Managing risks to improve farmers’ livelihoods
What are these Slides

These slides are the reference material for the trainers of Agricultural Risk Management (ARM) courses.

They can be used also by the participants of such courses to take notes during the presentations.

The slides provides the trainers with the ARM basic framework to deliver during the training.

How to use the Slides

The slides are divided into chapters that address the main themes of the ARM training.

In each chapter the topics of each sessions and key concepts are illustrated.

The trainers can use this set of slides during the ARM training or change /create own set of slides depending on their approach to the training.
About PARM

The Platform for Agricultural Risk Management (PARM) is a global initiative focused on making risk management an integral part of policy planning and implementation in the agricultural sector in developing countries. This facility is a mandate of the G8 and G20 discussions on food security and agricultural growth, supported by a multi-stakeholder partnership between the European Commission (EC), the French Development Agency (AFD), the Italian Development Cooperation (DGCS) the International Fund for Agricultural Development (IFAD), the German Cooperation (BMZ/KfW). In Africa the platform has developed a strategic partnership with the New Partnership for Africa’s Development (NEPAD) and operates within the Comprehensive Africa Agriculture Development Programme (CAADP) framework.
# Table of contents

**Chapter 1**  
Understanding risk in agriculture ................................................. 7

**Chapter 2**  
Risk assessment at farm level .................................................. 15

**Chapter 3**  
Identification of risk management tools .................................... 21

**Chapter 4**  
ARM strategy and monitoring .................................................... 29

**Glossary** ................................................................. 35
What is a risk? Definition

- A risk is an *uncertain event* that is the result of natural hazards or human activities and that leads to physical *damage* or monetary *losses*.
- Agricultural risks affect farm activities and farmers’ livelihoods – and at a broader level, the value chain and related businesses, and the entire country.
CHAPTER 1 Understanding risk in agriculture

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What is a risk? Key components

- **FREQUENCY/PROBABILITY**: the likelihood of experiencing any natural or human hazard at a location/region in a defined time in the future

- **ELEMENTS AT RISK**: the elements which would be affected by the hazard if it occurs

- **SEVERITY/POTENTIAL EFFECT**: the expected losses from a hazard of specific elements at risk

Agriculture is a risky business

- **DAMAGE**
  - Crops or livestock can be lost
  - Prices can fall
  - Livelihoods at risk

- **OPPORTUNITY**
  - Risk and higher returns can be driving forces of good entrepreneurship and innovation

Notes:
Which are the risks?

Risks faced by farmers are numerous and varied, and are specific to the country, climate, and local agricultural production systems.

Examples of risks in farming activities

1. Inputs
   - Low-quality seeds
   - Pest and disease

2. Growing
   - Frost
   - Drought

3. Storage
   - Crop loss due to pests
   - Storage facility damage

4. Selling
   - Low price
   - Market access

Risks faced by farmers include:
- Weather-related risks
- Market-related risks
- Financial risks
- Institutional risks

Capacity Development (CD) | Managing risks at farm level | Understanding risk in agriculture
CHAPTER 1 Understanding risk in agriculture

Risk preferences/approaches

- **Risk Taker**: Individual that looks for risky opportunities, who is open to options with more gain but also potentially higher losses.
- **Risk Adverse**: Individual that is more cautious and prefers less risky options.
- **Risk Neutral**: Individual that is in a neutral position between risk taker and risk adverse.

What is not a risk?

- Trend
- Cycle
- Constraint
CHAPTER 1 Understanding risk in agriculture

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What we have learned about agricultural risks (1)

• Every day, farmers face risks when running their activities and they need to take decisions that affect their business
• Risks are different, as well as solutions
• Solutions can be managed at (single) farm level, or in a more collective way
• No single solution can cover all risks

What we have learned about agricultural risks (2)

• Need for an integrated approach: development of a strategy to manage risks that include all stakeholders involved
• Good information is crucial
• All stakeholders have to play a role in ARM:
  • Farmers need to anticipate, assess and elaborate plans
  • Government needs to create an enabling environment
  • Private sector can help elaborating and providing solutions
What is agricultural risk management?

Agricultural Risk Management (ARM) is the process of dealing with risks. It requires anticipating potential problems and planning solutions in advance to limit negative consequences.

Assessing the risks, taking decisions on risk management tools to put in place, and monitoring and evaluating the effectiveness of tools and strategies are key elements of ARM.

