

# Platform for Agricultural Risk Management

Managing risks  
to improve farmers'  
livelihoods

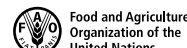


CAPACITY  
DEVELOPMENT | 02

AGRICULTURE RISK  
MANAGEMENT  
IN DEVELOPING  
COUNTRIES:  
A LEARNING COURSE  
FOR PRACTITIONERS

## Module 4

# Planning, implementing and evaluating ARM strategies





PARM  
PLATFORM FOR  
AGRICULTURAL RISK  
MANAGEMENT

Platform  
for Agricultural  
Risk Management

Managing risks  
to improve farmers'  
livelihoods

## Module 4

# Planning, implementing and evaluating ARM strategies

## In "Agriculture Risk Management in Developing Countries: a learning course for practitioners"

PARM (2018) by *D.Kahan* and *S.Worth*.

PARM/IFAD: Rome, Italy.

## What is this Module

This module is part of an advanced learning course on Agricultural Risk Management (ARM). The course is designed to support self-directed/independent learning, as well as trainings, on ARM issues. This Module provides the framework to build practitioners' capacity in planning, implementing and evaluating agricultural risk management strategies.

## How to use the Module

This module is divided into **lessons** that build along the lines of learning outcomes. Each lesson is divided into **sessions** that address the main themes. Each session is divided further in **tasks** that isolate key concepts.

## Legenda



### Learning objectives

Main ARM concepts that the Lesson explains.



### Definition

A concise description of a concept.



### Learning task

A rational and detailed description of an ARM issue.



### Example

A practical explanation of concepts and issues.



### Case study

An explanation of an ARM issue or topic using real country' facts and information.



### Exercise

To test your acquired knowledge.



### To learn more

Advanced concepts to deepen ARM issues' understanding.



### Advantages & disadvantages

List of pros and cons to improve the usability of ARM measures.

## Acknowledgments

The curriculum of this training material has been drafted in 2015 by PARM and FAO, in collaboration with the European Commission, NEPAD as well as with other partners, to develop an e-learning course on Agricultural Risk Assessment and Management, based on their combined expertise.

This series of modules on Agriculture Risk Management in Developing Countries: a learning course for practitioners has been prepared by David Kahan and Steve Worth for the Platform for Agricultural Risk Management (PARM) with significant contribution through technical guidance of Ilaria Tedesco (PARM) and Massimo Giovanola (PARM). Module 3 of this series builds upon the previous version of "Module 3" authored by Kisan Gunjal in 2016.

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## 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.



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## Learning Outcomes

At the end of this module, learners should be able to:

- Explain what a farm-level, a meso-level and a macro-level ARM strategy is;
- Compare and select risk management tools and put them together to form an effective and relevant risk management strategy; and
- Explain the role of farmers, farmer organisations, community organizations and policy makers in the formulation, implementation and in ensuring strategies benefit those who need the risk protection the most.

As a part of the planning stage, this module will explore different approaches to identify and select risk management solutions in the context of the strategies presented in Module 3. It will also explore how the risk management strategies solutions can be developed into action plans and incorporated into stakeholders' strategies to reduce agricultural risks.



## Outline of the Module

This Module has five lessons:

- Lesson I. Identifying tools for a farm-level risk management strategy
- Lesson II. Planning a farm-level risk management strategy
- Lesson III. Implementing and monitoring a farm-level risk management strategy.
- Lesson IV. Evaluating a farm-level risk management strategy
- Lesson V. The Role of Policy in the ARM process

## Outline of the lessons in this Module

### LESSON I

## Identifying tools for a farm-level risk management strategy

### SESSION 1

#### Selecting risk management tools and integrating them into ARM strategies

This session builds knowledge and skills related to: Comparing risk management tools; Selecting risk management tools to be implemented; Consolidating the risk management tools in risk management strategies; and short-listing the most effective risk management strategies.

### LESSON II

## Planning a farm-level risk management strategy

### SESSION 1

#### Drawing on available institutions, infrastructure and policies: opportunities and limitations

This session provides guidance on how to go about implementing an ARM strategy, and who else should be involved. It outlines the processes involved in engaging institutions that can contribute to the ARM process, exploiting existing infrastructure that can be factored into the ARM strategy; and drawing on existing policy that will contribute to the planning, implementing or evaluating the ARM strategy.

### SESSION 2

#### Getting technical and financial help to implement farm-level strategies

This learning task addresses issues related to identifying, assessing and securing the technical and financial support needed to implement an ARM strategy.

### SESSION 3

#### Tailoring learning tools for farmers in specific locations

As the title suggests, this learning task provides guidance on making sure that an ARM strategy is tailored to suit farmers operating in different contexts. This will help avoid the application of formulaic and 'one-size-fits-all' approaches.



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## Implementing and monitoring a farm-level risk management strategy

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### SESSION 1

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#### **Developing a plan to implement and monitor a farm-level risk management strategy**

This learning task briefly describes the requirements and process of developing an implementation plan.

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### SESSION 2

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#### **Implementing the strategy**

This learning task provides guidance on preparing for implementation with specific reference to assessing the availability and status of structures, systems and resources required for implementation. It also addresses the steps for preparing for and carrying out participatory implementation of an ARM strategy, including establishing indicators, setting up the monitoring process, gathering data and monitoring the implemented strategy, and consolidating the overall implementation and monitoring plan.

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## Evaluating a farm-level risk management strategy

### SESSION 1

#### Evaluation and why it is important

This learning task presents the basics of the evaluation process and explains its importance to the success of the ARM strategy being implemented.

### SESSION 2

#### Evaluation methods and tools

This learning task discusses the issues of where evaluation data will come from and how it the data will be gathered.

### SESSION 3

#### Designing an evaluation of an ARM strategy

This learning task takes the learning a simple design process involving six stages: plan; capture; analyse; report; utilise; and assess.

### SESSION 4

#### Applying evaluations at different levels

This learning task very briefly discusses issues to consider when designing evaluations for the micro-, meso and macro-levels. It highlights the importance of considering the particular needs and preferences of each level of stakeholder and, where possible, each individual or group of stakeholders

### SESSION 5

#### Examples of ARM evaluation plans

This learning task presents two case studies. One discusses the evaluation of a conservation agriculture project in Zambia, the other discusses skills transfer for conservation agriculture in Sudan.



## The role of policy in the ARM strategies

### SESSION 1

#### **The role of government: providing context**

This learning task discussed the development and implementation of public policy and legislation to improve the wellbeing of households in the food and agricultural system, and society in general. It also addresses the responsibility of the macro-level to provide an effective regulatory environment and to ensure benefits of ARM strategy reach especially the vulnerable. It discusses the impact of constraints in the food and agricultural system on ARM.

### SESSION 2

#### **Relief in the wake of disasters**

This learning task covers the responsibility of the macro-level government in preparing strategies to address natural and other disasters. Also discusses the role extension workers play in disaster relief planning and implementation.

### SESSION 3

#### **Investments to overcome technical barriers (Infrastructure)**

This learning task discusses the importance of having the right infrastructure in place to make ARM effective, and provides some tools to assess the status of infrastructure. It also discusses issues around innovation, research and technology development and their impact on ARM processes.

### SESSION 4

#### **Addressing enabling systems**

This learning task addresses four key systems issues (markets, subsidies, the regulatory environment and information systems), their impact on ARM, and the role extension workers play in using and contributing to the effectiveness of these systems.

### SESSION 5

#### **Building Capacity within the Food and Agriculture System**

This learning task briefly discusses the need for developing human and institutional capacity for ARM at the macro-level, and the role of extension in both these areas. It also discusses in some detail the value of developing partnerships and networks at the macro-level. It provides guidelines for developing these and explores the role of extension workers in this area of work.

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## SESSION 6

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### Advocacy

This learning task explains what advocacy is, stresses its importance for and role in ARM, and provides steps to planning an advocacy programme.

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## SESSION 7

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### Developing and implementing ARM strategy

This learning task discusses the nature of ARM strategies at the micro-, meso- and macro-levels and how they are related to one another. It provides understanding about the processes involved in planning and implementing macro-level ARM strategies, including some of the challenges to planning and implementing ARM strategies. And it briefly outlines the need to mainstream ARM into other macro-level governance and development processes. In each case, the role of extension workers is highlighted.


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## Lesson I

# Identifying tools for a farm level risk management strategy

This lesson consolidates the learning from the first three modules into practical application. It contextualises the risk tools in some selected typical situations from local perspective at farm and local community level.





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## **SESSION 1** Selecting risk management tools and integrating them into ARM strategies

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Learning objectives

**ARM tools comparison**

**ARM tools selection**

**ARM strategy consolidation**

## SESSION 1

# Selecting risk management tools and integrating them into farm strategies

Module 2 discussed how to assess risk, both qualitatively and quantitatively. Module 3, presented 12 possible risk management strategies. This lesson will discuss how to identify and evaluate the alternative tools according to the specific farm situation, based on the results of the risk assessment. Essentially, this lesson provides insight on how to decide on what is appropriate.

In Module 3, the risk management tools were divided into four categories:

- On-farm and community level risk management tools
- Finance related risk management tools
- Market related risk management tools
- Government-based risk management tools

Another way to categorise risk management strategies is using the following three categories:

- Risk mitigation
- Risk transfer
- Risk coping

As discussed in Lesson 1.1, risk mitigation seeks to minimise the negative impacts of risk (in this case, at farm-level). The aim is to reduce exposure to, the severity of, or the probability of loss from risk events. This requires finding out what is causing the problem one is trying to prevent, and then working to reduce or eliminate those factors.

**Risk transfer** seeks to transfer the uncertainty of outcome to other counterparts. This approach is the contractual shifting (transfer) of a risk from one party to another party (e.g. an institution) that is better able to cope with the risk. This approach to risk management does not attempt to reduce the risk itself – neither the probability nor the severity of the risk. It rather seeks to shift the risk to someone else. **Risk sharing** is a form of risk transfer; it transfers some of the risk to a third party.

**Risk coping** accepts the negative consequence of the risks when the risks cannot be mitigated or transferred. Risk coping strategies help farmers and business operators better absorb and recover from the impact of risks when they occur. It helps them take steps to maintain their (agricultural) livelihood and to avoid depleting (e.g. selling, consuming) their assets as a means of coping.

Selecting and integrating alternative risk management measures involves four processes. These are presented as sub-learning tasks:

**Task 1.1:** Comparing Risk Management Tools

**Task 1.2:** Selecting Risk Management Tools to be implemented

**Task 1.3:** Consolidating the Risk Management Tools in Risk Management Strategies & Short-listing the most effective Risk Management Strategies



## 1.1. Comparing Risk Management Tools

Extension workers and farmers both need to be aware of which tools are relevant for which risk. They also need to know how the tool addresses risk – i.e. mitigate, transfer, cope or more than one.

In this learning activity, comparing ARM tools is approached in two ways. First, as shown in Table 1, it is a comparison of a wide range of tools (including some of those discussed in Module 3) that can be employed to mitigate or transfer risk before the risk event happens, and tools that can be employed to cope with risk after the risk event happens. These tools are further allocated according to the level(s) at which they are commonly applied.

Before the risk event happens, farmers have the opportunity to take steps to mitigate and/or transfer risk. Similarly, once the risk event happens, farmers will have to act – especially if they have not implemented any risk mitigation or transfer tools. At the meso-level, the majority of tools available are related to transferring risk – which essentially entails sharing farmers' risk. The macro-level tools employed before a risk event happens are often structural in nature and are designed to support large numbers of farmers and/or whole sectors of the economy – especially the agri-food sector. The macro-level tools applied after a risk event has happened essentially a relief from the negative aimed at helping those affected by the event cope and otherwise recover from the impact of the risk.

**Table 1:** Comparing risk management tools

	Micro-level (Farm/household)	Meso-level (Market / Wider geographic area)	Macro-level (Government / National context)
<b>Before the risk event</b>			
Risk Mitigation	<ul style="list-style-type: none"> <li>• Avoid risk</li> <li>• Diversify income</li> <li>• Informal borrowing</li> <li>• Low-risk (low-return) production choices</li> <li>• Diversify farming enterprises</li> <li>• Intercropping</li> <li>• Climate smart agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• Training on risk management</li> </ul>	<ul style="list-style-type: none"> <li>• Macro-economic policy</li> <li>• Disaster prevention</li> <li>• Disease control regulation</li> <li>• Tax system for income smoothing</li> <li>• Social protection programmes</li> </ul>
Risk Transfer (sharing risk)	<ul style="list-style-type: none"> <li>• Crop sharing</li> <li>• Contract farming</li> <li>• Vertical integration</li> <li>• Informal risk pooling</li> </ul>	<ul style="list-style-type: none"> <li>• Insurance schemes</li> <li>• Warehouse receipt system</li> <li>• Commodities exchange and futures market</li> <li>• Contract farming</li> </ul>	<ul style="list-style-type: none"> <li>• State-subsidised insurance programmes</li> </ul>
<b>After the risk event</b>			
Risk Coping	<ul style="list-style-type: none"> <li>• Sale of assets</li> <li>• Reduce consumption</li> <li>• Reallocate labour</li> <li>• Informal/intra-family borrowing</li> <li>• Safety nets</li> <li>• Migration (domestic / international)</li> </ul>		<ul style="list-style-type: none"> <li>• Disaster relief</li> <li>• Cash transfers</li> <li>• Food aid</li> <li>• Agricultural support programmes</li> </ul>

Source: Adapted from OECD, 2011

The second approach is based on the content of the tools presented in Module 3. Table 2 indicates into which of the three categories the risk management tools could fall – some could fall into more than one category. It also shows the level at which the tool would be applied. As can be seen, the first eight tools – crop and enterprise diversification, crop rotation, intercropping, pest and disease management, livestock management, soil and water conservation, reduced tillage and spreading sales – are tools that farmers can apply on their own or together with a front-line extension worker. These tools are generally within the reach of even very small-scale farmers. The next six tools – contract farming, hedging, forward pricing, warehouse receipts, insurance and leasing – are more advanced and are more likely to be adopted by farmers with greater financial resources. The application of these tools will likely need support from extension workers and possibly specialists in agribusiness management, marketing and finance. The next two – individual and household and community-based coping tools can similarly be applied by farmers and their families directly or with the help of community and farm leaders. Finally, the last two – public food grain reserves and disaster assistance programmes – will require a higher-level intervention, although they are still relevant for small farmers at micro level.

**Table 2:** Risk Management Tools: Mitigate, Transfer or Cope?

Risk Management Tool	Risk Mitigation	Risk Transfer	Risk Coping	Application Level
1. Crop and Enterprise Diversification	X			Micro
2. Crop Rotation	X			Micro
3. Intercropping	X			Micro
4. Pest and Disease Management	X			Micro
5. Livestock management	X			Micro
6. Soil and Water Conservation	X			Micro
7. Reduced, Modified and Minimum Tillage	X			Micro
8. Spreading Sales		X		Micro
9. Contract Farming		X		Micro
10. Hedging		X		Micro
11. Forward Pricing		X		Micro
12. Warehouse Receipt System		X		Micro/ Meso
13. Insurance		X		Micro/ meso
14. Leasing Assets		X		Micro/ meso
15. Individual and Household Coping Tools			X	Micro
16. Community-based Coping Tools			X	Micro/ meso
17. Public Food Grain Reserves	X	X	X	Macro
18. Disaster Relief Programmes			X	Macro

Another useful way to identify and evaluate the alternative tools according to the specific farm situation is to look at the kind of risk(s) being addressed and comparing that to the effect the possible risk management strategy has relative to the identified risk(s).

To explore this further, this lesson will focus on climate smart agriculture (CSA) which comprises three basic components:

- Conservation agriculture
- Soil and water conservation
- Improved livestock management practices

Conservation agriculture (CA) is not a single tool but a combination of various components, such as minimum soil disturbance (also through reduced tillage), soil cover (or mulching), crop rotation, planting pits, etc.

The aim of CSA, as an agricultural risk management tool, is to mitigate and adapt to climate-led changes, and to reduce the impact of agriculture on the climate itself. Of course, the primary concern in this instance is using CSA to address the impact of the risk exacerbated by climate change.

As was learned in Module 1, farmers and value chain business operator face the following types of risks:

- Weather risk Yield/ production risk
- Pest and disease risk
- Price and market risk
- Financial risk
- Institutional, regulatory & policy risk
- Human element risks
- Social risk
- Environmental risk

It should be fairly evident that, of these eight types of risk, CSA is most relevant to:

- Weather risk
- Yield/production risk
- Pest and disease risk
- Environmental risk

CSA could also be potentially relevant to financial risks and human element risks.

Table 3 gives a snapshot view of how CSA mitigates each of these risks and the nature of the mitigation. It also outlines the pitfalls of adopting and applying this ARM tool, as well as a summary evaluation of the tool with respect to ARM.

**Table 3:** How CSA mitigates agricultural risks by type of risk

Risk Type	Effect(s)	Nature of Mitigation
Weather risk Yield/ production risk	<ul style="list-style-type: none"> <li>• Long-run reduction of risks to crop yields (level and stability of crop yields)</li> <li>• Reduce risks to production through increasing soil fertility</li> <li>• Resilience to climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Severity of impact</li> <li>• Likelihood/Frequency</li> <li>• Severity of impact</li> </ul>
Pest and disease risk Yield/production risk	<ul style="list-style-type: none"> <li>• Better control of pests, diseases and weeds</li> </ul>	<ul style="list-style-type: none"> <li>• Likelihood/Frequency &amp; Severity of impact</li> </ul>
Environmental risk	<ul style="list-style-type: none"> <li>• Higher water retention</li> <li>• Increased rain water use efficiency</li> <li>• Mitigation of downstream flooding</li> <li>• Reduced sedimentation of waterways</li> <li>• Slowdown loss of carbon sequestered in soil,</li> <li>• Enhanced biodiversity, etc.</li> <li>• Reduce soil erosion through improving soil structure</li> </ul>	<ul style="list-style-type: none"> <li>• Likelihood/Frequency</li> <li>• Severity of impact</li> <li>• Likelihood/Frequency</li> <li>• Likelihood/Frequency</li> <li>• Likelihood/Frequency</li> <li>• Likelihood/Frequency</li> <li>• Severity of impact</li> <li>• Likelihood/Frequency</li> </ul>

(...)

(...) Risk Type	Effect(s)	Nature of Mitigation
Financial risk	• Reduced labour use for land preparation	• Likelihood/Frequency & Severity of impact
Human element risks	• Reduced labour use for land preparation	• Likelihood/Frequency & Severity of impact
<b>Pitfalls</b>		
<ul style="list-style-type: none"> <li>• Time lag of four or more years before the full benefits are realized</li> <li>• Costs and investments are generally incurred up front</li> <li>• Lack of security of tenure may be a deterrent</li> <li>• Opportunity cost for use of residues (instead of being sold)</li> <li>• Requires adequate management and technical skills</li> <li>• Difficult to implement without off-farm assistance for training, input supplies and finance</li> </ul>		
<b>Summary evaluation of risk management tool</b>		
<ul style="list-style-type: none"> <li>• Applicable at farm-level</li> <li>• Most effective in mitigating weather risks (i.e. yield/production risks), pest and disease risks and environmental risk</li> <li>• Not suitable for short-term (e.g. less than 4 years) risk mitigation</li> <li>• High implementation costs</li> <li>• High farmer skill requirement</li> <li>• Requires assistance from off-farm stakeholders for training, input supplies and collaboration on cross-farm implications (e.g. other farmers adopting/not adopting CSA)</li> </ul>		

This snapshot view of CSA shows that this ARM tool can be applied at farm-level and is most effective at mitigating weather risk, pest and disease risk and environmental risk. It also shows, however, that it is not effective as a short-term response to risk, and that it does require upfront capital investment – which is often a serious challenge for smallholder farmers. Further, while CSA can be adopted by a farmer (micro-level), it may require the assistance of others, most likely at the meso-level, such as extension workers.

Extension workers and farmers can evaluate any of the possible ARM tools in a similar way.

To continue with the example of CSA, as noted earlier, CSA comprises a number of activities, each of which could be considered a risk management tool in its own right. Thus, it is useful to consider the mitigation effect of each of these CSA-related activities. Table 4 gives an indication of the mitigation effect of some of the elements of CSA.

**Table 4:** Mitigation effect of elements of climate smart agriculture

Element	Mitigation effect
<b>Conservation agriculture</b>	Reducing wind and soil erosion, increasing water retention, improving soil structure, aeration and fertility to increase crop yields sustainably and building the resilience of farm systems
Minimum tillage	Reduced labour and time on tillage under CA can allow farmers to manage timely plantings to take advantage of irregular rains
Permanent crop cover with crop residue mulching	Help manage soil temperatures, reduce evapotranspiration, incidence of weeds, and promote a healthy bio-balance in the soil, thus helping to improve crop yields (...)

(...) Element	Mitigation effect
Crop rotations & Intercropping	Can help maintain/improve soil cover, nutrient levels, soil organic matter, water filtration, and provide a secondary source of food, fodder, fibre and fuel
Planting pits, etc.	Allows runoff water to be captured and conserved for better plant growth. The organic cover minimises the loss of water from evaporation
Soil and water conservation	Reduce or eliminate soil erosion and degradation. A related goal is to manage water quality through addressing rainfall runoff and factors influencing groundwater quality

Again, each of the ARM tools available can be analysed in this way. This analysis can be used at all three levels of risk assessment and planning. At the micro-level, an individual farmer can use it to decide how effective it would be in mitigating, transferring or coping with risk for his or her farm. Again, this assessment is often an intuitive process, but with the help of an extension worker, the assessment can be made more objectively.

At the meso-level, an extension and advisory service (e.g. private, public or NGO services), a farmer's association or a local, or district or provincial government can use the analysis to determine how effective it would be to promote one or more elements of climate smart agriculture on an area-wide scale to mitigate yield/production risk, weather risk, and pest and disease risk. From this perspective, the meso-level actor may also select CSA, when considering mitigating environmental risk for which it may have a regulatory responsibility. If adopted, the meso-level agencies would develop a programme to promote adoption of one or more of the CSA activities among many farmers – especially those at greatest risk or in areas most where environmental risk is high. The information generated by this analysis can be incorporated into the cost-benefit analysis which would normally be required to decide whether or not to invest funds in such a programme.

Similarly, at the macro-level, the national government can use the analysis to determine how effective CSA would be as a general approach to risk mitigation with respect to all of the relevant risk types. Its application may be specifically targeted to farmers or areas that are particularly vulnerable, or to the whole country as a general strategy for mitigating risk to the whole of the agriculture and food sector. As with the meso-level, the macro-level decision-makers can also use the information as a part of the cost-benefit analysis, which would be required to decide on whether or not to invest funds in such a programme.

