurance programme (e.g. in percentage of farmers/smallholder farmers, agricultural GDP, share of specific value chains)?	
Manuals	GIZ/IFC/a2ii, and others (2017): <i>Mainstreaming Gender and Targeting Women in Inclusive Insurance: Perspectives and Emerging Lessons, A Compendium of Technical Notes and Case Studies</i>	2
	https://a2ii.org/sites/default/files/field/uploads/fullwomeninclusiveinsurancebmz_web.pdf	
	A2ii (2013): <i>Country-level microinsurance development process: operationalizing the action plan</i>	2
Source of information	https://a2ii.org/sites/default/files/field/uploads/2014_03_06_annex_11toolkit_iv_final_draft.pdf	
	The Global Facility for Disaster Reduction and Recovery (GFDRR) is a global partnership that helps developing countries better understand and reduce their vulnerability to natural hazards and climate change	
	https://www.gfdr.org/en/node/3729	
Guiding questions	Public works-linked insurance (R4)	
	http://www.wfp.org/climate-change/initiatives/r4-rural-resilience-initiative	
	How sustainable is the business model of the insurance products?	
Guidelines	What is the role of public insurance providers?	
	UNEP FI <i>Principles for Sustainable Insurance for insurance companies, business and beyond climate risk insurance products</i>	3
	http://www.unepfi.org/psi/the-principles/	
Insurance developer	Munich Re's sustainable crop insurance systems (SystemAgro)	3
	www.munichre.com/agro	
	Munich Re, Swiss Re, insurance brokers (e.g. AON Benfield, Guy Carpenter, Milliman), DHI modelling agency.	

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for InsuranceGuiding Questions
and ToolsSTEP 2
Developing an Insurance
Strategy at all LevelsGuiding Questions
and ToolsSTEP 3
Developing Insurance
Products at all LevelsGuiding Questions
and ToolsSTEP 4
Building Insurance Capacity
at all LevelsGuiding Questions
and ToolsExpected Outputs
When Using the Tools

STEP 4: Building Insurance Capacity at all Levels

While indemnity-based insurance against extreme weather events is available for large industries and the higher-income population, index products are still relatively new, resulting in higher capacity development efforts for all actors:

- **Strategic orientation on the role of insurance in the context of DRM and CCA** for government institutions and potential customers, including agricultural SMEs as part of the private sector.
- **Information on index products and inclusive insurance for the insurance** industry and government officials: This includes the differences between traditional indemnity products and index products, as index products require different modelling and the payout does not fully correspond with the occurred damage and needs precise data (e.g. weather or yield data, basis risk).

For reaching the poor and vulnerable, the inclusive insurance approach should be introduced to government officials and the insurance industry, as it requires participatory product development, new sales processes and administration with non-traditional partners.

- **Policy dialogue** with the government, and particularly the insurance supervisor and regulator pertaining to index products, pan-national insurance pools and inclusive insurance is a long-term process; the process should start early.
- **Develop awareness-building campaigns**, including financial and insurance literacy and marketing strategies for insurance providers.
- **Organize technical training and advisory services** for all stakeholders, particularly to the non-traditional delivery channels, related to the key processes such as product sales and renewals, insurance administration and claims management. For instance, mobile technology such as mobile premium transfer (if regulation permits) requires significant inputs in information technology security – a process that would require the involvement of global actors, identification of training institutions (preferably local training providers) and the development of training materials, including Training of Trainers.
- **Pay special attention to claims management** as payouts after extreme weather events pose significant challenges to involved parties, when disrupted electricity and communication systems delay distribution of mobile payments, and claims verification or proof of insurance become difficult if documents have been destroyed and travelling is impossible. The insurance industry, financial institutions and the government have to prepare for these circumstances (see Philippines example in [Phase 4.A Step 2](#)).



Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels

-

Guiding Questions
and Tools

-

STEP 3
Developing Insurance
Products at all Levels

-
-

Guiding Questions
and Tools

-



STEP 4
Building Insurance Capacity
at all Levels

□ Guiding Questions
and Tools

-
-

Expected Outputs
When Using the Tools

GUIDING QUESTIONS AND TOOLS

Guiding questions		Complexity
Do the involved actors have the respective capacity to manage insurance schemes in the context of DRM?		
Is there a capacity-building strategy to address the needs of all relevant actors?		
Does the strategy reflect the specific capacities and operations required for all-inclusive agricultural/climate risk insurance (e.g. participatory approaches, non-traditional delivery channels, dialogue with a broad range of actors)?		
Handbook	World Bank/GFDRR/JICA (2015): <i>Pacific Catastrophe Risk Insurance Pilot Report – From Design to Implementation. Some Lessons Learned</i> https://www.gfdr.org/sites/default/files/publication/Pacific_Catastrophe_Risk_Insurance-Pilot_Report_140715%281%29.pdf	
Training courses, CB materials	ILO Impact Insurance http://www.impactinsurance.org/tools/	3
	World Bank: FARMD Forum for Agricultural Risk Management in Development http://www.agriskmanagementforum.org/	3
	IAIS (2014): A Core Curriculum for Insurance Supervisors. Regulation and Supervision Supporting Inclusive Insurance Markets – Basic-Level Module	2
	https://a2ii.org/sites/default/files/field/uploads/2014_02_18_inclusive_insurance_module_final_draft_-_edited_0.pdf IFAD: Platform for Agricultural Risk Management (PARM) www.p4arm.org	
	CABFIN: partnership (Capacity Building in Rural Finance): Rural Finance and Investment Learning Centre (RFILC): Knowledge hub on rural finance and agricultural investment issues www.ruralfinanceandinvestment.org	



Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels



Guiding Questions
and Tools



STEP 3
Developing Insurance
Products at all Levels



Guiding Questions
and Tools



STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools



Expected Outputs
When Using the Tools

Box 9: Pitfalls in Insurance against Extreme Weather Events

Preparation: Insurance must be tailored to local needs and conditions. Without risk assessment and insurance demand studies, which consider DRM performance analysis, it is impossible to define the potential products and customers at the national, regional and local levels.

Integrated DRM approach: Insurance is not suitable as a 'stand-alone' instrument but must complement other DRM mechanisms.

Participation, transparency and accountability: Participation of potential customers and delivery channels in product design ensure ownership and higher acceptance of the product. Implementation processes, especially marketing and claims management, need to be transparent and accountable, otherwise customers lose trust, resulting in low renewal rates. This is even more important with index products because misunderstandings can arise about what is covered and what is not without good communication and education.

Product development: Products must be affordable and create value for the customer. The downsizing of traditional products neglects the particular needs of the clients, regardless of which level. Ensure that critical risks are not under-insured or that they are compensated by other mechanisms such as prevention or DRF.

Weather risk sequencing through the 'layered approach' can be a challenge as frequent events will not be insured (not affordable), while less-frequent but high-severity (approx. > 20 years) events will show low acceptance and renewal rates, especially if the insured suffered a loss and no payout was triggered. Scaling-up requires better client value (e.g. understanding clients' needs and linking the product to additional services to form hybrid models).

The client value of products and services: Due to the basis risk, the client value of index products can be a challenge if the insured suffers a loss but does not receive a payout. Linking index products with additional services that are beneficial to customers will enhance product value (e.g. agricultural and business training, access to credit, high-quality seeds, access to equipment, information on market prices, etc.). Insurances linked to prepaid phone cards create high numbers, but not necessarily client value.

Client value and sustainability assessment is crucial and must be checked (e.g. PACE method, ILO). Effective monitoring and evaluation systems such as the insurance key performance indicators measure outputs, outcomes and impacts and can ensure that the products actually reach and benefit the customers.

Delivery of products: Micro level products for low-income groups need non-traditional, effective and efficient delivery channels that are trusted by the customers. Organizations that are close to the insured are essential for scaling-up. The scope of mobile technology is often overrated; it can play an important administrative role (if regulation permits and IT security is ensured), although it has its limitation on awareness-building and the display of complex information. Governments have to ensure that macro level product payouts reach the poor and vulnerable (e.g. defined in contingency plans).

Capacity development: Insurance against extreme weather events is complex and still relatively new. Accordingly, capacity-building involves all stakeholders and covers programmes ranging from conceptual and strategy inputs via awareness and marketing campaigns to technical training and policy dialogue. Capacity-building is not a one-time event but rather a strategy containing a set of continuous, sequenced programmes of various methods.

Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels



Guiding Questions
and Tools



STEP 3
Developing Insurance
Products at all Levels



Guiding Questions
and Tools



STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

Sustainability: Setting up insurance schemes is a multi-year effort implying a long-term perspective. Affordability of products can challenge sustainability and could be enhanced, for example, through social protection schemes by paying market-based premiums through indirect macro level sovereign insurance, or smart subsidies.

For developing pan-national macro level insurance, the initial capital requirement exceeds the financial capacity of potential member countries. The international debate on climate change adaptation led to the international support of capital for sovereign pan-national insurance pools (African Risk Capacity, CCRIF, PCRAFI).

Ensure that insurance schemes do not incentivize practices that are not environmentally sustainable.

Enabling environment: Only a few countries have appropriate regulation of index products, pan-national pools and processes, and inclusive insurance. Even if suitable regulation is not in place, supervisors and regulators may grant permission on a case-by-case basis – although the dialogue has to start at an early stage of the project, otherwise the delivery may be at stake. Strengthening regulatory and legal frameworks that govern the market require long-term collaboration with national governments and regulatory and supervisory agencies.

Successful impact of any insurance solution also depends on how well products or schemes align with a country's development priorities.

Definition
STEPS
Brief Description

Involved Actors

A1. Insurance

STEP 1
Analysing and
Determining the
Need for Insurance

Guiding Questions
and Tools

STEP 2
Developing an Insurance
Strategy at all Levels



Guiding Questions
and Tools



STEP 3
Developing Insurance
Products at all Levels



Guiding Questions
and Tools



STEP 4
Building Insurance Capacity
at all Levels

Guiding Questions
and Tools

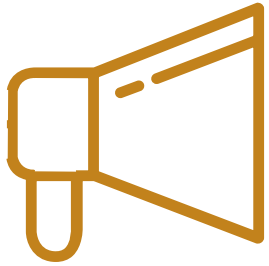


*Expected Outputs
When Using the Tools*



Expected Outputs When Using the Tools

- ✓ Insurance provides quick funds for timely relief and resilient recovery without putting tremendous strain on the fiscal budget to reduce the financial repercussions of volatility related to disasters.
- ✓ Index insurance could bridge the gap between slow disbursement of national funds to the local government and the affected population.
- ✓ Insurance enables individual producers, private enterprises and financial institutions to shorten business interruptions, reduce adverse coping strategies, start the recovery process quickly and expand the business.
- ✓ Macro level insurance payouts create a safety-net mechanism for the (extreme) poor and vulnerable.
- ✓ Meso level products for financial institutions contribute to continuing in lending business after disasters and may open opportunities for smallholder/pastoralists and MSMEs for easier access to credit.
- ✓ Micro level insurance products (especially forecast-based financing) contribute to enhanced agricultural development and food security.
- ✓ Insurance may give lenders and investors confidence that there is a mechanism in place for protecting their capital and may reduce the reluctance to investing in disaster-prone countries.
- ✓ Insurance promotes climate resilience by catalysing other mechanisms in the process of comprehensive risk management (anticipate), protecting against extreme weather events and climate shocks (absorb), and promoting growth by unlocking opportunities (adapt).



PHASE 3

Preparedness

A
B

Definition

The 'preparedness' phase is the "knowledge and capacities developed by governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current (weather-related) disasters (United Nations General Assembly, 2016)". Preparedness is a part of the Emergency Response Preparedness (ERP) approach developed by the Inter-Agency Standing Committee (IASC) (IASC, 2015) and contains the following components:

- A Risk monitoring and Minimum Preparedness Action.**
- B Advanced Preparedness Actions plus contingency planning.**

Brief Description

Preparedness builds on the 'prevention' phase and sets the ground for the government and other agricultural stakeholders to understand, develop and coordinate an effective response and recovery system. It includes all actions for reducing loss and damage across actors at national and local levels, but also across borders reaching other potentially affected countries.

The ERP approach reflects the IASC Transformative Agenda, ensuring that response preparedness efforts of relevant organizations are inclusive and coordinated. Legal frameworks and capacities are to be in place prior to the disaster. All preparedness efforts must be supported by formal institutional, legal and budgetary capacities and take place at all levels (more details in Phase 4 Response and 5 Recover).

This applies also to social protection systems that 1) aim at enhancing the economic and social situation of the extreme poor and vulnerable (disaster-independent assistance) and 2) programmes that come into effect after extreme weather events. Organizations such as the FAO developed the concept of 'risk-informed and shock-responsive' social protection systems, based on the results of the risk and vulnerability assessment (see Annex 2). It includes early action plans and contingency funds triggered by early warning systems. Further, humanitarian aid may be disbursed through social assistance delivery mechanisms, assuming they are effective.



PHASE 3

Preparedness

A
B

*Overarching questions
from an insurance perspective*

Involved Actors

Due to the multitude of activities that need to be coordinated simultaneously, various stakeholders at national and local levels are involved with the support of humanitarian international organizations like UNOCHA, IFRC and national and international meteorological agencies (e.g. World Meteorological Organization) for weather forecasts.

For the agricultural sector at the national level, the Ministry of Agriculture needs to lead, together with the Ministry of Finance and ministries related to humanitarian response and emergency, and in close cooperation with affected ministries such as rural development, transport and infrastructure. At the meso level, the sub-national government collaborates with the media, the private sector, civil society and communities (further details under Phase 3.A Step 2 Cross-Cutting Coordination). Local banks have an important function as the demand for emergency loans increases significantly after extreme weather events (see [Phase 2.A Pre-Disaster Financing](#)).

The two components aim at answering the following key questions:

- Which preparedness mechanisms complement preventive measures, disaster financing and insurance to reduce potential losses and damages in the agricultural sector?
- What are the consequences of preparedness measures on insurance?
- How can the insurance industry contribute to enhancing preparedness?



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

STEP 1 Setting Up Early Warning Systems



Guiding Questions and Tools

STEP 2 Cross-Cutting Coordination

Guiding Questions and Tools

STEP 3 Cross-Cutting Capacity Development

Guiding Questions and Tools



Expected Outputs When Using the Tools

A. Risk Monitoring and Minimum Preparedness Action

Definition

The risk analysis and monitoring of the ERP approach is considered to be the first component under the 'prepare' phase. This is already described in Phase 1 Prevention (see section A Risk Assessment). In general, the risk analysis identifies the extreme weather events that could cause a loss and determines whether thresholds are low, medium or high. The development of a contingency plan is recommended when risk thresholds are defined to be medium or above (see [Phase 2.A Step 3](#)). The risk monitoring should be undertaken to provide early warnings, which allow for early action such as scale-up of drought-resilient agricultural cultivation practices, and dissemination of climate information to support decision-making.

STEPS

The ERP and Minimum Preparedness Action cluster a wide range of activities under four broad categories: 1) risk monitoring, 2) coordination, 3) needs assessment and information management, and 4) operational capacity and arrangements to deliver relief programmes. Out of these categories, only those activities that are of specific relevance for the insurance focus of the publication are selected:

- 1) **Early warning systems.**
- 2) **Coordination (cross-cutting).**
- 3) **Capacity development (cross-cutting).**

Brief Description

Minimum Preparedness Actions are a set of activities that every country team must implement in order to establish a minimum level of emergency preparedness. The MPAs are not risk-specific and usually do not require significant additional resources to implement activities such as preparing for joint needs assessments, gap analysis, information management, coordination and operational capacity. Developing an early warning system is one crucial activity under the MPA and a basis for early action.

Involved Actors

See the introduction section of the 'Preparedness' phase, above.

Definition
STEPS
Brief Description
Involved Actors



SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

STEP 1
Setting Up Early Warning Systems



Guiding Questions and Tools

STEP 2
Cross-Cutting Coordination

Guiding Questions and Tools

STEP 3
Cross-Cutting Capacity Development

Guiding Questions and Tools



Expected Outputs When Using the Tools

SYNERGIES: INSURANCE AND THE MPA PREPAREDNESS

Early warning could lower insurance premiums

Establishing early warning systems and strategies is most crucial for protecting people and their assets (including public infrastructure). In addition, better asset protection through ‘early warning – early action’ could possibly lower the cost of premiums for indemnity-based insurance (micro level) and of index products for governments (macro level).

The insured to take corrective action prior to the extreme weather event when the payout of index insurance is triggered by early warning information before the event occurs.

Early warning could trigger ‘forecast-based payouts’ for reducing the impact of disasters

EXAMPLE: The African Risk Capacity is a pan-African agency that provides weather insurance to African governments for risks within the agricultural sector, e.g. flood and drought. It develops a complex early warning service as part of a comprehensive insurance solution, African RiskView, that combines existing rainfall-based early warning models on agricultural drought with data on vulnerable populations for estimating food insecurity response costs across the continent. The information on probable maximum costs of drought-related responses before an agricultural season begins is critical for financial preparedness for drought, and for providing the basic infrastructure needed to establish and manage a parametric risk pool, and trigger early disbursements (‘forecast-based payout’). It further helps in preparing contingency planning and investment decisions aimed at enhancing agricultural productivity or market development.

Insurance data useful for preparedness – early warning

Involving the insurance industry in data provision for weather forecasts enhances the quality of early warning systems in the agricultural sector.

Significant data for setting up an agricultural monitoring framework and a food security early warning system can be obtained from the insurance industry (see Box 10, below).

Coordination with insurers smoothens payouts after disasters

Including insurers in the coordination mechanisms can enable them to prepare for effective payout structures that need the cooperation of other agencies after extreme weather events when public infrastructure is damaged (see Philippines example in [Phase 4.A Step 2](#)).

Insurers can enhance the capacity of governments

The information of pan-national insurance pools and reinsurers can enhance the capacity of governments when developing their DRM strategies.

EXAMPLE: ARC services include an up-to-one-year capacity development period to the member governments for developing a tailored insurance coverage, contingency plans, and prevention mechanisms for BBB.

Governments can contribute to risk and insurance awareness-building

Insurance literacy can be integrated into government agricultural, veterinary and DRM awareness campaigns, especially when conducted with a long-term view (e.g. through agricultural extension services or national disaster management agencies/offices).



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action



STEP 1 Setting Up Early Warning Systems



Guiding Questions and Tools

STEP 2 Cross-Cutting Coordination

Guiding Questions and Tools

STEP 3 Cross-Cutting Capacity Development

Guiding Questions and Tools



Expected Outputs When Using the Tools

STEP 1: Setting Up Early Warning Systems

Effective early warning systems contain a set of systems to enable threatened populations and public authorities at the national and local levels to prepare to act promptly. For the agricultural sector, early warning systems enable governments and organizations to manage humanitarian crises such as severe food insecurity, and animal disease outbreaks caused by extreme weather events. At the community level, these systems advise individual producers and entrepreneurs on the likelihood of a threat and how to reduce its potential impact. Early warning is the basis for the broader concept of 'early warning – early action', which is a paradigm shift. A comprehensive early warning system contains the following:

- The **'warning'** system includes hazard information, monitoring and forecast, preferably with sufficient and consistent data.
- The **'information'** system analyses areas and populations likely to be affected and places this information into the warning messages. These are measures that community members could use to exploit the forecasted seasonal climate: for example, farmers could receive information on planting time, good farm management practices, choice of inorganic fertilizers and use of farm manure, suitable crop types and varieties, and available seed suppliers. For pastoralists, water and fodder availability, bushfire information, legal information and also a livestock-movement monitoring system would be useful. Analysis from the local level adds to a precise knowledge of the producers' situation.
- The **'communication'** system allows timely communication on potentially occurring extreme weather events for quick decision-making and authoritative warnings.