Agricultural risk management cycle

1. Identify risks
2. Assess risks
3. Identify tools to manage risks
4. Implement risk management tools
5. Monitor tools and results

A farmer needs to follow 5 steps to manage agricultural risks.
Approach to agricultural risks

Dealing with risks means including them into farm business practices.

Dealing with risk also implies better farming income opportunities. When risks increase, it gets more difficult to take decisions, and Agricultural Risk Management (ARM) techniques are more needed.

How to deal with risks:

- **Ex-ante measures (before the negative consequences of the risks emerge)**: crop diversification, irrigation, insurance, etc.
- **Ex-post measures (after the negative consequences of the risks emerge)**: credit, temporary employment, savings, etc.

Why is the ARM approach holistic?

NO RISK IS CONSIDERED IN ISOLATION

- the focus is not on a single farm activity, but on the **whole farm** or farm-household system
- the focus is not on a single isolated risk, but encompasses all of the **interlinked risks at stake**
- the focus is not on a single tools, but on the **whole set of tools available** to deal with risks
ARM stakeholders/actors

There are many stakeholders involved in different ways and at different levels:

- **Micro level**: Farmers and small businesses
- **Intermediate level**: Farmers' organizations, NGOs, input suppliers, financial service providers
- **Macro level**: Government, International Organizations
Agricultural Risk management Capacity Development Activity
Risk assessment at farm level

Agricultural risk and consequences at farm level

If agricultural risks catch farmers unexpectedly (without any tools or strategy in place), possible responses to risk are:

- selling livestock, land and/or home
- reducing expenditures
- searching for other jobs
- sending children to work
- borrowing food and money
- migrating, etc.
Information needs and types (1)

To assess and plan actions to manage risks, farmers need to be informed. Information is a key component (or input) to run successfully any farming activities.

Information may be more or less accurate, more or less accessible, and more or less costly depending on different risks, sources and farmers’ characteristics.

Information is related to:
- Production (i.e. yields)
- Weather and climate (i.e. rainfall, temperature)
- Input (i.e. seed, fertilizers)
- Prices (i.e. of crops in different markets and of inputs)
- Pest and disease (i.e. outbreaks)
- Access to credit (i.e. current interest rate for lending money)

Information needs and types (2)

Information can be generated from farming activity or can be obtained from other sources other than the farm. In particular:
- On farm information are gathered at own farm level. A good practice is keeping records of production and prices for crop and livestock at farm level at different times of the year.
- Off-farm information include various types and sources of information, and external help, such as:
  - Neighbour farmers/Farmers’ organizations, Extension service
  - Government newsletters
  - Newspapers/Radio
  - SMS or other mobile phone applications
### Information needs and types (3)

On-farm and off-farm information to assess agricultural risks can have some limitations, for example:

- Information is often not presented in the form of indicators of frequency and severity of events
- Translating data/numbers into usable information can be difficult
- Information maybe unavailable
- Information access may be difficult and expensive to access for key stakeholders (especially farmers)
- Information access can be asymmetric for different stakeholders, leading to unbalance bargaining power and relationships

### Basic elements to assess risks (1)

A risk can be assessed by determining two elements:

- **FREQUENCY** (or probability) that refers to how often an event or a hazard occurs;
- **SEVERITY** that is related with the size of losses associated with the occurrence of an event or hazard. The worst case scenario is also often taken into account.

**Evaluating frequency and severity is not an easy task. Sometimes farmers need external help to understand how agricultural risks may affect their business.**
CHAPTER 2 Risk assessment at farm level

Basic elements to assess risks (2)

Types of losses can be:

- Lower yields
- Income and assets losses
- Livestock losses
- Human life losses

Basic elements to assess risks (3) - Example

In the last 20 years the coffee wilt disease has destroyed my crop 2 times

I have lost 75% of my harvest and the possibility of income

The risk occurred once every 10 years on average.

The negative consequences consist in the losses of 75% of Emma production, affecting her income.
Basic elements to assess risks (4)

**Uncertainty** is one of the main characteristics of risk. The uncertainty relates to **WHEN** something will happen (frequency) and **HOW** severe the impact will be (severity).

Financial resources or efforts cannot often address all the risks at the same time.

Therefore, there is the need to set **priorities** on which risks to handle first to damage at least possible farming activities.

Setting priorities helps to better manage risks and protect farming activities from major damage.