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A word of caution: While the tables that have been presented are generally applicable, in each circumstance, tables would have to be developed based on the facts on the ground both in terms of the specific farm situation and the conditions of the country in which the farm is situated.





## 1.2. Selecting risk management tools to be implemented

Once each of the possible risk management strategies has been evaluated according to their relevance to the risk(s) being considered, the next step is to decide which of the strategies will be used for which risks that have been identified. To decide on what are the best or most appropriate ARM tools, it is useful to filter them through five factors adapted from the World Bank (2016):

- Affordability of implementation;
- Feasibility of implementation;
- Coherence and compatibility with policy, programmes, priorities, practice and context;
- Long-term sustainability; and
- Scalability of implementation.

Farmers and value chain business operators will greatly benefit by assessing each ARM tool that they are considering using the first three factors. It will help them make decisions wisely. Ideally, then, (with the help of the extension worker) the farmer or business operator should evaluate each ARM tool against at least the first four factors. It is suggested that a scoring system of 1 to 3 be used where 1 = low; 2= moderate; 3 = high. It is assumed that all three factors carry equal weight. Thus, a score (with a maximum of 9) can then be calculated to facilitate selecting the most promising strategies. The results can be captured in a table set up as follows (adapted from World Bank, 2016). Table 5 and 6 show an example ARM Tool assessment matrix at farm and extension service levels, respectively, considering the single components of CA as an overall measure/tool for CSA.

**Table 5:** ARM Tool assessment matrix (Farmer)

Tool (Conservation Agriculture)	Affordability	Feasibility	Coherence	Score Max=9
Minimum tillage				
Permanent crop cover with crop residue mulching				
Crop rotations & Intercropping				
Planting pits				

While it may be possible to make a detailed quantitative assessment for each factor, it is more likely that the scores will be determined intuitively and subjectively. That is the approach followed in this lesson. The example used in this lesson is: permanent crop cover with crop residue mulching.

Extension workers will approach this somewhat differently. First of all, they will need to assess ARM tools using all five factors. Secondly, because they work with many farmers and, perhaps groups of farmers, extension workers will be particularly concerned about sustainability and scalability. Thus, for extension workers, the assessment matrix would include all five factors as set out in Table 6; and maximum score of 15 would be possible.

**Table 6:** ARM Tool assessment matrix (Extension worker)

Tool (Conservation Agriculture)	Affordability	Feasibility	Coherence	Scalability	Sustainability	Score Max=15
Minimum tillage						
Permanent crop cover with crop residue mulching						
Crop rotations & Intercropping						
Planting pits						

The following presents guidelines for rating the different factors when assessing ARM tools.

### Factor 1: Affordability of implementation

Affordability addresses the following questions about the risk management tool being considered:

- Is it affordable?
- Is it cost effective? (e.g. is it profitable?)

Farmers and value chain business operators will need to consider the affordability of a risk management tool in the context of their own farming or business operations. Whether determining this on their own or with the assistance of an extension worker, they will have to consider both short- and long-term affordability. Do they have the finance needed up-front to adopt and implement the ARM tool? Will they be able to recover those costs in the long-term? Will the change be profitable in the long-term?

Determining the cost-benefit of the ARM tool can be done simply, and if necessary with the help of an extension worker. Essentially, it requires 4 steps:

1. Clearly identifying the specific risk management action (e.g. permanent crop cover with crop residue mulching);
2. Identifying the benefits of the risk management action;
3. Identifying the costs of the risk management action; and
4. Weighing the difference between the benefits and the costs

The costs and benefits do not have to be translated into monetary amounts. They can be considered qualitatively. For example, still using the example of permanent crop cover & mulching, the assessment might look like this:

1. Specific risk management action: Permanent crop cover with crop residue mulching
2. Benefits: Helps improve crop yields by (a) managing soil temperatures, (b) reducing evapotranspiration & incidence of weeds, (c) promoting a healthy bio-balance in the soil
3. Costs: (a) cost of planting permanent crops (b) takes time to be effective; (c) opportunity cost on mulched residues
4. The cost benefit ratio: moderate (2) [This example set the ratio as 2. However, in practice, the ratio is subjective. There is no 'right' ratio. The decision depends on the perspective of farmer, and on his/her risk profile and circumstances].

Note: If the farmer needs specifically to know how the ARM tool will affect their profitability, he will need to calculate this specifically – perhaps through partial budgeting which he can do with the assistance of an extension worker.

## Factor 2: Feasibility

Feasibility looks at the question: How ‘easily’ can the ARM tool be implemented in the short- to medium-term? This assessment requires looking at the following factors:

- Human resources
- Financial resources
- Physical resources
- Time and
- Political will.

At the micro-level, the first four factors are particularly relevant. They help the farmer or business operator ensure that they have the resources needed to implement the ARM tool being considered. Political will is more relevant to a meso-level assessment.

For each of these four factors there is a key question to be answered.

**Human resources:** Does the farmer or business operator have enough people (e.g. labour) with enough time to implement the tool effectively?

Some of the ARM tools may require substantial changes in the way farm or business labour is allocated – including the farmer or operators own time. This is an important point to take into consideration when deciding whether or not to adopt a particular ARM tool.

**Financial resources:** Does the farmer or business operator have enough money to implement the tool effectively?

Each of the ARM tools will require some amount of immediate cash expenditure and perhaps longer-term investment expenditure. Some of these might include equipment costs, investment in infrastructure (new or maintenance), running costs (e.g. disposable items), material costs (e.g. seeds for permanent crops), contract costs (e.g. out-sourcing) and insurance premiums.

Even if the cost-benefit analysis of the ARM tool shows that it is a good option, the farmer or operator is still going to have to raise whatever upfront capital may be needed to implement the ARM tool.

**Physical resources:** Does the farmer or business operator have, or have access to, the infrastructure and equipment needed to implement the tool effectively?

For some ARM tools, such as Climate Smart Agriculture and Diversification, specific infrastructure and/or equipment will be needed to implement the tool. If the farmer does not have these, then, unless they acquire them, they will not be able to implement the tool. As indicated above, this will also have implications for their financial resources.

**Time:** Does the farmer or business operator have enough time to implement the tool effectively?

Some of the ARM tools can be implemented very quickly. For example, diversifying crops may be as 'simple' as purchasing different seeds and fertiliser. Other ARM tools may take longer to implement – for example, establishing a permanent crop cover or establishing rainwater harvesting structures.

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To summarise and provide a rating for feasibility, each feasibility element is rated on the 1, 2, 3 scale. Again, assuming that each of the elements carries equal weight, the resulting scores can be added up and divided by the number of elements (e.g. 6) to produce an overall score for feasibility.

Feasibility element	Rating
Human resources	2
Financial resources	3
Physical resources	2
Time resources	1
Total	8
Average	2

In the example given above, the overall feasibility score is 2. This number would be entered into the ARM assessment table (Table 7).

**Table 7:** ARM Tool Assessment Matrix (Farmer)

Tool (Conservation Agriculture)	Affordability	Feasibility	Coherence	Score Max=9
Minimum tillage				
Permanent crop cover with crop residue mulching				
Crop rotations & Intercropping				
Planting pits				

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Depending on how extension is normally carried out the meso-level extension worker can assist farmers (individually or collectively) to determine the feasibility of the ARM tools being considered.

Similarly, when considering the promotion of ARM tools, the extension worker will need to consider feasibility on a wider scale. Does the extension worker have or have access to the human, financial and physical resources, as well as the time needed to promote and support the implementation of the tool? Presumably, the meso-level extension agencies will have operational budgets and other resources to support farmers in the process of considering the various ARM tools.

Additionally, meso-level extension workers and agencies will also need to consider the factors of long-term sustainability and scalability. Both of these factors are applicable at the meso- and macro-levels where decisions have to be made about the possibility of widespread promotion and application of a given ARM tool.

### Factor 3: Coherence and Compatibility

For farmers and business operators, this factor simply means that they need to think about how the ARM tool fits into the way they run their farms and businesses. Does it align with their priorities? Do the required practices of the tool fit the farm or business situation?

In addition to assisting farmers and business operators consider the coherence and compatibility of the ARM tool with their farms and businesses. Extension workers will also need to consider how the ARM tool fits into the policy, programmes and priorities of the agency with whom they work. To do this, they will need to identify the relevant policies and programmes and compare their aims, principles and priorities with those of the ARM tool being considered.

Policies may include legislation governing marketing, environmental protection, land tenure, freedom of information, etc. Priorities may include long-term objectives for economic development or infrastructure. Practices may include long-standing arrangements between producers and markets, traditional production systems, cultural requirements, etc. Analysing coherence and compatibility can be a complex process, but a simple approach can be just as effective.

In terms of the scoring, a score of 1 would indicate that the ARM tool is not at all coherent or compatible with existing policy and programmes. A score of 2 would indicate that there is moderate coherence and compatibility. A score of 3 would indicate that there is a high level of coherence and compatibility.

This part of the evaluation of the ARM tools provides decision-makers the opportunity to revisit the tool itself to bring it into closer alignment with existing policy. Thus, when a tool scores a 1 or even a 2, the planners/decision-makers may want to redesign the tool to improve its alignment with existing policies, programmes and priorities.

### Factor 4: Sustainability<sup>1</sup>

In relation to ARM, sustainability is measured by two elements: (1) the willingness of farmers and/or other participants/beneficiaries to participate over the long term; and (2) the ability of the institutions and stakeholders at the meso- and macro-levels in both the public and private sectors support the programme after the initial implementation (Smith and Watts, 2009).

At the micro level, the farmer will have decided his/her willingness to apply the tool over the long term. They may ask an extension worker to help them consider this aspect of assessing ARM tools.

It is often the case that an extension worker is developing an ARM strategy to be implemented among a number of farmers or over a larger area. If they want to evaluate the sustainability of the proposed ARM tool, they will need to determine the willingness of the farmers and other beneficiaries to continue, in this example, with the use of permanent crop cover & mulching. Secondly, it will be necessary to determine how long the meso- and macro-level stakeholders are willing or able to sustain the activities related to the seed-adoption programme. Essentially, this is about the willingness of stakeholders to adopt policy and commit to its implementation. Willingness to continue participating and willingness to continue supporting will depend on a number of factors. A key one is the intended duration of the strategy to implement the tool(s). Some strategies are once-off strategies, such as emergency food relief; other strategies may require several years to implement.

Secondly, duration has implications for resources – especially financial and human resources. Often, the financial and human resources allocated to agricultural risk management strategies have been diverted from other mainstream activities of the stakeholders involved. This applies at all three levels. At the micro-level, farmers facing food shortages may resort to taking on off-farm work at the expense of being able to work his or her farm. Similarly, funds previously used to pay for labour, may now have to be used to pay, in our example, for permanent crop cover with mulching. Each farmer will have to decide how long to sustain this diversion of resources.

At the meso-level, resources normally used, for example, for investment in the value chain, may have to be diverted to cover the costs of implementing the selected risk management strategies. As with the farmers, the meso-level institutions will need to determine how long these resources can be diverted.

Likewise, at the macro-level, particularly at the government level, sustaining risk management strategies can place a heavy burden on public funds for which other priorities compete. This is one of the reasons that care must be taken to set the criteria for eligibility to participate in or benefit from the risk management tool. And, like the others in the system, the macro-level decision-makers will have to decide how long they will be willing and able to sustain this diversion of resources.

<sup>1</sup> Profitability is included as a part of affordability.

## Factor 5: Scalability

As noted earlier, scalability is not generally a factor to be considered by the micro-level farmer or business operator. It is more relevant to the extension worker that is assisting a number of micro-level farmers and/or business operators. See Box 1

Scalability essentially addresses the question: How easily can the tool be scaled-up and made available to multiple beneficiaries? It is important for the extension worker, together with the extension agency to consider scalability. Scalability is a function of seven determinants:

- Potential participation
- Estimated participation
- Cost of implementation
- Capacity limitations
- Relevance
- Appropriateness
- External validity

Table 8 gives a brief explanation of each determinant.

**Table 8:** Scalability determinants

Scalability determinants	What it means
Potential participation	The number of beneficiaries (e.g. farmers) who are eligible to participate in/make use of the tool
Estimated participation	The number of farmers who are likely to be willing to participate/make use of the tool
Cost of implementation	The cost of implementing the tool
Capacity limitations	The practical capacity to scale up the risk management tool
Relevance	The extent to which the assumptions on which the tool is based are valid on a larger or wider scale
Appropriateness	The extent to which it makes sense to scale up when weighed against other issues such as a commitment to decentralisation, subsidiarity and related factors
External validity	Determining whether and how similar results might be expected elsewhere or can be generalised or extrapolated

Source: Adapted from Smith and Watts (2009)

Using this approach, determining scalability is relatively straightforward.

**Potential participation:** The decision-makers will have to determine the criteria for being included in the proposed risk management tool. For example, in the example we are using about the impact of drought on crop production, someone must decide on the criteria for being part of the activities of the tool. Criteria will generally cover issues such as geographic area (e.g. those areas officially designated as drought-stricken), demographics (e.g. farm size or turnover, age, gender), and extent of (potential) impact. Other criteria might include participation in earlier strategies or specific development programmes, the ability to contribute to the cost of the tool, factors that facilitate similar results from potential participants. Whatever the criteria are, once they are established, they will make it possible to estimate the number of farmers or others in the food and agriculture system who could potentially be eligible to benefit from the tool.

**Estimated participation:** Being eligible does not mean that the farmer or other stakeholders will be willing to participate. Each farmer ultimately has his or her own criteria for accepting interventions. Based on what is known about those who are eligible, the planners will be able to estimate the number of farmers and/or other stakeholders who are likely to want to take part in the tool. In the example of planting permanent crop cover with mulching, it may be known which farmers have shown strong resistance to changing from their current practices to the practice of mulching. Even though they might be eligible, they are unlikely to adopt the tool or to otherwise participate. Thus, the estimated number of participants is essentially the number of eligible participants less the number who are unlikely to participate.

**Cost of implementation:** This is related to financial resources discussed earlier. The cost of implementing is generally a function of numbers expected to participate and the cost of reaching them. It is very likely when calculating the cost of implementation (as was done for determining feasibility), that the calculations of direct and indirect costs related to implementing the tool looked at different levels or scales of operation.

The more beneficiaries, the greater the cost becomes. The greater the distances involved, the greater the cost becomes. And the bigger the tool 'package', the greater the cost becomes. This will largely be determined by the estimated number of participants, their locations (i.e. distance from the point of origin of delivery of the products of the tool), and the size of the tool package. For example, a once-off 5-day training course about the use of permanent crop cover with mulching will cost less than an extension programme involving awareness, training, communication and individual farm visits.

Additionally, it is also helpful to apply the principle of economies of scale. For example, implementing the climate smart agriculture tool may carry substantial non-recurring costs (e.g. design of training materials and programmes). Thus, the more widely the programme can be applied (i.e. the larger the scale), the lower the 'per unit' cost of the programme.

**Capacity limitations:** This refers to the systems and structures required to deliver the tool. For example, if the tool is going to be jointly implemented by state, private and NGO field workers, then the capacity to scale up is limited by how many beneficiaries those field workers can reach in the time given. For example, planners may want to include households with homestead food gardens as well as smallholder farmers in the tool. However, the collective system of government, private sector and NGOs may not have enough field workers to reach all of them and there is no opportunity to recruit additional workers in the time required. This



effectively reduces the number of expected to participate.

**Relevance:** This refers to the extent to which the assumptions on which the tool is based are valid on a larger or wider scale. For example, a risk management tool for an area of a country may include dosing livestock against tick infestations. It could be potentially up-scaled to the whole country. However, because ticks do not occur above a certain elevation, it would not be relevant to scale up to that extent.

**Appropriateness:** The extent to which it makes sense to scale up when weighed against other issues, such as a commitment to decentralisation, subsidiarity and related factors. It may be that all the other factors support up-scaling the tool, but upscaling may cut across decision-making processes that are essential for other purposes. This factor is similar to the coherence and compatibility factor discussed earlier.

**External validity:** Determining whether and how similar results might be expected elsewhere or can be generalised or extrapolated. Applying an ARM tool on a wider scale only if there is evidence (or at least sufficient reason) showing that the plan can work in areas outside of the area in which the programme was developed. It may be necessary to amend elements of the programme to accommodate differences in circumstances among the intended beneficiaries.

**Box 1:** Scalability from the perspective of an extension worker



Frontline extension workers are often required to work on various levels at the same time. They are required to attend to the concerns of farmers (most commonly in groups) at the micro-level. However, most extension workers are part of a larger extension and advisory service which operates at all three levels (micro, meso, and macro). Thus, it would not be unusual for an extension worker to have to consider the possibility and feasibility of scaling up an ARM intervention originally designed to address the risk concerns of a single group of farmers with similar issues to include other farmers in the same or other area for which the extension worker is responsible.

Similarly, because the extension worker is usually part of a team that serves at the meso- and sometimes the macro-level, they may be called on to participate along with other extension workers in planning ARM strategies for farmers in a collection of micro-level areas.

In both cases, they will need to look at each of the factors outlined in Table 8. In both cases, resources will be limited, and thus, choices will have to be made as to the extent to which an ARM strategy can be scaled up – focusing on where and with which farmers the strategy will be most effective.

## Factor 6: Political will

Finally, the extension worker will also need to consider the issue of political will. Although discussing political will is often a sensitive matter, it is nonetheless important. While most people associate political will with politicians, it actually applies to anyone in a leadership position – even a smallholder farmer making decisions about his or her own farm. Essentially, political will refers to the commitment on the part of the leader or collective leadership to carry through a policy, programme or strategy – especially one that may be initially unpopular or meet popular resistance (particularly in the short term).

One of the challenges of implementing risk management strategies, particularly longer-term strategies that require substantial movement away from long-standing practices, is facing the opposition and the ‘political’ cost that might be incurred by implementing the tool. An example of this is the example we have been using – planting drought resistant seeds. One of the ‘costs’ identified is the potential for lower yields in a normal season. Farmers may resist adopting the tool because of this, and it is a potential cost. Another example is climate change. Leadership in the United States recently decided that the ‘cost’ of climate change risk management strategies is not acceptable, and thus withdrew from the Paris Accord on Climate change.

Thus, the key indicator of political will involves measuring the commitment of leaders who will be the ones seen as responsible for the tool to implement the tool even if it makes them unpopular. This will be highly subjective, but it must be honestly analysed. It requires a good understanding of the incentives and disincentives leaders are likely to face with respect to the proposed tool and a good understanding of the willingness of those leaders to implement the tool despite the disincentives they may face. Another factor to consider is the actual power people have at various levels of the system to make and implement decisions.



### 1.3. Consolidating the risk management strategies & Short-listing the most effective risk management strategies

The scores for each of the ARM tools (or ARM tool components) being considered are entered and totalled. The ARM tool(s) or component with the highest score is the most appropriate tool for that farmer or for the group farmers. The scores may vary greatly from case to case because each farmer or business operator has a unique set of circumstances and may have very different views about what is appropriate for them.

#### Prioritisation of Risk Management Strategies

<b>Specific risk being addressed</b>	<b>Drought leading to loss of income and shortage of food</b>
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**Table 9:** ARM Tool Assessment Matrix (Farmer)

<b>Tool</b>	<b>Affordability</b>	<b>Feasibility</b>	<b>Coher-ence</b>	<b>Score</b> Max=9
Conservation Agriculture				
Minimum tillage	2	1	2	5
Permanent crop cover with crop residue mulching	2	3	2	6
Crop rotations & Intercropping	2	1	2	5
Planting pits	2	1	1	4

Once each risk management tool has a prioritisation score, it will be possible to identify the most suitable strategies. In the example above, the highest scoring ARM tool component is permanent crop cover with crop residue mulching. However, as a part of the decision-making process, the farmer must also consider two things: (1) How each tool component complements or cuts across other chosen strategies; and (2) clarifying the pitfalls of each. Ultimately, one or more ARM tools will be selected and put together as a strategy. (This will be discussed in more detail in Lesson 4.3)


Again, in addition to the micro-level assessment, the extension worker will also need to consider these tools from the meso-level. In addition to looking at the affordability, coherence and feasibility of the tool, they will also need to assess the tools in terms of sustainability and scalability. Based on the outcome of these assessments, they will have a clearer picture how to prioritise their work with respect to ARM.



## Lesson II

# Planning a farm-level risk management strategy

This lesson addresses the next stage in the ARM cycle which entails planning and implementing an ARM strategy at the farm (micro-) level. The strategy comprises the ARM strategies identified and selected in the previous lesson. It contextualises the risk tools in some selected typical situations from local perspective at farm and local community level.



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**SESSION 1** Drawing on available institutions, infrastructure and policies: opportunities and limitations

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**SESSION 2** Getting technical and financial help to implement farm-level strategy

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**SESSION 3** Tailoring learning tools for farmers in specific locations

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Learning objectives

**Comprehensive farm-level risk strategy**

**ARM dissemination strategy**

**ARM adoption strategy**

**ARM financial support**

**ARM technical support**

## SESSION 1

# Drawing on available institutions, infrastructure and policies: opportunities and limitations

At this point in the ARM cycle, risks have been identified and analysed, and ARM tools have been identified and evaluated and selected and put together as a strategy. Thus, the next stages are implementing, resourcing and monitoring, and evaluating the strategy.

Meso-level extension workers and agencies will need to consider how to go about implementing the ARM strategy that was developed, and who else should be involved. This will require identifying and making plans to:

- engage institutions that can contribute to one or more aspects or stages of the risk analysis and management cycle;
- exploit existing infrastructure that can be factored into the risk management strategy that have been developed; and
- draw on existing policy that will contribute to the planning, implementing or evaluating the proposed risk management strategy.

Before a strategy can be implemented, some additional preparation is required. This will be explored in the following sub-learning tasks:

**Task 2.1.:** Identifying and assessing institutions

**Task 2.2.:** Identifying and assessing infrastructure

**Task 2.3.:** Identifying and assessing policies



## 1.1. Identifying and assessing institutions

Module 2, Lesson 2, Session 1 addressed developing three profiles:

- Institutional profiles and
- Response readiness profiles
- Roles and responsibilities profiles

Part of this included identifying what actions would be required to build capacity among these institutions to engage meaningfully in the risk assessment and management process. This learning task looks at what is needed to do to create partnerships among farmers/value chain business operators and agencies, businesses, institutions and organisations to strengthen the capacity of the system at the micro-level (i.e. the farm) to manage risk.

The profiles developed earlier give a good idea of which institutions can contribute (and of their capacity to contribute) to the ARM process with respect to the range of risk areas in the system. They would have been consolidated in a format similar to the following.