Box 10: Illustration of Early Warning Systems for Drought, Excessive Rainfall and Temperature

The impacts of agricultural failure due to extreme weather events could be better managed with improved climate prediction and enhanced monitoring capabilities. The key components of an **agricultural monitoring framework** include seasonal forecasting, agro-meteorological monitoring and post-harvest assessments.

This monitoring provides an early estimation of the quality of the agricultural season and the expected production by mid-growing season. Baseline pre-season weather risk analysis combined with agricultural monitoring will provide a clear indication of who will be affected and what type of (humanitarian) response is required. It would help farmers to make informed decisions.

Significant parts of this information can be obtained from the insurance industry, hence benefiting the preparedness development process.

This information is further fed into **food security early warning systems** and can help decision-making bodies such as agricultural planners to advise seasonal agricultural strategy (planting schedules, fertilizer distribution, seed choice, etc.), future food and marketing needs, further grazing areas for livestock, etc. It will further help government officials, external humanitarian agencies and NGOs to assess food security and relief food requirements.

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action



STEP 1
Setting Up Early Warning Systems



Guiding Questions and Tools

STEP 2
Cross-Cutting Coordination

Guiding Questions and Tools

STEP 3
Cross-Cutting Capacity Development

Guiding Questions and Tools



Expected Outputs When Using the Tools

- The **'early warning – early action'** concept uses the time provided by reliable and specific early warning information for directing preparedness towards those at most risk, increasing the level of inputs to (development) programmes, and allocating additional resources (e.g. call-down contingencies, reallocate budget funds proactively, broaden food and cash safety nets). Many programmes go beyond traditional humanitarian activities and support community resilience (e.g. making repairs to water sources, mobilizing extension services and veterinary support, farmers selling their harvest prior to the extreme weather event occurring). This is especially successful with slow-onset events such as drought, allowing producers to make substantial adjustments.

Essential parts of the 'early warning – early action' structure are:

- A legal base for the early warning system and the coordination framework.
- National ownership of the coordination platform, with the Early Action agenda, formally included within its mandate and documented in a contingency plan for early action.
- Transparency and trust, developing a shared vision among all stakeholders at all levels, a strengthened evidence base and a common commitment to open communication.

Box 11: Livestock 'Early Warning – Early Action' System in Ethiopia (IFRC/WFP/FAO, 2014)

The Pastoralist Livelihoods initiative used preparedness for improving the livelihoods and resilience with the following early action activities:

- Emergency livestock health interventions.
- Livestock supplementary feeding.
- Water infrastructure rehabilitation.
- Livestock diversification.
- Commercial destocking using market approaches.
- Slaughter destocking.

- The **'forecast-based financing' insurance** concept is particularly successful when the payout of innovative index insurance products are triggered by early warning information, enabling the insured to take corrective action with the funding received by the insurer (see Box 12, below).

Box 12: Insurance Example: Extreme El Niño Insurance Product, La Positiva Seguros

Early warning enables **forecast-based financing** that triggers funds to be paid prior to the extreme weather event to potentially affected population, e.g. the Extreme El Niño Insurance Product (EENIP), which is based on the sea surface temperature data gathered by the U.S. NOAA (National Oceanic and Atmospheric Administration). If sea surface temperatures exceed the temperature defined in the policy conditions, La Positiva Seguros pays the sum insured before an extreme El Niño weather event occurs. The insured know the amount they will receive and can begin the procurement at an early stage.

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action



STEP 1
Setting Up Early Warning Systems

-

□ Guiding Questions and Tools

STEP 2
Cross-Cutting Coordination

Guiding Questions and Tools

STEP 3
Cross-Cutting Capacity Development

Guiding Questions and Tools

-

Expected Outputs When Using the Tools

GUIDING QUESTIONS AND TOOLS

		Complexity ¹⁴
Guiding questions	How to develop early warning systems?	
	Does the early warning system include the concept of ‘early warning – early action’?	
Guidelines	Early Warning Conference (EWC) III (2006): <i>Developing Early Warning Systems: A Checklist</i> . Third International Conference on Early Warning, Bonn	3
	http://www.unisdr.org/files/608_10340.pdf	
	IFRC/WFP/FAO (2014): <i>Early Warning, Early Action – Mechanisms for Rapid Decision Making</i> http://www.droughtmanagement.info/literature/IFRC_Early_Warning_Early_Action_2014.pdf	
Platform	FAO platform describing the concept, country experiences and the early action fund http://www.fao.org/emergencies/fao-in-action/ewea/en/	2
Guiding questions	Are early warning messages and their respective modes of delivery tailored to the different recipient groups?	
Tools	Focus group discussions with all potentially affected groups. For the agricultural sector, especially farmers, herders and the agricultural value change enterprises.	3
Guiding questions	Is the early warning system linked to insurance policyholders?	
Source of information	African Risk Capacity insurance pool http://www.africanriskcapacity.org/ <i>Example of forecast-based financing insurance: La Positiva Seguros, Peru</i> http://seguros.riesgoycambioclimatico.org/publicaciones/Nota-Tecnica2-eng.pdf	3

¹⁴ According to the testing in Ghana 1 means very complex, skills required, 2 medium complex, 3 low complexity and easy to use. 0 means that the tool was not tested. The ranked tools listed on top were considered to be most relevant.



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

STEP 1 Setting Up Early Warning Systems



Guiding Questions and Tools



STEP 2 Cross-Cutting Coordination

Guiding Questions and Tools

STEP 3 Cross-Cutting Capacity Development

Guiding Questions and Tools



Expected Outputs When Using the Tools

STEP 2: Cross-Cutting Coordination

Coordination is cross-cutting and relevant for all preparedness components as well as to response and recovery (see further details in Phases 4 and 5). The concept of early warning – early action requires the coordination with actors involved in prevention.

Effective coordination mechanisms and communication strategies involve all stakeholders at all levels:

- **Inter-ministerial coordination between national and local government agencies:** e.g. periodically updating disaster preparedness plans to develop institutional structures with a legal mandate for post-disaster land-use and physical planning, ensuring that existing policies are in line with the weather-related risk identified in the risk and impact assessments.
- **Private sector:** e.g. for applying enhanced building codes, strengthening mobile technology for emergency events, training of staff members.
- **Insurance industry:** e.g. insurance providers, jointly with the MoF and regulators, could define scenarios for quick payouts after extreme weather events when infrastructure is damaged (for further details see **4.A Response with Various Relief Programmes**); such a system could be integrated with response monitoring that measures who receives relief and recovery assistance, what assistance is delivered to them and what results are achieved.
- **Civil society:** e.g. linking NGO local preparedness plans with national government plans, spreading early warnings to communities.
- **Communities:** e.g. contributing to local preparedness plans, disseminating early warnings, participating in DRM activities.
- **External actors** such as international relief organizations and donors (see involved actors in the introduction of the ‘preparedness’ phase, above).

A clear understanding of roles and responsibilities enables all the actors to establish a working relationship and enhance the participation of all stakeholders at every level, particularly communities (see Box 13, below).

Actor structure and responsibilities for ERP planning are:

- Led by a Resident/Humanitarian Coordinator.
- Managed by a Humanitarian Country Team.
- Supported by an inter-cluster/sector coordination group representing affected clusters/sectors.
- Implemented by a broad range of actors at the sub-national level, including civil society and the private sector.

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

**STEP 1
Setting Up Early Warning Systems**

Guiding Questions and Tools



**STEP 2
Cross-Cutting Coordination**

Guiding Questions and Tools

**STEP 3
Cross-Cutting Capacity Development**

Guiding Questions and Tools

Expected Outputs When Using the Tools

GUIDING QUESTIONS AND TOOLS

	Guiding questions	Complexity
	What institutions are needed for coordinating and executing preparedness activities in the national preparedness plan(s)?	3
	What are their roles and responsibilities?	
Platforms	World Meteorological Organization, Multi-Hazard Early Warning System (WHEWS) platform: Seven good practices and principles common to all, irrespective of political, social and institutional settings http://www.wmo.int/pages/prog/drr/projects/Thematic/MHEWS/MHEWS_en.html	3
	Famine Early Warning Systems Network (FE WSnet) https://www.fews.net/	
Guideline	Inter-Agency Standing Committee – IASC (2015): <i>Emergency Response Preparedness (ERP) – risk analysis and monitoring, minimum preparedness, advanced preparedness and contingency planning</i> https://interagencystandingcommittee.org/system/files/emergency_response_preparedness_2015_final.pdf	3
Guiding questions	Are the relevant policies and legal frameworks in place for quickly implementing response and resilient recovery activities?	3
Guidelines	EU/UNEP/World Bank/GFDRR (2015): Guide to developing disaster recovery frameworks, Sendai Conference version https://www.gfdr.org/sites/gfdr/files/publication/DRF-Guide.pdf	3
	International Federation of Red Cross and Red Crescent Societies, IFRC (2012): <i>IFRC Recovery programming guidance 2012</i> http://www.ifrc.org/PageFiles/41104/IFRC%20Recovery%20programming%20guidance%202012%20-%20201232900.pdf	
Guiding questions	If weather-related insurance is integrated into the DRM strategy, are insurance providers included in the coordination processes?	3
Tools	Focus group discussion with the relevant government officials, including MoF and regulators, the insurance industry and technology providers (if involved in payout processes).	



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

STEP 1 Setting Up Early Warning Systems



Guiding Questions and Tools

STEP 2 Cross-Cutting Coordination

Guiding Questions and Tools



STEP 3 Cross-Cutting Capacity Development

Guiding Questions and Tools



Expected Outputs When Using the Tools

STEP 3: Cross-Cutting Capacity Development

The ability to respond in the immediate aftermath of an extreme weather event depends on the level of operational readiness in place. Capacity-building and gap analysis of government agencies highlight the level of required capacities of all actors. This is particularly relevant for ministries, as the government has a key role to play and the staff is frequently changing. Operational preparedness aims to reduce this gap and indicates the minimum level of readiness for delivering humanitarian assistance and protection according to international standards.

Box 14: Example of the Sub-Saharan Africa Regional Climate Outlook Forums

In sub-Saharan Africa, regional climate outlook forums provide seasonal climate forecasting. They have been organized jointly by the regional meteorological institutions, the World Meteorological Organization and the International Research Institute for Climate and Society (IRI), with funding support from donor agencies.

This entails competence for activities such as (further details in Phase 4 Response and Phase 5 Recover):

- Baseline situation analysis and (post-disaster) needs assessments, including gender analysis to identify underlying inequalities and vulnerabilities to be counterbalanced during response and resilient recovery.
- Information management with a systematic process of collecting, processing, verifying and analysing sex- and age-disaggregated data and information, and disseminating relevant information to the involved actors.
- A central legal framework for resilient recovery ensuring that the laws, processes and protocols are appropriate for responding when extreme weather events occur and incentivising BBB instead of looking for a 'quick fix'.
- Contingency plans and early action contingency plans (for further details see **Phase 3.B Step 2 Developing Contingency Planning**).
- Appropriate communication systems and strategies with and for all actors (e.g. the media, international humanitarian organizations, local NGOs and civil society, including women's organizations) to ensure the timely flow of information before and during an emergency.
- Disaster preparedness exercises and training for emergency scenarios with the population, civil society organizations and entrepreneurs.

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

**STEP 1
Setting Up Early Warning Systems**



Guiding Questions and Tools

**STEP 2
Cross-Cutting Coordination**

Guiding Questions and Tools



**STEP 3
Cross-Cutting Capacity Development**

□ Guiding Questions and Tools



**Expected Outputs
When Using the Tools**

GUIDING QUESTIONS AND TOOLS

		Complexity
Guiding questions	What are the key capacities needed for implementing preparedness activities?	
	Was a capacity-building assessment conducted and what were the identified gaps, if any?	3
Guidelines	IASC (2015): <i>Emergency Response Preparedness (ERP) – risk analysis and monitoring, minimum preparedness, advanced preparedness and contingency planning</i>	
	https://interagencystandingcommittee.org/system/files/emergency_response_preparedness_2015_final.pdf	
	UN OCHA (2013): <i>Disaster response in Asia and the Pacific – A Guide to International Tools and Services</i>	3
Guideline	http://www.unocha.org/publications/asiadisasterresponse/	
	Platform containing various organizations that offer capacity development, including training courses in development	3
Guiding questions	Is there up-to-date stakeholder mapping and are the relevant stakeholders sufficiently trained for operationalizing their tasks?	
	How are the private sector and communities involved in preparedness measures?	
Training platforms	Gravitazz Institute for Disaster Reduction and Emergency Management conduct training and capacity development for all relevant stakeholders in Africa	
	http://gravitazzcontinental.com/	
	United Nations University – ITC School on Disaster Geo-Information Management (UNU-ITC DGIM), Twente – International Institute for Geo-information Science and Earth Observation (ITC) (2011): <i>Multihazard- Risk Assessment. Distance Education Course</i>	1
Database	https://www.itc.nl/	
	UNICEF-led Government WASH Cluster to support humanitarian response through operational information	1
Handbook	https://www.humanitarianresponse.info/	
	IASC (2006): <i>Gender Handbook in Humanitarian Action – Women, Girls, Boys and Men. Different Needs – Equal Opportunities</i>	
	https://www.humanitarianresponse.info/system/files/documents/files/Gender%20Handbook.pdf	

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

**STEP 1
Setting Up Early Warning Systems**

-

Guiding Questions and Tools

**STEP 2
Cross-Cutting Coordination**

Guiding Questions and Tools



**STEP 3
Cross-Cutting Capacity Development**

Guiding Questions and Tools

- ●

*Expected Outputs
When Using the Tools*

Guiding questions	If insurance is part of the DRM strategy:	
	Is the insurance industry and are other organizations involved in insurance delivery capacitated for quick payouts after extreme weather events?	
	Are agricultural extension workers trained for insurance literacy awareness-building?	
Training platforms	GIZ (2014): <i>Aiding the disaster recovery process – The effectiveness of microinsurance service providers’ response to Typhoon Haiyan</i> https://microinsurancenet.org/sites/default/files/MIN_Typhoon%20Paper_WEB.pdf	
	More tools for insurance training in Phase 2.A.1 Insurance .	
	Focus group discussion with the relevant government officials, including MoF and regulators, the insurance industry, delivery channels (e.g. NGOs, MFIs) and technology providers (if involved in payout processes).	3



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Risk Monitoring and Minimum Preparedness Action

STEP 1
Setting Up Early Warning Systems

-

Guiding Questions and Tools

STEP 2
Cross-Cutting Coordination

Guiding Questions and Tools

STEP 3
Cross-Cutting Capacity Development

Guiding Questions and Tools

-



Expected Outputs When Using the Tools

Expected Outputs When Using the Tools

- ✓ Enhanced preparedness capacities contribute to efficient managing of extreme weather events, resulting in an orderly transition from response toward sustainable recovery.
- ✓ Plans for and implementation of comprehensive early warning systems save lives and reduce losses, resulting in lower costs for response and recovery.
- ✓ Strategy plans for effective coordination, planning and exchange of information enable the government to reach out to the affected population and speed up the recovery process.
- ✓ Insurance-related outputs (see page 90 'Synergies: Insurance and the MPA Preparedness').

- INTRODUCTION
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- PHASE 5





Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action

STEP 1

Implementing APA
Activities – Stockpiling
and Storage Facilities

Guiding Questions
and Tools

STEP 2

Developing Contingency
Planning

-
-

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

B. Advanced Preparedness Action

STEPS

The ERP – APA clusters the wide range of activities under two broad categories: 1) (various) advanced preparedness actions and 2) contingency planning. Out of these categories, only those activities are selected which are of specific relevance for the insurance focus of the publication:

1) Organizing APA activities, e.g. stockpiling of relief goods.

2) Contingency planning.

Brief Description

The APA builds on the MPAs but responds to a **specific risk** and aims at guiding the Humanitarian Country Team and sector institutions (e.g. MoA) to an advanced level of readiness. This considers the results of the MPA gaps analysis and further tasks that may have started under the MPA, such as developing an information sharing and media strategy, reviewing of Standard Operating Procedures and developing an inter-agency response planning task force.

The second component is contingency planning that fosters a common understanding of all partners involved and defines the response strategy and an operational plan to meet critical humanitarian needs. The contingency plan is one component of the overall response planning process.

Box 15: National Drought Mitigation Centre: 10-Step Drought Planning Process for Response (Lesukat, 2012)

1. Appoint a drought task force or committee.
2. State the purpose and objective of the drought mitigation plan.
3. Seek stakeholder input and resolve conflicts.
4. Inventory resources and identify groups at risk.
5. Prepare and write the drought mitigation plan.
6. Identify research needs and fill institutional gaps.
7. Integrate science and policy.
8. Publicize the drought mitigation plan and build awareness and consensus.
9. Develop education programmes.
10. Evaluate and revise drought mitigation plans.



Definition
STEPS
Brief Description



Involved Actors
SYNERGIES

B. Advanced Preparedness Action

STEP 1
Implementing APA
Activities – Stockpiling
and Storage Facilities

Guiding Questions
and Tools

STEP 2
Developing Contingency
Planning

-
-

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

Involved Actors

See the introduction section of the 'Preparedness' phase, above.

SYNERGIES: INSURANCE AND APA PREPAREDNESS

Stocktaking helps affected population to re-start faster and lessen suffering if index insurance payout was not triggered

Fodder and grain storage helps livestock to overcome extreme weather events and affected farmers to re-start planting. This is particularly important if the insurance product does not trigger a payout due to the basis risk.

Example: Grain reserves, part of ARC contingency plans, enable farmers to restart business quickly and national food aid systems can reduce the cost of food aid and food assistance disbursements.

Insurance for relief facilities/ materials speed up response programmes

If relief material and storage facilities are to be insured, the government would have quick funds available for replacing damaged emergency supplies and contributing to applying the concept of building back better to evacuation centres and storage facilities.

Macro level insurance contingency plans benefit the vulnerable population

As macro level indirect insurance payouts are not always spent in a way that benefits affected populations, contingency plans can be an effective tool when defining target groups for disseminating payouts to the affected poor and vulnerable population.

Defining payout processes and identifying delivery channels contribute to quick insurance payouts that enable the affected population and government to start response and resilient recovery programmes faster.

EXAMPLE: ARC incorporates all aspects in the contingency plans of its insured member countries. The contingency plans should be considered as strategies for the 'response' phase and integrated into national planning processes (see Box 17, below)

(Re)insurance data useful for preparedness (contingency plans)

Contingency plans are most effective when integrated into an emergency preparedness framework, for instance by defining that payouts are to be spent for prevention, response and recovery. (Re)insurers' data contribute to funding needs assessment for response and recovery.



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action



STEP 1 Implementing APA Activities – Stockpiling and Storage Facilities

Guiding Questions
and Tools

STEP 2 Developing Contingency Planning

-
-

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

STEP 1: Implementing APA Activities – Stockpiling and Storage Facilities

Identifying and implementing preparedness measures are based on impact and DRM analysis as well as the MPA gaps analysis. The government, jointly with the assistance of civil society organizations and private actors, organizes all activities needed for establishing a comprehensive and effective preparedness strategy. Out of the many activities, only stockpiling and the required storage facilities are described below as they are particularly important for the population and could be insured. The activities are:

- Stockpiling of equipment and supplies that include emergency storage facilities of necessary relief materials and food for affected population (e.g. fodder for livestock).
- Enhancing the resilience of storage facilities and (evacuation) centres as they themselves can be affected by extreme weather events. The same applies to critical infrastructures such as electricity, water supply or transportation. The role of private businesses and Private-Public Partnerships is crucial when establishing resilient infrastructure, storage facilities and buildings according to building back better standards.
- Insuring basic relief material and storage facilities could equip the government with the funds for replacing damaged emergency supplies and contribute to applying the concept of building back better for the emergency centres and storage facilities. It further reduces the costs of food aid after the extreme weather event.