Prioritization of risks (1)

A risk matrix can help prioritize different risks faced by farmers and decide which measures to put in place to manage them. Ranking is done by considering the frequency and severity of each risk.
CHAPTER 2 | Risk assessment at farm level

Platform for Agricultural Risk Management | Managing risks to improve farmers’ livelihoods

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Prioritization of risks (2) – How to use it

1. List all of the risks that can potentially harm farming activities.
2. Rank each risk by frequency from very low to very high.
3. Rank each risk by severity from very low to very high.
4. Place the risks within the matrix, based on the combination of their severity and frequency.

You are now able to prioritize and decide which measures to put in place to manage your risks, starting from the high-level risks (red cells) and moving to the low-level risks (green cells).

Notes:

Prioritization of risks (3) – Example

Emma has compiled the risk assessment for maize farming activity.

<table>
<thead>
<tr>
<th></th>
<th>SEVERITY</th>
<th>FREQUENCY</th>
</tr>
</thead>
</table>
| BUY INPUTS
  low-quality not genuine | MEDIUM   | LOW       |
| GROWING
  bad weather | HIGH     | LOW       |
  pest and disease | MEDIUM   | MEDIUM    |
| STORAGE *
  grain borer rice | MEDIUM   | HIGH      |
| SELLING
  low prices compared to production costs | MEDIUM   | MEDIUM    |

* Storage is the risk to prioritize because it has a combination of frequency and severity higher than other risks.

Notes:
CHAPTER 3

Agricultural risk management cycle

A FARMER NEEDS TO FOLLOW 5 STEPS TO MANAGE AGRICULTURAL RISKS:

1. Identify risks
2. Assess risks
3. Identify tools to manage risks
4. Implement risk management tools
5. Monitor tools and results

Notes:
CHAPTER 3 Identification of risk management tools

How to deal with risks (1)

Farmers can reduce the negative impacts of risks at farm level through different measures:

- **risk mitigation**, i.e. minimizing the negative impacts at farm level including preventive actions or tools to reduce exposure to, severity of, or probability of loss
- **risk transfer**, i.e. transferring uncertainty of outcome to other counterparts who are not farmers
- **risk coping**, i.e. accepting the negative consequence of the risks
- **risk avoidance**, i.e. completely avoiding any risks

These measures are then associated with different tools and different levels of responsibility.

How to deal with risks (2)

Each measure is associated to risks that have different frequency and severity

![Diagram showing different risk management measures]
Cross-cutting elements of risk management measures

- **Farmer Awareness and Capacity Development**: Farmers need to know which tools exist and how they can actively protect farming activities against risks. Extension messages and farmer trainings can be helpful measures to raise awareness.

- **Information systems**: Understanding and assessing risks requires access to information. Provision of timely information to farmers is a key component to contain negative effects of risks. Early warning is included as part of the information system.

How to classify ARM tools

- **Risk mitigation measures** can be grouped in:
  - on-farm tool
  - off-farm tools
  - other farm-level risk-reducing choices

- **Risk transfer measures** can be grouped in:
  - market-based tools
  - finance-based tools

- **Risk coping measures** include:
  - savings
  - government transfers
CHAPTER 3 Identification of risk management tools

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On-farm management tools

Climate-smart agriculture:
They are farming practices implemented in response to the negative effects of climate and weather risks on production, incomes and well-being. Examples: conservation agriculture, soil and water conservation, etc.

Production diversification:
It is a farmer’s choice that consists in diversifying farming activities to scatter risks impacts between different produce. Examples: multiple crops, including livestock and fisheries, etc.

Other farm-level risk:
They are other conventional instruments that can be used at farm-level. Examples: technology adoption, storage, WRS, etc.

Warehouse receipt system (WRS)

A warehouse receipt system (WRS) is a formal agreement between a licensed storage facility and a named depositor on quantity and quality of a specified commodity held in a secure storage environment.

The step for a WRS are:
1. A farmer deposits a storable agricultural commodity in a warehouse
2. The warehouse issues a receipt to the farmer
3. This receipt can then be used as collateral to obtain a loan or to market the agricultural commodity as desired
CHAPTER 3 Identification of risk management tools

Off-farm management tools

Asset diversification
It is a farmer’s choice that consists in sharing farmers’ wealth between different assets. Examples: buying machineries, buying jewellery, etc.

Income diversification
It is a farmer’s choice (whenever possible) to generate income from activities located outside the farm (i.e. non-farm jobs). Examples: Handcrafting, working at a small stands, etc.