**Table 10:** Roles and responsibilities in risk assessment and management

	Risk Management Stages					
	Identifying risks	Analysing data	Planning	Implementing	Resourcing	M&E
Risk areas in System						
Input Production						
Input Supply						
Land						
Infrastructure						
Organisational Capacity						
(Production) Technology						
Finance						
Farmer/Business level Markets & Marketing						
Processing						
Wholesaling						
Retailing						
Exporting						
Point of consumption						

Following on the example used in the previous learning task, the ARM strategy includes Conservation Agriculture as a CSA composed tool. Conservation Agriculture uses different tactics: Minimum tillage; Permanent crop cover with crop residue mulching; Crop rotations; Intercropping; and Planting pits.

This learning task will focus on **permanent crop cover with crop residue mulching**. In order to decide with which institutions partnerships should be established, it is first necessary to identify what is required to implement permanent crop cover with crop residue mulching. This may require some research. In general, promoting and implementing any ARM tool will involve at least the following: Training; Demonstration; Planning; Equipment, tools and supplies; Finance; Information and advice; Monitoring; and Communication.

Drawing on the various profiles, it will be possible to identify specific institutions that can be involved in one or more of the activities related to implementing permanent crop cover with crop residue mulching. A framework like the one below can be used to record the name and capacity of and the support required by each institution that can help with each activity.

<b>Tool:</b> Conservation Agriculture			
<b>Tactic:</b> Permanent crop cover with crop residue mulching			
<b>Stage in cycle:</b> Implementing			
<b>Activity</b>	<b>Institution</b>	<b>Capacity</b>	<b>Support required</b>
Training			
Demonstration			
Planning			
Organising			
Equipment, tools and supplies			
Finance			
Information and advice			
Monitoring			
Communication			

Completing this task will give a clear idea about which institutions can help promote and implement this part of the ARM strategy. It will also give an idea of what support they will need to effectively and efficiently support the promotion and implementation of the strategy. From this an action plan can be developed to engage these institutions in promoting and implementing this part of the ARM strategy.





## 1.2. Identifying and assessing infrastructure

The next action to take is to identify and assess the infrastructure needed to implement the ARM strategy. To do this, it will be necessary to know what facilities, structures, equipment, technologies and services are available (or otherwise accessible) in or near the area in which ARM strategy is to be promoted and implemented.

This assessment will need to be done on two levels:

- What infrastructure does the farmer need to implement the ARM strategy; and
- What infrastructure does the meso-level extension worker or agency need to promote and implement the ARM strategy?

Continuing with the example of permanent crop coverage with mulching, the following questions are asked:

- Micro-level: What infrastructure does the farmer need to implement this?
- Meso-level: What infrastructure is required by the extension worker to introduce permanent crop coverage & mulching to the farmers?

Make a list to answer each question. For each item on the list, determine the following:

Availability and accessibility:

- What is required and what is available?
- What are the costs involved? Who will cover these costs?
- What terms and conditions apply to accessing and using the infrastructure?
- What knowledge and skills are required to use the infrastructure?
- What else might limit availability and accessibility of the infrastructure?

Condition:

- What is the condition of the infrastructure?
- How reliable is the infrastructure?
- What other issues might limit using the infrastructure?

Not all questions will apply to all infrastructures. For example, a training facility will probably not require any special knowledge and skills. However, using the Internet will require some level of computer skills. Similarly, the training facility may not have any conditions that limit using it. However, the Internet may have a very low bandwidth, which may make using it very slow.



Remember, this exercise will be done twice. The first time is to identify and ensure the availability of the infrastructure the farmer needs to implement the ARM strategy. The second is to identify and ensure the availability of the infrastructure the extension worker needs to promote the adoption of the ARM strategy.



### 1.3. Identifying and assessing policies

The third element in this process is identifying and assessing policies that will aid in implementing the ARM strategy. While farmers and business operators will benefit from this, this assessment would most likely be done by the extension worker.

The assessment involves three steps:

1. Identify any public or private sector policy (local, regional, national) that might facilitate implementing the ARM strategy. For example, there might be a relief policy (e.g. flood relief) that provides funds for qualifying farmers. There might be a policy that supports/funds specialised training for farmers to learn about/adopt various technologies (e.g. permanent crop coverage & mulching) or that support access to information or services (e.g. market information and market advice).
2. For each policy, the following needs to be established:
  - The name of the policy
  - The aim of the policy
  - The implementing agency/department/institution (including contact details)
  - The intended beneficiaries
  - The qualifying criteria
  - The terms and conditions for benefitting (e.g. repayment, rewards/penalties)
  - The administrative requirements (e.g. applications, documentation, submission procedures/deadlines, etc.)
  - Other relevant matters
3. Assess the farmers' status with respect to each relevant policy and, where there are gaps make a plan to bridge those gaps.

A simple way to capture this information is set out below.

Name of the policy				
Aim of the policy				
Implementing agency/details				
Requirements/ Status	Details	Status of farmer(s)	Gap	Action to fill gap
Intended beneficiaries				
Qualifying criteria				
Terms and conditions				
Administrative requirements				
Other relevant matters				

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<b>CD 2</b>	<b>Planning, implementing and evaluating arm strategies</b>	<b>MODULE 4</b>
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This will need to be done for every relevant policy. When this has been done, it will be possible to:

- determine which policies can be used to support the implementation of all or parts of the ARM strategy.
- which farmers qualify/do not qualify
- which farmers could qualify with some intervention from the extension worker or agency

When all three parts of this aspect of developing the implementation plan for the ARM strategy have been completed, it will be possible to develop an action plan for creating partnerships between farmers and organisations with respect to various aspects of the ARM strategy.

## SESSION 2

# Getting technical and financial help to implement farm-level strategy

Implementing the ARM strategy will require technical and financial support. A technical plan and a financial plan (budget) should be developed for each of the elements of the ARM strategy. This applies at the level of the farmer as well as at the level of the extension worker.

Continuing with the example of permanent crop coverage & mulching, the farmer will need to identify what technical and financial help they will need and where to get them. The extension worker can help with this.

The extension worker will also need to consider this from the perspective of their plans to promote the adoption of permanent crop coverage with mulching. In this case, the extension workers want to plan a programme to train the farmers to understand and adopt permanent crop cover with mulching on the farm.

The following technical and financial plan for training programme is based on a programme designed by the African Conservation Tillage Network.

#### Learning Outcomes - Participants will:

- Appreciate the advantages of permanent crop cover and residue mulching
- Understand the function of permanent crop cover and residue mulching
- Acquire the skills and techniques necessary for establishing permanent crop cover and mulching crop residue.

**Timing of this Lesson:** This lesson should take place 2-3 months before the time of planting so that participants have time to prepare their land before the rains begin.

<b>Materials Needed:</b>	<b>Source</b>	<b>Budget</b>
Training materials		
Demonstration plot		
Cover crop genetic material		
Production tools & implements		
Mulching tools & implements		
Other		
<b>Total for materials</b>		
<b>Preparation &amp; Running Costs</b>	<b>Who</b>	<b>Budget</b>
Research local extension service recommendations for cover crops and mulching		
Dry run for all demonstrations		
Orientation of trainers and facilitators		
Transport		
Accommodation, etc.		
Other		
<b>Total for preparation</b>		
<b>Total cost of training</b>		

This will need to be done for each aspect of the ARM strategy. Because this can be quite detailed, it recommended an extension planning matrix or other planning tool be used. The most appropriate tool will be the one used by the organisation employing the extension worker.

## SESSION 3

# Tailoring learning tools for farmers in specific locations

There are many ways to develop learning tools and training programmes. This learning task uses the FAO (1995) approach to Designing Participatory Training.

There are nine (9) basic steps to designing a participatory training programme. In this case, they have adapted to suit the ARM process.

The participatory principle:

- Being participatory means that it requires collaboration among all participants through most of the steps – but especially steps 3-9.
- Being participatory also means that new information will emerge continuously. Therefore, the programme design must remain flexible because it must absorb and integrate new needs and priorities identified by the participants as they come up.

The following steps are not necessarily carried out strictly in the order in which they are presented, and many of the steps will be repeated.

### Design Step 1: Select Resource Person(s)

Select an overall programme coordinator who will initiate the design of the programme, develop training materials and methodology, then coordinate communications among participants, and provide support and management for all aspects of programme implementation. Additional resource persons may be required, e.g. ARM specialist.

### Design Step 2: Define the General Problem

Initiate background research by visiting the field or institutions and studying documents, as required. Then, draft tentative goals. [*In the case of ARM, extensive research and assessment will have already been done, risks will have been analysed and will have defined the problems and which will have developed in the proposed ARM strategies.*]

### Design Step 3: Identify the Participants

Make a list of names of individual farmers/business operators or of farmer/business organisations that will need to participate in the training. [*This list may vary for each of the tools or projects included in the proposed ARM strategy. There will also be a lot of information from the institutional profiles and other analyses done in the earlier stages of the ARM cycle.*]

### Design Step 4: Get support and Commitment

Before any programme can get started, it will need support in the form of human, material and financial resources for the duration of the programme. This means that commitment will be needed from decision-makers, at every level, in the organisation employing the extension worker, from decision-makers in the other organisations that will be involved in the programme, and from the participants.

### Design Step 5: Start a Dialogue

Engage the potential participants in a conversation about the purpose and processes of the strategy and/or of the specific risk management tool or project to be implemented. Work together to identify key issues for the programme. Aim for usefulness and relevance. Also identify the potential beneficiaries and other role-players and stakeholders that might need to be involved.

### Design Step 6: Select Programme Participants

After identifying the issues and the relevant stakeholders, with the help of representatives of the farmers, etc., select the specific participants to be involved in the training programme. The data from the ARM analyses will guide the process.

### Design Step 7: Set Programme Objectives

Although the ARM strategies have built-in objectives, it will still be necessary to work with the participants in setting out sub-objectives and milestones. For example, with permanent crop cover with mulching, the main objective is to get the farmers to adopt the practice and apply it correctly. However, it will be useful to set more specific objectives related to adopting and applying objectives, such as learning which crops to plant and how to perform the mulching. These objectives would be based on the current capacity of the participants (i.e. farmers). All objectives need to be realistic, relevant (to the situation of the participants and to the objective of the ARM strategy or specific tool), possible in terms of budgets and other resources.

### Design Step 8: Design the Programme

This has two parts. First, together with the participants, develop final programme goals and expected outcomes.

Second, also with the participants, identify the individual steps for achieving each of the outcomes. [See the example for the participatory exercise discussed earlier] Here, it will also be necessary to identify resources needed, and create a timetable.

As a whole, the programme should support a participatory process of capacity-building.



### Design Step 9: Monitor and Evaluate Continuously

To monitor and evaluate the programme, structures (e.g. review committees), systems (e.g. data collection and analysis), review dates, and monitoring and evaluation reporting systems need to be set up. These systems do not have to be complex or sophisticated; it is more important that the participants participate in the M&E process.

**Monitoring** is checking that the programme is being implemented according to the plan. In this case, because it is a participatory approach, it will be necessary to monitor the process of designing the programme to make sure that it remains participatory and stays relevant to the aims of the ARM strategy/tools and stays relevant to the participants meant to benefit from the programme. For monitoring of the implementation, it will also be necessary to set up a mechanism to make changes to the plan along the way, based on the reviews that are made.

**Evaluation** measures impact (i.e. the actual achievement of outcomes, objectives and goals). Evaluations need to be done during at least three stages: at the end of each milestone or major process; at the end of the programme; and at some time well after the programme (perhaps a year or more), to determine if the outcomes have been sustained.



## Lesson III

# Implementing and monitoring a farm-level risk management strategy

This lesson walks the learner through the process of preparing to implement an ARM strategy incorporating tools described in Module 3. The focus is on developing the structures, systems and tools needed to implement a strategy and to monitor the process.



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**SESSION 1** Developing a plan to implement and monitor  
a farm-level risk management strategy

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**SESSION 2** Implementing the strategy

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Learning objectives

**ARM strategy plan**

**ARM strategy monitoring**

**ARM strategy monitoring**

## SESSION 1

# Developing a plan to implement and monitor a farm-level risk management strategy

When the activities learned in Lesson 4.1 have been completed, an overall ARM strategy will have been developed. At the level of the farm, an individual farmer will need to make a plan for implementation. The plan can be simple and straightforward. It needs to clearly outline the following:

- A list of the materials required, when they are required, how much they will cost, and where they can be obtained.
- A list of activities to be carried out, when they are to be done, the labour required, and any cash costs that might be involved.

One of the ways to capture this information is using a seasonal calendar which would allow the farmer to easily capture all of the required information in one place.

Developing an implementation plan at the meso-level, when the extension worker is considering wider application of the strategy, is more complex. It is beyond the scope of this publication to give direction on this. Each extension agency or advisory service will have its established procedures for planning extension/advisory activities.

Whatever approach is used, it is important that the implementation plan be clear and well structured so that it is simple to implement, monitor and evaluate. Thus, the plan must clearly indicate at least the following:

- The overall aim of the ARM strategy
- The specific objective of each of the tools
- The results expected from each of the tools and overall
- The activities required to implement the strategy
- The resources (materials and human resources) required
- Timeframes for activities and resources.

**Box 2:** Developing an action plan

To help develop an action plan, use the following checklist:

- What are the activities to accomplish the objectives?
- Why is the activity taking place?
- Who benefits or is the target of the activity?
- Who is doing the activity? Which human resources do we use?
- Where is the activity taking place?
- When is the activity taking place?
- Who is responsible for coordination/implementation?
- How is monitoring and evaluation assured?
- What is the budget?

Source: Touwen (2001)

Below is a hypothetical example of a simple extension plan to implement an ARM strategy for a group of smallholder farmers.

In this example, the farmers, with the assistance of their local extension worker, identified that market prices for the two crops they produce were too unpredictable. This affected the stability of their income and created a real risk to their livelihoods. Again, together with the extension worker, the farmers agreed to use two risk management tools as their ARM strategy. The tools included contract farming to transfer/share risk with the market and diversifying their crops.

Working with this analysis and selection of ARM tools, the extension worker developed a simple extension plan to implement the ARM strategy. They clarified the overall aim of the strategy, the objective of each of the two tools, and the results expected overall as well as from each tool. They identified the activities and resources required to implement the strategy. And they determined the overall timeframe, as well as the timeframe for each of the activities. They consolidated all of this information in a set of tables.

## ARM IMPLEMENTATION PLAN FOR FARMERS IN ZONE 1

The overall aim of the ARM strategy	To create a more stable income for the farmers by addressing the price risk the farmers are facing
Objective of diversifying crops	To ensure each farmer is less dependent on only 2 crops
The results expected from diversifying crops	That each farmer will produce at least five different crops of which at least one is a high-value cash crop
Objective of contract farming	To ensure that farmers get a predicable price for their crops
The results expected from contract farming	That each farmer will have a contract for at least two of their crops at least one of which is for a high-value cash crop

## Activities required to implement the strategy: Diversifying crops

Activity	Resources required	Timeframe (complete by)
Conduct feasibility studies on various crops	Input from Agricultural Department economists. Production and market data.	Seven months before the start of the season
Select a range of suitable crops	None	Six months before the start of the season
Communicate selection with farmers	Venue, refreshments, presentation materials	Six months before the start of the season
Help farmers decide which crops they want to plant	As above	As above
Identify the technical requirements to plant the crops and establish budgets	Production guidelines from subject matter specialists and input suppliers	Five months before the start of the season
Identify the farmers' training needs to plant the crops and develop training programmes	Skills audit materials, support from subject matter specialists and local agricultural college	Five months before the start of the season
Implement training programme	Training materials, venues, accommodation, support from subject matter specialists and local agricultural college	Three months before the start of the season
Help the farmers set out implementation plans	Standard travel and accommodation	Three months before the start of the season
Monitor the farmers' plans as they are implemented; provide support	Standard travel and accommodation; data systems	Prep by start of the season; monitoring ongoing
Help farmers evaluate the results and plan for next season	Venue, refreshments, evaluation materials, support from subject matter specialists	Two months after the end of the season

## Activities required to implement the strategy: Contract marketing

Activity	Resources required	Timeframe
Identify potential market partners	Support from Agricultural Department economists and subject matter specialists	Seven months before the start of the season
Facilitate negotiations between potential partners and farmers	Venues, refreshments, workshop facilitation materials	Six months before the start of the season
Assist farmers in reviewing terms of proposed contracts	Standard travel and accommodation	Five months before the start of the season
Help farmers finalise contracts	Standard travel and accommodation	Five months before the start of the season
Link contract commitments to the crop diversification implementation plans	See crop diversification plan	Three months before the start of the season
Monitor the plans as they are implemented; providing support	Standard travel and accommodation; data systems	Prep by start of the season; monitoring ongoing
Help farmers evaluate the results and plan for next season	Venue, refreshments, evaluation materials, support from subject matter specialists	Two months after the end of the season

There are numerous resources to assist with this kind of planning, two of which are the following:

Conservation Agriculture Toolbox for Zimbabwe found at [http://www.fao.org/ag/ca/Training\\_Materials/CA\\_toolbox\\_Zimbabwe.pdf](http://www.fao.org/ag/ca/Training_Materials/CA_toolbox_Zimbabwe.pdf)

Lead Farmer Extension and Training Guide on Sustainable Agriculture found at <https://cepa.rmportal.net/Library/natural-resources/DF%20Lead%20Farmer%20Extension%20and%20Training%20Guide%20on%20Sustainable%20Agriculture.pdf>

National Agricultural Extension Manual: Timor-Leste (especially Annex 6) found at <https://www.google.co.za/search?q=%22extension+planning%22+adoption+farmer+steps&ei=72mzWunDCsnFgAa14pWwDg&start=20&sa=N&biw=1337&bih=760>

Adaptation for Smallholder Agriculture Programme (ASAP) - Food and Nutrition Security and Market Linkages Programme: Final project design report: Lao People's Democratic Republic found at <https://operations.ifad.org/documents/654016/07c7ce99-1aeb-44fa-ae3a-5a8929f421fd>

## SESSION 2

# Implement the strategy



## 2.1. Preparation for implementation

In the case of an individual farmer or group of farmers implementing their ARM strategy, preparation is fairly straightforward. What is required is to make arrangements for the material and labour listed in the plan. Where necessary, the farmer(s) can ask for help from other farmers or from an extension worker.

In the case of an extension worker implementing an ARM strategy on a wider scale, the strategy can be rolled out according to the timeline set out according to the plan developed as outlined in Learning Task 4.2.1. once all the structures, systems and human, physical, financial and other resources have been mobilised.

### Structures

Implementing any plan requires structures (i.e. decision-making bodies) and systems to manage the process. If the plan (e.g. strategy) is simple, then it is may be possible to manage everything through one or two structures. If the plan is complex, it may require multiple structures organised hierarchically. For example, there may be one overall management structure, with subsidiary teams for each strategy and, if needed, for each output. Structures should reflect logical groupings and should make implementation easier and simpler and to ensure compliance. If a structure is not essential, it should not be established. The fewer the structures leads to fewer levels of hierarchy, and the fewer the better.

Most organisations will have at least some of these structures in place. What may be required is the creation of structures that run across more than one institution or organisation. It is particularly important to make sure there is a structure(s) in place that is responsible for overall coordination (including monitoring) and for evaluation (of impact).



### Systems

Regardless of how many structures are put in place, managing the implementation of any plan requires a range of systems: financial management; procurement; communication; operations; human resource management; and asset management.

Most organisations already have such systems in place. It is necessary to make sure that the existing systems will support the needs related to implementing the ARM strategies.

### Resources

Before the ARM strategy can start being implemented, all the resources need to be mobilised and in place or scheduled to be in place when needed according to the implementation timetable.



## 2.2. Participatory Implementation & Monitoring

While it may appear easier to implement the ARM strategy from the top-down, experience indicates that applying a participatory approach will increase the likelihood of both short- and long-term success.

*Participatory implementation* involves (IFAD, 2001): Capacity-building; Participatory impact monitoring; Participatory impact assessment; Reality-check workshops; and Participatory evaluation.

This step focuses on the concepts and principles of participatory implementation. Step 3 will discuss the tools and processes involved.

To make participatory implementation effective, it requires at least the following (IFAD, 2001):

- Developing common parameters and indicators to measure impact;
- Agreeing on common approaches and management and communication tools to facilitate the work of stakeholders and role-players;
- Encouraging reflection, openness and safety in risk-taking (to reduce working in 'silos'); and
- Sharing lessons learned about collective action (to foster the practice).

### Preparing for participatory project implementation

One of the challenges of project implementation that an extension worker might face is that circumstances on the ground may change in the time that has passed between project design and project implementation. During that same period, however, the stakeholders should have started mobilising resources in accordance with commitments they made during the design stage. Thus, when it is time to start implementing the strategy, it is necessary to reconfirm that the situation that gave rise to the ARM strategy has not changed so much that the strategy is no longer relevant. The aim is not to start a new round of negotiations, but it is important to make sure it is possible to proceed with implementation.

It is also necessary to confirm if the stakeholders who were assigned specific responsibilities or who committed to contribute resources can still meet those commitments. This is particularly important when applying a participatory implementation approach that involves less formal and resourced structures such as farmers' organisations, etc. There may have been policy, administrative or even political changes at the macro-level. It is essential to determine the following (URD, n.d.:191):

- Do the stakeholders have the capacity to fulfil their commitments?
- Has their situation changed so that they are no longer able to provide the resources?
- If they are having difficulties, how can the project be adapted to support them?

It may be necessary to make some adjustments to the ARM strategy and/or the implementation plan.

Similarly, it is necessary to ensure that all of the structures and systems and resources are in order, and to make adjustments where necessary.

Once all of this has been finalised, the project implementation can start. And it starts with the first activity(ies) of the overall action plan. The next major stage is monitoring implementation.

### Participatory project implementation: Monitoring

As noted above, implementation is a matter of following the plan that has been developed. What then becomes critical is monitoring the implementation process.

Monitoring checks that the project is being implemented according to plan. It also provides the information needed to make adjustments to accommodate changes on the ground.

Participatory monitoring means that all the stakeholders and agencies decide together how results will be measured and what action to take once monitoring information has been collected and analysed. It also means that all stakeholders have an opportunity to provide feedback on the project as it is being implemented, and to have input into any decisions about adjustments to the project or the way it is being implemented.

Participatory monitoring works best when the monitoring system and how the various stakeholders will be involved have been clearly defined. The key areas to clarify are:

- The monitoring indicators;
- The methods to be used;
- How feedback will be given; and
- How the monitoring results will be used.

## The monitoring indicators

If a participatory process has been followed to develop the ARM strategy, then the stakeholders will already know what criteria have been set for the goal, purpose and outputs. They will also know what the sequences activities, their start/stop dates and the resources required. Thus, it should not be necessary to start from the very beginning. However, it may be necessary to review the indicators that were recorded in the logical frameworks developed for each project. This part of project monitoring relates more to evaluation, which is discussed in the next lesson.