Box 16: Example of Emergency Food Security Reserve of Ethiopia

The **emergency food security reserve** of Ethiopia is an example that attempts to pre-position food stocks in remote and vulnerable areas. Food reserve systems should be complemented with local purchase when local production is high and local markets are threatened.

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action



STEP 1
Implementing APA
Activities – Stockpiling
and Storage Facilities

□ Guiding Questions
and Tools

STEP 2
Developing Contingency
Planning
●
●

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

		Complexity ¹⁵
Guiding questions	Are the applied preparedness activities sufficient for effective response programmes?	
	Are storage and evacuation facilities identified and known by all actors including community members?	
Tools	Local government/municipality mapping of evacuation centres and storage facilities.	3
	Semi-structured interviews with local government officials, individual producers and communities, members of business associations and cooperatives, and civil society organizations.	3
Guiding questions	Are the storage and evacuation facilities resilient to extreme weather events?	
	Which building standards were applied?	
	Would insurance be a useful mechanism for rebuilding damaged storage facilities/evacuation centres and quick restocking of relief supply?	
Tools	UN World Conference on DRR, 14. 18.3.2015, Sendai, Japan, ISSUE BRIEF: <i>Reconstructing After Disasters – Build Back Better</i> https://www.unisdr.org/archive/43289	2
	Insurance (see Phase 2.A.1 Insurance).	

¹⁵ According to the testing in Ghana 1 means very complex, skills required, 2 medium complex, 3 low complexity and easy to use. 0 means that the tool was not tested. The ranked tools listed on top were considered to be most relevant.



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action

STEP 1
Implementing APA
Activities – Stockpiling
and Storage Facilities

Guiding Questions
and Tools



STEP 2
Developing Contingency
Planning

-
-

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

STEP 2: Developing Contingency Planning

Contingency planning results in contingency plans that need to be specific and are based on the risk and impact analysis and the MPA gaps analysis. They include recurrent local weather risks of a lower magnitude that can be multi-dimensional. Contingency plans should communicate anticipated funding requirements and support the timely drafting of a Flash Appeal in the event of an extreme weather event – they need a regular update. Sector-level contingency/preparedness plans (e.g. agricultural sector) form a part of the national contingency plan.

Box 17: General Contingency Activities

- Situation and risk analysis (including gender and diversity analysis).
- Development of a response strategy (including regular update).
- Operational delivery resulting in a cluster summary plan.
- Coordination and management arrangements.
- Operational support arrangements.
- Identification of preparedness gaps and actions (preferably, this includes contingency plans for early action).
- Funding requirements.

The following is an example of drought contingency planning (can be applied to any other agricultural extreme weather event):

- **Cyclic approach:** Drought management takes drought as a cyclic event that starts with drought planning, including DRR (during normal phases), to drought response (in critical and emergency phases). Drought preparedness and mitigation feeds into contingency planning, while contingency plans inform effective drought responses and vice versa.
- **Key activities:** Risk assessment and its impacts, describing seasonal calendars that are a basis for drought contingency planning and should be embedded into drought contingency plans. Developing scenarios and defining timelines for the selected activities (to be integrated into the seasonal calendar that is included in the contingency plan). Decide what support is needed at each stage of the drought (see also Annex 5 Gender Roles in Emergency Livestock Activities).
- **Institutional framework:** For example, Kenya has a drought management authority responsible for overall drought risk management, collaborating and coordinating partners at the national platform for DRR.



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action

STEP 1
Implementing APA
Activities – Stockpiling
and Storage Facilities

Guiding Questions
and Tools



STEP 2
Developing Contingency
Planning

- ●
-

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

Key components of a drought management system

(Lesukat, 2012):

- A national drought management policy.
- A drought early warning system.
- A set of district-level contingency (“shelf”) plans.
- A drought contingency (response) fund.
- Drought coordination and response structures.

Contingency plans that include **insurance** policies and payouts have to make sure that there is accountability and a monitoring and evaluation plan. These contribute to the development, or further enhancement, of a risk management information system, and also incentivize people to take early action (see Box 17, above).

Box 18: Insurance Example: ARC Contingency Plan Principles

ARC contingency plans ensure payouts and other benefits reach the extreme poor, as they cannot afford insurance premiums. As the plan covers a period of the first few months after the extreme drought, it has to be linked to the broader ERP concept and disaster recovery frameworks of the respective government.

Contingency planning is developed collaboratively between national governments, in-country partners and, where needed, the ARC Secretariat according to the following planning guidelines, e.g.:

- Time Sensitive and/or Catalytic: ARC payouts must be used for time-sensitive activities that would not be possible without ‘first available funds’ (ideally within 120 days).
- Livelihood enhancement: ARC payouts should not be used for general investment activities but for protecting livelihoods of beneficiaries who would be more negatively impacted if they needed to wait to receive assistance.
- Duration: Each activity should be completed within six months to ensure that financial resources are utilized in a timely and efficient manner.

EXAMPLE: Contingency plan – ARC Senegal (ARC, 2013)

ARC insurance is integrated into broader policies (e.g. the National Strategy for Economic and Social Development – SNDES and The Agricultural-Forestry-Livestock Framework Act – LOASP) and calculated along a five-year risk-return period and \$30m maximum coverage. The parameter is based on simulations conducted using the early warning Africa RiskView allowing an ARC payout in advance of a drought. The contingency plan (“Operations Plan”) takes into account existing national systems and deploys an ARC payout to support activities to reach needy households in a timely and cost-effective manner.



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action

STEP 1
Implementing APA
Activities – Stockpiling
and Storage Facilities

Guiding Questions
and Tools



STEP 2
Developing Contingency
Planning

-
- ●

Guiding Questions
and Tools

**Expected Outputs
When Using the Tools**

Activities

As drought would result in a deterioration of food and nutritional security for households and animals, the following support would be financed from ARC payouts: 1) food distribution and the distribution of food coupons (e.g. vulnerable 800,000 persons for 120 days), 2) supplementary feeding for children and mothers, and 3) implementing livestock relief operation.

Coordination (illustrated for activity 1 – food distribution/vouchers)

The Direction de la Protection Civile (DPC), as a part of the Ministry of Interior, would coordinate all ARC response activities at the central level. For each activity, one institution is defined to lead the implementation, using different sub-structures. The food assistance would be coordinated by the Food Security Steering Committee at the national level.

At the regional level, decentralized structures of the Ministry of Interior (local elected officials) would implement the activities. If needed, the government would use NGOs, the World Food Programme and/or the private sector as a channel to provide foodstuffs in areas where these partners have effective structures.

Targeting

Every year, a vulnerability assessment is conducted in cooperation with all major institutions involved in food security. This needs assessment would lay the basis for the identification of beneficiaries for activities financed with ARC payouts.

The flow of funds and M&E

The Ministry of Finance would allocate ARC funds to the respective institutions involved in the implementation of the activities within 48 hours. Each institution would be responsible for managing and accounting for the funds. The local institutions would send a monthly report on the disbursement status, coordinated by the DPC at the national level.

At the end of the operation, DPC would submit a final comprehensive operational and financial report to ARC (audited by the respective Senegalese ministries and the Auditor General's office, according to the jointly developed ARC terms of reference).



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action

STEP 1
Implementing APA
Activities – Stockpiling
and Storage Facilities

Guiding Questions
and Tools



STEP 2
Developing Contingency
Planning

-
-

□ Guiding Questions
and Tools

Expected Outputs
When Using the Tools

GUIDING QUESTIONS AND TOOLS

Guiding questions	Complexity
How to develop a contingency plan?	
Guidelines ISAC (2007): <i>Inter-agency contingency planning guidelines for humanitarian assistance</i> . IASC Sub-Working Group on Preparedness and Contingency Planning http://www.who.int/hac/network/interagency/ia_guidelines_dec2007.pdf IFRC (2012): Contingency planning guide http://www.ifrc.org/PageFiles/40825/1220900-CPG%202012-EN-LR.pdf	3
Guiding questions Is there a contingency plan for the sector that allows for the efficient, effective and equitable use of resources to appropriately meet humanitarian needs? Does the contingency plan ensure that resources and actions are directly linked to the different roles and responsibilities of each actor involved? How does the contingency plan ensure fast insurance payouts to the affected poor and vulnerable population?	
Guidelines FAO (2016): <i>Leaving No One Behind – Addressing climate change for a world free of poverty and hunger</i> http://www.fao.org/3/i6371en/i6371EN.pdf UNISDR/ EC (2012): <i>Drought Contingency Plans and Planning in the Greater Horn of Africa</i> http://www.unisdr.org/files/26436_droughtcontingencylow.pdf IFRC (2010): <i>A practical guide to Gender-sensitive Approaches for Disaster Management</i> http://www.ifrc.org/PageFiles/96532/A%20Guide%20for%20Gender-sensitive%20approach%20to%20DM.pdf	3
Source of information Reports on DRF and risk transfer experience and sustainable concepts (e.g. African RiskView has a wide range of applications for governments, and development and humanitarian actors, in addition to the role it plays in supporting the African Risk Capacity – ARC) http://www.africanriskcapacity.org/	3
Guiding questions Is macro level insurance linked to contingency plans?	
Example Example of contingency plans integrated into macro level insurance: African Risk Capacity contingency plans covering poor/vulnerable population.	3



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Advanced Preparedness Action

STEP 1
Implementing APA
Activities – Stockpiling
and Storage Facilities

Guiding Questions
and Tools

STEP 2
Developing Contingency
Planning

-
-

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

Expected Outputs When Using the Tools

- ✓ APA enables the government to deliver effective and efficient relief, and protection to affected people.
- ✓ Contingency plans (with regular updates) allow for the efficient, effective and equitable use of resources to appropriately meet humanitarian needs, including processes for distributing insurance payouts to the affected poor and vulnerable population.
- ✓ Stocktaking of relief equipment and supplies in resilient storage facilities speeds up response activities and avoids further losses.
- ✓ Insurance-related outputs (see page 90 'Synergies: Insurance and APA Preparedness').





PHASE 4

Response

A

B

*Overarching questions
from an insurance perspective*

Definition

Response is defined as “actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected (United Nations General Assembly, 2016)”. The ‘response’ phase consists of two components:

A Response – with relief programmes.

B Post-disaster financing.

Brief Description

Effective and efficient response activities rely on disaster risk-informed preparedness strategies, and action defined in contingency or preparedness plans (see Phase 3). This includes the development of the response capacities of all actors (e.g. individuals, communities, civil society organizations, the private sector and government agencies). Despite well-strategized plans, a general problem with the emergency appeal-based fundraising is that it is based on voluntary contribution. That makes humanitarian aid often too unreliable and unpredictable to be taken into the decision-making process by recipient governments and people. Any humanitarian response can only complement local efforts to optimize the impacts.

The two components aim at answering the following key questions:

- What is the effect of insurance on response and relief programmes – and subsequently on the affected population, the private sector and the government?
- Can insurance better integrate agro-meteorological and climate information in humanitarian decision-making processes?
- Can insurance reduce the adverse impacts of ex post financing?



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes

STEP 1
Post-Disaster
Needs Assessment

Guiding Questions
and Tools

STEP 2
Relief Programmes and
Alternative Livelihoods

Guiding Questions
and Tools

STEP 3
Policy Adjustment of Existing
Legal Frameworks and
Strategies

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

A. Response – with Various Relief Programmes

Definition

“Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief (UNISDR Knowledge Platform, 2017).” Response in the context of the agricultural sector means supporting households with opportunities to engage in productive and sustainable livelihood strategies and is closely linked to food security, though not exclusively.

Steps

Response contains the following steps:

- 1) **Post-disaster needs assessment (PDNA).**
- 2) **Relief programmes and alternative livelihoods.**
- 3) **Policy adjustment of existing legal frameworks and strategies.**

Brief Description

Disaster response is predominantly focused on immediate and short-term needs. Response strengthens the quality and impact of relief programmes, while recognizing that decisions made at the response stage can have a significant impact on early recovery, as these processes are interlinked. By developing a framework to manage recovery, a government may be able to better address longer-term disaster vulnerability through coherent programmes that bridge the current gap between recovery and development.

Actors Involved

“Emergency services are a critical set of specialized agencies that have specific responsibilities in serving and protecting people and property in emergency and disaster situations (United Nations General Assembly, 2016).” Though everybody affected is involved in relief activities, according to its own capacity it is the overall responsibility of the national government to set up a ‘lead agency’ for managing the response and recovery process. The ‘lead agency’ could be structured according to the following options:

- Strengthen existing sectoral line ministries, which would be the ministry of agriculture for reconstructing the agricultural sector.
- Create a new institution to manage recovery.
- A hybrid arrangement of both; the ministry of finance and departments of humanitarian assistance are always involved.

The PDNA, but also the subsequent recovery process, includes participation of the relevant government ministries (e.g. agriculture, infrastructure, and rural development), civil society, the private sector and the affected communities, often with the support of international organizations such as the World Bank, the United Nations system, or the European Union, and with humanitarian relief organizations such as the Office for the Coordination of Humanitarian Affairs and the International Federation of Red Cross and Red Crescent Societies.



Definition
STEPS
Brief Description
Involved Actors



SYNERGIES

A. Response – with Various Relief Programmes

STEP 1
Post-Disaster
Needs Assessment

Guiding Questions
and Tools

STEP 2
Relief Programmes and
Alternative Livelihoods

Guiding Questions
and Tools

STEP 3
Policy Adjustment of Existing
Legal Frameworks and
Strategies

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

SYNERGIES: INSURANCE AND RESPONSE

Anticipating potential losses	Insurance is a tool to anticipate potential loss and damage and enhances the ability to estimate the impact of weather events on individuals, the private sector and countries.
Enabling governments to plan better	Insurance policies provide information prior to an event about the payout amount and the disbursement time, allowing governments (and other insured) to plan their post-disaster response and relief efforts accordingly.
Reducing liquidity gaps	Insurance (and pre-disaster financing) ensures the availability of funds for post-disaster response and recovery, although insurance should not be the means for paying for response and recovery per se. Index products especially reduce government liquidity gaps after extreme weather events and relax ad hoc budget redistribution that disrupts the development plans of the state.
Immediate start of the response	The appeal-based fundraising process of international humanitarian agencies is time-consuming and may take about eight months from identification of crop failure to humanitarian aid delivery. Index insurance payout is attempted to happen within three weeks, enabling the government to start relief programmes quickly.
Depoliticize disaster responses	As insurance payouts are defined in insurance policies, they follow objective indices, hence helping to depoliticize disaster responses.
Quick re-start of business	The private sector would benefit as quick payouts enable SMEs to restart their business operations, hence limiting post-disaster impacts on the economy (details in Phase 2.A.1 Insurance).
Avoid slipping back into poverty	For the affected population, insurance can play a role as a safety net as it helps the insured to not resort to negative coping strategies that might impede sustainable development, or let affected people slip back into poverty.
Faster replacement of damaged stock	Insuring the stock for relief programmes would lead to faster replacement if food items or relief equipment were destroyed or damaged.
Appropriate institutional arrangements help quick insurance payouts if the infrastructure is damaged	<p>Institutional arrangements for insurance payouts have to be developed prior to extreme weather events and contain multiple actors from the industry (e.g. insurance providers and reinsurers), the government (e.g. ministries of finance and social protection, and insurance regulators) and delivery channels (e.g. NGOs, MFIs, suppliers and technology providers).</p> <p>Actors involved have to plan ahead when infrastructure is damaged but quick insurance payout is essential (see section 4.A).</p>



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes



STEP 1 Post-Disaster Needs Assessment

Guiding Questions and Tools

STEP 2 Relief Programmes and Alternative Livelihoods

Guiding Questions and Tools

STEP 3 Policy Adjustment of Existing Legal Frameworks and Strategies

Guiding Questions and Tools

Expected Outputs When Using the Tools

STEP 1: Post-Disaster Needs Assessment

PDNAs provide governments with the relevant information for quantifying recovery needs and formulating broad strategies (EU/UNEP/World Bank/GFDRR, 2015). The findings serve as the basis for designing a resilient recovery framework and for mobilizing financial resources for implementation.

The link between the agricultural monitoring and humanitarian response mechanisms is the needs assessment process. If humanitarian assistance is to be effective, it needs to be coordinated and harmonized with households' critical decision-making period. In the current set-up of humanitarian response, the funding procedure is dependent on the formal completion of the PDNA and can considerably delay the humanitarian operation. A baseline pre-season weather risk analysis, combined with agricultural monitoring, will provide a clear indication of who will be affected. The post-disaster needs assessment window could be shifted to before disasters happen, for example done during the critical time of the growing season. This will shorten the whole process by several months. In this way, the knowledge of extreme weather events and the agricultural monitoring framework will be directly linked with humanitarian decision-making.

In addition to the pre-disaster agricultural monitoring framework, the agricultural sector assessment would ideally build upon the exposure and vulnerability assessments conducted during the risk assessment (see Phase 1) that include damages along the agricultural value chain:

- **Physical terms**, e.g. crops/fields/livestock, goods, and productive assets such as equipment, shops/workshops/storerooms.
- **Economic terms**, e.g. capital stock/savings, the projected loss of income, productivity and growth.
- **Environmental terms**, e.g. natural resources such as water, soil quality, forest, and agricultural and pastoral land.
- **Institutional and social issues**, e.g. agricultural extension services and the collaboration of the MoA with related line ministries (e.g. finance, transport, environment, and disaster management agencies).

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes



STEP 1
Post-Disaster
Needs Assessment

Guiding Questions
and Tools

STEP 2
Relief Programmes and
Alternative Livelihoods

Guiding Questions
and Tools

STEP 3
Policy Adjustment of Existing
Legal Frameworks and
Strategies

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

Guiding questions		Complexity ¹⁶
How to conduct post-disaster needs assessments (PDNAs)?		
Guidelines	EU/UN/World Bank/GFDRR (2013): <i>Post-Disaster Needs Assessment Guidelines</i> http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Climate%20Strategies/PDNA%20Volume%20A%20FINAL%2012th%20Review_March%202015.pdf	3
Guiding questions	Is there funding ensured for a thorough post-disaster needs assessment?	
Guidelines	Refer to preparedness and contingency plans (see Phase 3.B Advanced Preparedness Action).	
Guiding questions	Are the response options based on a PDNA and in line with government priorities, capacities and mandates and with the community priorities?	
Guideline	<i>UNDAC Field Handbook</i> (2013) for Guiding the Missions to Disasters or Emergencies https://www.unocha.org/sites/dms/Documents/UNDAC%20handbook%20-%20English.pdf	2
Guiding questions	Is there an agricultural sector report available, specifying the needs of the sector particularly in physical, economic and environmental terms?	
	Is the sector's report based on a pre-disaster agricultural monitoring framework?	
Guideline	Sectoral adjustment of PDNA methodology and 'preparedness' phase, including local data and documents of the relevant institutions (esp. MoA). IFAD (2009): <i>Emergency livestock interventions in crisis and post-crisis situations</i> https://www.uncclearn.org/sites/default/files/inventory/ifad82.pdf	

¹⁶ According to the testing in Ghana 1 means very complex, skills required, 2 medium complex, 3 low complexity and easy to use. 0 means that the tool was not tested. The ranked tools listed on top were considered to be most relevant.

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes

STEP 1 Post-Disaster Needs Assessment

Guiding Questions and Tools

STEP 2 Relief Programmes and Alternative Livelihoods

Guiding Questions and Tools

STEP 3 Policy Adjustment of Existing Legal Frameworks and Strategies

Guiding Questions and Tools

Expected Outputs When Using the Tools



STEP 2: Relief Programmes and Alternative Livelihoods

Relief programmes respond to the immediate needs of the target population through, for example, food imports, food distribution, livelihoods and asset protection, and cash for work activities, to longer-term recoveries such as restoring livelihood and community assets (e.g. storage facilities, canals [cleaning], irrigation systems, local infrastructure).