Market-based tools

Contract farming, i.e. contractual arrangements between small-scale producers and commercial stakeholders or companies to reduce or eliminate price and market risks for farmers (by guaranteeing them a fixed price and/or a certain amount of supply in advance)

Commodity exchange, i.e. a “platform” where different groups of participants - buyers and sellers – trade agricultural commodities based on rules and procedures previously defined by the exchange
CHAPTER 3 Identification of risk management tools

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Finance-based tools

**Agricultural insurance**, i.e. a contract where a party (the insurer) protects the insured against an amount of loss if the negative event(s) take place within a specified time period. The farmer pays a fee, called a premium. The amount of the fee will depend on the frequency and severity of the risk.

**Weather index-based insurance**, i.e. a type of insurance that gives financial compensation for damages or losses based on an index that includes weather factors.

Risk coping

**Savings or selling assets**, It is a farmer’s choice/necessity to build up savings or sell assets to prepare for hard times.

**Government transfer tools**
They include public food/grain reserves, disaster assistance programmes, social protection and safety nets.
CHAPTER 3 | Identification of risk management tools

Summing up

Risk Mitigation tools
- Climate-smart agriculture
- Crop diversification
- Improved inputs
- Work-off farm
- Warehousing storage
- Finance and microfinance

Risk coping tools
- Rotating credits in community
- Government cash transfer

Market-related risk transfer tools
- Contract farming
- Insurance

Finance-related risk transfer tools

Notes:
What is an ARM strategy?

The choice of the priority risks to handle emerges as an outcome of the risk assessment.

ARM tools then need to be identified to manage the priority risks and to design the overall ARM strategy.

As often one tool alone is not enough, an effective ARM might include a combination of tools to improve the response to the negative consequences of risks, in line with a holistic approach to agricultural risks.

An ARM strategy at farm level should be adapted to farmers' specific and changing needs, to the local context and be part of the overall farming management processes and, if appropriate, discussed with other stakeholders (for example extension workers).
What makes an ARM strategy effective

The effectiveness of an agricultural risk management strategy is linked to:

- a correct assessment of all risks impacting farming activities
- an identification of the tools that follows an accurate (tools) assessment and selection
- the implementation of the identified tools
- periodical and meticulous monitoring and evaluation of tools

Moreover, strategy should reflect farmers’ risk preferences and also clearly indicate:

- objectives
- resource requirements
- performance measures and constraints
- timing and schedule
Assessment and selection of ARM tools (1)

A successful ARM strategy is based on a correct ARM tools assessment and selection.

An assessment process will narrow down the options of the tools and help the farmer select the most effective ones to design the ARM strategy at farm level.

Farmers need to recognize the main characteristics of risk management tools (individual tools and tools in combination), including advantages and disadvantages of each of them, their costs and benefits, and how adaptable and effective they are in the farming context.

Assessment and selection of ARM tools (2)

The choice of tools is done by comparing suitable ARM tools considering a range of criteria that help determine their appropriateness and fit. This assessment is often an intuitive process, but with the help of an extension worker, the assessment can be done more objectively.

The criteria for assessing and therefore selecting the tools can be classified as follows:

- Availability
- Affordability
- Cost-Benefit Analysis (CBA)
- Feasibility
- Coherence
- Sustainability
- Reliability
- Attitude to risk of the farmer
How to implement an ARM strategy

A farmer needs a plan on how to implement the ARM strategy. The plan has to include what is required to apply the ARM tools and to make them effective in managing risks at farm level.

It might be useful to make a list that includes the following:

- materials/resources required (including labour), how to obtain them, when they are required, their costs, etc.
- activities to be carried out, when they need to be done, etc.

Example of a TO DO List on the ARM strategy

It would be useful to compile a checklist with questions such as:

- Which are the tools to implement at farm level?
- What is the aim of each tool and of the overall ARM strategy?
- What are the activities needed to accomplish the objective of managing priority risks?
- Which are the benefits or the target of the activity/ies?
- Who is doing the activity?
- What human resources are needed?
- When is the activity taking place?
- What is the budget?
- How is monitoring and evaluation done?
ARM tools monitoring activities (1)

Monitoring tools consist in evaluating if the tools have mitigated the negative impact of risks as expected.

The performance can be evaluated as:
- **good** if the tools are effective in limiting the negative consequences of risks,
- **bad** if the tools are not responding as desired.