## Setting up and managing the monitoring process

Once there is clarity on the two monitoring processes (for outputs, purposes and goals, and for the sets of activities), the next step is to decide how the monitoring is going to be done, and who will be involved.

In most cases, there is a central or coordinating agency responsible for the overall governance of the ARM strategy. In the example we have been developing, the main coordinator (e.g. the extension worker) has been an extension/advisory service. However, despite this general oversight, some aspects of project monitoring should be delegated to stakeholders and to structures comprised of stakeholders.

One of the central functions of participatory monitoring is to capture the input from stakeholders as well as from those responsible for implementing the project, and especially beneficiaries of the strategies. The process needs to provide a balance between the need to be inclusive and manageable.

According to IFAD (2001), participatory monitoring can be done in various ways, depending on what is being monitored. Methods include:

- Incorporating monitoring into existing decision-making and problem-solving structures and processes (including those in extension worker's organisation, stakeholders' organisations and structures known to the beneficiaries);
- Using participatory tools and exercises;
- Establishing specific monitoring structures;
- Using surveys, interviews, focus group discussions, etc.

Whatever combination of methods is used, the participatory monitoring process should provide feedback to participants based on the information gathered, and should include these participants in decision-making. The process and 'rules' for decision-making need to be very clear and agreed to by all stakeholders.

A participatory approach is generally slower than more administratively efficient (top-down) methods, but it also more sustainable and effective over the duration of the project. Again, it is necessary to find the balance. A key element of finding the balance is good communication.

In addition to monitoring the project with stakeholders that are directly involved in the ARM strategy, it may also be necessary to monitor progress with external stakeholders and formal governmental structures not directly involved in the ARM strategy (e.g. government ministries). In some cases, such additional monitoring is already in place or is a pre-condition to implementing the strategy.

### Gathering data and monitoring the implemented strategy

In addition to structures and systems, the key to monitoring is gathering data and analysing them using decision frameworks. Much like the process used to develop the implementation plan, there should also be a plan to implement the monitoring process. One of the simplest ways to develop this plan is to base it on the consolidated implementation plan.

What is monitored will depend on the specific plan developed and the indicators used. Again, for the individual farmer this is a relatively simple task of making note that the strategy is being implemented as intended. The information required should not be extensive or complex.

The extension worker implementing the strategy on a wider scale will probably need to make arrangements to gather the information needed to be able to monitor the implementation of the ARM strategy. In this regard, the extension worker will need to monitor things on three levels:

- Implementation of activities (including tracking acquisition and use of resources) against the targets for time, resource allocations, and budgets where monitoring focuses on technical progress in terms of time and money and making adjustments accordingly;
- Monitoring the processes, relationships and partnerships that impact output delivery.
- Monitoring the impact of the strategy as it is implemented – laying the foundation for evaluating the success of the overall programme.

### Data to be gathered for monitoring review sessions

The implementation plan can be used to identify the data needed for monitoring. The following gives an indication of the kind of data needed to monitor implementation.

#### Monitoring *progress of activities*

- Starting and stopping times compared to planned start/finish
- Resources used compared to resources allocated
- Money spent compared to the budget allocated
- Individuals involved compared to assigned human resources

#### Monitoring the *implementation process*

- Frequency of meetings and attendance
- Levels of participation and interaction
- Follow-through on decisions

Monitoring the *impact of the strategy*

The programme to introduce Conservation Agriculture in the eastern, southern and central regions of Zambia provides some insight into the types of indicators used and, thus, the data required to monitor the impact of the strategy (Aune et Al., 2012). In this case, the following indicators were used:

- Impact on soil properties (e.g. soil fertility) measured by chemical properties of the soil;
- Impact on planting times measured by dates of planting relative to rainfall;
- Impact on weed control measured by man hours required;
- Impact on fertilisation measured by the rate of application and the extent of residue retention;
- Impact on yield measured by tons per hectare;
- Impact on labour use measured by man-hours and task allocation by gender; and
- Cost effectiveness measured by gross margins.

**Consolidating the monitoring plan**

Once the requirements of monitoring plan have been finalised, they can be compiled into a monitoring plan. The template below is a simple mechanism for recording the questions to be answered, the details of the data to be gathered, and the plan for assessing the data.

Questions	
<b>Data gathering</b>	What do you want to know?
	How will you know it? (indicator)
	Where will the data come from?
	Who will capture the data?
	When will the data be captured?
<b>Assessment</b>	Estimated cost
	Who will be involved?
	How will it be reported?
	When will the evaluation occur?

This same template can be used to develop implementation monitoring reports. The reports can be organised in any number of ways. The most common approach would be to focus the reports around the questions relating either to an activity or an output. However, as will be seen in the next lesson, reports can also be designed to report on the project’s purpose and goal.



## Lesson IV

# Evaluating a farm-level risk management strategy

This lesson introduces the learner the greater context in which evaluating an ARM management strategy occurs and is designed. It includes also various ARM strategy evaluation methods and tools applied at different level.



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**SESSION 1** Evaluation and why it is important

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**SESSION 2** Evaluation methods and tools

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**SESSION 3** Designing an evaluation of an ARM strategy

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**SESSION 4** Applying evaluations at different levels

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Learning objectives

**Evaluation tools**

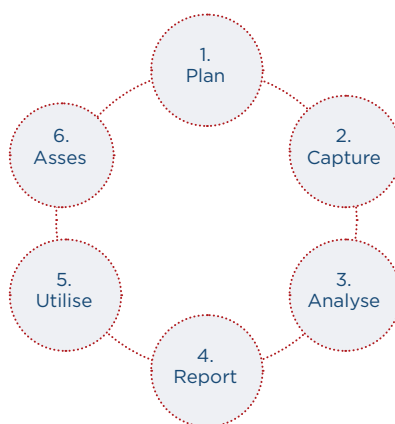
**ARM strategy evaluation design**

**ARM strategy evaluation application**

## SESSION 1

# Evaluation and why it is important

Evaluation is a structured process of assessing the success of a project in meeting its goals and to reflect on the lessons learned. It follows the same stages as monitoring.



When applied to a project or programme an evaluation is generally concerned about two things:

- To what extent did the project/programme solve the problem that it was designed to address?
- What lessons did we learn that we can apply to future projects/programmes?

In practical terms, the evaluation of a project/programme will review the outcomes in terms of:

- The targets and their respective indicators
- Time, resources and budgets
- The structures, systems and processes

In each case, the evaluation looks at the plan vs. the actual, aka what actually happened. But it is important to understand that evaluations are meant to be much more than a process of ticking boxes of achieved or not achieved. While the quantitative aspects of an evaluation are important, the qualitative aspects of an evaluation are equally important.



Many of the aspects of an evaluation will be the same as or similar to many of the aspects of monitoring. We learned in the last lesson that monitoring is done as the project/programme is being implemented. Monitoring is primarily concerned with making sure that the implementation plan is going according to plan and operating within the approved allocation of resources and funds. While there is some tracking of progress toward achieving goals, that is not its primary function.

The key difference between monitoring and evaluation is that evaluation is about placing a value judgement on the data and information gathered during a project, including the monitoring data. Thus, the evaluation of a project's success will vary based on whose value judgement is used. For example, a project manager's evaluation may be different to that of the project beneficiaries, or other stakeholders. A good evaluation will attempt to embrace all such views to truly understand the value of the project and the impact it has had.

It is this difference that makes evaluation important. It is not sufficient to know that a plan has been implemented according to plan, or even that it has achieved its goals. It is essential to understand that the project has solved (or at least substantially improved) the original problem and that those benefiting from the project are in better, stronger position going forward. This is especially true for projects related to the human condition, such as the ARM strategies that have been discussed in this publication.

ARM strategies – indeed, the whole ARM cycle – are about improving the lot of farmers, value chain business operators and other actors in the food and agricultural system. Seen from a livelihoods perspective, evaluations help determine if the livelihoods in the system have been made more sustainable, particularly by reducing their vulnerability to the negative impacts of risk through building their capacity and the capacity of the overall system to mitigate, transfer and cope with risk.

ARM strategies should not only aim at 'fixing' a particular problem, but beyond that, they should fundamentally strengthen the overall structure and operation of the collective systems. They should contribute to the advancement of the food and agricultural sector – including the individual farms and business and value chains. They should contribute to stabilising livelihoods, economies and food security.

There is, however, an important link between monitoring and evaluating. First, a well-planned and executed monitoring plan makes the evaluation much easier. Most of the questions asked and data collected during monitoring will also be relevant to the evaluation. Many of the indicators used in monitoring are also used in evaluating the project.

### Types of evaluations

Generally, evaluations are either formative or summative. Formative evaluations most often take place in the lead up to the project (i.e. as it is being planned and developed). They may also take place during project implementation in order to improve the project design as it is being implemented.

Formative evaluations help:

- Understand or clarify the need for the project;
- Make clear the theory of change on which the project is based;
- Improve the project's design as it is implemented; and
- Ensure that the project activities are being delivered efficiently and effectively.

Formative evaluations are often qualitative in nature, as they address the question: is this project relevant and appropriate?

**Summative evaluations** take place during and after project implementation. They assess whether the project has met its goals, whether there were any unintended consequences, what was learned, and how to improve. Summative evaluations are most often quantitative in nature (e.g. measuring projects against targets), but may also include qualitative elements to contextualise the evaluation. Summative evaluations address the question: Did the project achieve its goal?

Within these two approaches, there are essentially three types of evaluations (as shown in *Table 11*):

1. Process evaluations: focusing on operations, implementation and service delivery
2. Outcomes evaluations: focusing on whether the project has met its objectives
3. Impact evaluations: focusing on whether the project solved the problem it was designed to address.

**Table 11:** Types of evaluation

Evaluation Type	Function	Types of questions
Process evaluation	<ul style="list-style-type: none"> <li>• Determines whether program activities have been implemented as intended.</li> <li>• Focuses on the program's operations, implementation, and service delivery</li> </ul>	<ul style="list-style-type: none"> <li>• Has the project reached the intended target group/ beneficiaries?</li> <li>• Are the relevant project activities reaching the intended beneficiaries?</li> <li>• Are participants and other key stakeholders satisfied with all aspects of the project?</li> <li>• Are all activities being implemented as intended including timing &amp; quality?</li> <li>• Are services/ benefits being delivered as intended including quantity &amp; quality?</li> <li>• Have any changes been made to intended activities? Why?</li> <li>• Are materials, information, presentations and communications suitable for the target audience/ beneficiaries?</li> </ul>
Outcomes evaluations	<ul style="list-style-type: none"> <li>• Measures whether a project has delivered the intended results in terms of its objectives and indicators</li> </ul>	<ul style="list-style-type: none"> <li>• Were the intended outputs of the project achieved (and within the parameters set such as quantity and time)?</li> </ul>
Impact evaluations	<ul style="list-style-type: none"> <li>• Measures whether a project has achieved its ultimate goal</li> <li>• Measures whether the project solved the problem that it was designed to address</li> </ul>	<ul style="list-style-type: none"> <li>• How well has the project achieved its goal?</li> <li>• Has the project achieved its intended effect?</li> </ul>

## SESSION 2

# Evaluation methods and tools

The first three stages of evaluation – plan, capture, analyse – are critical. The plan outlines what will be the focus of the evaluation and how it will operate. When designing the evaluation of a project, it is important to be clear at the beginning on which type of evaluation is needed. It is also important to define the objectives of the evaluation. Possible objectives include:

- Evaluate the project’s impact in terms of its goal, purpose and outputs
- Assess the project’s relevance/value from the perspective of the intended beneficiaries to gauge whether needs or conditions have changed
- Assess the intended beneficiaries’ level of satisfaction about the way the project was implemented and/or the results it achieved
- Identify the effects of the intervention on a specific set of problems
- Compare how activities evolved in relation to the initial action plan
- Identify key learning points, to improve future project design and implementation
- Adapt the intervention to a new situation

Whatever its objective, the evaluation will require data and information. Ample time must be given to deciding what data and information will be captured, and how it will be captured. It is also important to decide how data and information will be analysed. As with the monitoring plan, the following framework can be used to develop the plan.

Questions	
<b>Data gathering</b>	What do you want to know?
	How will you know it? (indicator)
	Where will the data come from?
	Who will capture the data?
	When will the data be captured?
<b>Assessment</b>	Estimated cost
	Who will be involved?
	How will it be reported?
	When will the evaluation occur?

This step focuses on the questions:

- Where will the data come from?
- How will the data be gathered?

There are generally two sources of data: project records and human recollection. If the implementation and monitoring plan was well designed and well executed, then many of the records will already be available. Instruments will have been developed to capture data as the activities are carried out. There will be records of the activities themselves, as well as of the resources, budget and time used to complete each activity. Progress reports will have been formatted to record the monitoring data. All of these records are sources of data for the evaluation.

Depending on the nature of the implementation plan, there may be some information on the impact of the project as it is rolled out. Impact can be partly measured quantitatively. In the contract-farming example we have been using, there may be a record of the number of farmers assisted, the number of marketing agencies contacted, number of contracts signed and the current status of negotiations around contract content. This information is also relevant to the evaluation.

In addition to the quantitative data provided by project records, there is much quantitative and qualitative data that will not be recorded. It is held in the minds of the people working on the project, people supporting the project, and, most importantly, people meant to be benefitting from the project. Knowing how many contracts have been signed tells only part of the story. To truly evaluate the impact of the project much more is required. For example:

- The farmers consulted compared to the number of farmers who wanted to go into contract farming?
- What motivated farmers to adopt or not adopt contract farming
- How prepared were the farmers who adopted contract farming to meet the conditions of the contract?
- Perceptions of the farmers about how fair the contracts are
- What is the actual understanding of the farmers about the contracts they have signed?

Similar questions can be asked of the marketing agencies contacted throughout the project.

In order to evaluate the process of implementing the project, it will be necessary to know:

- How activities were carried out
- What challenges were encountered and how they were resolved
- How well reporting and other communication systems worked
- How well the administrative and financial systems worked
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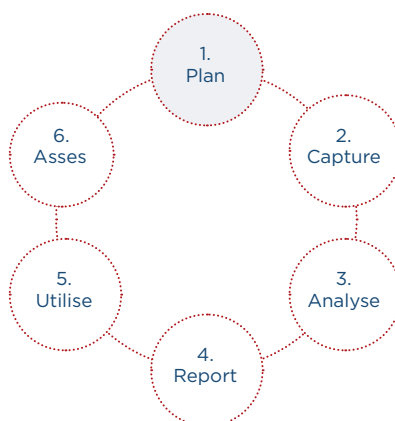
## SESSION 3

# Designing an evaluation of a farm-level ARM strategy

The simplest way to design any evaluation is to go through the six stages: plan; capture; analyse; report; utilise; and assess.

### Stage 1: Plan

- Determine the objective of the evaluation
- Determine the questions to be asked



The questions drive the evaluation and, thus must be chosen thoughtfully. The questions will, in part, be determined by the focus of the evaluation.

Focus of Evaluation	Evaluation questions
<b>Process</b>	<ul style="list-style-type: none"> <li>• How well was the project designed and implemented (i.e. its quality)?</li> </ul>
<b>Outcome</b>	<ul style="list-style-type: none"> <li>• To what extent did the project meet the overall needs?</li> <li>• Was there any significant change and to what extent was it attributable to the project?</li> <li>• How valuable are the outcomes to the organisation, other stakeholders, and participants?</li> </ul>
<b>Learnings</b>	<ul style="list-style-type: none"> <li>• What worked and what did not?</li> <li>• What were unintended consequences?</li> <li>• What were emergent properties?</li> </ul>
	(...)

(...) Focus of Evaluation	Evaluation questions
<b>Investment</b>	<ul style="list-style-type: none"> <li>• Was the project cost effective?</li> <li>• Was there another alternative that may have represented a better investment?</li> </ul>
<b>What next</b>	<ul style="list-style-type: none"> <li>• Can the project be scaled up?</li> <li>• Can the project be replicated elsewhere?</li> <li>• Is the change self-sustaining or does it require continued intervention?</li> </ul>
<b>Theory of change/ Theoretical assumption</b>	<ul style="list-style-type: none"> <li>• Does the project have a theory of change (i.e. What was the theoretical assumption that suggested the project would work)?</li> <li>• Is the theory of change reflected in the project logic?</li> <li>• How can the project logic inform the research questions?</li> </ul>

Source: Adapted from Evaluation Toolbox (2010)

For each question decide the following for data gathering:

- What is being measured?
- What is the indicator that measures progress?
- Where will the data come from?
- How will the data be gathered?
- Who will capture the data?
- When will the data be captured?
- Estimated cost

For each question decide the following

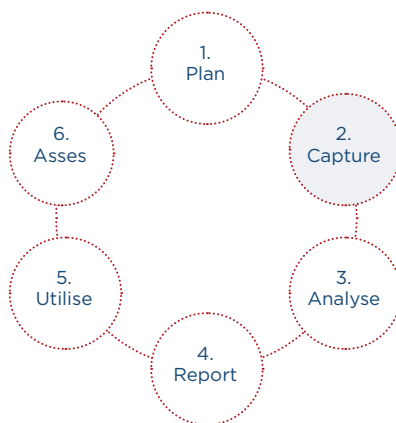
- Who will be involved?
- How will it be reported?
- When will the evaluation occur?

It is advisable to set up a table for each question

Question:
Data Gathering
What we want to know
Indicator
Source of data
Data gathering method & tool(s)
Data to be captured by
Start/Finish date for capturing data
Estimated cost
Analysis
Others involved (& role)
Reporting format and procedure

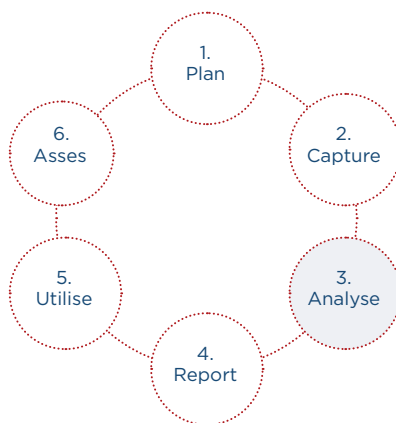
Once all of this detailed work has been completed, it can be compiled into a comprehensive evaluation plan.

### Stage 2: Capture



This stage is the first step of implementing the evaluation plan. The structures, systems and tools that have been agreed to are all implemented, and the required data is now gathered and captured.

### Stage 3: Analyse

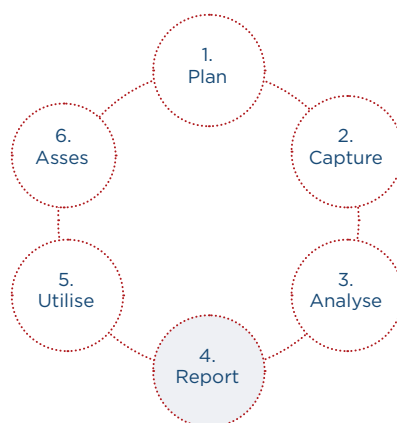


The aim of this stage is to analyse the raw captured data from stage 2, in order to draw out meaningful features and trends. Quantitative data can be analysed initially using various methods such as spreadsheets to calculate change, percentage, etc. Qualitative data can be analysed using various formal methods such as thematic analysis and discourse analysis. However, most of the methods used follow a similar process consisting of identifying, coding, and categorising patterns or themes found in the data.

There will be two kinds of categories. One is the pre-set categories that were identified when planning the evaluation. They will generally match with the key questions being asked. The other is emergent categories. It is best to use both approaches. This will make sure the data reports on categories that are important to those who designed the evaluation, but it will also allow for additional insights to be captured and make it easier to identify unintended consequences.

Once the 'most important' categories have been created, relevant data can be captured under each category. Generally, this will follow a pattern of positive, negative and neutral statements relative to the category. Once all the data has been captured, the analysis report(s) can be written.

### Stage 4: Report



Projects will be evaluated on many levels. In this example of contract farming, the farmers themselves will want to know the results of implementing the ARM tool. They may know how it affects themselves individually, but they will also want to know how others were affected. At the other end of the spectrum, the agency with overall responsibility for the ARM strategy will want to know how well the initiative worked and what impact it had on the problem it was designed to address. And, in addition to these, there will be many other stakeholders who will want to know the outcome of all or parts of the ARM strategy – particularly those parts in which they have been involved.

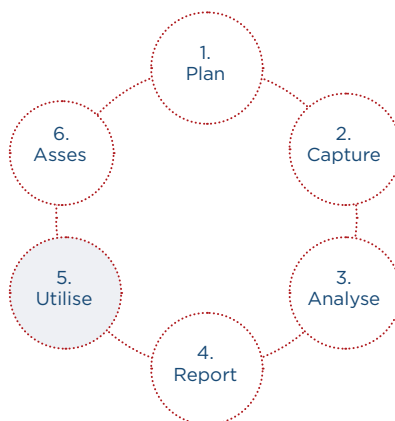
In each case, consideration must be given to how to report the results of the evaluation. In general, however, whatever the nature of the reporting mechanism, all reports will cover, to a greater or lesser extent and with varying levels of detail, the same framework.



Report Focus	Explanation
Identification	<ul style="list-style-type: none"> <li>• A clear heading or title of the report that tells the reader what the report is about</li> </ul>
Summary	<ul style="list-style-type: none"> <li>• A concise summary or overview of the main findings, lessons and recommendations</li> </ul>
Review of project essentials	<ul style="list-style-type: none"> <li>• The main purpose of the project (i.e. the problem it was designed to address and the theory of change it adopted)</li> <li>• An overview of the project and its goal, purpose and outputs</li> <li>• Key stakeholders and beneficiaries</li> </ul>
Evaluation framework	<ul style="list-style-type: none"> <li>• Purpose of the evaluation</li> <li>• Main evaluation questions</li> <li>• Evaluation methods &amp; tools</li> </ul>
Findings	<ul style="list-style-type: none"> <li>• The findings for each main evaluation question</li> </ul>
Conclusions & Recommendations	<ul style="list-style-type: none"> <li>• Interpretation of the findings against intended outcomes and processes</li> <li>• Recommendations for use of the findings</li> </ul>
Supporting references	<ul style="list-style-type: none"> <li>• Details about sources of information used</li> </ul>
Additional details	<ul style="list-style-type: none"> <li>• Information that is too detailed for the main report, but may help stakeholders clarify issues.</li> </ul>

## Stage 5: Utilise

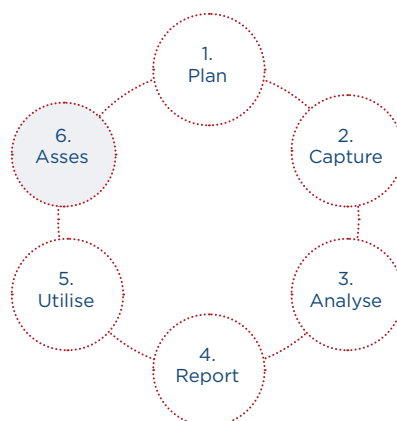
The purpose of the evaluation determines the use of the information developed and reported.