Index insurance, with its fast payouts, has a crucial role to play in coping with emergencies. Particularly, in the case of damaged infrastructure such as roads, lack of electricity, interrupted communications and dysfunctional access to finance, payouts can be delayed. In this situation, a ‘tangible early recovery voucher’ would speed up the payout and could improve confidence in insurance. Payouts do not necessarily have to be in cash when prices for basic items are high, payment-in-kind such as construction material may be of better value. For example, in the Philippines other measures were taken by the government and the insurance providers to adjust existing processes to smooth the payout after Typhoon Haiyan in 2013 (GIZ-RFPI, 2015), including:

- The Philippine Insurance Commission relaxed the conditions for claims settlement, e.g. documentation of losses after Typhoon Haiyan.
- Official circulars permitted a fast initial payout of a lesser amount while the insurance providers paid the remaining part later.
- Insurance providers used mass onsite assessments of areas instead of individual claim verification.
- Insurers who knew their distribution channel well, and trusted them, permitted quick bulk-claim settlements, as individual verification would have been too time-consuming.
- Unconventional payment processes were initiated (e.g. setting up temporary Claims Action Centres, payment-in-kind).

Definition
 STEPS
 Brief Description
 Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes

STEP 1
 Post-Disaster Needs Assessment

Guiding Questions and Tools



STEP 2
 Relief Programmes and Alternative Livelihoods

□ Guiding Questions and Tools

STEP 3
 Policy Adjustment of Existing Legal Frameworks and Strategies

Guiding Questions and Tools

Expected Outputs When Using the Tools

GUIDING QUESTIONS AND TOOLS

Guiding questions	What is the requirement for response and resilient recovery measures to address the immediate needs of the affected population and who provides and supports payment for them?	Complexity
Tools	Results of the PDNA assessment (see tools above).	3
Guiding questions	How do insurance payouts affect the implementation of the relief programmes?	
Tools	Semi-structured interviews with government officials (and affected communities). Financial statements of the government pertaining to relief and recovery programmes. See section on ' Insurance ' for index products.	3 1



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes

STEP 1 Post-Disaster Needs Assessment

Guiding Questions and Tools

STEP 2 Relief Programmes and Alternative Livelihoods

Guiding Questions and Tools

STEP 3 Policy Adjustment of Existing Legal Frameworks and Strategies

Guiding Questions and Tools

Expected Outputs When Using the Tools



STEP 3: Policy Adjustment of Existing Legal Frameworks and Strategies

In order to start the response as quickly as possible, policies and strategies against extreme weather events need to be defined prior to the disaster (e.g. in the 'Preparedness' phase). After the extreme weather event, they may need to be adjusted according to the actual shock, the areas affected and the economic sectors.

The defined policies show how response can be integrated and combined with resilient recovery and sustainable development, which include a central vision for recovery, defining guiding principles, and setting up appropriate institutional arrangements resulting in a policy framework for resilient recovery (see Annex 3).

A policy framework for the agricultural sector value chain refers to the integrated DRM and the concept of BBB:

- **Agriculture**, e.g. sustainable agriculture/climate-smart agriculture, food security policies, livelihood empowerment and/or, for instance, a drought emergency response framework consisting of measures such as a food security monitoring systems for providing early warning information.
- **Industry**, e.g. green growth, inclusive finance and insurance strategies, and promotion of agricultural-related SMEs developed with the respective line ministries and business associations.
- **Environment and climate change**, e.g. National Adaptation Plan, the concept of shock-responsive and risk-informed social protection linked to DRM policies (e.g. public works), and environmental policies (e.g. action plans linked to the International Convention to Combat Desertification).
- **Research and development**, e.g. drought-resistant seeds and new technology for food processing/ transport/energy, etc.

Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes

STEP 1
Post-Disaster
Needs Assessment

Guiding Questions
and Tools

STEP 2
Relief Programmes and
Alternative Livelihoods

Guiding Questions
and Tools



STEP 3
Policy Adjustment of Existing
Legal Frameworks and
Strategies

□ Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

		Complexity
Guiding questions	Is a disaster recovery framework in place? If so, how does it reflect e.g. ‘build back better’ principles, and pro-poor, gender-sensitive and inclusive DRR approaches?	
	Is government legislature in place prior to the disaster, setting the new standards for (e.g. BBB developed in the ‘preparedness’ phase)?	
	Is a policy framework developed based on consultative processes with all relevant stakeholders and forums for inclusive planning?	
Guidelines	EU/UNEP/World Bank/GFDRR (2015): Guide to developing disaster recovery frameworks, Sendai Conference version (contains response and recovery) https://www.gfdr.org/sites/gfdr/files/publication/DRF-Guide.pdf	3
	UN World Conference on DRR, 14. 18.3.2015, Sendai, Japan, ISSUE BRIEF: <i>Reconstructing after disasters – Build Back Better</i> https://www.unisdr.org/archive/43289	
Guiding questions	Is the recovery vision coherent with the government’s broader, longer-term development goals and growth and poverty-reduction strategies?	
	Do the recovery objectives and policies prioritize sectors for recovery, and define key operating principles and performance benchmarks (definitions of effective, efficient and resilient recovery)?	
Guidelines	IFRC (2012): <i>IFRC Recovery programming guidance</i> (contains response and recovery) http://www.ifrc.org/PageFiles/41104/IFRC%20Recovery%20programming%20guidance%202012%20-%20201232900.pdf and http://weblis.ifrc.org/Libcat/index.html	3 1



Definition
STEPS
Brief Description
Involved Actors

SYNERGIES

A. Response – with Various Relief Programmes

STEP 1
Post-Disaster
Needs Assessment

Guiding Questions
and Tools

STEP 2
Relief Programmes and
Alternative Livelihoods

Guiding Questions
and Tools

STEP 3
Policy Adjustment of Existing
Legal Frameworks and
Strategies

Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

Expected Outputs When Using the Tools

- ✓ The needs assessment and subsequent policy framework increase opportunities to improve people's capacity and increases the ownership of resilient recovery.
- ✓ A policy framework avoids ineffective and time-consuming donor intervention by joint coordination among all stakeholders.
- ✓ A strategy plan enables the government to better address longer-term disaster vulnerability through coherent programmes that bridge the current gap between recovery and development.
- ✓ Insurance-related outputs (see page 111 'Synergies: Insurance and Response').



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1

Assessing Financial
Demand and Need

Guiding Questions
and Tools

STEP 2

Mobilizing Resources



Guiding Questions
and Tools

STEP 3

Establishing Public
Financial
Management Systems

Guiding Questions
and Tools

STEP 4

Establishing Financial
Auditing and
Monitoring Systems

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

B. Post-Disaster Financing

Definition

Disaster risk financing can be distinguished between pre-disaster and post-disaster financing (see DRF definition in Phase 2.A Pre-Disaster Financing).

STEPS

Post-disaster financing contains the following steps:

- 1) **Assessing the financial demand.**
- 2) **Mobilizing resources.**
- 3) **Establishing public financial management systems for post-disaster situations.**
- 4) **Establishing financial auditing and monitoring oversight systems.**

Brief Description

DRF strategies for governments look at contingent liabilities or potential assets that are vulnerable to extreme weather events. The strategies combine different financial instruments to protect against possible losses of different frequency and severity to reduce the budget shock caused by extreme weather events. According to EU/UNDP/WB/GFDRR (2015), it is useful to divide the budget into emergency funding (response) and reconstruction financing (resilient recovery) for disbursing funds rapidly and coordinating resources.

When countries lack the financial capacity to respond immediately and effectively to an extreme weather event, the adverse implications increase rapidly. Long-term development prospects suffer as the government diverts public funding from social and economic development programmes to fill the recovery gaps. Resilient reconstruction may be delayed or not take place at all due to a lack of resources.

Definition
STEPS
Brief Description



Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1
Assessing Financial
Demand and Need
Guiding Questions
and Tools

STEP 2
Mobilizing Resources
●

Guiding Questions
and Tools

STEP 3
Establishing Public
Financial
Management Systems
Guiding Questions
and Tools

STEP 4
Establishing Financial
Auditing and
Monitoring Systems
Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

Involved Actors

In addition to the institutions involved in pre-disaster financing, after the extreme weather event the prime responsible actors are the selected response and recovery 'lead agency', in coordination with the MoA and related ministries (e.g. infrastructure, rural development). They closely interact with international organizations and humanitarian aid institutions, and coordinate with the civil society, private sector and affected communities.

SYNERGIES: INSURANCE AND POST-DISASTER FINANCING

Insurance complements post-disaster financing mechanisms Neither DRF nor insurance are sufficient 'stand-alone' mechanisms. A three-layered approach combines pre-disaster financing, post-disaster financing and insurance products (see Phase 2 Retention and Transfer).

Reducing ad hoc budget restructuring Index products provide quick payouts for response and recovery and reduce ad hoc restructuring of budgets that hamper long-term development prospects.



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing



STEP 1
Assessing Financial
Demand and Need

□ Guiding Questions
and Tools

STEP 2
Mobilizing Resources

Guiding Questions
and Tools

STEP 3
Establishing Public
Financial
Management Systems
Guiding Questions
and Tools

STEP 4
Establishing Financial
Auditing and
Monitoring Systems
Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

STEP 1: Assessing Financial Demand and Need

The initial budget review should focus on channelling urgent resources for the relief efforts. Subsequent reviews can be based on the recommendations of the PDNA or similar rapid assessments, including the agricultural sector assessment. These financial reviews involve detailed sequencing and prioritizing:

- The damages to infrastructure and assets are valued in physical terms.
- Damages are assigned a monetary value (replacement costs according to the market prices prevailing just before and after the disaster). These costs are the baseline costs and to these needs to be added, for example, the cost of improvements for risk reduction and resilient recovery according to the BBB concept.
- Additional economic losses are calculated until full economic recovery (e.g. hidden administrative costs, changes in economic flows arising from the disaster such as lower productivity and exports that affect direct and indirect tax revenues).
- A detailed work plan is developed including the sequence of activities with associated funding requirements and amending the work plan as programme implementation begins.

GUIDING QUESTIONS AND TOOLS

Guiding questions	What is the financial requirement for relief and resilient response measures in the agricultural sector?	Complexity
	Does the financial demand assessment segregate the needs according to different (agricultural) sub-sectors (value chain) and producer groups?	
Guidelines	World Bank/A. De Janvry (2015): Quantifying Through Ex Post Assessments the Micro-Level Impacts of Sovereign Disaster Risk Financing and Insurance Programs https://openknowledge.worldbank.org/bitstream/handle/10986/22239/Quantifying0th0d0insurance0programs.pdf?sequence=1&isAllowed=y	1
	What are the most suitable financing products for post-disaster financing in terms of effectiveness, efficiency and speediness?	
Guiding questions	How does (or could) insurance reduce the opportunity costs of ex post financing?	
	EU/UNEP/World Bank/GFDRR (2015): Guide to developing disaster recovery frameworks, Sendai Conference Version https://www.gfdr.org/sites/gfdr/files/publication/DRF-Guide.pdf	3
Guidelines	For insurance-related tools see Phase 2 Retention and Transfer.	



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1
Assessing Financial
Demand and Need
Guiding Questions
and Tools



STEP 2
Mobilizing Resources

Guiding Questions
and Tools

STEP 3
Establishing Public
Financial
Management Systems
Guiding Questions
and Tools

STEP 4
Establishing Financial
Auditing and
Monitoring Systems
Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

STEP 2: Mobilizing Resources

The challenge of post-disaster recovery is to mobilize additional resources. To the highest extent possible, recovery should not be at the expense of normal, ongoing development processes. Depending on the nature and scale of the extreme weather event, recovery funding can be obtained from domestic or external resources.

Box 19: Pacific Disaster Risk Finance and Insurance in Vanuatu (2015)

The Vanuatu example indicates the broad timeframes over which each financing instrument may be accessed and utilized for post-disaster financing. This provides an indication for the government to select the most suitable DRF mechanisms.

Ex ante financing measures

- PCRAFI insurance (based on event trigger) – access: short term.
- Traditional insurance (based on damage/losses) – access: medium/long term.

Ex ante financing measures

- Emergency Fund – access: short/medium term.
- Contingent-debt financing facility – access: short/medium term.

Ex post financing measures

- The Emergency drawdown from Public Fund PFEMA S34C – access: short/medium term.
- In-year budget reallocation (PFEMA S34B) – access: short/medium term.
- Development partner/international agency emergency assistance and relief – access: short/medium term.
- Domestic credit from banking system – access: medium/long term.
- External credit from international agencies – access: medium/long term.
- Capital budget realignment (domestic and external funds) – access: medium/long term.
- Development partner assistance (reconstruction) – access: medium/long term.
- Tax and other revenue measures – access: medium/long term.

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1
Assessing Financial Demand and Need
Guiding Questions and Tools



STEP 2
Mobilizing Resources

- ●

Guiding Questions and Tools

STEP 3
Establishing Public Financial Management Systems
Guiding Questions and Tools

STEP 4
Establishing Financial Auditing and Monitoring Systems
Guiding Questions and Tools

Expected Outputs When Using the Tools

Resources generated by disaster-affected governments are as follows:

- **Budget redistribution:** Limited funding as this mechanism diverts resources from other budgets, often incurs repercussions on development.
- **Domestic and external credit:** Loans from the capital market are a standard instrument, but potentially slow and expensive and often require credit rating.
- **Tax increase:** Applied for general population, but is politically sensitive and may delay economic recovery.
- **International donor assistance:** Experience has shown that the disbursement of funds received is flexible and effective with no cost; it is also unreliable with regards to delivery period.
- **Concessional loans and grants:** Provision of additional resources to, for instance, local governments in the form of concessional loans and grants to support priority recovery and reconstruction investments.
- **Issuing sovereign reconstruction or development bonds:** Investors support various sectors, e.g. agriculture, energy, transportation and water/sanitation.
- Most importantly, the majority of recovery funding is supported by the **people themselves and those abroad (remittances)**. The public sector's share in recovery can vary widely; it depends on the nature and scale of disaster damage and relative balance of public and private sector asset ownership in the affected areas (EU/UNEP/World Bank/GFDRR, 2015).



- INTRODUCTION
- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- PHASE 5

Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1
Assessing Financial
Demand and Need
Guiding Questions
and Tools



STEP 2
Mobilizing Resources

□ Guiding Questions
and Tools

STEP 3
Establishing Public
Financial
Management Systems
Guiding Questions
and Tools

STEP 4
Establishing Financial
Auditing and
Monitoring Systems
Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

GUIDING QUESTIONS AND TOOLS

Guiding questions		Complexity
	How can financial resources be mobilized without being at the expense of normal ongoing development budgets and processes?	
	What are the main sources of funding, and at what costs and effects?	
Guidelines	World Bank Group/ GFDRR (2014): Financial Protection Against Natural Disasters: From Products to Comprehensive Strategies – An Operational Framework for Disaster Risk Financing and Insurance https://www.gfdr.org/sites/gfdr/files/publication/Financial%20Protection%20Against%20Natural%20Disasters.pdf	3
	World Bank – GFDRR/International Bank for Reconstruction and Development (2015): Advancing Disaster Risk Financing & Insurance in the Pacific – Regional Summary Note & Options for Consideration. Disaster Risk Financing and Insurance https://www.gfdr.org/sites/default/files/publication/2015.06.25_PCRAFI_Combined-%5BCompressed%5D-rev-0.9.pdf	3
	World Bank Group – GFDRR (2015): Pacific Disaster Risk Finance and Insurance in Vanuatu – Post-disaster budget execution guidelines. Secretariat of the Pacific Community https://www.gfdr.org/sites/default/files/publication/2015.06.25_PCRAFI_Combined-%5BCompressed%5D-rev-0.9.pdf	
Guiding questions	Could insurance have a positive impact on accessing external financial resources (e.g. better credit ratings by international rating agencies lead to faster loans at better conditions)?	
Guidelines	Ministry of Finance statistics, loan documents, etc.	
	Semi-structured interviews with ministry of finance officials, international rating agencies and financial institutions.	



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1
Assessing Financial
Demand and Need
Guiding Questions
and Tools

STEP 2
Mobilizing Resources

Guiding Questions
and Tools

STEP 3
Establishing Public
Financial
Management Systems
Guiding Questions
and Tools

STEP 4
Establishing Financial
Auditing and
Monitoring Systems
Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*



STEP 3: Establishing Public Financial Management Systems

Managing the inflows of resources and spending them effectively are challenging in a post-disaster environment. Risk financing is often disbursed across multiple teams. There is a risk that fragmentation across technical units and departments could prove to be an impediment to the effective coordination of investments, learning and identifying synergies (OECD, 2014):

- **Strengthening and/or establishing effective Public Financial Management (PFM)** modalities by the government could encourage international involvement and confidence in the recovery plan (considerations for developing national PFM are presented in Annex 4).
- **Transfer funding:** Decentralized implementation speeds up resilient recovery and is more likely to correspond to the actual needs of the affected communities. Transferring funds from national to 1) sub-national entities and/or 2) non-governmental organizations, as well as communities and individual producers.
An unresolved issue is the provision of assistance to agricultural entrepreneurs, who bare most of the cost of losses and damages. However, depending on government policy, SMEs could have access to concessional emergency loans or (one-time) subsidized insurance; appropriate products for SMEs are hardly available.
- **Multi-Donor Trust Funds** could be established to pool and channel donor resources in a coordinated way, in accordance with national priorities and by avoiding duplications and multiple bank accounts. Preconditions for effective management are a high degree of transparency and the will to avoid bureaucracy.

GUIDING QUESTIONS AND TOOLS

	Are mechanisms in place to manage inflow of funds, e.g. a public financial management plan? Are there financial processes in place that effectively disburse funds between levels of government, or directly to communities or systems that manage external resources?	Complexity
Guiding questions	Is a work plan available, including sequencing of tasks associated with funding requirements?	
	Has the government established a Multi-Donor Trust Fund for channelling funds in a coordinated manner?	
Guidelines	EU (2015): <i>Information Note on Multidonor Trust Funds Supported by the European Union</i>	
	https://ec.europa.eu/europeaid/sites/devco/files/multidonor-trust-funds-supported-by-the-european-union-2003-march-2015_en.pdf	3
	DevEx International Development (2011): <i>The world's largest multidonor trust funds: A primer</i>	
	https://www.devex.com/news/the-world-s-largest-multidonor-trust-funds-a-primer-72695 and https://www.devex.com/	2



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1
Assessing Financial
Demand and Need
Guiding Questions
and Tools

STEP 2
Mobilizing Resources

Guiding Questions
and Tools

STEP 3
Establishing Public
Financial
Management Systems
Guiding Questions
and Tools



STEP 4
Establishing Financial
Auditing and
Monitoring Systems
Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

STEP 4: Establishing Financial Auditing and Monitoring Systems

Financial auditing and monitoring systems build upon the public financial management systems for post-disaster situations and are linked to the M&E system:

- **Aid-tracking mechanisms:** During the ‘response’ phase, the government needs to quickly establish aid-tracking mechanisms that help to coordinate and allocate resources under a central framework – if combined with a cost-benefit analysis, it would contribute to assessing the efficiency of spending (see also **Phase 1.C Performance Analysis of Existing Disaster Risk Management Mechanisms**). Tracking of multiple streams of funding includes public sources, donor funds, private sector contributions and NGO sources.
- **Independent third-party auditing** will enhance accountability of the government. Auditing and monitoring oversight is designed at three levels: 1) overall recovery programme monitoring, 2) sector-level project monitoring, which consolidates the reporting of each sector, and 3) at the lowest level, individual project monitoring takes place.