If the tools and the strategy are performing bad, they need to be revised.

ARM tools monitoring activities (2)

**Monitoring is a regular review process** that ensures that:

- existing risk tools are still in place and working effectively
- existing risks are monitored to identify if any changes occur on the prioritization
- new risks are identified and considered as they arise
- new risk tools are being implemented

Monitoring the tools and strategy can be done over three main time frames:

- constantly
- periodically
- as needed
ARM tools evaluation

Evaluation is about judging the data and information gathered, including the monitoring data.

It is essential to understand if the ARM strategy has solved (or at least improved) the management of risks and related human conditions, such as the livelihood of farmers, value-chain business operators and other actors in agricultural system.

ARM strategies should not only aim at fixing problems but creating continuous actions for the advancement of the food and agricultural sector – including the individual farms and businesses and value chains.
Glossary

**Agricultural Risk Management (ARM)**
It is the process towards becoming better at dealing with risks. It requires anticipating potential risks and planning solutions in advance, so as to limit their negative consequences. Key elements of ARM can be summarized by the ARM cycle that includes the following steps: the identification of the risks, the assessment of the risks, the identification of risk management tools to put in place, the implementation of the tools, and monitoring and evaluating the effectiveness of the tools and strategy that are in place.

**ARM stakeholders**
They are the actors/agents in agricultural risk management practices. ARM stakeholders can be grouped into three categories or levels: *micro level*, i.e. farmers and small businesses; *meso (or intermediate) level*, i.e. farmers’ organizations, NGOs, suppliers of inputs, financial service providers; and *macro level*, i.e. government, international organizations.

**ARM Strategy**
It describes how they respond to risks using ARM tools. An effective strategy may include one tool or a combination of tools to improve the response to the negative consequences of risks.

**Constraints**
They are the known and certain conditions or impediments that lead to suboptimal performance, in this case of agricultural sector.

**Frequency**
It refers to how many times a risk occurs within a particular time period, based on past observations. This number (or percentage) conveys an idea as to future occurrence, but does not provide any certainty as to when the event or hazard may occur (again).

**Information**
Timely and accurate information are key components for successful farming activity and risk management. They can be generated from farming activity, or it can be obtained from off-farm sources.

**Holistic Approach**
A holistic approach to agricultural risks means that no risk is considered in isolation. All risk elements and interactions, including strategy and policy, have to be considered.

**Layers of responsibility**
In case of ARM, it refers to different stakeholders that can put in practice different risk measures options and have different the level of responsibility in the process.

**Losses**
Physical damages, economic losses, livestock losses and human deaths are all potential effects (or losses) of the risk.

**Risk**
It is an uncertain event, result of natural hazards or man-made activities that leads to physical damages or to monetary losses. It is characterized by a frequency and a severity.
### GLOSSARY

**Risk assessment**
It is the process that assign frequency and severity to each risk.

**Risk mitigation**
It involves the minimization of the negative impacts of risks taking precautionary or preventive actions to reduce exposure to, severity of, or probability of loss.

**Risk reporting**
It helps keeping track (in written form) of all the activities related to risk identification, tool implementation and monitoring.

**Severity**
It involves quantification of the negative consequences in terms of losses (monetary or physical) following the occurrence of a risk, calculated as an average and/or worst-case scenario.

**Tools assessment and selection**
It entails the choice of the best ARM tools for the situation and includes comparing each tool considering different criteria such as: availability, affordability, cost-benefit analysis (CBA), feasibility, coherence, sustainability, reliability, attitude to risk of the farmer

**Uncertain event**
It is another way to refer to risk, but we can assign frequency and severity to risks while it is not possible to a “fully” uncertain event.

**Risk coping**
It implies the acceptance of negative consequences of (some) risk occurrences and involves the use of ex-post ARM tools, such as government transfer or savings.

**Risk prioritization**
It is the process that set the priority risks to handle helps to better manage risks and protect farming activities from major damage, as often financial resources or efforts are unable to address all of the risks at the same time.

**Risk transfer**
It involves the transfer of the uncertainty of risk impacts to other actors (than farmers) who can be better at managing risks.

**Strategy implementation**
It refers to a plan to use ARM tools effectively in managing risks.

**Tools monitoring and evaluation**
Monitoring involves the routine surveillance of how tool(s) or an overall strategy is performing. Evaluation is instead the process that assesses the success of the ARM strategy in meeting its goals.