Focus of the evaluation	Use of information presented
Process	<ul style="list-style-type: none"> <li>• Confirm or Change the way the project is being implemented</li> </ul>
Outcome	<ul style="list-style-type: none"> <li>• Confirm or Change the outcome</li> <li>• Confirm or Change the way the outcome is being addressed</li> <li>• Confirm or Change the indicators used</li> </ul>
Learnings	<ul style="list-style-type: none"> <li>• Make improvements to the current or future projects</li> </ul>
Investment	<ul style="list-style-type: none"> <li>• Determine if the benefits are commensurate with costs</li> <li>• Determine possible efficiencies</li> </ul>
What next	<ul style="list-style-type: none"> <li>• Identify post-project activities for sustainability</li> <li>• Determine possible replication (increase or apply to another area)</li> </ul>
Theory of change/ Theoretical assumption	<ul style="list-style-type: none"> <li>• Confirm or Amend the theoretical assumption for the project</li> </ul>

### Stage 6: Assess

This stage calls for reflection on the evaluation process. What worked well? What worked poorly? What didn't work? What was missing? Did stakeholders and beneficiaries get the information they needed? How was the data used? How did the evaluation process benefit the current and future projects? How should monitoring and evaluation be improved.



\*\*\*

After stage 6, a new evaluation can be planned. Remember that evaluations can take place during project implementation, post-implementation (i.e. at the end of implementation) and ex-post-implementation (i.e. at some time in the future (e.g. 1 year) after implementation).

# SESSION 4

## Applying evaluations at different levels

As noted throughout this publication ARM encompasses three levels: micro; meso; and macro. The publication has largely been aimed at developing the capacity at the meso-level to plan agricultural risk assessment and management strategies to be implemented at the micro-level. The assessments and the ultimate strategies should be of keen interest to the farmers and business operators at the micro-level, to other stakeholders and operators at the meso-level, and to stakeholders, agencies and organisations at the macro-level. The stakeholders at each of these levels will have similar but also varying interests in the results of the evaluation.

When designing the evaluation process, it will be important to consider the particular needs and preferences of each level of stakeholder and, where possible, each individual or group of stakeholders.

A simple way to plan for this is to use the six stages of the evaluation cycle and to consider the following:

Stage	Considerations
Plan	<ul style="list-style-type: none"> <li>How, when and through what mechanisms the stakeholder wants to/should be involved</li> </ul>
Capture	<ul style="list-style-type: none"> <li>What the stakeholder can/should contribute</li> <li>What limitations the stakeholder has</li> </ul>
Analyse	
Report	<ul style="list-style-type: none"> <li>How the findings should be reported to the stakeholder</li> <li>What the stakeholder wants/needs to know?</li> <li>How reports should be shared (e.g. printed, workshops, presentations)</li> </ul>
Use	<ul style="list-style-type: none"> <li>How the stakeholder should be engaged to consider use of the information from the evaluation</li> </ul>
Assess	<ul style="list-style-type: none"> <li>How the stakeholder wants to/should be involved</li> <li>What the stakeholder can contribute</li> <li>What limitations the stakeholder has</li> </ul>

## CASE STUDIES OF ARM EVALUATION PLANS



### Case Study 1: A monitoring and evaluation report of the conservation agriculture project (CAP<sub>1</sub>) in Zambia.

The Conservation Agriculture Project 1 (CAP<sub>1</sub>) was a project implemented by the Conservation Farming Unit (CFU) of the Zambian National Farmers Union (ZNFU) from 2006 to 2011. The project focused on the Eastern, Southern and Central regions and had a target to reach 120,000 farm households. Project activities included promotion of different tillage methods like basins (30cm long, 15 wide and 20cm deep) and ripping, promotion of tuber and grain legumes through distribution of plant material and promotion of tree planting of *Faidherbia albida* and *Jatropha curcas*. The project has built up an extension system based on regional coordinators (CFU staff), farm coordinators, contract farmers and associate farmers. Noragric was given the role to monitor the project. Household surveys, field measurements and field visits were undertaken by two PhD students from Zambia, Norwegian M.Sc. students and staff from Noragric.

#### IMPACTS

The project has partly fulfilled the development objective and immediate objectives established at the beginning of the project. There is a slight improvement in food security. Among households experiencing food shortages, the average number of months with food shortage was reduced from 4.4 months in the baseline year (2007) to 3.2 months in 2010. Farmers have increased the income from crops by 32 % during this period. Farmers have furthermore increased their expenditures during the period and invested in improved housing and more livestock during this period. The total welfare of farmers may therefore have been improved.

Conservation agriculture (CA) was practiced on 26% of the cropped land of surveyed farmers in the 2009/2010 season while the rest is under conventional tillage. This shows that there is yet only a partial uptake of CA. For those that had adopted basins, the average area under this method was 0.71 hectares per farm whereas for farmers practicing ripping the average area under ripping was 1.21 hectares per farm. Planting basins were adopted by 58% of the farmers in the 2009/2010 season while 18% practiced ripping this year. Still 58% of the farmers practiced ploughing in the 2009/2010 season. Further upscaling of ripping is dependent on improved availability of rippers. It appears that there is higher adoption among households with low income and few animals. Previous participation in the CA projects had a very positive influence on the uptake of CA in the CAP<sub>1</sub>.

(...)

(...) CAP<sub>1</sub> has stimulated the production of crops like cassava, sweet potato, groundnuts and cowpea. Cassava production increased in the 2006/2008 to 2007/2008 period from 169 to 461 kg per household respectively and total tuber production is now more than one ton per household. Legume production has also increased considerably. There is no clear trend with regard to total maize production per household. The reason is probably that the area under CA is still quite low per household.

The objective to increase soil organic carbon content is not fulfilled. The reason is that the farmers are not able to retain crop residues since cattle are roaming freely in the dry season. Use of mulching is one of the principles of conservation agriculture, but it appears farmers do not adhere to this principle. Only two of the three principles of CA are respected in the project and this explains why there is no effect on soil organic matter. There is therefore a need to establish local institutions that can ensure improved grazing management. The establishment of *Faidherbia albida* on farmers' fields has been much slower than planned. The plan was to establish 200 *Faidherbia albida* trees per farm, but standing stock in 2009 was only 9 trees per farm. Survival of the trees is one of the factors that have slowed down tree establishment.

## OUTPUTS

Surveys and field observations showed that there are considerable differences in yield level and labour demand both within CA systems and between different cultivation methods. The survey results of 129 farmers showed yield levels of 1.8, 5.2, 2.3 and 3.8 tons per ha respectively for hand-hoeing, planting basins, ripping and ploughing.

Field observations showed that total labour use during the whole season was 124, 145, 61 and 83 person-days per hectare for planting basins, hand hoeing, ploughing and ripping respectively. Land preparation of basins took 24 hours per hectare while general use of a hand hoe took 21 hours per hectare. Labour demand of ploughing was 3.8 hours per hectare while ripping only took 0.8 hours per hectare. The tillage system that gave the highest gross margin was planting basins followed by ripping, hoe tillage and ploughing. The reason why basins give a higher gross margin is related to higher yields.

There has been a gradual increase in the use of herbicides. In the 2006/2007 season 1.1% of the farmers used herbicides whereas in the 2009/2010 season 8.2% of the farmers used herbicides. There is an increasing need to use herbicides as the cultivated area increases. The monitoring team observed that outdated herbicides like atrazine and paraquat were used in project areas.

Farmers practicing basin planting, general hoe tillage and ripping, start sowing in general 12 -15 days earlier than farmers who practice ploughing. Basins therefore do not lead to earlier sowing than general hoe agriculture. For many farmers, planting time is also determined by the availability of improved seeds.

(...)

(...) The research component of the project has been weak. Many experiments have been conducted, but there is no publication from the experiments in national or international journals. The coordination between CAP<sub>1</sub> and other projects on CA has been insufficient resulting in inefficient use of resources and in some areas, there has been an overlap between projects working on CA. CA does not seem to be well mainstreamed into the policies of the Ministry of Agriculture yet as the Ministry is not allocating funds to CA.

### OVERALL ASSESSMENT

Despite these difficulties, there is an overall positive effect of the project. CA is gradually expanding, and the agronomic and economic effects of CA are positive. The cropping system is also more diversified, which makes agriculture less vulnerable to shocks like drought and flooding.

Source: Aune et al. (2012)



## Case Study 2 Planning and Evaluation of Technology Transfer for Conservation Agriculture

**Sudan: Supporting Traditional Rainfed Small-scale Producers in Sinnar State, Sudan**

### Part 1: The Plan

1. The main risks to poor crop production are the low and erratic rainfall culminating into severe drought in some years; lack of soil and water conservation practices; the prevalence of traditional agricultural production that utilizes minimum inputs with consequent reduction in soil fertility; and crop losses to pests and diseases, increased infestation of parasitic and noxious weeds, lack of extension services and technological gap and limited capacity of farmers to produce food in an efficient and sustainable manner. In fact, about half of the state land mass i.e. extending from arid and semi-arid to sub-humid climatic zones is susceptible to within season and seasonal severe periodic droughts that are known often to span over 1-3 years. Within season dry spells of 15 to 21 days are more common.
2. Sinnar States fall within the Savanna belt of south-central Sudan with its characteristic long dry season (October to May) and short rainy season (June to September). Rainfall amount varies between 250 mm per year in the northern parts and 700 mm in the southern parts. Owing to the tropical nature of the climate, rainfall amount shows enormous variations in space and time with drought being a normal feature of the climate.
3. The overall goal of the agriculture and technology transfer component is to remove the risks currently faced by the traditional rain-fed small-scale producers so that they can increase their crop and livestock production, gain food self-sufficiency and improve their livelihoods by having additional source of revenues while conserving the resource (...)

(...) base. This would be achieved through implementation of conservation agriculture technological packages in place of current conventional tillage based on wide level disc (WLD) cultivation, for reducing vulnerability to drought, soil mining and climate change in the demonstration and scaling up interventions that integrate crop and animal husbandry and forestry management; and capacity building of extension staff and farmers and agro-pastoralists.

**1.** The WLD plough is the dominant tillage practice throughout the three agro-ecological zones, with often the use of ridging in the northern zone. The WLD is used here as a primary tillage practice whereas it is initially designed to perform secondary tillage operation for soil pulverization. It is mainly used for weed control and its depth of cut is very shallow (3 – 5 cm) and thus not appropriate for water conservation. It is applied into two operations. The first operation, called dry disking is applied after a few showers of rains and when (100 – 150 mm) enough water is received to seal the cracks ; in order to incorporate the left over from previous season crop residues and elimination of newly germinating weeds. The second is called the green disking for seed broadcasting and also control of weeds when applied after 1 – 2 weeks from first operation, depending on the rainfall. Although the WLD operations are speedy and at low cost, tillage efficiency in weed control and soil tilling is extremely poor and has variable plant establishment. In most cases more seeds than the optimum rate was sown to compensate for great loss due to broadcasting practice. Often thinning is performed either mechanically using the WLD after one month from planting or not performed. Seeds that failed to emerge are rarely replanted. However, the recurrent use of this implementation has created a clay pan and hard compacted soil surface hindering water infiltration. Late planting and missing of not less than 30 – 40 % of annual rainfall is normally associated with this pattern of land preparation.

**2.** Soil degradation created by poor cultural practices (repeated use of WLD, deforestation and absence of wind break) and crop husbandry (mono-cropping, absence of rotation, lack of integration of animal and crop production and lack of soil and water conservation) have all led to soil exhaustion and increased infestation with parasitic weeds like *Striga hermonthica* (Buda) and invasive noxious weeds and tough plants including *Xanthium brasiliicum* (ramtok), *Sonchus Cornutus* (moleata), *Sonchus olerocous* (moleata local), *Euphorbia acquptiaca* (um malbini), *Commelina* spp. (Beywod) and *Ocimum basilicum* (Reyhahan).

**3.** More recently, herbicides for control of weeds were introduced in both the traditional and mechanized rain-fed farming areas with the objective of reducing labour cost. However, the use of herbicide has seriously affected the environment by eliminating broad leaved grasses giving way to the prevalence of noxious and non-desirable and non-nutritive grass species to animals grazing and dominance of sorghum-like weeds species such as *Sorghum halpance* (Adar), *Hibiscus* spp. and (Ankoj) in the cultivated plot. In economic terms, it does not eliminate weeding operation completely. Manual weeding is always required. In addition, spraying the chemical herbicide under unpredictable and (...)

(...) unreliable rainfall pattern has been damaging to the mother crop, by burning it. It is worth mentioning that its application requires adequate soil moisture to be effective and to avoid plant burning. Many farmers have noticed the damaging effect of herbicides and are very reluctant to use it. Therefore, instead of solving the problem of weed infestation, the use of herbicide has created environmental hazard and economic loss. The combination of WLD use and weed chemicals have resulted in serious deterioration of the land productive capacity, which impaired crop productivity to the extent that some growers abandoned their exhausted and invaded fields with noxious weeds.

**4.** The farmers will be given the options of a full and partial package of minimum tillage where s/he can utilize seed drill and mechanical weeding using simple inter-row cultivator and/or manual planting and weeding preceding a one pass of minimum tillage operation.

**5.** The technology transfer component would promote the use of simple, community-driven, adapted, and replicable technologies benefiting as large a number of beneficiaries as possible utilizing potential land and rainwater resources. It comprises a series of sub-components to improve agricultural production and generate the highest impact on productivity, focusing on integrated packages of water harvesting and soil conservation, cropping systems management and supportive services of technology transfer and extension. The interventions will involve field crops and home garden crops as well as rangeland and forestry productivity improvement.

## Part 2: The Evaluation Plan

NB: ET: Extension Teams; ARC: Agricultural Research Corporation; MAAW: Ministry of Agriculture and Animal Wealth

Indicator	Objectives	Data needed	Data source	Methods	Frequency of collection	Who is responsible	Analysis & dissemination
1. Increase in production over average production	Assess impact of CA technology on crop yield	Crops yield under demo & traditional practice before intervention	Farmers field	Random field sampling	Seasonally	ET, ARC, Technicians & scientists	ET, ARC, scientists, project, MAAWI
2. Increase in Planted Area	Measure the response of farmers and adoption trend to innovations especially during the scaling up phase.	Increase in planted area from one season to the next	Field survey	Random field selection of farmers	Seasonally	ET, ARC, Technicians & scientists, Farmers	ET, ARC, scientists, project, MAAWI



(...) Indicator	Objectives	Data needed	Data source	Methods	Frequency of collection	Who is responsible	Analysis & dissemination
3. Rainfall	to evaluate the performance of the technologies under different rainfall pattern and their efficiency during drought periods	Daily rainfall data	Network of rain gauge	Monitoring of rainfall using rain gauge	Daily basis during the cropping season	ET, Farmers, Teachers, Elite in the villages	ET, Project, MAAWI
4. Wetting depth of soil moisture	Monitor effect of the technologies on water conservation & offset the damaging effect of inter-season dry spells.	Periodic wetting front depth in cm during wet and dry conditions.	Fields	Measuring wetting front depth using stick and a ruler on demo farms and neighbouring traditional farms.	During wet & dry conditions of the rainy season	ET, ARC Technicians	ET, Technicians
5. Drought alleviation indicator	To assess the effect of the technologies in alleviating the drought consequence and water stress on crop yield	Number of plants reached the physiological maturity (produced heads).	Field sampling	Counting the number of plants bearing heads & % referred to those which are not at heading and harvest time.	Once at crop maturity stage	ET, ARC, Technicians & scientists, Farmers	ET, ARC scientists, Project M&E & MAAWI
6. Crop yield stability	Analysing the best technology that reduces crop failure with rainfall fluctuations.	6 years yield data by the technology of CA	Project record	Actual field data recording from farmers	Every season at harvest time for 6 years	ET, ARC, Technicians & Farmers	ET & ARC, scientists, project M&E & MAAWI
7. Farmers' selection and adoption of technology	Assess response of farmers to technological packages in terms of adoption rates	Number of farmers adopting a particular technology whether participants and non-participants	E T records	Field survey	End of harvest season	ET, farmers, ARC, Technicians	ET, M&E, MAAWI
8. Jubraka contribution to household food needs and income	to assess its economic benefit as a result of new intervention	% of crops output contribution to home consumption & income	E T records	Participating women survey	After crop maturity	ET, women	ET, M&E, MAAWI

(...) Indicator	Objectives	Data needed	Data source	Methods	Frequency of collection	Who is responsible	Analysis & dissemination
9. Efficiency of farm pond supplementary irrigation for jubraka	To ensure adequate water supply to meet the deficit in crop water needs	Records of filling and irrigation times provided by the pond over the rainy season		Field monitoring and recording	Throughout the rainy season	ET, women	ET, MAAWI
10. Operation and maintenance of supplementary irrigation system	To ensure proper supplementary irrigation efficiency, O & M and removal of sediment	No. of women participated in maintenance & status of pond & filter box	Field work	Follow cleaning operation and performance of system	Before and during the rainy season	ET, women	ET
11. Percent of land fully and partially put under improved practices sustainably	To foresee farmers response and capacity to deal with the improved new technology	Areas and no. of farms treated full or partially	E T records	Field monitoring of random samples of participating & non-participating farmers	Throughout the growing season	ET, women, ARC technicians	ET, M & E, ARC scientists
12. Quality extension services provided in support of technology transfer	To measure impact of capacity building program on ET skills and knowledge	E T performance and quality delivering of extension services	Follow records and evaluation	Field assessment and cross check	Prior to season and during field activities	Project M & E, ARC scientists	M & E and MAAWI
13. Strengthening practical skills and capacities of farmers	To ensure upgraded farmers skills and capacities for implementation and management of the technological packages	Number of farmers participated in farmers learning groups (FFS), training and field days, workshops and accessed extension services.	E T records	Surveys and field monitoring	During farmers engagement on activities	Project M & E, ARC scientists	M & E and MAAWI
14. Parasitic weeds	Indirect assessment of soil fertility status	striga population & related crop yield	Farmers' fields	Random counting number of striga population and crop yield sampling	Mid-season to harvest	ET, ARC technicians	ET, ARC scientists, MAAWI

Source: Omer (2010)






## Lesson V

# The Role of Policy in ARM Strategies

This final section focuses on the macro-level. It is important that extension workers be aware of macro-level policies and their role in developing, implementing and monitoring ARM strategies. They are in fact uniquely positioned between the micro- and macro-levels and can play a significant role in developing, reviewing and revising policy.



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**SESSION 1** The role of government: providing context

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**SESSION 2** Relief in the wake of disasters

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**SESSION 3** Projects to overcome technical barriers (Infrastructure)

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**SESSION 4** Addressing enabling systems

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**SESSION 5** Building Capacity within the Food and Agriculture System

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**SESSION 6** Advocacy

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**SESSION 7** Developing and implementing ARM strategy

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Learning objectives

**Evaluation tools**

**ARM strategy evaluation design**

**ARM strategy evaluation application**

## SESSION 1

# The role of government (macro-level): providing context

As indicated various times, for the purposes of this publication, ARM has been viewed from three levels:

**Micro-level:** This level comprises households and individual farmers and business operators in the value chain. Characteristically, these are the people who face the immediacy of risk. The potential impacts of risk directly affect their individual livelihoods

**Meso-level:** This level comprises individuals, institutions and agencies that have interest or a stake in the performance of the food and agriculture system on a wider geographical scale, such as a municipality, district, province or state. The operational premise is that these role-players do not establish policy that would normally be associated with the macro-level. The primary function of the meso-level is to facilitate operations and activities at the micro-level.

**Macro-level:** This level comprises institutions and agencies that operate at the highest geo-political level. Most often this is the national government represented by national-level ministries or nationally operating private institutions, NGOs or representatives of foreign states (e.g. UN agencies). The primary function of this level is establishing overarching policy – including structures and systems and determining the fundamental operational frameworks and levels of subsidiarity.

The role of extension workers: The following learning activities address policy in its broadest context. Thus, this set of learning activities is aimed primarily at informing the extension worker of the purpose and general function of macro-level policy. As will be seen, extension workers will benefit from understanding how these policies might impact decisions made at the micro-level and how they inform extension planning with respect to ARM. To the extent possible, the role extension workers may have to play in developing these policies is highlighted.



## 1.1. Developing and implementing public policy and legislation to improve the wellbeing of households in the food and agricultural system, and the society in general

Governments are charged with fostering the wellbeing of all the individuals and families residing within its jurisdiction. Governments are concerned with education, infrastructure, health, the economy, justice, maintaining order, and cultural and social identity and norms.

Beyond its universal function, general economic policy is also the first, and probably the most important, action a government takes to facilitate appropriate risk management. A good business and economic environment makes it possible for different risk market solutions to be developed. The development of farming businesses and markets for agricultural risk require macro-economic stability and a secure legal framework. Markets for inputs, outputs and credit that function properly, create a good framework that farmers and value chain business operators can use to manage their risk.

Agricultural support policies and programmes also influence risk management, even those that are not specifically intended to address risk. Many of these policies and programmes create additional sources of income that may reduce exposure to risk and improve coping capacity. However, if the level of support is too large, farmers and business operators may be less motivated to implement risk management strategies or to participate in risk related markets.

Government is also responsible for legislation and directives that directly affect farming activities, including legislation addressing food-safety, the environment, labour, and land.

Finally, governments are responsible for preparing and implementing plans for catastrophic risk. Preparations cover ex post action as well as definitions of what constitutes a catastrophic risk and determining what type and size of action is appropriate.

Collectively, the presence or absence, and the strength or weakness, of these government-level measures create the environment in which agricultural risk assessment and management are carried out (Antón, 2008).

For many developing countries, major issues in the overall economy, such as unemployment and poverty – which are often higher in rural areas – demand the attention of government. Frequently, government intervention will be needed to assist individuals, families and even whole communities to transition from declining industries to emerging ones, and to do so while minimising social displacement and dysfunction. A significant part of this, in addition to making economic adjustments, will be to invest in research and development, increasing the flow of, and access to information and, above all, building human capital to meet the future.

These conditions create the theatre of operation for ARM assessment and management. It is important for extension workers – at whatever level they operate – to be at least generally aware of the main government policies that shape the context in which they carry out their extension work, including ARM. They will need to understand how these policies affect the choices farmers can make regarding ARM. They need also to be able to contribute to the development or review of such policies and provide the perspective of the farmers (including the perspective of ARM).



## 1.2. Providing effective regulatory and enabling environment

One of the key roles of the macro-level (i.e. government) is to provide an effective regulatory and enabling environment for all actors and stakeholders in the food and agriculture system. This will, naturally, impact on ARM and on the choices that farmers, business operators and extension and advisory services make in response to identified risks. Thus, it is essential that these stakeholders are aware of and take into account those laws and policies that will influence the ARM decisions<sup>1</sup>.