GUIDING QUESTIONS AND TOOLS

Guiding questions		Complexity
	Has the government established an aid-tracking system?	
	Is an independent third-party auditing (external auditor) in place?	
Guidelines	<p>GFDRR Disaster Aid Tracking (DAT) initiative</p> <p>https://www.preventionweb.net/files/29576_track15yearretrospective.pdf operated by the <i>AidData</i> database</p> <p>https://www.aiddata.org/search?query=Disaster+Aid+Tracking+%28DAT%29+initiative+</p>	1



Definition
STEPS
Brief Description

Involved Actors
SYNERGIES

B. Post-Disaster Financing

STEP 1
Assessing Financial
Demand and Need
Guiding Questions
and Tools

STEP 2
Mobilizing Resources
●

Guiding Questions
and Tools

STEP 3
Establishing Public
Financial
Management Systems
Guiding Questions
and Tools

STEP 4
Establishing Financial
Auditing and
Monitoring Systems
Guiding Questions
and Tools



*Expected Outputs
When Using the Tools*

Expected Outputs When Using the Tools

- ✓ If post-disaster financing is combined with pre-disaster financing, insurance and other DRM mechanisms, it reduces ad hoc fund allocation efforts with their adverse consequences and secures funds before extreme weather events occur.
- ✓ Combining post-disaster financing with insurance will reduce the amount of funding to be mobilized for resilient recovery.
- ✓ Systematic financial need assessment enables the government to set recovery priorities and is a basis for mobilising required funding.
- ✓ Establishing effective and transparent financial management and auditing systems enhances the reputation of public authorities and may attract external funding.
- ✓ Insurance-related outputs (see page 120 'Synergies: Insurance and Post-disaster Financing').





PHASE 5

Recovery

Definition

Recovery is defined as “restoring or improving of livelihoods . . . , as well as economic, physical, social, . . . and environmental assets, systems and activities, of a (weather-related) disaster-affected community or society, aligning with the principles of sustainable development and ‘build back better’, to avoid or reduce future disaster risk (United Nations General Assembly, 2016)”.

STEPS

Resilient recovery contains a multitude of activities that can be clustered under the following key steps:

- 1) Setting sectors’ priorities and implementing sector-level recovery programmes.**
- 2) Adjusting institutional frameworks for resilient recovery.**
- 3) Establishing/refining effective coordination and communication mechanisms.**
- 4) Developing standard implementation procedures within the BBB concept.**
- 5) Developing a monitoring and evaluation system.**

Brief Description

Recovery supports people’s efforts to recover, rebuild and strengthen their resilience. The recovery programming needs to be time-bound and define realistic, appropriate achievements and should be linked to longer-term development (IFRC, 2012).

BBB is an essential concept of resilient recovery aiming to reduce vulnerability and improve living conditions while promoting a more effective and sustainable reconstruction. This can be realized through a variety of measures such as enhancing preparedness, relocating critical facilities to safer areas, integrating DRR into infrastructure improvements, strengthening governance structures, and establishing predictable contingent financing mechanisms including insurance.

Involved Actors

The involved institutions are the same as in the ‘response’ phase (Phase 4), with a focus on the ‘lead agency’ for overall coordination. Other actors include the implementing departments at the local level and supporting civil society organizations, the affected communities in cooperation with the (local) private sector, international agencies and the media.



Overarching questions
from an insurance perspective

PHASE 5

Recovery

The five steps aim at answering the following key questions:

- What is the effect of insurance on resilient recovery programmes (including the BBB concept) – and subsequently on the affected population, the private sector and the government?
- Can insurance provide a chance to improve pre-disaster planning?

SYNERGIES: INSURANCE AND RESILIENT RECOVERY

While Insurance payouts from index products can bridge the financial liquidity gap until other assistance can be obtained (respond programmes), indemnity products can provide funding for including the BBB concept for more resilient reconstruction.

Stimulating resilient recovery

EXAMPLE: Integrated approaches such as the pan-national insurance pool ARC support government efforts to quickly and effectively implement resilient recovery activities. For instance, the contingency plans define delivery mechanisms to the affected poor and vulnerable population, integrated DRM and a monitoring system. These plans are linked to resilient recovery mechanisms, which can facilitate longer-term investments in increasing food security, DRR and climate resilience.

BBB may result in reduced premiums

Insured public buildings and critical infrastructure, when reconstructed according to BBB criteria, could lead to reduced premiums for indemnity insurance products. This, in turn, benefits not only the government but also people living in disaster-prone areas as basic services would not be disrupted for long.

Shorter business interruptions due to insured infrastructure – indirect impact

People along the agricultural value chain can indirectly benefit from government insurance as public infrastructure could be reconstructed faster and better (BBB), resulting in shorter business interruptions for, for example, agricultural traders and the transport sector.

Unlocking opportunities stimulated by insurance

In the 'Recovery' phase, governments and individual policyholders could realize that insurance can help lessen the financial repercussions of volatility and create a space for investments and planning at the macro level. Through this channel, insurance can help to 'unlock opportunities'. At the micro level, insurance contributes to increased savings, could improve creditworthiness, boost economic growth and increase investments in higher-return activities (if complemented by other factors).

EXAMPLE: Public or semi-public insurance providers can play an important role, such as the government-owned insurer Philippine Crop Insurance Corporation that operates with a market-based and a social mandate to provide weather-related insurance cover for various agricultural producers, including subsistence farmers and agricultural SMEs.



STEP 1
Implementing Sector-Level Recovery Programmes

Guiding Questions and Tools

STEP 2
Regulating Institutional Frameworks and Mandates for Recovery

Guiding Questions and Tools

STEP 3
Establishing/Refining Effective Coordination and Communication Mechanisms

Guiding Questions and Tools

STEP 4
Developing Standard Implementation Procedures within the BBB Concept

●
Guiding Questions and Tools

STEP 5
Developing Monitoring and Evaluation Systems

Guiding Questions and Tools

Expected Outputs When Using the Tools

STEP1: Implementing Sector-Level Recovery Programmes

After (inter)sectoral strategies are developed, the ‘lead agency’ undertakes a programme-by-programme approach with activities summarized in the ‘general steps’, below:

Box 20: General Steps of Recovery Programme-by-Programme Approach

General steps	EXAMPLE: Livestock interventions (IFAD, 2009)
<p>Prioritizing:</p> <p>Based on the PDNA assessment, the government identifies the sectors in line with the broader recovery vision and policy framework aiming at equitable and demand-responsive recovery across affected jurisdictions and communities.</p>	<p>Livestock programmes based on thorough understanding of the situation. The vulnerability of livestock owners will vary according to, for example:</p> <ul style="list-style-type: none"> • Their lifestyle, i.e. pastoral (nomadic or semi-nomadic) or mixed-farming system. • Type of livestock species – they are affected in different ways because of variations in vulnerability to specific types of disasters and in recovery capacity. • Conditions – they change significantly across regions and communities.
<p>Project selection criteria:</p> <p>Inter-sectoral priorities are based on criteria such as potential for direct and large humanitarian impact, pro-poor and gender perspective, potential to generate sustainable livelihoods (including food security), and resilient reconstruction of critical infrastructure and services.</p>	<p>Key questions when designing activities:</p> <ul style="list-style-type: none"> • What types of livestock systems have been affected by the disaster and how? • Which groups are most affected or vulnerable, and what are their priority needs? • Which livestock intervention is the most appropriate (considering types of problems, target group, gender (see Annex 5)?





STEP 1
Implementing Sector-Level Recovery Programmes

□ **Guiding Questions and Tools**

STEP 2
Regulating Institutional Frameworks and Mandates for Recovery
Guiding Questions and Tools

STEP 3
Establishing/Refining Effective Coordination and Communication Mechanisms
Guiding Questions and Tools

STEP 4
Developing Standard Implementation Procedures within the BBB Concept

● **Guiding Questions and Tools**

STEP 5
Developing Monitoring and Evaluation Systems

Guiding Questions and Tools

Expected Outputs When Using the Tools

Preparation of resilient recovery projects:

Mapping for identifying the stakeholders to be included in the planning and development process, e.g. local government, civil society, technical institutions (e.g. agricultural extension services), academia, the private sector and affected communities.

EXAMPLE: Emergency destocking could be an initial intervention followed by various project options listed below:

Emergency destocking allows for the removal of animals from a region before they die. These programmes involve buying farmers' livestock at a fair price (or offering healthy animals or goods in exchange), arranging for immediate slaughter and the distribution of dry or fresh meat.

Translating sector strategies into projects:

Consultative processes ensure that agricultural sector strategies and projects are relevant across different implementers and communities, under consideration of interfaces with other sectors such as housing, forestry, and recovery land planning.

Various project options:

- Emergency destocking programmes.
- Emergency veterinary and animal health support.
- Emergency feeding and supplementary nutrition.
- Livestock refuges and shelters.
- Provision of alternative water sources.
- Herd reconstitution and restocking.
- Other interventions (e.g. financial services).

For instance, in drought-prone areas where pastoralists have sold off livestock as a way of coping with the impact of the extreme weather event, recovery programming can help herders to purchase livestock quickly (replacement) so that they are not depleted of their assets and can restart their businesses swiftly. If herders had livestock insurance and received early warnings, the forecast-based payout could enable them to buy fodder before animals die (e.g. Red Cross programme, Bangladesh).

GUIDING QUESTIONS AND TOOLS

Guiding questions	What type of agricultural recovery programmes were selected for which affected groups (e.g. smallholder farmers, large commercial production, types of the value chain businesses)?	Complexity
	Do the programmes reflect a transformation from response via resilient recovery to development?	
Guide-lines	Government policy and strategy papers (especially from the MoA) and agricultural sector strategies and project documents developed during the recovery phase.	1
Manual	IFAD (2009): <i>Emergency livestock interventions in crisis and post-crisis situations</i> https://www.unccllearn.org/sites/default/files/inventory/ifad82.pdf	





STEP 1
Implementing
Sector-Level
Recovery Programmes
Guiding Questions
and Tools

STEP 2
Regulating Institutional
Frameworks and
Mandates for Recovery
Guiding Questions
and Tools

STEP 3
Establishing/Refining Effective
Coordination and
Communication Mechanisms
Guiding Questions
and Tools

STEP 4
Developing Standard
Implementation Procedures
within the BBB Concept
Guiding Questions
and Tools

STEP 5
Developing Monitoring
and Evaluation Systems
Guiding Questions
and Tools

**Expected Outputs
When Using the Tools**

STEP 2: Regulating Institutional Frameworks and Mandates for Recovery

Existing development policies should form the basis of resilient recovery planning. Building upon the institutional arrangements defined in the pre-disaster phase (e.g. preparedness), the capacities and the institutional framework may need to be further developed and adjusted according to the scale of the extreme weather event and the areas and population affected:

- **Pre-existing policies may require rethinking**, including land-use zoning and the provision of physical infrastructure, particularly for entire regions that have been devastated and need to be re-planned. Three options exist to create a legal mandate for post-disaster strategic land-use and physical planning: 1) amending existing legislation, 2) introducing new legislation, and 3) creating a mandate through ordinances and government orders (regulation).
- **Legislation** sets the basis for organizing recovery. Resilient recovery can be sensitive if there is legislative confusion over institutional responsibility. Extreme weather events can heavily impact land use and building codes during the recovery process, as governments can decide to adjust policies to include climate-sensitive actions that affect private sector assets.
- **The role of the private sector for resilient recovery**: If local and national economies are to grow and be built back better after a disaster, the participation of the private sector in recovery planning and operations is important because it designs and constructs buildings and infrastructure. A formal relationship that links private enterprises to the official response and recovery institutions in the form of public-private partnerships can be beneficial for both actors. Transparent relationships need to be established before disasters strike.

GUIDING QUESTIONS AND TOOLS

	Is there an institutional framework for resilient recovery in place?	Complexity
Guiding questions	Does it provide an effective balance between national-level policy decisions and decentralized local implementation, including human resources?	
	IFRC (2012): <i>IFRC Recovery programming guidance 2012</i> . Key resources for undertaking a market assessment include:	
Guidelines	Emergency Market Mapping and Analysis Toolkit (EMMA) https://www.emma-toolkit.org/toolkit	2
	Red Cross Red Crescent Movement Guidelines for Cash Transfer Programming http://webviz.redcross.org/ctp/docs/en/3.%20resources/1.%20Guidance/1.%20Key%20documents/RCRCM%20CTP%20Preparedness%20guidance.pdf	2





STEP 1
Implementing
Sector-Level
Recovery Programmes

Guiding Questions
and Tools

STEP 2
Regulating Institutional
Frameworks and
Mandates for Recovery

Guiding Questions
and Tools

STEP 3
Establishing/Refining Effective
Coordination and
Communication Mechanisms

□ Guiding Questions
and Tools

STEP 4
Developing Standard
Implementation Procedures
within the BBB Concept

● Guiding Questions
and Tools

STEP 5
Developing Monitoring
and Evaluation Systems

Guiding Questions
and Tools

*Expected Outputs
When Using the Tools*

STEP 3: Establishing/Refining Effective Coordination and Communication Mechanisms

Coordination and communication take place both vertically (within the government administration) and horizontally (with the private sector, civil society organizations, communities, etc.):

- Defining the **recovery vision and policy** at the highest levels of government ensures acceptance and coherent application across the many simultaneous ongoing reconstruction projects. A two-tiered implementation can balance national government policy setting, overseen by the ‘lead agency’, with decentralized implementation, organized by a selected ‘implementing agency’ – all part of the Humanitarian Country Team.
- **Multi-actor collaboration:** A collective effort across government units, NGOs, the private sector and communities promotes a successful recovery process. To effectively manage the contributions of various stakeholders, it is important to clarify their roles and responsibilities.
- A well-defined **internal and public communications strategy** recognizes the different types of stakeholders, identifies the most effective means of communication, and avoids duplication of tasks. It can enhance transparency and raise awareness of the recovery effort among the general public, both national and international, particularly in donor countries.

GUIDING QUESTIONS AND TOOLS

Guiding questions	Are there communication strategies and coordination plans within government agencies and external actors available?	Complexity
	Are mechanisms in place that coordinate responsibility for recovery across the national government, local government, donor, civil society and community levels (national coordination – local implementation)?	
Guideline	UNDAC (2013): <i>Field Handbook</i>	
	https://www.unocha.org/sites/unocha/files/1823826E_web_pages.pdf	
	IFRC (2008): <i>A framework for community safety and resilience in the face of disaster risk</i>	
	http://www.ifrc.org/Global/Case%20studies/Disasters/cs-framework-community-en.pdf	
Guiding questions	Is the insurance industry included in the framework? If not, how could insurance contribute?	
Tools	See Phase 4 Response and Phase 2.A.1 Insurance.	



STEP 1
Implementing
Sector-Level
Recovery Programmes

Guiding Questions
and Tools

STEP 2
Regulating Institutional
Frameworks and
Mandates for Recovery

Guiding Questions
and Tools

STEP 3
Establishing/Refining Effective
Coordination and
Communication Mechanisms

Guiding Questions
and Tools



STEP 4
Developing Standard
Implementation Procedures
within the BBB Concept

- ● Guiding Questions and Tools

STEP 5
Developing Monitoring
and Evaluation Systems

Guiding Questions
and Tools

**Expected Outputs
When Using the Tools**

STEP 4: Developing Standard Implementation Procedures within the BBB Concept

Standardizing certain implementation procedures and rapid procurement systems before an extreme weather event enables the ‘lead agency’ and line ministries to quickly start the recovery process:

- **Standardize project approval processes:** Existing project approval and reporting procedures may need to be simplified to meet the time constraints during recovery, which are often delayed due to lengthy bureaucratic procedures.
- **Developing or adjusting fast-track procurement systems** that simplify agreed tender and purchasing processes to rapidly provide goods and services to the areas in which they are needed, but do not compromise transparency and equitable processes.
- **Establishing resilient recovery and reconstruction standards:** Guiding principles need to be translated into practical standards confirming that recovery projects incorporate resilience against future extreme weather events, for instance:
 - *Pro-poor recovery:* Governments should take advantage of recovery plans for including national poverty alleviation and long-term development objectives, which would strengthen the local economy. This would move from emergency humanitarian relief to long-term sustainable development.
 - *Build back better:* Ensuring compliance with reconstruction standards during the implementation phase is key to resilient recovery. Standards must be defined well ahead of actual implementation, during prevention and preparedness phases. The broad BBB concept aims at strengthening a community’s resilience in terms of the physical, social, environmental and economic conditions (see BBB core measures in Annex 6).

Box 21: FAO Strategy of BBB in the Agricultural and Fishing Sectors

Coastal Agriculture: The restoration of sustainable agricultural activities is dependent on the rehabilitation of damaged agricultural areas and infrastructure, e.g. reclamation of salt-affected soils, appropriate land-use planning, and the adjustment of cropping systems. Agriculture and home gardening are major activities along coastal zones but cannot be isolated from other activities, including fisheries, forestry and tourism, and must be integrated into multi-sector approaches balancing increased productivity and resource preservation.

Forest and Agricultural Business: Rehabilitation of mangrove forests is to be planned within the context of integrated coastal area management. Otherwise, it could have negative effects on the local people (e.g. dislocation, restricted access to coastlines by fishers, the occupation of farmland). Planting coastal shelterbelts, replanting timber and fruit trees, and restoring small timber-milling facilities would serve to protect inland assets and improve household economies.



STEP 1
Implementing Sector-Level Recovery Programmes

Guiding Questions and Tools

STEP 2
Regulating Institutional Frameworks and Mandates for Recovery
Guiding Questions and Tools

STEP 3
Establishing/Refining Effective Coordination and Communication Mechanisms
Guiding Questions and Tools



STEP 4
Developing Standard Implementation Procedures within the BBB Concept

-
- Guiding Questions and Tools

STEP 5
Developing Monitoring and Evaluation Systems

Guiding Questions and Tools

Expected Outputs When Using the Tools

Fisheries: Damaged fishing vessels must be repaired according to minimum specifications of seaworthiness. Fishery-related ecosystems, such as coral reefs and seagrass beds, should be protected through zoning (e.g. restricted-use and non-use). Fishing gear and practices must be compatible with responsible fisheries and sustainable use of resources through marine-culture such as fish pens/cages and seaweed culture.

General Recovery: The huge demand for wood for reconstruction may result in over-logging of forests. For example, indications are that illegal logging is on the rise in Aceh Province, where the estimated volume of wood needed for reconstruction is eight times the amount of wood harvested legally each year.

GUIDING QUESTIONS AND TOOLS

Guiding questions	Is there suitable legislation and written institutional mandate for post-disaster land-use and physical planning?	Complexity
Tool	See tools in Phase 4 Response and Phase 5 Recovery.	
Guiding questions	Are there standard operational and implementation procedures (SOPs), including (rapid) procurement, in place within the ‘build back better’ concept that includes reconstruction standards?	
Tools	UNISDR (2017): <i>Build Back Better – in recovery, rehabilitation and reconstruction</i> http://www.recoveryplatform.org/assets/sendaiframework2015/Build%20Back%20Better.pdf	3
Tools	Office of the UN Secretary General (2006): <i>Key Propositions for Building Back Better</i> http://www.preventionweb.net/files/2054_VL108301.pdf	1
Guiding questions	How would land-use/physical planning and the BBB concept affect insurance (e.g. lower premiums)?	
Tools	With the insurance industry and the respective government officials/line ministries.	2





STEP 1
Implementing
Sector-Level
Recovery Programmes
**Guiding Questions
and Tools**

STEP 2
Regulating Institutional
Frameworks and
Mandates for Recovery
**Guiding Questions
and Tools**

STEP 3
Establishing/Refining Effective
Coordination and
Communication Mechanisms
**Guiding Questions
and Tools**

STEP 4
Developing Standard
Implementation Procedures
within the BBB Concept
●
**Guiding Questions
and Tools**

STEP 5
Developing Monitoring
and Evaluation Systems
□ **Guiding Questions
and Tools**

**Expected Outputs
When Using the Tools**

STEP 5: Developing Monitoring and Evaluation Systems

Establishing M&E systems defines what to monitor and evaluate (activities and outcomes), when to monitor and evaluate (timing and frequency), how to monitor and evaluate (tools and indicators), who will monitor and evaluate, and how to use the results. Early involvement of state auditors and leaders from affected communities in defining appropriate indicators will facilitate a smoother, more realistic monitoring process.