In practical terms, governments need to:

- improve the access of farmers to essential inputs and services that increase their productivity in an environmentally sustainable manner
- help smallholder producers to raise their socio-economic well-being while facilitating their integration in value chains
- facilitate entrepreneurs and agribusinesses to thrive in an economically, socially and environmentally responsible way

Governments do this by establishing appropriate regulatory systems that ensure the safety and quality of agricultural goods and services without being so costly or unwieldy that they discourage farmers and value chain business operators from entering the market. Governments must proceed with wisdom and moderation because:

- Excessive regulation drives farmers and business operators into the informal economy;
- Excessive regulation tends to increase unemployment; and
- Poorly-designed regulations often lead to high transaction costs that suppress trading volumes, productivity and access to finance.

The food and agriculture system needs an enabling environment to effectively contribute to growth, reduce poverty and inequality, provide food security and deliver environmental services – in addition to securing the livelihoods of micro-level producers and business operators (and their households). That environment is shaped by government policies and regulations. They influence the costs, risks and barriers to competition for operators in the value chains. If done correctly, they increase the competitiveness of farmers, value chain business operators and other entrepreneurs in the system which makes it possible for them to integrate into domestic, regional and global markets.

With regard to ARM, it is essential to have legislation and policy that can lower risk to create a context in which the outcomes of the decisions of farmers and business operators are more predictable. However, in creating policy, governments need to strike the right balance between using regulations to correct problems in the market and minimising the transaction costs that those regulations create, and which are borne primarily by role-players in the value chain.

<sup>1</sup> Much of this narrative is drawn from World Bank (2017)



The World Bank developed a programme called “Enabling the Business of Agriculture” (EBA) to measure legal barriers for businesses operating in agriculture. The programme looked at several areas of legislation. Specifically, it looked at regulations governing seed, livestock, veterinary medical products, animal feed, genetic resource, fertiliser, machinery, finance, markets, transport, water, and ICT. It also looked at two overarching aspects: gender and environmental sustainability which track inclusivity and sustainability. EBA sets criteria for measuring regulations for each of the areas of legislation. Among these indicators are:

- Time, cost and regulation for registration
- Time, cost and requirements for testing and standards
- Quality control in the market
- Protection and licensing of breeder rights
- Requirements for importation and labelling
- Establishment and operation of institutions

The studies done found that there were two types of indicators: legal indicators and efficiency indicators. Legal indicators are directly entrenched in legislation. Efficiency indicators emerge from the time and cost imposed by the regulatory system such as the number of procedures and the time and cost to complete required processes.

This is an example of an effort to determine the extent to which government legislation is fostering or inhibiting environments that are conducive to the effective and efficient functioning of the food and agriculture system which impacts risk assessment and management decisions.

## Regulatory Environment

The regulatory environment can strongly affect the implementation of risk management solutions. For example, using contract marketing as a strategy to manage market price risk will work only if there is a sufficiently rigorous regulatory environment for contract enforcement.

Further, inappropriate regulations can delay the adoption and use of the risk management tools and strategies. Similarly, policies imposing excessive transaction costs on farmers' and other organisations in the value chain may also make ARM tools unaffordable.

The regulatory environment for facilitating the adoption and implementation of risk management solutions amongst smallholder farmers encompasses such issues as access to markets, particularly where markets are weak; access to land where land markets and security of tenure are absent; laws pertaining to contracts, to promote contract farming; intellectual property rights; health and food safety; biosafety and environmental regulations; and the legal arrangements for farmers' organisations.

The regulatory environment also has significant implications for the ways in which agricultural products are produced and reach domestic and foreign markets, for promoting private investment in agricultural research and development, and for fostering innovation and the use of more sustainable agricultural practices by smallholder farmers.

Regulations and policies may also determine which stakeholders benefit most from ARM, by emphasizing large or small farms, commercialization rather than food security, or enterprises dominated by men rather than women. For example, if policies fail to address the challenges that women face in securing land tenure, women may be less interested in investing in more intensified production. It is up to governments to make the right choices based on their development objectives and policy priorities. Two key areas are policies regulating food quality and safety, and policies regulating research and the use of technology.

### Policies regulating food quality and safety

The food and agriculture system impacts the whole of society and, thus is often regulated for food quality and safety. Such regulations tend to influence the price that farmers get in the market. They may also limit the production and post-harvest options available to farmers and business operators. Thus, it is important that farmers and extension workers be aware of these regulations and take them into account when considering ARM solutions. The main regulatory policies include:

- Food quality policy (implementation of both product and processing standards);
- Plant and animal health policy (sanitary and phytosanitary standards);
- Food safety policy; and
- Environmental regulations.

### Policies regulating research and the use of technology

Innovation is a key driver in agricultural risk management. Some of the policies to track are:

- Research policy that impacts choices of genetic material and technology for production and post-harvest processing and handling;
- Advisory Services policy that impacts the availability of information, advice and training needed to make ARM decisions; and
- Technology policy that impact the technology choices farmers and business operators have when considering ARM options.

In each case, farmers, business operators and extension workers need to be as informed as possible about regulations and policies that may affect their options, choices and decisions related to ARM. Additionally, extension workers need to be sufficiently informed of these regulations and policies and their potential impact on the choices farmers and business operators can make when considering ARM strategies. Further, because extension workers have insight into the impact of such policies on farmers and business operators, they can share that insight with policy-makers to help ensure that the policies accommodate the needs of those operating at the micro-level in the agri-food system and help minimise any (unanticipated) negative consequence.



### 1.3. Ensuring benefits of ARM strategy reach especially the vulnerable

#### Worldwide the gap between rich and poor

Two hundred years ago, Adam Smith stated: “No society can surely be flourishing and happy, of which the far greater part of the members are poor and miserable”. One of the great challenges facing all economies is the growing gap between the rich and the poor which has grown to its highest level in 30 years. It is highest in developing countries, despite substantial economic growth in the last 20 years. Given this context, it becomes even more important that ARM strategies are implemented in such a way that they reach the most vulnerable people in the food and agriculture system. It must be one of the key principles of developing ARM strategies. This is also consistent with the concept of ‘pro-poor’ policies which are policies that directly target poor people and are more generally aimed at reducing poverty. Pro-poor policies processes ensure that the poor are directly involved in the policy process, and ensure that they and the projects to which they give rise, lead to pro-poor outcomes – particularly through improving the assets and capabilities of the poor.

The benefits of ensuring participation far outweigh the costs. This is particularly important to extension workers who are responsible for making plans to reach farmers and business operators to inform, train or otherwise assist them with ARM. Resources available to extension workers will very likely be less than the needs of farmers and business operators at the micro-level. Thus, within the limited budgets it will be important for the extension worker to ensure that sufficient support is given to the most vulnerable.

#### Arranging ARM processes so that they reach the most vulnerable

Poor rural households are exposed to the same range of risks as all other households involved in farming and value chain businesses, but they are more vulnerable to their impact and have fewer resources and fewer options to manage risk. Thus, in addition to governments having strategies to improve the livelihoods of poor farmers (e.g. through value chain development and facilitating access to non-farm related income), governments also need to ensure that risk management strategies reach these poor families. To ensure this happens, it is essential to understand clearly the impact of risks on the households and how they deal with the effects. This would facilitate improving public policies aimed at protecting the rural poor – which would include ARM policies and strategies.

The following are some of the strategies that governments and even extension workers can use to target the poor:

- Establish a mechanism and criteria to clearly identify the vulnerable. Within this, there are specific considerations: making sure that women, women-headed households and child-headed households are included; targeted households need to have a clearly defined minimum productive capacity (e.g. skills, land, financial resources, labour) to be able to use whatever support is offered;

- Focus on empowerment, particularly of farmer organisations and other civil society structures development and credit coops;
- Focus on linking farmers to efficient service providers to facilitate their access to improved inputs and services;
- Identify the specific services that would benefit the poor and vulnerable (e.g. credit and extension and advisory services);
- Prioritise rural infrastructure including roads, electricity, water and telecommunications;
- Bundle strategies and shape them to increase productive capacity;
- Ensure that subsidies are structured so that they clearly target intended beneficiaries (i.e. target farmers who do not already apply agricultural inputs and the poorest and most vulnerable households; focus on market-based solutions that utilise and support existing private input suppliers; and ensure there is an exit strategy) and have a planned exit; and
- Adopt strategies for which it is 'easy' to target the most vulnerable (e.g. voucher systems).

In terms of contributing to the development of pro-vulnerable policies, extension workers are in a good position to help macro-level agencies identify vulnerable individuals and populations.



## 1.4. Understanding the impact of constraints in the food and agricultural system on ARM

A key premise of this publication has been that a risk is not a constraint. And yet, there is a practical relationship between the two. Adopting and implementing risk management strategies is possible only if a number of things are in place. The framework for risk assessment and management presented in Module 1 provides a guide to the “things” that need to be in place. It reminds us to ask questions, all of which refer to factors that might constrain the farmer from adopting or implementing a particular risk management tool.

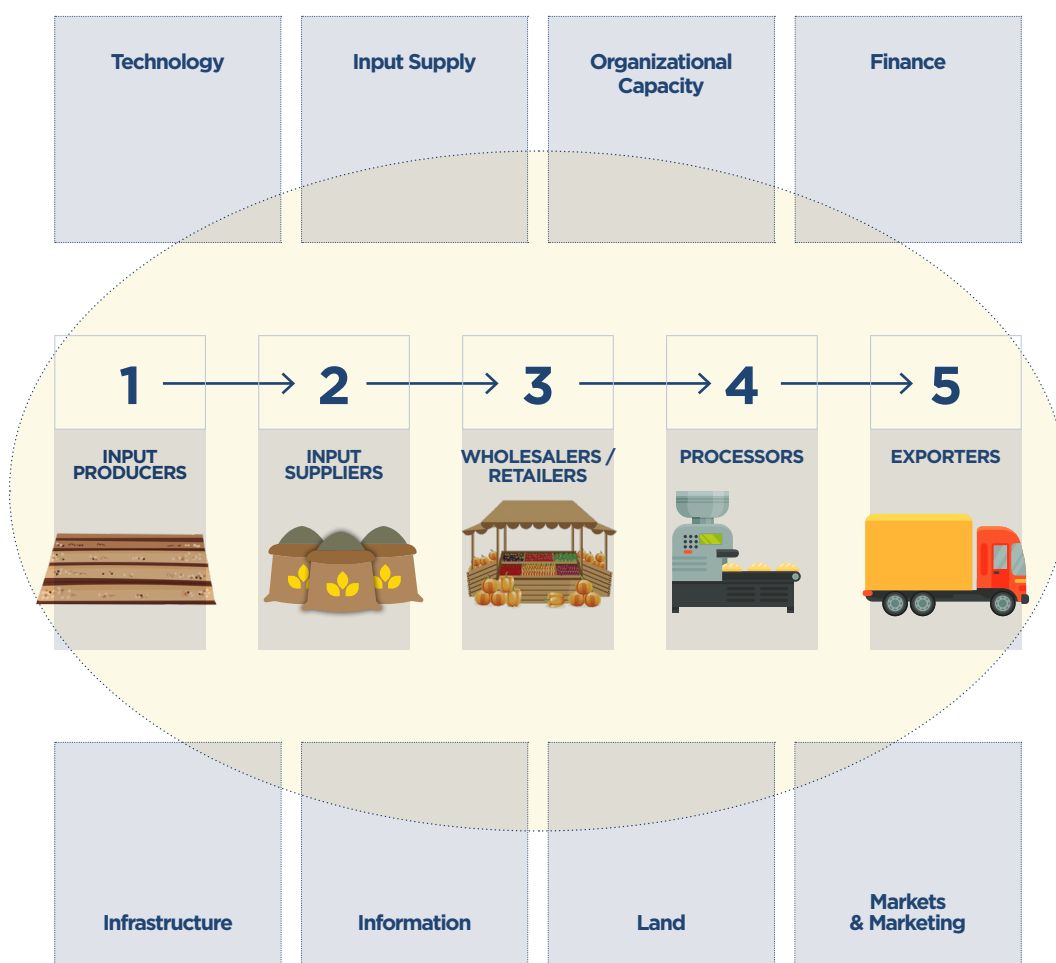
When farmers consider the tools presented in Module 3, their willingness and ability to adopt these are often contingent on their confidence that (a) they have the capacity to make the changes required, and that (b) the value chain and other elements of the food and agriculture system can accommodate the changes proposed by the risk management tool. Take, for example, a farmer deciding to mitigate production risk by diversifying their enterprises. Some basic questions to be asked are:

- Does the farmer have the organisational capacity to work with multiple enterprises and/or with the particular enterprises identified for diversification?
- Does the farmer have access to the finance needed to implement the diversification tool?
- Is there a market for the new enterprises? Does the farmer have access to that market? Does the farmer have the capacity to engage with that market?

- Are the inputs (e.g. seed, fertiliser, chemicals, etc.) available and accessible in the quantities needed?
- Is the on-farm infrastructure (e.g. fencing, storage, irrigation) and off-farm infrastructure (e.g. roads, telecommunications) adequate to support diversification?
- Does the farmer have or have access to the technology needed to diversify, and the capacity to use it?
- Is the land sufficient and suitable for the new enterprises?
- Does the farmer have or have access to the information needed to diversify, and the capacity to manage it?

These all refer to possible constraints that impact the capacity of the farmer to adopt and implement, in this example, enterprise diversification.

Constraints might also exist at the meso- and national level. Figure 4 in Module 1 also helps identify such constraints and raises fundamental questions that influence the capacity of the farmer to adopt the enterprise diversification tool.



- Are the inputs required for diversification produced in sufficient quantities? And are they suitable for the system in which the farmer operates?
- Are input suppliers willing and able to supply the inputs required for diversification?
- Are the downstream actors in the value chain willing and able to provide the services required to accommodate diversification (e.g. are there adequate facilities for storage, transport, handling, processing, etc.?)

It is in this space where government finds one of its key roles in agricultural risk management: strengthening and increasing the capacity of the value chain, thereby making it more possible for farmers and business operators to choose risk management strategies. As noted in the previous section, there are a number of government actions that serve the specific purpose of agricultural risk management, but which may also be part of the government's plan for the development of the agricultural sector. The following actions may serve both purposes:

- Stable macroeconomic policies and business environment
- Risk management training and information to farmers
- Facilitating the production and sharing of information on risks
- Facilitate access to credit
- Output market interventions / Regulations (price stabilisation)
- Border measures (e.g. tariffs)
- Disaster prevention (e.g. flood control)
- Prevention of animal diseases (domestic and border measures)
- Research and Development of new varieties or breeds
- Agricultural support programmes

While many of these actions may be beyond the scope of an individual extension worker or meso-level agency, it is important that they understand these actions and their relation to the constraints farmers and business operators face when making decisions about ARM. Further, the better informed they are about these actions, the better able extension workers will be to contribute to the processes that develop actions such as these into legislation and policy. Finally, extension workers will often have valuable, detailed information about the various elements such as the availability of inputs, the condition of infrastructure, the availability, accuracy and reliability of information, and challenges faced by farmers with post-harvest activities. Their knowledge can help ensure that policies are informed by experience on the front-line.

## SESSION 2

# Relief in the wake of disasters

A critical responsibility of the macro-level government is to provide relief in the wake of disasters. This issue has been mentioned in previous learning tasks. In this learning task, we will look more closely at this important role of government in agricultural risk assessment and management<sup>2</sup>.

Government coverage to protect vulnerable farmers and value chain business operators (especially vulnerable ones) against catastrophic weather risks should be considered a priority. The need for this is created by the fact that a large percentage of small farmers are unlikely to have the capacity to pay for protective systems (e.g. flood control) or commercial insurance.

Extension workers are unlikely to be the principal role-players in the development of disaster risk management strategies. However, they are very likely to be key role-players in implementing the strategies should a disaster strike that directly affects the communities in which the farmers and business operators live, and with whom he or she works. Thus, it is important for extension workers to know what disaster risk management strategies are in place and how they are meant to operate.

To this end, it is useful to know that coverage policy and plans need to have clear protocols. Being aware of the specifics of the policy and plans in his or her area will enable the extension worker to carry out any responsibilities that may be assigned in this connection. Specifically, disaster risk management strategies need to ensure four things:

1. Identify clear rules for triggering public sector assistance and possibly linking this support to measurable indicators;
2. Identify the most effective and efficient delivery mechanisms for reaching farmers and business operators after a catastrophic event;
3. Ensure that the tools and data infrastructure for an *ex ante* and *ex post* targeting of public support are appropriate, accessible and affordable, and provide data in formats that can be easily used; and
4. Ensure all sources of financing (i.e. contingent credit lines, reinsurance, etc.) are sustainable.

Further, extension workers are also likely to be aware of who is most vulnerable to natural disasters. For example, they know which farmers are most likely to be affected by floods. They also know which farmers are most vulnerable in terms of resilience. Such information can help decision-makers when considering who should benefit and the kind of help to be offered.

<sup>2</sup> This section was adapted from van Zyl (2006)

## SESSION 3

# Projects to overcome technical barriers (Infrastructure)



### 3.1. Having the right infrastructure in place

Agricultural supply chains (particularly small-scale producers and value chain business operators) and, more generally, the whole of the food and agriculture system increasingly face risks related to logistics and infrastructure that affect the availability and timing of goods and services, energy, and information. The impact of these failures and blockages in logistics ripple throughout the agricultural supply chain from pre-production to final consumer. They impact on product quality, traceability, and ultimately, profitability.

Farmers and business operators need access to reliable and affordable transport, communications, energy, and information technology. Access or lack thereof affects decisions about choice of enterprises, production programmes, productivity, and of input and output markets. For example, power outages for processors affect quality and poor road conditions may lead to damaged produce and livestock. Similarly, the demand for inputs and other support services, the ability to repay loans, and buyers and processors upstream in the supply chain are all directly and indirectly affected by the quality, condition and efficiency of infrastructural systems and services.

Often the greatest sources of risk for farmers and intermediary traders are poor and perhaps seasonally impassable roads, intermittent trucking services, harbour delays, faulty truck-loading practices and 'red tape'. Farmers and business operators also face risks caused by weak communications infrastructure and resulting delays in time-sensitive market information. This weakens their production and marketing decisions and bargaining power. The condition of market centres, collection stations, or other transaction points typically also pose potential logistical and infrastructural risks.

It is then essential that governments assess infrastructure conditions. Extension workers will want to be a part of this as well so that they are confident about the practical feasibility of the various ARM options being considered.

The assessment should include the conditions of transport, communications, energy, water, and sanitation infrastructure, in addition to their availability, all of which influence the level of risk exposure. It is equally essential that the government invests in developing infrastructure to reduce or mitigate potential risks. In particular, investments should be made in transport infrastructure and systems (including air- and seaports where relevant), in communication infrastructure, energy infrastructure, knowledge and information collection, storage and dissemination systems, product storage and handling facilities, marketplaces, processing facilities, and weather stations.



Because infrastructure is subject to degradation, and physical damage and destruction, from weather, conflicts, labour disputes and other influences, it is also essential that the investment programmes include long-term maintenance programmes. Table 12 sets out potential government investments in infrastructure to reduce risk in the value chain – specifically risk reduction or mitigation and risk coping.

**Table 12:** Government investments in infrastructure to reduce risk in the value chain

Value Chain Specific Production, Marketing, Processing		External to the value chain		
Production	Marketing, Processing	Support Service Providers	National	International
Risk Reduction or Mitigation				
<ul style="list-style-type: none"> <li>• Farm machinery and equipment</li> <li>• Irrigation and drainage systems</li> <li>• Water and sanitation</li> <li>• Storage and handling facilities</li> <li>• Maintenance of physical assets</li> <li>• Small transport, communication, and energy infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Machinery and equipment</li> <li>• Water and sanitation</li> <li>• Storage and handling facilities</li> <li>• Maintenance of physical assets</li> <li>• Enterprise-level transport, communication, and energy infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Storage and handling facilities and services</li> <li>• Medium-scale transport, communication, energy infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Weather stations</li> <li>• Early warning systems</li> <li>• Large-scale transport, communication, energy infrastructure</li> <li>• Back-up systems for critical infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Early warning systems</li> <li>• Global communications</li> <li>• Multi-country water resource infrastructure</li> </ul>
Risk Coping				
<ul style="list-style-type: none"> <li>• Repair and/or replace infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Repair and/or replace infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Repair and replace services</li> </ul>	<ul style="list-style-type: none"> <li>• Fund repair and replacement of infrastructure Investments in new transport and communication infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Fund repair and replacement of infrastructure</li> </ul>

Source: Adapted from World Bank (2010)

In terms of contributing to investment decisions, extension workers can share technical information about the state of infrastructure in their respective areas. In this way they can help ensure investments are made in areas of greatest need to farmers and business operators. They can also share insight into the status of infrastructure at the meso-level and how that affects agricultural risk and ARM processes.



## 3.2. Technology innovation, research and development

It is also the responsibility of governments to invest in and give direction to innovation, research and development of technology. This is critical because technology has the potential to increase productivity, lower costs and reduce production risks; but without direction may lead to new concerns and risks. For example, adopting a technology (e.g. seed) that has a higher yield potential, but a greater yield variance and potential losses in poor years, may increase average profit but also increase risk. It is for this reason that government, in partnership with farmers and the private sector, should invest in and guide the development of agricultural production, processing and related technologies.

Technology is useful if it is affordable and is appropriate to scale and conditions. There are even technologies specifically designed to help manage risk, e.g. water harvesting technologies. Unfortunately, there is a plethora of failed technology-based projects and technologies, accumulated over decades that did not take affordability and appropriateness into account. Technologies need to become increasingly and more widely available and accessible to small- and medium-producers and processors in low-cost forms. From the rediscovery and reapplication of integrated indigenous systems to new scientific breakthroughs we already have many useful tools and technological resources that need to be made more available to small and medium farmers. These include, for example:

- Improved breeding for new traits;
- Climate-resilient agricultural systems, such as precision farming and remote field sensing that more efficiently utilise irrigation and inputs, sequester carbon and reduce GHG emissions;
- Improvement of minor or neglected crops;
- Producing grains perennially; and
- Mobile phone-based systems and other information technologies for price information, plant analysis, and digital transactions.

Technology can facilitate the adaptability that will be increasingly required as climate change and other forces drive the future. Technology should not, however, be based solely on complex machines and high-tech science. Technologies, production systems and resource management systems borne of local knowledge and science must also be included as they often offer the most appropriate and affordable way to address farming and value chain processing issues. Many local-level and worthwhile innovations are pro-poor and can be incorporated by farmers and processors into risk management strategies, making them more sustainable. One example is locally developed water storage systems to store water for trees or crops in arid areas. Another is using companion planting such as leguminous trees and ground-cover intercropped with a variety of crops. Often such locally developed technologies gain no traction and are overlooked. However, government investment in documenting, assessing and evaluating these innovations, could lead to considerable learning and low-cost sharing, and help expand risk management options.