An effective M&E system for recovery should be able to:

- Track physical progress of reconstruction activities.
- Track results for other recovery activities outside the scope of reconstruction.
- Provide regular and comprehensive information on allocation and disbursement of funds (public and private).
- Provide data for evaluating economic and social impacts of recovery programmes.
- Inform outcome-based mid-term review of the recovery implementation.

GUIDING QUESTIONS AND TOOLS

Guiding questions		Complexity
Guideline	<p>How does the M&E system contribute to the transparency of the recovery projects?</p> <hr/> <p>Is the M&E system equitable and does it ensure accountability?</p> <hr/> <p>Conceptual framework:</p> <p>GFDRR (2012): Monitoring and Evaluation of Disaster Recovery & Risk Reduction https://openknowledge.worldbank.org/bitstream/handle/10986/10119/587940BRI0211M10BOX353819B01PUBLIC1.pdf</p> <p>Katich, Kristina (2010): Monitoring and Evaluation in Disaster Risk Management. EAP DRM Knowledge Notes, No. 21. World Bank. https://openknowledge.worldbank.org/handle/10986/10119 and https://openknowledge.worldbank.org/bitstream/handle/10986/10119/587940BRI0211M10BOX353819B01PUBLIC1.pdf</p>	2



STEP 1
Implementing
Sector-Level
Recovery Programmes

Guiding Questions
and Tools

STEP 2
Regulating Institutional
Frameworks and
Mandates for Recovery

Guiding Questions
and Tools

STEP 3
Establishing/Refining Effective
Coordination and
Communication Mechanisms

Guiding Questions
and Tools

STEP 4
Developing Standard
Implementation Procedures
within the BBB Concept

●
Guiding Questions
and Tools

STEP 5
Developing Monitoring
and Evaluation Systems

Guiding Questions
and Tools

Expected Outputs
When Using the Tools

Expected Outputs When Using the Tools

- ✓ More efficient use of resources because of systematic priority setting based on surveys, SOPs, procurement procedures, etc.
- ✓ Effective implementation and enhanced ownership (including the affected communities) as institutional structures and communication plans are developed and applied to the concept of BBB.
- ✓ Faster recovery at better quality combined with less risk of prolonged dependency on outside assistance by strengthening resilience.
- ✓ Insurance-related outputs (see page 129 'Synergies: Insurance and Resilient Recovery').

Glossary of Terms¹⁷

Adaptation: in human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.

Agriculture input providers: these are suppliers that provide inputs for agricultural production such as fertilizers, fodder, and products that are allowed to be used for crop protection, cleaning, and as additives in food production.

Agriculture sector: also known as the agribusiness sector, it comprises all of the business activities performed that range from agricultural production to final product consumption. The sector is one of the world's largest employers, both generating income and contributing to food security and nutrition. It includes the entire value chain: the supply of agricultural inputs, the production and transformation of agricultural goods, and their distribution as products to final consumers.

Agro-climate risk management: is the application of risk reduction policies and strategies related to climatic variability and its adverse effects on agricultural production, including the important socioeconomic activities and livelihoods linked with it.

Basis risk: is the risk of discrepancy between an insurance payout and an actual loss incurred. An instance of weak correlation between a defined trigger threshold and realized loss, potentially due to spatial and temporal variations as well as the specificities of the loss, may prevent a payout from occurring. In this case, the insured party bears the amount of the uninsured loss.

Build back better: is the post-disaster integration of disaster risk reduction measures during the recovery, rehabilitation and reconstruction phases in order to increase the resilience of nations and communities through the restoration of physical infrastructure and social systems, and the revitalization of livelihoods, economies and the environment.

¹⁷ This glossary is based on the following sources:

FAO (2010). Agricultural value chain development: Threat or opportunity for women's employment? Gender and Rural Employment Policy Brief #4, 2010. Available at <http://www.fao.org/docrep/013/i2008e/i2008e04.pdf>

Warner, Koko, and others (2013). Innovative Insurance Solutions for Climate Change: How to integrate climate risk insurance into a comprehensive climate risk management approach. Report No. 12. Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS).

World Bank (2014). Financial Protection against Natural Disasters: An Operational Framework for Disaster Risk Financing and Insurance. Available at <https://www.gfdrr.org/sites/default/files/documents/Financial%20Protection.pdf>

UN General Assembly (2016). Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction.

World Bank Group (2017). Global Financial Inclusion and Consumer Protection Survey. 2017 Report. Available at http://www.who.int/health_financing/topics/financial-protection/en/

FAO (2017). Agribusiness and value chains. Available at <http://www.fao.org/3/a-i6811e.pdf>

Capacity development: is the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals. It is a concept that extends the term of capacity-building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems and the wider enabling environment.

Contingency plan: is a type of risk management tool which is used to ensure that sufficient arrangements are in place in order to respond to a disaster. This is most often carried out via a planning process, which then leads to an action plan and subsequent actions.

Contingent liabilities: are potential liabilities that have not yet been actualized but may occur. Contingent liabilities are important for policy and analysis, and thus information on them needs to be collected. A high level of contingencies may signify an unacceptable level of risk within the agricultural sector.

Credit portfolio: is an investment folder containing debts, like home and car loans. Private investors can build credit portfolios, but more commonly they are held by banks and other financial institutions.

Credit rating: is a score given to an individual, firm or other entity that represents credit risk and whether or not the borrower will be able to pay back the money borrowed, or reimburse the money for items purchased on credit. The rating is based on an entity's financial status and past records of debt repayment, amongst other factors. Insurance can help to reduce losses caused by credit-default.

Disaster risk management: is the usage of disaster risk reduction strategies and the application of policies to prevent new disaster risk, reduce existing disaster risk and manage residual risk in order to contribute to the reduction of disaster losses and build resilience.

Early warning system: is an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments and businesses to take timely action in order to reduce the risks of disaster prior to its occurrence.

Financial protections: are the results achieved when financial products are obtained through direct payments in order to build financial resilience and guard governments, the private sector and households from exposure to financial hardship.

Forecast-based financing: is a mechanism that provides access to funding in order to ensure early action and prepares to respond based on in-depth scientific forecast and risk analysis. The mechanism has three components: 1) trigger levels based on detailed risk analysis of relevant hazards for a particular region are identified; 2) selection of actions/predetermined early action to reduce the humanitarian impact of the event; and 3) pre-disaster (early) financing mechanism that automatically allocates funding once a forecast reaches a pre-agreed trigger level.

Forecast-based payout: is the amount of money paid out to an insurance policyholder, which is established according to calculations, estimations and modelling of a future event.

Index insurance: is a type of insurance contract that involves the use of predetermined parameters (e.g. temperature, rainfall, or area yield), and thresholds as the basis for payouts to be issued. Once a certain threshold of a certain parameter is crossed (for example, when rainfall surpasses a predetermined level), payments will be issued to policyholders. Index insurance works in contrast to indemnity insurance, which involves damage assessments and payments that correspond to a policyholder's actual loss.

Insurance premium: is the amount charged to an insured party for an insurance coverage that reflects the expectation of loss. The terms of the payment (i.e. payment due dates, frequency, and amount to be paid) are stipulated in a contract.

Insurance products: are the different types of insurance agreements sold by an insurer. For example, an insurer may sell car and home insurance, liability insurance, healthcare coverage and contracts tailored for businesses. The various products offered by insurers are made to target different clients and the specific risks that they may be facing.

Integrated climate risk management approach: is a risk-oriented guide which incorporates climate change adaptation measures into disaster risk management policies and plans for sustainable development. It takes into consideration the physical, social, economic, financial and environmental dimensions of a country, region or municipality. It leverages insurance as a risk transfer instrument which can catalyse targeted investments that can be used in order to prevent and reduce risks, address residual risk and prepare to respond and recover from the impacts of a disaster.

Liquidity gap: is the discrepancy between the amount of financial assets accessible from available sources and the actual need for those resources.

NatCatSERVICE database: is a database of losses, which have been caused by natural disasters. This database, owned by Munich Re, is one of the world's most comprehensive databases. Users of this database can produce quickly online analyses that meet their own needs.

Premium: is the monetary sum paid by the insured party to the insurer for the duration (term) of insurance coverage granted by the policy.

Protection gap: is the disparity of access to financial markets or affordability in emerging and low-income countries and access in high-income countries.

Reinsurance: when the potential for losses surpasses the limit of an insurer (insurance company) due to the level of exposure of a risk or group of risks, the insurer may purchase reinsurance – insurance of the insurance.

Relief programme: is a series of practical interventions or financial assistance provided in order to help the affected populations meet their needs and overcome hardship after having been impacted by a disaster. A relief programme can be put into place during an emergency situation or it can be carried out post-disaster.

Residual risk: is the amount of risk left over after natural or inherent risks have been reduced by risk controls.

Resilience: is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

Risk transfer: is the process in which the burden of financial loss or responsibility for risk financing is shifted to another party, through insurance, reinsurance, government regulations or other means.

Value chain: is the set of actors and activities within the agricultural sector which brings a basic agricultural good from production in the field to final consumption, where at each stage value is added to the product. A value chain can be a network or vertical linkage between numerous independent business organizations and can involve the processing, packaging, storage, transport and distribution of a product. The term 'value chain' is often used synonymously with the term 'supply chain'.

Water resource management systems: are the combinations of various approaches used to strengthen water security, especially in the context of increasing water scarcity, growing demand, greater extremes and rising uncertainty due to the numerous challenges related to water resources. These approaches include the different institutional organizations, infrastructural projects, information management arrangements, technologies and investments, as well as the legal and regulatory frameworks that work towards achieving a better allocation, administration and conservation of water resources.

Example of detailed calculation and data sources in the Pacific Island Countries – agricultural sector.

Source: World Bank/ADB/SPCCPS (2013): PCRAFI – Better Risk Information for Smarter Investments – Catastrophe risk assessment methodology

Annex 1

Example for Calculating Replacement Costs – Agricultural Sector

The **Applied Geoscience and Technology Division** incorporates the Pacific Islands Applied Geoscience Commission (SOPAC) and includes information on the areas of water and sanitation, disaster management, seabed resources, maritime boundary delimitation and monitoring of ocean processes. This database is the most comprehensive exposure dataset for the Pacific and is hosted by SPC-SOPAC. (<http://gsd.spc.int/maps-and-spatial-data-repository>; and <http://www.pacgeo.org/>).

The following approach was applied for calculating the average replacement costs:

- **Subsistence farmers** are assumed to invest only a fraction of the costs incurred by an average producer in the region. Therefore, the replacement costs for subsistence producers have been reduced to one-fourth of the traditional cost.
- **Commercial producers** that invest heavily in technology with export-oriented production are assumed to have higher replacement costs than the average crop production systems. For commercial farmers, the replacement costs have been increased by half of the traditional cost.

The LULC databases, with information on all vegetation, were used to create the cash crop exposure database. Cash crops were indexed by sampling the LULC data on an 80-by-80 metre grid for most countries. For the larger countries (Papua New Guinea, Samoa and Fiji), the sampling grid was taken at 270-by-270 metres. These different sampling resolutions balanced accuracy and economy, allowing for the detection of cash crops in small atolls. In addition, the crop types indicated in the LULC maps, which sometimes included multiple crops in one area, were mapped appropriately to a similar crop classification in which the replacement costs and damage functions could be easily assigned.

In general, the different crops in the Pacific Island Countries (PICs) react distinctly when affected by cyclones, tsunamis or flooding. For example, it has been documented that recently introduced crops, which are used to serve export markets, are very susceptible to damage from cyclonic winds or salt spray compared to more resilient, native crops or those that have been cultivated over centuries by the PICs farmers.

The **Pacific Risk Information System** (PRIS) has been developed under the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). PCRAFI aims to provide PICs with disaster risk modelling and assessment tools for enhanced DRM and to engage in a dialogue with PICs on integrated financial solutions to increase their financial resilience to natural disasters and climate change.

The PRIS is the result of a three-year effort to collect detailed information on assets, population, hazards and risks. Physical inspections of more than 80,000 buildings and digitization and inference from satellite imagery of more than three million buildings and assets have been undertaken to create an exposure dataset of buildings, major infrastructure, major crops and population. The PRIS also includes the most comprehensive regional historical hazard catalogue (115,000 earthquake and 2,500 tropical cyclone events) and regional historical loss database ever developed for major disasters

Social protection: CFS Framework for Action for Food Security and Nutrition in Protracted Crises (CFS-FFA):

Principle 1: Meet immediate humanitarian needs and build resilient livelihoods

Principle 2: Focus on nutritional needs

Principle 3: Protect those affected by or at risk from protracted crises

Annex 2

FAO Example of Shock-Responsive and Risk-Informed Social Protection

Food Security and Nutrition/Natural Resources Management with SP functions	Social Protection	Using Rural Enablers for Social Protection
Supporting local food production and consumption simultaneously by linking agricultural interventions for sustainable management of natural resources with local food procurement for school feeding programmes.	Designing social protection interventions that reinforce sustainable productive capacities through training and access to financial services and resources, with a focus on women's groups, linked to social safety nets to support social inclusion of the vulnerable.	Establishing and supporting rural organizations, including women's associations and producer organizations, to provide access to social protection, e.g. risk-sharing schemes, such as livestock or crop insurance (e.g. weather index-based).
<ul style="list-style-type: none"> • Food transfers (including food reserves, food distribution, vouchers). • Food/agricultural subsidies. • Livelihood and asset packages. • Targeted transfers (e.g. seasonal, seeds), including of assets and inputs. • Public Works Plus, inputs/food. • Crop insurance. 	<ul style="list-style-type: none"> • Cash transfers. • Child grants. • Disability benefits. • Health and social insurance. • In-kind transfers. • Pensions. • Public works. • Unemployment benefits. 	<ul style="list-style-type: none"> • Community-based credit associations. • Women's associations. • Producers' organizations.

Source: FAO (2016): The role of social protection in protracted crises

Social assistance plays an important role in helping affected people to cope with the shock.

Box 21: Example of Cash Transfer (IFRC, 2012)

Annex 2

FAO Example of Shock-Responsive and Risk-Informed Social Protection

Cash transfers are particularly well suited to situations where employment, income, livelihood or economic production opportunities have been lost or disrupted as they allow people to obtain goods and services of their choice directly from markets (if they are operational) for meeting basic needs and asset replacement.

The use of cash transfers should be determined based on a needs assessment, the kind of cash modalities, and delivery mechanism. Cash interventions are often insufficient on their own and can be combined with other forms of assistance.

Cash can be delivered to individuals, households, groups and whole communities through, for e.g.:

- Unconditional transfers with no stipulations as to how the money is to be used.
- Conditional transfers with requirements for the money to be spent in a certain way.
- Commodity or cash vouchers detailing the items and services that the recipient can buy.
- Cash for work (payment for work involving community services or infrastructure).

The flowchart below highlights the series of action ranging from response to resilient recovery within the indicated time line that has to be adjusted according to the specific country conditions.

Source: EU/UNEP/World Bank/GFDRR (2015): Guide to developing disaster recovery frameworks

Annex 3

Flowchart of the Disaster Recovery Framework

Up to 3 months	3-6 months	6+ months
Relief work (response)	Resilient recovery towards sustainable development	
<ul style="list-style-type: none"> • Humanitarian response. • Post-disaster assessment. 		
Policy and strategy setting:		
<ul style="list-style-type: none"> • Define the vision for recovery. • Define guiding principles and primary sectors for recovery. 	Develop criteria for inter-sectoral prioritization/ resource allocation, develop sector-level recovery strategy.	Translate sector strategies into projects (interface between 3-6 months and 6+ months).
Institutional framework:		
<ul style="list-style-type: none"> • Assess government capacity to manage recovery. • Set up approximate institutional arrangements. • Appoint appropriate recovery leader. • Clarify institutional roles and responsibilities. • Establish coordination mechanisms for non-governmental entities. 	<ul style="list-style-type: none"> • Strengthen the capacity of 'lead agency' and implementation entities. • Ensure a smooth transition from relief to recovery. 	

Annex 3

Flowchart of the Disaster Recovery Framework

Up to 3 months	3-6 months	6+ months
Financing for recovery:		
Conduct funding gap analysis, mainstream off-budget funds to complement public financing, mobilize funds (budget review, donor aid, the private sector, etc.).	<ul style="list-style-type: none"> Allocate a budget, monitor transfer and use of funds. Strengthen public financial management. 	Streamline procurement and funds flow procedures (including fast-track procurement procedures).
Implementation arrangements:		
	<ul style="list-style-type: none"> Develop participatory forums for communities, civil society, private sector. Set up coordination mechanisms. 	<ul style="list-style-type: none"> Standardize project approval process. M&E system. Public communication on recovery progress.

Annex 4

Public Financial Management Plans

Considerations for national PFM plans:

- Capacity of institutions and budget systems, and opportunities to strengthen them.
- The scale of international aid and coordination of aid.
- Number of institutional levels involved in the PFM cycle.
- Financial arrangements for emergency relief (response) and long-term resilient recovery.
- Nature of emergency procedures and implementation arrangements (including procurement and logistics).
- Fiduciary integrity and anti-corruption.

Source: EU/UNEP/World Bank/GFDRR (2015): Guide to developing disaster recovery frameworks

Annex 5

Gender Roles in Emergency Livestock Activities

The potential impact of any intervention on women's access to and management of resources – in particular, livestock and livestock products – needs close attention.

A pre-intervention assessment of gender roles and responsibilities is needed within the affected community to analyse the extent and impact of the emergency and the implications of the planned activities. In some pastoralist communities, for example, women may be responsible for young but not adult stock, or they may have control of livestock products (e.g. milk, butter and skins) as part of their overall control of the food supply, while men have disposal rights over the animal itself.

In this context, the following aspects should be considered at the project design stage:

- **Roles and decision-making capacities:** Supporting women as livestock owners, animal health care providers, feed gatherers and birth attendants, and as users of livestock products is crucial for gender-responsive interventions.
- **Gender responsibilities:** In many livestock-based societies, cash is controlled by men while food is the responsibility of women. In such cases, meat distribution may help to support women's role in securing the family food supply, while cash purchase of livestock may increase male heads of household's spending power, over which women may have little control.
- **Women's safety:** Consideration of gender roles in the provision of water and feed for livestock, particularly in the case of poorer women and girls who may risk, for example, violent assault if they have to travel distances to collect water for livestock.
- **Women and animal health:** Women (and girls) are often responsible for small and/or young stock, including the diagnosis and treatment of diseases. They should, therefore, be involved in animal health interventions and training.
- **Social and cultural norms:** The design of veterinary services needs to take account of local social and cultural norms, particularly those related to the roles of men and women as service providers (e.g. in some communities it is difficult for women to move around freely or travel alone to remote areas where livestock might be kept).
- **Women's workload:** Milking of dairy animals and cleaning of animal housing are often tasks that fall disproportionately upon women members of the household. In addition, feed collection and management may mean particularly onerous duties for women and girls. Hence, particular care should be taken to ensure that the planned activities do not compromise the interests of women in affected communities.