Another important area of technology development is information and communications technologies. ICTs can help take innovations to farmers and business operators and provide them with a range of information that can be used in value chain processes as well as in risk assessment and management. Because of the considerable contribution ITCs can make to agriculture and agricultural risk management, it is a worthy area for governments to invest in to create more local human and infrastructural capacity, especially among the more remote and most vulnerable, to access and use information systems. ICT can help farmers and business operators access and integrate with global monitoring and information systems that will extend the reach of the farmers, producers and other stakeholders and role-players in the food and agriculture system.

Some assume that there is a necessary trade-off between productivity (generated by hi-tech solutions) and protecting the environment and natural resources. However, this is a false dichotomy, which can be overcome by investing in research leading to complementary technologies that can achieve the dual purpose of improving productivity, and ensuring the improvement of the management of natural resources in the same system. Part of the investment will have to be in changing the way technologies are developed and deployed – moving from the outdated linear model of research and innovation, toward models that create genuine learning partnerships that engage farmers, private firms, and civil society organisations alongside researchers and policy-makers in scientific enquiry (World Bank, 2010; Dlamini & Worth, 2016).

**Table 13:** Government investments in technology to reduce risk in the value chain

Value Chain Specific Production, Marketing, Processing		External to value chain		
Production	Marketing, Processing	Support Service Providers	National	International
<b>Risk Reduction or Mitigation</b>				
<ul style="list-style-type: none"> <li>• New technology (improved varieties and breeds)</li> <li>• Other improved inputs</li> </ul>	<ul style="list-style-type: none"> <li>• New logistics or processing technology</li> <li>• Information services to producers</li> <li>• Extension services</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and promote new technology</li> <li>• Information services</li> <li>• Extension services</li> </ul>	<ul style="list-style-type: none"> <li>• Investments in research and development</li> <li>• Extension services</li> <li>• Education system</li> </ul>	<ul style="list-style-type: none"> <li>• Investments in research and development (e.g., CGIAR)</li> <li>• Global centres of excellence for research and education</li> </ul>
<b>Risk Coping</b>				
<ul style="list-style-type: none"> <li>• Alter technology for future application</li> </ul>	<ul style="list-style-type: none"> <li>• Adopt and promote new technology for the future</li> </ul>	<ul style="list-style-type: none"> <li>• Promote and adopt new technology for the future</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and promote and adopt new technology for the future</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and promote and adopt new technology for the future</li> </ul>

Source: Adapted from World Bank (2010)

Technology development is a point of serious debate and discussion in agricultural extension. The main issue is about making sure that farmers and business operators are able to participate in the actual development of technologies. Sometimes they can be conduits between farmers and business operators, at other times they may be advocates for farmers and business operators, and at still other times, they may need to facilitate dialogue and interaction between the micro- and macro-level to ensure that investments reflect requirements, realities and opportunities on the ground.

## SESSION 4

# Addressing enabling systems

There are hundreds of systems that contribute to the environment in which farmers and value chain business operators function. Some are created and directly managed by the public sector. Others are created and directed by the private sector. All of them are, at least in theory, subject to overarching public legislation which sets the rules of their operations.

A primary role of government is to ensure that the many systems that govern human and economic life in a country function properly and deliver what they are intended to deliver – including those that govern the operation of the food agricultural system. All systems are designed on a premise of some kind, with a specific purpose within that framework. If the premise changes, then the system may no longer fulfil its purpose. Further, as is suggested by the diagram and the range of regulatory and operational systems, most systems are complex collections of various sub-systems. If one of the sub-systems change, even an apparently insignificant one, the system may also fail to fulfil its purpose. Also, it is too often the case, that two systems designed separately interfere with each other, preventing either or both from functioning as intended.

Thus, one of the responsibilities of governments that affects ARM, is to continuously review the systems that were established to create the working environment for farmers, value chain business operators and other actors in agriculture and related fields. The review should aim to ensure that the systems continue to create an enabling environment as intended. Extension workers need to be sufficiently informed about these systems and how they relate to ARM, so that they are able to contribute to their review and further development. To this end, extension workers have knowledge of the practical operation of systems, particularly from the perspective of farmers and business operators. Such insight can help decision-makers stay in touch with the realities experienced at the micro-level and avoid developing and implementing decisions that work on paper, but not in practice.



## 4.1. Markets

Module 3 presents four risk management tools that are related to markets: Agricultural Diversification; Contract Farming; Spreading sale; Hedging; Forward pricing; and Warehouse Receipts System.

Farmers will not adopt or participate in any of these tools unless they have confidence in the market required to make it possible. For example, the lesson on Agricultural Diversification

highlighted the fact that farmers are more likely to diversify production if they have access to markets. And since diversification is such an attainable risk management tool, this alone justifies governments working to expand markets for agricultural products, and to facilitate access to those markets, particularly by smallholder farmers.

Creating or improving access to markets has a number of practical dimensions. Many smallholders do not have physical or economic access to more profitable markets for their crops. Distance, poor roads, and limited transport options cause physical isolation. Often, smallholder producers have small quantities of crop or livestock to sell, they need immediate cash payment, they have little or no capacity to store crops safely, and have limited access to or knowledge of prices and quality requirements beyond the farm gate. These constraints inhibit their capacity to assess risk and consider risk management options. And as a result, most smallholders sell their products on the roadside or somewhere near their farms (IFC, 2013).

Four key constraints limit farmer access to markets: poor road connections; ineffective market information systems; inadequate supply chain mechanisms to ensure product quality; and high transaction costs – all of which emphasise the need for close linkages among farmers, processors, traders, and retailers to coordinate supply and demand. However, efficient, coordinated markets require good governance and effective public policy. The food and agriculture system needs infrastructure, institutions, and services that provide market information, establish grades and standards, manage risks, and enforce contracts. Parallel to this, however, is often the need to help farmers build their bargaining power through producer organisations (BIRTHAL & JOSHI, 2007; WORLD BANK, 2007).

Table 14 outlines some of the actions that can be taken by government in terms of public investments and public policy to strengthen farmers' links to the market. To add perspective, the table also shows actions the private sector can take.

**Table 14:** Public and private options for strengthening farmer links to the market

Public Sector			
Issue	Public Investments	Policy Environment	Private Sector
Lack of access to markets	Invest in education, rural infrastructure (roads, markets, electricity, irrigation); support formation of producer organizations	Liberalize domestic trade; foster development of input and credit markets	Assist farmers in forming producer organizations
Weak technical capacity	Support market-oriented extension	Foster environment for private extension to emerge	Provide extension and key inputs to farmers
Lack of market information	Invest in price and other market information systems		Provide accurate, timely information on accessible platforms
Meeting quality standards	Support farmer training on good agricultural practices for quality enhancement and food safety	Establish grades and standards	Supply inputs and train farmers on quality management and food safety
Meeting contract conditions	Train firms in contract design and management; train farmers on their rights and obligations	Foster institutions for dispute resolution; strengthen producer organizations	Foster trust; develop contracts that are self-enforcing
			(...)

(...) Farmer exposure to risk	Foster development of commodity and future exchanges; train firms on use of market instruments to hedge risk	Create enabling environment for insurance market	Use contracts that share risk equally among parties; assist farmers to access insurance
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Source: Adapted from World Bank (2007)

Creation of and improving access to local and regional markets can transform the risk profile of farmers and consumers.



## Flooding India with milk: Transforming India's Dairy Industry

### What Happened

India's dairy industry is largely traditional, local, and informal. Milk production is dominated by smallholder farmers, including landless agricultural workers, who rely primarily on family labour to collect and deliver milk to consumers and markets. Eighty percent of milk comes from farms of only two to five cows. These many small farms traditionally lacked access to markets. No system existed for procuring milk produced in rural areas, and the perishable nature of milk made it difficult and expensive to transport.

In response to the limitations of this system, milk producers of the Anand district in the state of Gujarat organized themselves into a private cooperative called Kaira District Cooperative Milk Producers' Union Ltd. in 1946. Government intervention (Operation Flood) stretching from 1970 - 1996, expanded the concept into a sophisticated procurement system using rural production to satisfy urban demand.

Operation Flood was designed to increase milk production, ensure that a stable supply reached rural and urban consumers, and raise the incomes of dairy farmers; replacing ad hoc production, marketing, and selling of milk with an organized, continuous dairy-supply chain from production to consumption. The intervention was organized in three tiers. At the base, farmer-controlled, village-level cooperatives were responsible for supplying milk to the production and marketing chain, making local dairy sales, and testing samples of dairy products. The middle tier was constituted of district-level cooperative unions, which owned and operated processing plants, transported equipment for collecting and processing milk, and managed cattle feed plants. They also provided animal healthcare through livestock centres. At the apex were state federations, which conducted marketing and coordinated interstate sales.

This network of structures became known as the national milk grid. It was expanded in three phases. It targeted nearly 7 million farm families and 170 milk sheds, and improved veterinary healthcare. Between the periods of 1988-89 and 1995-96, milk production increased from 42 million litres a day to 67 million litres a day, milk procurement increased from 28 million litres a day to 35 million litres a day.

(...)

**(...) How it Happened**

Operation Flood linked rural dairy producers to urban consumers through dairy cooperatives, trucking networks, chilling plants, refrigerated vans, railway wagons, and processing plants. Linking production to consumption created the incentives needed to encourage dairy producers and others involved in the supply chain. Gradually their confidence rose in dairying as a stable source of employment and income.

Operation Flood aided this process by introducing numerous technological and infrastructural advances in dairying, including crossing exotic breeds of cows, with indigenous breeds to improve production, and introducing silos, pasteurizers, storage tanks, and refrigerators that conformed to international standards, increasing the nation's capacity to convert milk, a highly perishable commodity, into a commodity that could be stored and traded nationwide, and new technologies to improve the weighing and testing of milk and to improve the capacity to sell it in bulk.

**The Impact**

Households in villages with cooperatives had higher average incomes from all income sources, higher average incomes from milk, and higher average levels of employment. The creation of a national milk grid and the establishment of village cooperatives and district unions throughout India generated many jobs; as of the early 21st century, 11 million households were employed by dairy cooperatives. The households benefited from cooperatives they owned, as well as from cooperatives that sold them feed, provided veterinary care, and purchased their milk.

More than a decade after the conclusion of Operation Flood, the dairy cooperative network continues to grow, and production and marketing continue to increase. The number of individual cooperative participants remains high (at 13 million in 2008, including 3.7 million women), and cooperatives still produce high volumes of milk. And although these numbers represent only a small proportion of India's dairy market from any angle, they still convey the scale of Operation Flood's success in revolutionizing the dairy industry in India.

Consumers now have increased access to more and better-quality milk products. Since the 1970s, the total output of milk and milk products has continuously risen faster than crop production. The program effectively engaged the rural poor: in 1984, 72 percent of cooperative members were small and marginal farmers (or those who operated fewer than 5 hectares of land) and the majority of these were also from minority castes and tribes. Landless farmers' incomes doubled after the organization of milk collection through cooperatives. Later studies showed that among landless households, milk production made a considerable contribution to income generation and confirmed the potential for poor households to increase their income through milk production.

(...)

**(...) Lessons learned**

- Focus on the market

Operation Flood focused not only on boosting milk production, but also on developing a strong marketing system for milk. Operation Flood continuously analysed the rising demand for livestock products and designed an integrated and comprehensive program to meet this demand, complete with supply-chain management systems and centralized quality control.

- Support collective action

Operation Flood demonstrated how collective action can be an effective tool in promoting commercialization among farmers. By bringing dairy producers together in cooperatives, the program provided markets with quantities of milk that would have been too costly to assemble from producers on an individual basis. The cooperatives also played a role in strengthening social cohesion, overcoming rural caste and class hierarchies, and fostering a sense of ownership in the development process.

- Envision creative structures

Operation Flood revolutionized how dairy was conceived and organized. Concentrating on a single primary product, it created a vertically integrated value chain encompassing every aspect from primary producer to final consumer. Horizontal integration—bringing inputs, extension, and services all within the same program—also helped ensure that the benefits of economies of scale were available to each producer. The cooperative infrastructure made it easy for producers to use new products and processes.

Source: Spielman & Pandy-Lorch (eds) (2009)

While the primary responsibility for agricultural risk assessment and management rests with the actors directly involved in the food and agricultural sector (e.g. farmers, value chain business operators, commodity organisations, etc.), in most countries, especially developing countries, these actors cannot always address these individually or even as collective bodies. Government intervention and support is needed. The intervention needs to be based on a holistic approach (as opposed to a linear approach) to ensure policy choices are efficient and coherent and based on an understanding of risk as a situation in which there is interaction between many elements that can be organised around three axes: the sources of risk, farmers' strategies and government policies (OECD, 2009:5).

Generally speaking, agriculture is characterised by two sources of uncertainty: yield uncertainty generated by climatic or other hazards such as pests and diseases; and price uncertainty generated by the occurrence market shocks (FAO, 2006: 43). These risks can be divided into three different groups:

- Risks that are frequent but do not imply large losses;
- Intermediate risks; and
- Catastrophic risks that are infrequent but generate a large amount of damage to farm income



Risks in the first category are typically managed on the farm (risk mitigation); risk in the second category are usually managed through insurance or market solutions (risk transfer); and risk in the third category generally requires government to be directly involved (risk coping). **There is a role for government in each of these three**, and is thus something extension workers need to understand.

The OECD (2009) analysed the role of government in agricultural risk management. That study divided the role into decisions made before an event happens (based on forecasts) and decisions made after an event happens (based on actual results). The decisions were further divided into those aimed at creating markets for risk management, modifying (risk management) market incentives, risk reduction and mitigation, and coping with risk. The range of decisions is shown in Table 15. These illustrate the range of actions that governments have taken with respect to agricultural risk management.

**Table 15:** Potential roles of government in risk management in agriculture

	Market creation	Modifying market incentives	Risk reduction and mitigation	Coping with risk
<i>Before event</i>	<ul style="list-style-type: none"> <li>Stable macroeconomic policies and business environment</li> </ul>	<ul style="list-style-type: none"> <li>Subsidies to insurance</li> </ul>	<ul style="list-style-type: none"> <li>Disaster prevention (flood control...)</li> </ul>	<ul style="list-style-type: none"> <li>Agricultural support programs</li> </ul>
(based on forecasts)	<ul style="list-style-type: none"> <li>Risk management training and information to farmers</li> </ul>	<ul style="list-style-type: none"> <li>Subsidies to reinsurance</li> </ul>	<ul style="list-style-type: none"> <li>Prevention of animal diseases (domestic and border measures)</li> </ul>	
	<ul style="list-style-type: none"> <li>Facilitating the production and sharing of information on risks</li> </ul>	<ul style="list-style-type: none"> <li>Subsidies on futures contracts</li> </ul>	<ul style="list-style-type: none"> <li>Legal form of farms</li> </ul>	
	<ul style="list-style-type: none"> <li>Increase competition in the insurance market</li> </ul>	<ul style="list-style-type: none"> <li>Participation in mutual funds</li> </ul>	<ul style="list-style-type: none"> <li>Research and Development of new varieties or breeds</li> </ul>	
	<ul style="list-style-type: none"> <li>Law and institutions for futures and options markets</li> </ul>	<ul style="list-style-type: none"> <li>Incentives on saving accounts</li> </ul>	<ul style="list-style-type: none"> <li>Agricultural support programs</li> </ul>	
	<ul style="list-style-type: none"> <li>Defining the limits of government and farmers' responsibility in risk management</li> </ul>	<ul style="list-style-type: none"> <li>Facilitate access to credit</li> </ul>		
	<ul style="list-style-type: none"> <li>Private / public partnerships</li> </ul>	<ul style="list-style-type: none"> <li>Output Market interventions / Regulations (price stabilization)</li> <li>Border measures (tariffs...)</li> </ul>		
<i>After event</i>			<ul style="list-style-type: none"> <li>Countercyclical programs</li> </ul>	<ul style="list-style-type: none"> <li>Social assistance programs</li> </ul>

(...)

(...) based on actual results rather than forecasts	• Tax system for income smoothing	• Disaster relief (payments, subsidised credit...)
triggered after the event	• Border and other measures in case of contagious disease outbreak	• Other Ad hoc ex post payments
decided after the event	• Ad-hoc payments for quick economic recovery	



## 4.2. Subsidies

Subsidies are often used by governments to achieve equity in the market and/or to address issues of redistribution (as an element of poverty alleviation and 'caring' for the vulnerable elements of the society and economy). Most often subsidies are applied to input prices, market prices, interest on credit and insurance.

The use of subsidies is subject to debate. While it is argued that agricultural subsidies can help drive prices down to benefit consumers, it is also argued that farmers in countries (usually developing countries) are disadvantaged and would have a harder time competing on the world market. This impact expands when the subsidies are for crops that are grown in those same developing countries – farmers there would have to compete with farmers from countries using subsidies. IFPRI, for example, argues that subsidies have cost developing countries massive losses in agricultural and agro-industrial income (IFPRI, 2003).

### Pros and cons of subsidies

The principal benefits of subsidies are:

- 1. Stabilising food supply:** In countries where food production is lower than demand, subsidies can encourage greater production. Such subsidies usually target specific commodities, to make production more attractive (i.e. financially viable). This will encourage farmers to produce the commodity that qualifies for the subsidy and, in this way, can help stabilise the supply of food.
- 2. Reduced agricultural imports:** This benefit is similar to stabilising the food supply. Countries where food production is less than demand have to import food products. Subsidies lead to greater production of the imported food, which reduces the need to import the commodity.
- 3. Stabilised agricultural infrastructure (including land):** Financial aid to farmers may help farmers finance the purchase of farming equipment and technology, as well as improvements to infrastructure (e.g. transport to the market). Where land is privately owned, the subsidies ultimately reflect in the value of the land.

- 4. Provide steady income to farmers:** Subsidies ‘guarantee’ farmers a steady income by smoothing income in times of losses due to unfavourable weather events or problems in the market.

Some of the principal disadvantages of subsidies are:

- 1. Government Intervention in the market place:** Agricultural producers often argue that agricultural subsidies paid to farmers in industrialised countries unfairly skew world markets. They also argue that subsidies disadvantage local producers, and push up the price of land, and increase unemployment and poverty among farmers in developing countries in Africa, Asia and Latin America.
- 2. Disadvantages farmers in countries without subsidies:** Farmers in countries without subsidies will have to compete with farmers from countries using subsidies who can land food in the non-subsidy country at below normal market prices – prices at which the local farmer cannot make a profit.
- 3. Lack of product diversity:** Subsidies are usually aimed at specific commodities. Farmers who need subsidies, or who are attracted by the ‘smoother’ income, may be drawn into producing only those commodities that are subsidized. This can reduce the diversity of agricultural products in the market. Additionally, less diversity may lead to importation of non-subsidised, but desired commodities, which effectively defeats the intention of reducing agricultural imports.
- 4. Discrimination of other farmers/business operators:** Because agricultural subsidies target specific commodities, those farmers that specialise in commodities that are not eligible for subsidy, are excluded from the financial benefits. This leaves them exposed to risk, and could lead them to leave their specialisation.
- 5. Harm to the environment:** Alternating crops and diversification are well-practiced methods of sustainable farming. A documented disadvantage of subsidies is that it encourages mono-cropping. The continuous planting of the same crop for prolonged periods could eventually damage the soil.
- 6. Distortion of production decisions:** Subsidies related to specific commodities may lead farmers to decide to produce commodities they might not otherwise choose to produce or to start using marginal land. If the change in commodities requires substantial changes to their production methods, it may be difficult to revert to the original production programme. Similarly, subsidies related to specific inputs (e.g. GMOs, pesticides, etc.), may lead farmers to adopt inputs that may be difficult to discontinue using at a later time.
- 7. Avoidance of non-subsidised ARM tools:** Being attracted by subsidies that (at least in the short-term) reduce the cost of doing business may lead farmers and business operators to avoid non-subsidised ARM alternatives which may make better long-term business sense.

In the short term, consumers in importing countries benefit from lower food prices. In the long-term, this system undermines competitiveness of food production in both exporting and importing countries. Three of key causes of undermining are as follows:

- the subsidy can trigger over-production of the subsidised product, which can lead to distortions in the market and adversely impact natural resources through pollution or resource depletion;
- overproduction in developed countries has to be disposed of, and this may result in “dumping” the excess production developing countries, undermining their economies; and
- governments have to find the money to pay for subsidies (e.g. taxation or borrowing) which can lead to macroeconomic problems; or subsidies may be financed by diverting money from other programmes or services such as health and education (Pearce and von Finckenstein, 1999).

Of course, not all of the pros and cons will apply specifically at the farmer level – in fact most are macro-level considerations. However, it is essential that extension workers have a clear understanding of both sides of the story, so they can help farmers and business operators decide on participating in subsidy schemes that may be available. In particular, extension workers will want to help farmers think through “cons” 6 and 7 above.

In terms of developing subsidy programmes, if subsidies are to be used, the concept of ‘smart’ subsidies offers guidance to get around the shortcomings often associated with subsidies (Baltzer and Hansen, 2011/12:2-3):

- **Targeting specific farmers:** target farmers who do not already apply agricultural inputs and the poorest and most vulnerable households, which reduces the risk of displacing commercial (non-subsidised) input sales and promotes pro-poor growth.
- **Market-based solutions:** utilise and support development of existing private input supply networks which avoids supplanting private input suppliers with state-controlled distribution systems, which, in turn, enhances the efficiency of input delivery and increases the likelihood that the programme has a sustained impact after its termination.
- **Exit strategy:** devise credible exit strategies that put a time limit on the support which reduces the risk that the programme becomes ‘hijacked’ by political interests and facilitates long-term sustainability where beneficiaries are clearly informed that the support will not continue indefinitely and that they will need to return to self-sustained use of inputs.

If governments need to use subsidies to support farmers and/or to alleviate poverty, the subsidies need to be coordinated with public investments in agricultural research aimed at improving the productivity of smallholders (and reducing the price of their products). They need also be accompanied by investments and public services such as infrastructure (e.g. irrigation and roads), extension, education and health that specifically target marginal and remote areas where there is usually a higher percentage of lowest-income farmers (FAO, 2012).