Source: IFAD (2009): Emergency livestock interventions in crisis and post-crisis situations

Annex 6

Build Back Better Concept

Global experience with major disasters offers a number of key guiding recommendations to support 'build back better':

- Building greater financial resilience within government to manage and respond to natural disasters, and formalized strategic and resource commitments toward recovery management.
- Promoting the institutionalization of post-disaster assessments and national recovery frameworks to enhance risk governance, ensure recovery readiness, strengthen coordination of governments, civil society, the private sector, multi-laterals and others, and increase efficient and effective recovery and reconstruction operations.
- Strengthening capacity for recovery planning and monitoring at the national, local and community levels, and establishing clear roles and responsibilities for all actors in a recovery setting, including academia.
- Strengthening mechanisms for cooperation in recovery and reconstruction that include sharing rosters of experts, tools, bi-lateral support between countries, progress monitoring, and standardized approaches, for e.g. recovery planning frameworks.
- Developing national and international policy standards for informing and guiding disaster recovery strategies.
- Maintaining an institutional continuum between preparedness, response, recovery, mitigation and sustainable development measures.

Source: Build back better concept – UN World Conference on DRR, 14.-18.3. 2015, Sendai, Japan

Bibliography

Guidelines/Manuals/Studies

- Access to Insurance Initiative (2017). *Proportionality in practice: Disclosure of information*. Available at https://www.microfinancegateway.org/sites/default/files/publication_files/case_study_pip_disclosure_eng_web_2.pdf
- African Risk Capacity (2013). *Response Plan For Drought-Related Crises*. Available at http://www.africanriskcapacity.org/wp-content/uploads/2016/11/OP_Pool1_Senegal-Operational-Plan.pdf
- African Risk Capacity (updated version from 2013). *Contingency Planning Standards and Guidelines*. Available at <http://www.africanriskcapacity.org/2016/12/05/standards-and-guidelines/>
- Australian Institute for Disaster Resilience (2002). *Disaster Loss Assessment Guidelines*. Available at <https://knowledge.aidr.org.au/media/1967/manual-27-disaster-loss-assessment-guidelines.pdf>
- Balmes, Chiden (2011). *The world's largest multidonor trust funds: A primer*. DevEx International Development. Available at <https://www.devex.com/news/the-world-s-largest-multidonor-trust-funds-a-primer-72695>
- Bester, Hennie, and others (2010a). *MicroInsurance Country Diagnostic Studies: Analytical Framework and Methodology*. Access to Insurance Initiative. Available at https://a2ii.org/sites/default/files/reports/case_study_proportionality_in_practice_2.pdf; and <https://a2ii.org/en/knowledge-centre/tools-and-guidance>.
- Bester, Hennie, and others (2010b). *Country Process Guidelines for Microinsurance Market Development*. Access to Insurance Initiative. Available at https://a2ii.org/sites/default/files/field/uploads/2011_10_12_toolkit_2_0.pdf
- Birkmann, Jörn (2013). *Measuring Vulnerability to Natural Hazards – Towards Disaster Resilient Societies*. UN University Office, New York. Available at <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>
- CARE/Benfield Hazard Research Centre (2015). *Guidelines for rapid environmental impact assessment in disasters*. Available at <http://www.lives-tock-emergency.net/userfiles/file/assessment-review/Benfield-Hazard-Research-Centre-CARE-2005.pdf>
- Clarke, Daniel, and others (2016). *Evaluating Sovereign Disaster Risk Finance Strategies: A Framework*. World Bank. Available at <http://documents.worldbank.org/curated/en/430111468184437717/Evaluating-sovereign-disaster-risk-finance-strategies-a-framework>
- Climada Manual open-source tool for assessing the economics of climate adaptation by UNISDR Prevention https://github.com/davidnbresch/climada/blob/master/docs/climada_manual.pdf and <http://www.preventionweb.net/educational/view/42020>
- ClimateWise (2014). *Insurability in the face of climate change*. Available at <https://www.cisl.cam.ac.uk/business-action/sustainable-finance/climatewise/pdfs/insurability-in-the-face-of-climate-change.pdf/view>
- Clinton, William (2006). *Key Propositions for Building Back Better*. Available at http://www.preventionweb.net/files/2054_VL108301.pdf
- Cohen, Monique, and others (2006). *Guidelines for Market Research on the Demand for Microinsurance*. USAID. Available at <http://www.microinsurance-network.org/groups/guidelines-market-research-demand-microinsurance>
- Damanaki, Maria (2016). *Nature's Answer to Climate Risk*. Project Syndicate, 26 May. Available at <https://www.project-syndicate.org/commentary/climate-risk-mitigation-natural-ecosystems-by-maria-damanaki-2016-05?barrier=accesspaylog>



De Janvry, Alain (2015). *Quantifying Through Ex Post Assessments the Micro-Level Impacts of Sovereign Disaster Risk Financing and Insurance Programs*. Policy Research Working Paper, No. 7356. Washington, D.C.: World Bank. Available at <https://openknowledge.worldbank.org/handle/10986/22239>

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH/GlobalAgRisk (2012). *Extreme El Niño Insurance for Climate Change Prevention and Adaptation in Peru*. Available at <http://seguros.riesgoycambioclimatico.org/publicaciones/Nota-Tecnica2-eng.pdf>

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH/DFID (2013). *Promoting women's financial inclusion – A toolkit*. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213907/promoting-womens-financial-inclusion-toolkit.pdf

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH/Adelphi/EURAC (2014). *The Vulnerability Sourcebook: Concept and guidelines for standardised vulnerability assessments*. Available at <https://www.adelphi.de/en/publication/vulnerability-sourcebook-concept-and-guidelines-standardised-vulnerability-assessments>

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (2017a). *Inclusive Insurance and the Sustainable Development Goals*. Available at <http://www.microinsurancenetwerk.org/sites/default/files/Inclusive%20Insurance%20and%20the%20Sustainable%20Development%20Goals%20.pdf>

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH/IFC/a2ii, and others (2017b). *Mainstreaming gender and targeting women in inclusive insurance: perspectives and emerging lessons*, a compendium of technical notes and case studies <http://documents.worldbank.org/curated/en/229301511502882182/Mainstreaming-gender-and-targeting-women-in-inclusive-insurance-perspectives-and-emerging-lessons-a-compendium-of-technical-notes-and-case-studies>

European Union (2015a). *EU guideline for impact assessment*. Available at <https://ec.europa.eu/info/sites/info/files/better-regulation-guidelines-impact-assessment.pdf>

European Union (2015b). *Information Note on Multidonor Trust Funds Supported by the European Union*. Available at https://ec.europa.eu/europeaid/sites/devco/files/multidonor-trust-funds-supported-by-the-european-union-2003-march-2015_en.pdf

European Union /United Nations/World Bank (2013). *Post-Disaster Needs Assessment Guide*, Vol. A and B. Available at <http://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/pdna.html>

European Union/United Nations Development Programme/World Bank/Global Facility for Disaster Reduction and Recovery (2015). *Guide to developing disaster recovery frameworks*, Sendai Conference version. Available at <https://www.gfdrr.org/sites/gfdrr/files/publication/DRF-Guide.pdf>

Food and Agriculture Organization (2008). *Disaster risk management systems analysis – A guidebook*. Available at <http://www.fao.org/3/a-i0304e.pdf>

Food and Agriculture Organization (2010). *Agricultural value chain development: Threat or opportunity for women's employment?* Gender and Rural Employment Policy Brief #4. Available at <http://www.fao.org/docrep/013/i2008e/i2008e04.pdf>

Food and Agriculture Organization (2011). *The role of women in agriculture*. ESA Working Paper No. 11-02. Available at <http://www.fao.org/docrep/013/am307e/am307e00.pdf>

Food and Agriculture Organization (2015). *The impact of disasters on agriculture and food security*. Available at <http://www.fao.org/3/a-i5128e.pdf>

Food and Agriculture Organization (2016a). *Agriculture and Food Insecurity Risk Management in Africa. Concepts, lessons learned and review guidelines*. Available at <http://www.fao.org/3/a-i5936e.pdf>

Food and Agriculture Organization (2016b). *The impact of disasters on agriculture: Addressing the information gap*. Available at <http://www.fao.org/3/a-i7279e.pdf>

Food and Agriculture Organization (2016c). *A gender-responsive approach to disaster risk reduction (DRR) planning in the agricultural sector*. Available at <http://www.fao.org/3/a-i6531e.pdf>

Food and Agriculture Organization (2016d). *Leaving no one behind - Addressing climate change for a world free of poverty and hunger*. Available at <http://www.fao.org/3/i6371en/i6371EN.pdf>

Food and Agriculture Organization (2016e). *The role of social protection in protracted crises: Enhancing the resilience of the most vulnerable*. Guidance Note. Available at <http://www.fao.org/3/a-i6636e.pdf>

Food and Agriculture Organization (2017a). *Agribusiness and value chains*. Available at <http://www.fao.org/3/a-i6811e.pdf>

Food and Agriculture Organization (2017b). *Benefits of farm level disaster risk reduction practices in agriculture – Preliminary findings*. Available at <http://www.fao.org/3/a-i7319e.pdf>

Food and Agriculture Organization (2017c). *Food Security Update: A quarterly bulletin of FAO Subregional Office for Eastern Africa*. October. Available at <http://www.fao.org/3/a-i8135e.pdf>

GERICS Climate Service Center (2016). *How to read a Climate-Fact-Sheet*. Briefing Paper. Available at http://www.climate-service-center.de/imperia/md/images/csc/projekte/climatefactsheets/manual_cfs-update_march2016.pdf

German Federal Ministry for Economic Cooperation and Development (2015). *Disaster Risk Management – Approach and Contributions of German Development Cooperation*. Available at https://www.giz.de/en/downloads/giz2015-en-Materialie245a_disaster_risk_management.pdf

Gettleman, Jeffrey (2017). More Than 1,000 Died in South Asia Floods This Summer. *New York Times*, 29 August. Available at <https://www.nytimes.com/2017/08/29/world/asia/floods-south-asia-india-bangladesh-nepal-houston.html>

Global Facility for Disaster Reduction and Recovery (2012). *Monitoring and Evaluation of Disaster Recovery & Risk Reduction*. Available at <https://docplayer.net/1627531-Monitoring-and-evaluation-of-disaster-recovery-risk-reduction.html>

Hallegatte, Stephane, and others (2017). *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*. Climate Change and Development. Washington, D.C.: World Bank. Available at <https://openknowledge.worldbank.org/handle/10986/25335>

Hougaard, Christine (2013). *Country-level microninsurance development process: operationalising the action plan*. Access to Insurance Initiative. Available at https://a2ii.org/sites/default/files/field/uploads/2014_03_06_annex_11toolkit_iv_final_draft.pdf

Inter-Agency Standing Committee (2006). *Women, Girls, Boys and Men: Different needs – equal opportunities*. Available at <https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/Gender%20Handbook.pdf>

Inter-Agency Standing Committee (2007). *Inter-agency contingency planning guidelines for humanitarian assistance*. IASC Sub-Working Group on Preparedness and Contingency Planning. Available at http://www.who.int/hac/network/interagency/ia_guidelines_dec2007.pdf

Inter-Agency Standing Committee (2015). *Emergency Response Preparedness (ERP) – Risk analysis and monitoring, minimum preparedness, advanced preparedness and contingency planning*. Available at https://interagencystandingcommittee.org/system/files/emergency_response_preparedness_2015_final.pdf

Intergovernmental Panel on Climate Change (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation – Special Report of the IPCC*. Available at https://wg1.ipcc.ch/srex/downloads/SREX-All_FINAL.pdf

Intergovernmental Panel on Climate Change (2018). *Annex II – Glossary in Climate Change 2018: Impacts, Adaptation, and Vulnerability*. Available at <https://www.ipcc.ch/report/ar5/wg2/>

International Association of Insurance Supervisors (2014). *Regulation and Supervision Supporting Inclusive Insurance Markets*. Basic-level module core curriculum for insurance supervisors. Available at https://a2ii.org/sites/default/files/field/uploads/2014_02_18_inclusive_insurance_module_final_draft_-_edited_0.pdf

International Association of Insurance Supervisors/a2ii (2013). *Self-assessment and Peer Review on Regulation and Supervision supporting Inclusive Insurance Markets*. Available at https://a2ii.org/sites/default/files/field/uploads/toolkit_3_-_self-assessment_and_peer_review_process_0_0.pdf

International Federation of Red Cross and Red Crescent Societies (2008). *A framework for community safety and resilience in the face of disaster risk*. Available at <http://www.ifrc.org/Global/Case%20studies/Disasters/cs-framework-community-en.pdf>

International Federation of Red Cross and Red Crescent Societies (2010). *A practical guide to: Gender-sensitive Approaches for Disaster Management*. Available at <http://www.ifrc.org/PageFiles/96532/A%20Guide%20for%20Gender-sensitive%20approach%20to%20DM.pdf>

International Federation of Red Cross and Red Crescent Societies (2012a). *Contingency planning guide*. Available at <http://www.ifrc.org/PageFiles/40825/1220900-CPG%202012-EN-LR.pdf>

International Federation of Red Cross and Red Crescent Societies (2012b). *IFRC Recovery programming guidance 2012*. Available at <http://www.ifrc.org/PageFiles/41104/IFRC%20Recovery%20programming%20guidance%202012%20-%201232900.pdf>

International Federation of Red Cross and Red Crescent Societies/UNDP (2015a). *The Checklist on Law and Disaster Risk Reduction – An annotated outline*. Available at <http://www.ifrc.org/Global/Publications/IDRL/Publications/The%20Checklist%20on%20law%20and%20DRR%20Oct2015%20EN%20v4.pdf>

International Federation of Red Cross and Red Crescent Societies/UNDP (2015b). *The Handbook on Law and Disaster Risk Reduction*. Available at <http://www.ifrc.org/Global/Photos/Secretariat/201511/Handbook%20on%20law%20and%20DRR%20LR.pdf>

International Federation of Red Cross and Red Crescent Societies/WFP/FAO (2014). *Early Warning, Early Action: Mechanisms for Rapid Decision Making*. Available at http://www.droughtmanagement.info/literature/IFRC_Early_Warning_Early_Action_2014.pdf

International Fund for Agricultural Development (2009). *Emergency livestock interventions in crisis and post-crisis situations*. Available at <https://www.slideshare.net/copppldsecretariat/emergency-final>

International Fund for Agricultural Development (2010). *The Potential for Scale and Sustainability in Weather Index Insurance for Agriculture and Rural Livelihoods*. Available at https://documents.wfp.org/stellent/groups/public/documents/newsroom/wfp281391.pdf?_ga=2.202105048.836142875.1521720890-2012939049.1521720890

International Fund for Agricultural Development (2017). *Remote sensing for index insurance – Findings and lessons learned for smallholder agriculture*. Available at <https://reliefweb.int/report/ethiopia/remote-sensing-index-insurance-findings-and-lessons-learned-smallholder-agriculture>

International Fund for Agricultural Development/WFP (2011). *Weather Index-based Insurance in Agricultural Development: A Technical Guide*. Available at <https://www.wfp.org/content/weather-index-based-insurance-agricultural-development-technical-guide>

International Monetary Fund (2017). *World Economic Outlook. Seeking Sustainable Growth Short-Term Recovery, Long-Term Challenges*. Available at <https://www.imf.org/en/Publications/WEO/Issues/2017/09/19/world-economic-outlook-october-2017>

Jaffee, Steven, and others (2008). *Rapid Agricultural Supply Chain Risk Assessment. Conceptual Framework and Guidelines for Application*. Draft, June 13. Available at <http://siteresources.worldbank.org/INTCOMRISMAN/Resources/RapidAgriculturalSupplyChainRiskAssessmentConceptualFramework.pdf>

Kimetrica (2014). *Independent Review of the African Risk Capacity (ARC) Contingency Planning*. Available at <http://docplayer.net/23562463-Independent-review-of-the-african-risk-capacity-arc-contingency-planning.html>

Kraemer, Moritz, and others (2015). *RatingsDirect – Storm Alert: Natural Disasters Can Damage Sovereign Creditworthiness*. Available at <http://unepfi.org/pdc/wp-content/uploads/StormAlert.pdf>

Le Quesne, Felicity, and others (2017). *The role of insurance in integrated disaster & climate risk management: Evidence and lessons learned*. Report No. 22, October 2017. Available at http://www.climate-insurance.org/fileadmin/user_upload/ACRI__2017_Role_of_Insurance_in_ICRM_online.pdf

Lesukat, Marko (2012). *Drought Contingency Plans and Planning in the Greater Horn of Africa*. UNISDR. Available at http://www.unisdr.org/files/26436_droughtcontingencylow.pdf

Organisation for Economic Co-operation and Development (2012a). *Disaster risk assessment and risk financing – A G20/OECD Methodological Framework*. Available at <http://www.oecd.org/gov/risk/G20disasterriskmanagement.pdf>

Organisation for Economic Co-operation and Development (2012b). *Sustainability in Impact Assessments*. Available at [http://www.oecd.org/gov/regulatory-policy/Sustainability%20in%20impact%20assessment%20SG-SD\(2011\)6-FINAL.pdf](http://www.oecd.org/gov/regulatory-policy/Sustainability%20in%20impact%20assessment%20SG-SD(2011)6-FINAL.pdf)

NOAA National Centers for Environmental Information (2018). *State of the Climate: Global Climate Report – Annual 2017, January*. Available at <https://www.ncdc.noaa.gov/sotc/global/201713>

Poole, Lydia (2014). *A Calculated Risk – How Donors Should Engage with Risk Financing and Transfer Mechanisms*. Paris. Available at <https://www.oecd.org/dac/A%20calculated%20risk.pdf>



Sangalang, Stephanie (2015). *Framework for natural disaster impact assessment: Indicators of resilience, risk, and vulnerability in victims of Typhoon Haiyan*. Available at <http://conferences.iaia.org/2015/Final-Papers/Sangalang,%20Stephanie%20-%20Framework%20for%20natural%20disaster%20impact%20assessment.pdf>

Schaefer, Laura, and others (2016). *Climate risk insurance for the poor & vulnerable: How to effectively implement the pro-poor focus of InsuResilience*. Available at http://www.climate-insurance.org/fileadmin/mcii/documents/MCII_2016_CRI_for_the_Poor_and_Vulnerable_full_study_lo-res.pdf

Singh, Abhay (2017). PM Narendra Modi to make aerial survey of flood-hit Purnia today. *The Times of India*, 26 August. Available at <https://timesofindia.indiatimes.com/city/patna/pm-narendra-modi-to-make-aerial-survey-of-flood-hit-purnia-today/articleshow/60226590.cms>

Slim, Hugo (2012). *IASC Real-Time Evaluation of the Humanitarian Response to the Horn of Africa Drought Crisis in Somalia, Ethiopia and Kenya*. Synthesis Report. Available at https://reliefweb.int/sites/reliefweb.int/files/resources/RTE_HoA_SynthesisReport_FINAL.pdf

Souvignet, Maxime, and others (2016). *Economics of Climate Adaptation (ECA) – Guidebook for Practitioners*. Available at https://www.kfw-entwicklungsbank.de/PDF/Download-Center/Materialien/2016_No6_Guidebook_Economics-of-Climate-Adaptation_EN.pdf

Swiderek, Donna, and John Wipf (2014). *Aiding the disaster-recovery process – The effectiveness of microinsurance service providers' response to Typhoon Haiyan*. Available at <https://microinsurancenet.org/groups/aiding-disaster-recovery-process-effectiveness-microinsurance-service-providers-response>

Swiss Re (2009). *Shaping climate resilient development, a framework for decision-making – A report of the economics of climate adaptation working group*. Available at http://ccsl.iccip.net/climate_resilient.pdf

Swiss Re (2014). *Sigma*. Natural catastrophes and man-made disasters in 2013: large losses from floods and hail; Haiyan hits the Philippines. pp. 15-25. Available at http://media.swissre.com/documents/sigma1_2014_en.pdf#page=17

Tisdall, Simon (2012). East Africa's drought: the avoidable disaster. *The Guardian*, 18 January. Available at <https://www.theguardian.com/world/2012/jan/18/east-africa-drought-disaster-report>

United Nations General Assembly (2016). *Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction*. Available at http://www.preventionweb.net/files/50683_oiwegreportenglish.pdf

United Nations Office for the Coordination of Humanitarian Affairs (2013). *Disaster response in Asia and the Pacific – A Guide to International Tools and Services*. Available at <http://www.unocha.org/publications/asiadisasterresponse/>

United Nations Disaster Assessment and Coordination (2013). *UNDAC Field Handbook*. Available at https://www.unocha.org/sites/unocha/files/1823826E_web_pages.pdf

United Nations Environment Programme Finance Initiative (2012). *Principles for Sustainable Insurance*. Available at <http://www.unepfi.org/psi/the-principles/>

United Nations International Strategy for Disaster Reduction (2009). *2009 UNISDR Terminology on Disaster Risk Reduction*. Available at http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

United Nations International Strategy for Disaster Reduction (2015). World Conference adopts new international framework for disaster risk reduction after marathon negotiations. 18 March, 2015. Available at <https://www.unisdr.org/archive/43289>

United Nations International Strategy for Disaster Reduction (2017 Consultative version). *National Disaster Risk Assessment – Governance System, Methodologies and Use of Results*. Available at https://www.unisdr.org/files/globalplatform/591f213cf2f52828_wordsintoactionguideline.nationaldi.pdf

United Nations International Strategy for Disaster Reduction (2017). *Build Back Better: in recovery, rehabilitation and reconstruction*. Available at <http://www.recoveryplatform.org/assets/sendaiframework2015/Build%20Back%20Better.pdf>

Warner, Koko, and others (2013). *Innovative Insurance Solutions for Climate Change: How to integrate climate risk insurance into a comprehensive climate risk management approach*. Report No. 12. Bonn: United Nations University Institute for Environment and Human Security.

World Bank (2005). *Managing Agricultural Production Risk: Innovation in Developing Countries*. Report No. 32727-GLB. Available at http://siteresources.worldbank.org/INTARD/Resources/Managing_Ag_Risk_FINAL.pdf

World Bank (2010). Monitoring and Evaluation in Disaster Risk Management. EAP DRM Knowledge Notes, No. 21. Available at <https://openknowledge.worldbank.org/handle/10986/10119> and <https://openknowledge.worldbank.org/bitstream/handle/10986/10119/587940BRI0211M10BOX353819B-01PUBLIC1.pdf?sequence=1&isAllowed=y>

World Bank (2011). *Weather Index Insurance for Agriculture: Guidance for Development Practitioners*. Available at <http://documents.worldbank.org/curated/en/590721468155130451/Weather-index-insurance-for-agriculture-guidance-for-development-practitioners>

World Bank (2012). *Advancing disaster risk financing and insurance in ASEAN Member States – Framework and options for implementation*. Available at https://www.gfdr.org/sites/gfdr/files/publication/DRFI_ASEAN_REPORT_June12.pdf

World Bank (2013a). *Feasibility Study for the Design and Implementation of Cotton Index Insurance – Chaco Province, Argentina*. Available at <http://www.microinsurancenet.org/groups/feasibility-study-cotton-and-livestock-index-insurance-argentina>

World Bank (2013b). *Papua New Guinea Agricultural Insurance Pre-Feasibility Study*. Available at <http://www.microinsurancenet.org/groups/feasibility-study-crop-and-livestock-index-insurance-papua-new-guinea>

World Bank (2014). *Financial Protection against Natural Disaster: An Operational Framework for Disaster Risk Financing and Insurance*. Available at <https://www.gfdr.org/sites/default/files/documents/Financial%20Protection.pdf>

World Bank (2015). *Agricultural risk management in the face of climate change*. World Bank Group Discussion Paper 09. Available at <https://openknowledge.worldbank.org/bitstream/handle/10986/22897/Agricultural0r0ce0of0climate0change.pdf?sequence=1&isAllowed=y>

World Bank (2016). *Agricultural Sector Risk Assessment – Methodological Guidance for Practitioners*. Agriculture Global Practice Discussion Paper 10. Available at <http://documents.worldbank.org/curated/en/586561467994685817/pdf/100320-WP-P147595-Box394840B-PUBLIC-01132016.pdf>

World Bank (2017). *Gender and Agricultural Risk – A Gendered Approach to Agricultural Risk Assessments and Management Strategies*. Available at <http://documents.worldbank.org/curated/en/159951492518078437/pdf/114272-WP-PUBLIC-gendered-approach-ADD-SERIES.pdf>

World Bank (2018). Disaster Risk Financing and Insurance Program. Available at <http://www.worldbank.org/en/programs/disaster-risk-financing-and-insurance-program>

World Bank/Asian Development Bank/Secretariat of the Pacific Community – CPS (2013). *PCRAFI – Better Risk Information for Smarter Investments – Catastrophe risk assessment methodology*. Available at http://siteresources.worldbank.org/EXTDISASTER/Resources/8308420-1342531265657/PCRAFI_REPORT_WEB_Final.pdf

World Bank/Global Facility for Disaster Reduction and Recovery (2014a). *Understanding risks in an evolving world – Emerging Best Practices in Natural Disaster Risk Assessment*. Available at https://www.gfdr.org/sites/gfdr/files/publication/Understanding_Risk-Web_Version-rev_1.8.0.pdf

World Bank/Global Facility for Disaster Reduction and Recovery (2014b). *Financial Protection Against Natural Disasters – From Products to Comprehensive Strategies: An Operational Framework for Disaster Risk Financing and Insurance*. Available at <http://documents.worldbank.org/curated/en/523011468129274796/Financial-protection-against-natural-disasters-from-products-to-comprehensive-strategies-an-operational-framework-for-disaster-risk-financing-and-insurance>

World Bank/Global Facility for Disaster Reduction and Recovery (2015). *Pacific Disaster Risk Finance and Insurance in Vanuatu – Post-disaster budget execution guidelines*. PCRAFI Secretariat of the Pacific Community, ACP-EU Natural Disaster Risk Reduction Program. Available at <http://pcrafi.spc.int/>

World Bank/Global Facility for Disaster Reduction and Recovery (2016). *Fiscal Disaster Risk Assessment and Risk Financing Options (Sri Lanka)*. Available at <https://www.gfdr.org/sites/default/files/publication/fiscal-disaster-risk-assessment-financing-options.pdf>

World Bank/Global Facility for Disaster Reduction and Recovery/European Union (2017). South West Indian Ocean Risk Assessment and Financing Initiative (SWIO-RAFI) – *Summary Report*. Available at <http://documents.worldbank.org/curated/en/951701497623912193/South-West-Indian-Ocean-risk-assessment-and-financing-initiative-SWIO-RAFI-summary-report>

World Bank/Global Facility for Disaster Reduction and Recovery/International Bank for Reconstruction and Development (2015). *Advancing Disaster Risk Financing & Insurance in the Pacific – Regional Summary Note & Options for Consideration*. Available at https://www.gfdr.org/sites/default/files/publication/2015.06.25_PCRAFI_Combined-%5BCompressed%5D-rev-0.9.pdf

World Bank/Global Facility for Disaster Reduction and Recovery/Japan International Cooperation Agency (2015). *Pacific Catastrophe Risk Insurance Pilot Report - From Design to Implementation. Some Lessons Learnt*. Available at https://www.gfdr.org/sites/default/files/publication/Pacific_Catastrophe_Risk_Insurance-Pilot_Report_140715%281%29.pdf

World Bank/Global Facility for Disaster Reduction and Recovery/UKaid (2016). *Disaster risk finance as a tool for development*. Available at <https://www.gfdr.org/sites/default/files/publication/DisasterRisk.pdf>

World Bank Group (2017). *Global Financial Inclusion and Consumer Protection Survey, 2017 Report*. Available at <https://openknowledge.worldbank.org/bitstream/handle/10986/28998/122058.pdf?sequence=2&isAllowed=y>; http://www.who.int/health_financing/topics/financial-protection/en/

World Economic Forum (2018). *The Global Risks Report 2018, 13th Edition*. Insight Report. Available at http://www3.weforum.org/docs/WEF_GRR18_Report.pdf



Capacity Development materials

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH. Climate Expert tool for private sector entrepreneurs. Available at <http://www.climate-expert.org/en/home/>

Early Warning Conference (EWC) III (2006). *Developing Early Warning Systems: A Checklist*. Third International Conference on Early Warning. Bonn. Available at http://www.unisdr.org/files/608_10340.pdf

Emergency Market Mapping and Analysis toolkit (EMMA). Available at <https://www.emma-toolkit.org/>

European Union tool KULTURisk. Available at <http://www.kulturisk.eu/>

Food and Agriculture Organization (2007). *Climate variability and change: adaptation to drought in Bangladesh - A resource book and training guide*. Available at <http://www.fao.org/3/a-a1247e.pdf>

Food and Agriculture Organization. Tool for Designing, Monitoring and Evaluating Land Administration Programmes, e.g. cost-benefit analyses. Available at <http://www.fao.org/in-action/herramienta-administracion-tierras/module-5/practical-evaluation-guide/introduction-cba/en/>

Food and Agriculture Organization/International Fund for Agricultural Development/Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH/GIZ/United Nations Capital Development Fund/World Bank. *Capacity Building in Rural Finance partnership (CABFIN)*. Rural Finance and Investment Learning Centre. Available at www.ruralfinanceandinvestment.org

GERICS Climate Service Center (2013): *Statistical methods for the analysis of simulated and observed climate data, applied in projects and institutions dealing with climate change impact and adaptation*. Available at https://www.climate-service-center.de/imperia/md/content/csc/projekte/csc-report13_englisch_final-mit_umschlag.pdf

GERICS Climate Service Center (2014). *Adapting to Climate Change – Methods and Tools for Climate Risk Management*. CSC Report No. 17. Available at https://www.climate-service-center.de/imperia/md/content/csc/csc_report17.pdf

Gravitazz Institute for Disaster Reduction and Emergency Management. Available at <http://gravitazzcontinental.com/>

International Fund for Agricultural Development. Platform for Agricultural Risk Management (PARM). Available at <http://www.p4arm.org>

International Labour Organization. Impact Insurance. Available at <http://www.impactinsurance.org/tools/>

International Labour Organization. Impact Insurance: PACE tool. Available at <http://www.impactinsurance.org/tools/PACE>; and <http://www.impactinsurance.org/sites/default/files/PACE%20technical%20guide%20v1.0.pdf>

Microfact. Key performance and social indicators. Available at <http://www.microfact.org/microinsurance-tools/>

Platform containing various organizations that offer capacity development, including training courses in development. Available at <http://www.learn4dev.net/public/portal>

The International Red Cross and Red Crescent Movement (2007). *Guidelines for cash transfer programming*. Available at <http://www.ifrc.org/Global/Publications/disasters/finance/cash-guidelines-en.pdf>

United Kingdom Climate Impacts Programme. Adaptation Wizard tool. Available at www.ukcip.org.uk/wizard/

United Nations Development Programme (2013). *A Comparative Review of Country-Level and Regional Disaster Loss and Damage Databases*. Available at <http://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/loss-and-damage-database.html>

United Nations/Stockholm Environment Institute. Software tool NAPAssess. Available at <http://sei-us.org/projects/id/37>

United Nations University – ITC School on Disaster Geo-Information Management (UNU-ITC DGIM), Twente – International Institute for Geo-information Science and Earth Observation (ITC) (2011). *Multihazard- Risk Assessment. Distance Education Course*. Available at <https://www.itc.nl/>

USAID (2012). *Pathways out of Poverty – Tools for Value Chain Development Practitioners*. Available at https://www.microlinks.org/sites/microlinks/files/resource/files/PoP_Tools_Value_Chain_Practitioners.pdf

World Bank. Forum for Agricultural Risk Management in Development (FARMD). Available at <http://www.agriskmanagementforum.org/>

Databases

Capacity for Disaster Reduction Initiative (CADRI). Global partnership of 14 United Nations and non-United Nations organizations for strengthening countries' capacities to prevent, manage and recover from the impact of disasters. Available at <http://www.cadri.net/>

Climada Manual. Open-source tool for assessing the economics of climate adaptation by UNISDR Prevention. Available at https://github.com/davidnbresch/climada/blob/master/docs/climada_manual.pdf and <http://www.preventionweb.net/educational/view/42020>

Climate Insurance experiences on risk transfer and insurance to climate risk management by Global Index Insurance Facility, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, Munich Climate Insurance Initiative. Available at <https://indexinsuranceforum.org/climate-insurance>

EM-DAT/Centre for Research on Epidemiology of Disasters. Available at <http://www.emdat.be/database>

European Union Copernicus Climate Services. Available at <https://climate.copernicus.eu/> and <https://cds.climate.copernicus.eu/#!/home>

Food and Agriculture Organization. Early Warning Early Action platform. Available at <http://www.fao.org/emergencies/fao-in-action/ewea/en/>

Food and Agriculture Organization. FAOSTAT. Food and agriculture data. Available at <http://faostat.fao.org/>

Food and Agriculture Organization. Modelling System for Agricultural Impacts of Climate Change (MOSAICC). Available at <http://www.fao.org/climatechange/mosaicc/en/>

Food and Agriculture Organization. Reconstruction calculations of roads. Available at <http://www.fao.org/docrep/t0579e/t0579e06.htm>

Food and Agriculture Organization/Global Information and Early Warning System. Available at <http://www.fao.org/es/giews/english/about.htm> and http://www.fao.org/giews/earthobservation/asis/index_1.jsp?lang=en

Forum for Agricultural Risk Management in Development (FARMD). Available at <http://www.agriskmanagementforum.org/>

GeoNetwork. Web interface to search geospatial data across multiple catalogs. Available at <http://geonetwork-opensource.org/>

GEOSS 'meta' platform. Available at <http://www.earthobservations.org/geoss.php>

GERICS Climate Service Centre. Available at www.gerics.de

Global Exposure Database (GED4GEM). Available at <http://www.globalquakemodel.org/openquake/about/>

Global Facility for Disaster Reduction and Recovery. Disaster Aid Tracking (DAT) initiative. Available at https://www.preventionweb.net/files/29576_track15yearretrospective.pdf and operated by the AidData database <https://www.aiddata.org/blog/increasing-the-development-impact-of-open-data>

Global Index Insurance Facility/World Bank. Available at <https://www.indexinsuranceforum.org/>

GRIP. Available at <http://www.gripweb.org/>

Munich Re's agriculture and weather risk transfer solutions. Available at <https://www.munichre.com/en/reinsurance/business/non-life/agro/index.html>

Munich Re's NatCatSERVICE. Available at <https://www.munichre.com/en/reinsurance/business/non-life/natcatservice/index.html>

Munich Re's NATHAN Risk Suite (Natural Hazards Assessment Network). Available at <https://www.munichre.com/en/reinsurance/business/non-life/nathan/index.html>

Munich Re's sustainable crop insurance systems (SystemAgro). Available at https://www.munichre.com/site/corporateresponsibility-root/get/documents_E326689889/mr/assetpool.shared/Documents/0_Corporate_Website/2_Reinsurance/Business/Non-Life/Systemagro/sustainable_crop_insurance_en.pdf

National Aeronautics and Space Administration topographic maps. Available at <https://pmm.nasa.gov/data-access>

NatureServe. Available at <http://www.natureserve.org/conservation-tools/data-maps-tools>

PREVIEW Global Risk Data Platform. Available at <http://preview.grid.unep.ch/>

Swiss Re database SigmaExplorer. Available at <http://www.sigma-explorer.com/>

Swiss Re Sigma database. Available at <http://www.swissre.com/sigma/>

United Nations Children's Fund-led Government WASH Cluster to support humanitarian response through operational information. Available at <https://www.humanitarianresponse.info/>

United Nations Development Programme, and others. Global Risk Identification Programme (GRIP). Available at <http://www.gripweb.org>

United Nations International Strategy for Disaster Reduction. Disaster information management system DesInventar. Available at <http://www.DesInventar.net/>

United Nations International Strategy for Disaster Reduction. PreventionWeb Knowledge Platform (2017). Available at <https://www.preventionweb.net/terminology/view/500>

United Nations International Strategy for Disaster Reduction. 2017 Global Platform for Disaster Risk Reduction. Available at <http://www.unisdr.org/conferences/2017/globalplatform/en/about>



World Bank climate portal on vulnerability, risk reduction and adaptation to climate change. Available at http://sdwebx.worldbank.org/climateportal/index.cfm?page=resource#user_guide

World Bank/Global Facility for Disaster Reduction and Recovery. Climate Change Knowledge Portal (CCKP). Available at <http://sdwebx.worldbank.org/climateportal/>

World Bank/Global Facility for Disaster Reduction and Recovery. Open Data for Resilience Initiative (OpenDRI) platform. Available at <https://opendri.org/>

WorldClim. Interpolates climate layers from major climate databases. Available at <http://www.worldclim.org/methods1>

World Meteorological Organization. Available at http://www.wmo.int/pages/prog/wcp/wcasp/RCOF_Concept.html

World Meteorological Organization. Multi-Hazard Early Warning Systems (MHEWS) Platform. Available at http://www.wmo.int/pages/prog/drr/projects/Thematic/MHEWS/MHEWS_en.html

World Meteorological Organization (2018). *WMO Statement on the State of the Global Climate in 2017*. Available at https://library.wmo.int/doc_num.php?explnum_id=4453

Networks – (research) Organizations and Insurance-related Organizations

Access to Insurance Initiative. Available at <https://a2ii.org/en>

African Risk Capacity. Available at <http://www.africanriskcapacity.org/>

Australian Centre for International Agricultural Research. Available at <http://aci-ar.gov.au/>

Consultative Group to Assist the Poor. Available at www.cgap.org

Global Facility for Disaster Reduction and Recovery. Available at <https://www.gfdrr.org/>

International Association for Impact Assessment. Available at www.iaia.org

International Association of Insurance Supervisors. Available at <https://www.iaisweb.org/home>

International Research Institute for Climate and Society. Columbia University. Available at <https://iri.columbia.edu/>; <https://iri.columbia.edu/resources/>

International Rice Research Institute. Available at <http://irri.org/our-work/locations/philippines>

La Positiva Seguros Peru, The Extreme El Niño Insurance Product. Available at <http://seguros.riesgoycambioclimatico.org/publicaciones/Nota-Tecnica2-eng.pdf>

Making Finance Work for Africa. Available at www.mfw4a.org

Microinsurance Network. Available at <http://www.microinsurancenetwork.org/>

Pacific Catastrophe Risk Assessment and Financing Initiative. Available at <http://pcrafi.spc.int/>

PROVENTION. Available at <http://www.proventionconsortium.net/>

R4 Rural Resilience Initiative (2018). Available at <https://www.wfp.org/climate-change/initiatives/r4-rural-resilience-initiative>

The Caribbean Catastrophe Risk Insurance Facility. Available at <http://www.ccrif.org/>

The Consultative Group for International Agricultural Research. Available at <http://www.cgiar.org/about-us/research-centers/>

The Willis Research Network. Available at <http://www.willis.com/willisresearchnetwork/>

World Bank/Global Facility for Disaster Reduction and Recovery. Disaster Risk Financing and Insurance Program. Available at <https://www.gfdr.org/sites/default/files/publication/thematic-note-diaster-risk-financing-and-insurance-program.pdf>