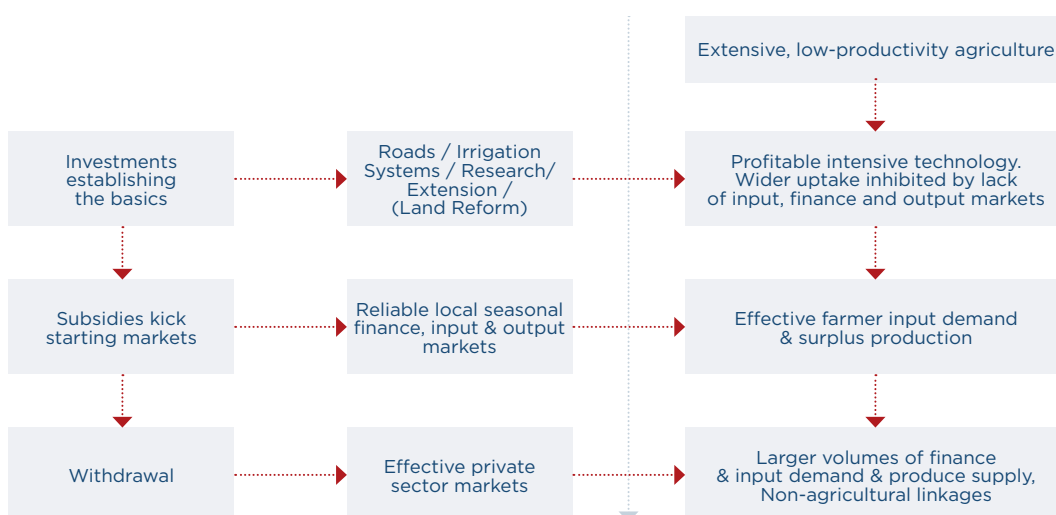
The point here is that, as discussed earlier, agricultural risk is exacerbated by constraints in the value chain, in the whole of the food and agriculture system, and in the wider socio-economic system. Thus, government’s role in agricultural risk management must be holistic, taking into account not only the risks themselves, but also the strengths and weaknesses of those facing

the risks, as well as the constraints along a wide front that increase the farmers’ and business operators’ vulnerability to risk by limiting their capacity to choose and implement ARM strategies.

Figure 1 gives a perspective on the role subsidies can play in transforming agriculture from extensive low-productivity agriculture to effective farmer input demand and surplus production leading to larger volumes of finance, input demand and produce supply and non-agricultural linkages. To be effective, subsidies need to be part of a larger plan including initial investments in establishing the basics like roads, irrigation, research and extension, and a deliberate exit strategy.

Extension workers can contribute considerably to the discussion around proposed subsidy programmes. Using the ‘smart’ subsidy framework, extension workers know which farmers to target. They can also give insight into the possible longer-term negative impacts of subsidies on farm-level operations which will help policy-makers design more effective and “smarter” subsidy programmes. They can provide input on the initial investment requirements, the nature and focus of the subsidies, and on the timing and process of withdrawing the subsidies.

**Figure 1:** Processes and conditions for agricultural transformations and the role of subsidies



Source: Doward & Morrison, (2015)



### 4.3. Information systems

Information is one of the most intensive aspects of risk management. Information is the main raw material for ARM decision-making. Without information, there is no way to assess the likelihood and severity of different risks, no way to be prepared in advance or improve resilience, nor to agree on how to manage or transfer the risk to others. Information from different sources on markets, climate and weather, diseases, inputs and technologies is needed to manage risks. Information systems influence every aspect of the food and agriculture systems. If they function effectively, they facilitate increased productivity and more efficient value chains primary production, good business practices, and improved livelihoods.

Information, and its availability, accessibility, reliability and communication have always mattered in agriculture. Ever since people have grown crops, raised livestock, and caught fish, they have sought information from one another. What is the most effective planting strategy? Where can I buy the improved seed or feed this year? Who is paying the highest price at the market? Producers rarely find it easy to obtain answers to such questions, even if similar ones arise season after season. As post-harvest processing advanced and the value chain expanded, new questions have been raised: What is the most efficient way to process or store the product? In what form will the product fetch the best price? The information needs have become more complex. And with the globalisation of food and agriculture, the demand for information continues to increase.

Providing such knowledge can be challenging. Food and agriculture systems and their value chains are often highly localised nature and demand that information be tailored specifically to distinct conditions. And, simultaneously, this must somehow be connected to processes that are national and international in scope.

At the primary production level, information about production, prices and diseases is key to assess farming risks and to choose the most appropriate risk management tools and strategies. Long historic inter- and intra-annual information, and disaggregated data for specific locations is particularly useful to farmers and to value chain business operators. Information is the key input for most management and risk management decisions at the micro-level. The capacity to expand, grow and diversify and to attract investment to facilitate is also dependent on the ability to assess and manage risks. Further, the willingness of external parties to invest in the agri-food system will be greatly influenced by how the uncertainty about the expected returns is assessed and managed.

Thus, to make decisions about the present and future of the agri-food system – all of which are directly influenced by risk – requires reliable, timely and accessible information. In this context, the need for better, more effective information systems is increasingly critical.

Naturally, information plays a key role in the work of an extension advising on and making plans related to ARM.

Information systems are meant to provide the full range of information required. An information system is a combination of information technology and human capacity to transform basic data into usable information. One of its functions is to translate raw data into useful, context-specific, or context applicable, information. This requires analysis and interpretation – both of which require an understanding of how the information created might be used.

Concurrently with the changes in the food and agricultural system, information systems themselves are also evolving, in terms of:

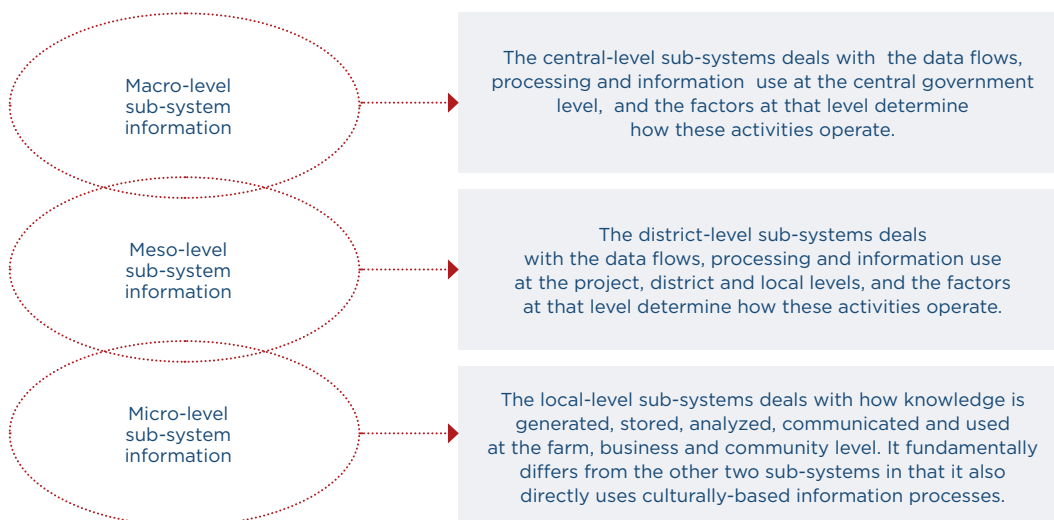
- the type and amount of information that is and can be gathered;
- who collects and hosts the information; and
- how information can be accessed.

Information and communication technologies now include satellite, sensor and geospatial data, and access through mobile devices. And while access is often still a problem in remote rural areas, ICTs are spreading, and rapidly becoming a primary vehicle for information management. This presents an important opportunity to improve agricultural risk assessment and management capacity: For the insurance industry to develop new products and fill information gaps; for the financial institutions to better address risk management for agricultural sector; and for farmers and value chain business operators to improve their resilience and enhance their investments in the farm or business, and in the household. It also presents an opportunity and a challenge for governments to better design their information policies and services.

Applying the carousel discussed in Module 1, it becomes apparent that information systems need to be able to accommodate a range of factors and to respond to changing policies and institutions. For instance, national-level planners will want to know how the food and agriculture sector is operating in terms of achieving its function and purpose in the economy. Ideally, an information system will provide decision-makers at local, district and central levels of governance with appropriate information to enable them to make effective and timely decisions related to their specific functions. Figure 2 shows the integrated information system.

There is overlap between the three sub-systems and in some senses the interfaces between them are the most important areas. For instance, the flow of information between the central and district levels will determine how well-informed policy can be developed, implemented and monitored. The interface between the district- the local-level sub-systems is particularly important from a governance and service delivery perspective. If farmers and business operators are to contribute to, and use, information from the formal system, then it is important to understand how they deal with information and how they use it. This is a negotiated space accommodating micro-level realities about how information is handled and norms within the formal system. This impacts how information systems the design, implementation and function of the integrated information system; it is essential to understand how the micro-level actors generate, store, analyse, validate, and communicate and use information. Similarly, it is important to understand how the meso- and macro-level actors generate, store, analyse, validate, and communicate and use information.

**Figure 2:** Multi-level integrated information system

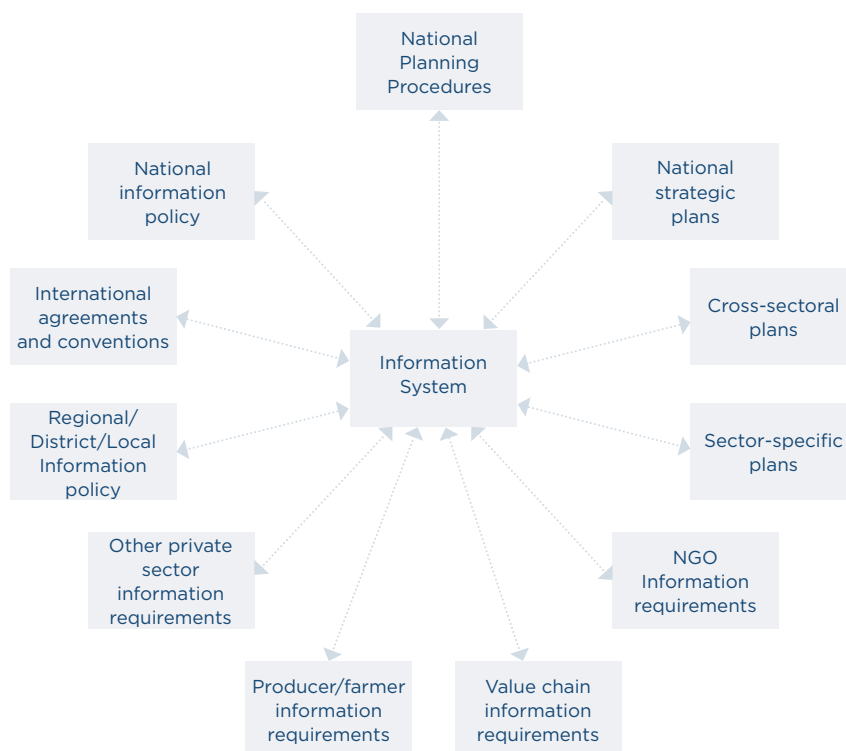


Thus, an important function of information systems is to provide information that allows individuals, agencies, businesses and institutions at all levels to operate effectively and efficiently. Further, the requirements and attitudes about information and knowledge change as actors evolve and their work and functions change, and as policy governing information changes. This means that information systems must be flexible and adaptive to accommodate present and future demands for information. There are multiple factors – including policy, planning and information requirements – that shape the information system as depicted in Figure 5.

As noted earlier, improved agricultural information systems can greatly help reduce uncertainties relevant to the food and agriculture system; they can increase awareness about price, weather, and other hazard risks, and thereby enable farmers, value chain business operators, governments and the other actors in the private and NGO sectors to better assess and manage risk.

Farmers, business operators and other actors in the agri-food system essentially need three ranges of information: Production information; Market information; and Weather information. They need this for routine farming and business planning, but they also need it for ARM. The range of information required for ARM was explored in some detail in Module 2 – it is particularly important to assess risk.

**Figure 3:** Factors shaping an information system for the food and agriculture system



Information is central to the work of extension workers. One of the main functions of extension workers is to disseminate information and to help farmers and business operators to understand, analyse and apply information to their respective farms and businesses. Additionally, extension



workers are often involved in gathering and interpreting information related to production, markets and weather. They may be required to share this information at the micro-level as well as at the meso- and macro-levels. Thus, they are particularly interested in information systems working effectively and efficiently.

In addition to using information systems, extension workers can also play a role in shaping information systems. Their knowledge of farmers' and business operators' information needs can help systems designers and managers improve their information gathering, packaging and dissemination processes.

### Production information systems

Production information systems generate information such as area, yields, land use, soil type and fertility, technology levels, and farm size, as well as the occurrence of pests and diseases. Farmers and value chain business operators need to know what is happening with various commodities. It is an essential part of deciding what to produce, how to produce and how much to produce. For example, when considering crop diversification as an ARM tool, the farmer will need information about the levels and extent of production of potential commodity choices.

The availability, reliability and quality of production information systems vary greatly around the world. One of the challenges is that the data is widely dispersed and perhaps controlled or managed by independent agencies such as commodity organisations to which only a select few have access. Further, the data may be too raw or too aggregated for use at the micro-level.

Thus, one of the key tasks of the macro-level institutions in the agri-food system will be to ensure that relevant, accurate and timely information is available, accessible and affordable to farmers and value chain business operators. Similarly, extension workers will also need to know where to find and how to access production information that farmers and business operators will need when making ARM decisions.

### Market Information Systems

Market Information Systems (MIS) are systems that gather, analyse and disseminate information about agricultural prices, quantities and other relevant information about agricultural products as they move from the farm, to wholesale and retail markets and finally to the consumer. An efficient MIS, collects and disseminates market information on a regular basis with the highest possible frequency (e.g. daily) and information is made available to potential users through multiple means.

Governments need to make sure that the MIS disseminates marketing information that will help farmers and value chain business operator gain more bargaining power. The MIS should also provide information to government and other stakeholders enabling them to monitor markets and inform decisions about potential intervention. MIS need to disseminate unbiased and independent information, otherwise they will fail to meet the standard of transparency that is essential to reduce marketing risks for farmers and value chain operators. Information needs to be up-to-date. It should include market prices of commodities and inputs, and their intra-seasonal variation. This will enable farmers to make more decisions on production activities and will give them more options when considering risk management tools and strategies. MIS should be designed so that

farmers are able to make better decisions about production, harvest and storage. It should help them identify the most appropriate markets for their products and give them greater bargaining power in those markets.

### Weather Forecast and Early Warning Systems

Early Warning Systems (EWS) are a critical part of systematic risk management and play a key role in assuring future agricultural production and access to food and water by the world's most vulnerable people. They have become increasingly important with climate change increasing the frequency of extreme weather events, such as hurricanes, floods and storms. Such events cannot be prevented but EWS that accurately convey information about impending events can significantly reduce damage associated with those events.

An effective EWS includes four components:

1. detection, monitoring and forecasting of hazards;
2. analysis of risks involved;
3. dissemination of timely and authoritative warnings; and
4. activation of emergency preparedness and response plans.

For the system to work as it should, these components need to be coordinated across multiple agencies at the macro- meso- and micro-levels. As with any system, failure in one component, or lack of coordination at or between the three levels, can lead to the EWS being less effective or failing completely.

The justification for government involvement and investment in EWS is straightforward. First, extreme weather events undermine development progress, constrain economic growth and threaten food production. Systematic risk management plays a critical role in assuring future agricultural production and access to food and water by the world's most vulnerable people. Second, climate action depends on the availability of high-quality scientific information. Climate data, science, information and knowledge are critical contributions to all facets of development under a changing climate.

It is also important that the system generates and disseminates climate-related information that is specifically tailored to farmers. Such information is critical to an integrated ARM process. And, finally early warning systems need to be linked to risk assessment and management systems (UNFCCC, nd).

Investments in EWS should be directed so as to ensure that the relevant stakeholders get timely and effective information about hazards, enabling them to plan and implement actions to avoid, reduce or better cope with the impact of risks.

It should be noted however, that EWS are really only as effective as the institutions that use them. Thus, governments need to invest in building institutional capacity to translate alerts into actionable decisions. A part of this will include ensuring linkages among decision-makers. Here, there is clearly a role for extension workers.

## SESSION 5

# Building Capacity within the Food and Agriculture System

A critical area for government intervention is in building capacity within the food and agriculture system. This includes developing human capacity, developing institutional capacity, developing partnerships and networks.



### 5.1. Developing human capacity

Developing human capacity is critical for effective ARM. It is the underpinning of sustainability. Properly functioning systems require people with the capacity to run, manage and engage with those systems. To do this, they need knowledge, skill and opportunity.

As macro-level policy and plans for ARM are being considered, decision-makers need to have a good understanding of the capacity of those who are meant to engage with the policy – particularly at the micro-level. There is little use in developing ARM policies and programmes that are beyond the capacity of the beneficiaries. However, macro-level institutions are likely to have less knowledge about the capacity of farmers and value chain business operators than will the extension and advisory services – and thus extension services become valuable contributors to the macro-level ARM processes.

Every extension service will have a system for assessing and developing the capacity of its personnel and clients. They will have mechanisms to develop the relevant knowledge and skills. The assessment will have to be predicated on:

- What knowledge is needed to conduct/manage the specific aspect of ARM; and
- What skills are needed to conduct/manage the specific aspect of ARM.

An often-overlooked aspect of building human capacity is the issue of ‘opportunity’. Opportunity refers to the level of power or command the person or group has over the systems and structures related to specific aspect of ARM. There are numerous instances, particularly in more traditional societies, where responsibilities and decision-making powers are clearly defined and restricted. In such instances, having knowledge and skills does not change the restrictions. This has real consequences on the ground – and it is particularly relevant when working with women, youth and children.

A common example of this is the limitation placed on women regarding raising livestock. In some societies, women are not permitted to look after large stock. Children, even if they are the head-of-household, are often not permitted to participate in community-level decision-making. This makes them more vulnerable to the risks that they might face regarding their farming and business operations.

Thus, it is essential to gain a clear picture of the practical opportunity actors as the micro-level have to take responsibility for the various activities involved in running a farm or value chain business.

Based on the assessment of knowledge and skills (in the context of requirements), a development programme can be developed. However, training will not resolve the issue of opportunity. Changing the right and authority people have to manage aspects of their farming or business enterprises, may require negotiating with traditional structures. This is a critical area where extension workers can contribute to the development and implementation of capacity building programmes – at both micro- and macro-levels.

Another key function of extension workers is to help build capacity of farmers and business operators. This aspect of capacity building for ARM was discussed in Module 2. However, extension workers also have a role in building individual capacity within the broader agri-food system. They are in a good position to provide aggregated information about the capacity of farmers and business operators in various aspects of ARM. They will also have knowledge about the capacity elsewhere in the system. The more experienced extension workers can also be called upon as training facilitators.



## 5.2. Building the capacity of institutions

Building the capacity of institutions is related to building human capacity. Just like people, institutions need knowledge and skills and must have the power or authority to manage their various activities. In terms of knowledge and skills, the same process followed for developing human resources would be followed to determine what knowledge and skills the institution needs to carry out its functions, determine the current status and establish the learning gap. Similarly, the limits of authority the institutions have to carry out their activities must also be established.

In addition to determining the knowledge, skills, and opportunity requirements and gaps, it is necessary to analyse the status of systems and structures required to run the institution.

Building capacity of institutions for ARM at the micro- and meso-levels was discussed in Module 2. But, as with building human capacity, extension workers can contribute to building capacity of institutions on a broader scale. Module 2 specifically addressed developing institutional profiles in terms of the various stages of the ARM cycle. The information consolidated in these profiles can be aggregated to provide a detailed understanding of the aggregate capacity of institutions to help with ARM. This information can help macro-level planners to design programmes that reflect the realities on the ground and that are therefore more likely to be effective. And, again, extension workers can be called upon to serve as training facilitators.



### 5.3. Developing Partnerships and Networks

Networks and partnerships are an important part of any over-arching risk management strategy. They reinforce the kind of cooperation that is often called upon when large-scale unfavourable events occur. They also create frameworks for collective assessing, planning for, and managing risk, which helps create greater overall resilience in the food and agriculture system. As will be discussed later, networks and partnerships should be promoted specifically around risk management responses and tools. It is often difficult for a single farmer or business operator to adopt a risk management tool or strategy on his or her own.

Networks and partnerships take many shapes and forms and serve a variety of purposes. They can be vertical or horizontal. They may operate within a single value chain, or across one or more value chains. They may involve actors at the same level in the same value chains or multiple value chains. They may operate at the micro-, meso- or macro-level, or across one or more levels.

For example, farmers may create networks or partnerships to share labour, trade information, or collectively negotiate product or market prices. Similarly, farmers and traders may create partnerships or networks to secure mutually beneficial market arrangements. While these partnerships and networks serve the immediate purpose of fulfilling the primary functions of the farms and businesses, they are also important for risk management.

One way to look at networks is to see them as processes that support three major flows:

- Physical product flows: the physical movement of goods through the food and agriculture system
- Financial flows: the movement of money, including income, payments and credit
- Information flows: the movement of information needed to make production, financial and related decisions.

At the core of each of these flows are logistics and communications. Networks need to be developed to ensure that they provide the right products, finance and information in the right amounts and at the right time.

Because partnerships and networks are so useful for normal operations and for risk management, governments and other macro-level agencies will want to foster, even advocate for establishing them and to otherwise support their development and functioning capacity to deliver as required.

Doing this will make a tremendous contribution to creating resilience in the face of risk. It will improve the capacity at all levels of the food and agriculture system to assess and manage risk. Macro-level interventions include building human and institutional capacity to manage networks and partnerships. They also include practical interventions, such as establishing communications, ICT, roads, electricity and transportation systems, as well as regulatory frameworks – all of which are needed to help networks and partnerships perform efficiently and effectively. An important part of implementing interventions is to ensure wherever possible, that the systems and services supporting the networks and partnerships are provided by the private sectors – especially those within the food and agriculture system.

One way to approach this is to help actors throughout the agri-food system identify relevant partnerships and networks by using the same frameworks we have been using throughout this publication. Networks and partnerships can be created for specific risk issues that are related to the eight key functions of the farm or value chain business (as discussed in Module 1). The development of networks and partnerships can be further refined by linking them to specific stages in the risk assessment and management cycle.



### Networks for Micro-Finance

As noted in Module 3, Micro-Finance Institutions (MFIs) can provide services in a cost-efficient way, especially if they are able to provide loans without collateral and reduce the transaction costs of dealing with accounts involving meagre sums of money. MFIs that follow the group loan approach use peer pressure of the members in the group to minimise problems of moral hazard, adverse selection and loan defaults. In general, membership-based organisations can facilitate access to financial services and be viable in remote rural areas.

However, it is often helpful or even necessary to support such institutions as is the case with the Association for Micro-Finance Institutions (AMFI) in Kenya.

AMFI is a member-based organisation established in 1999. The aim of AMFI is to build the capacity of the Kenyan Micro-finance industry. Since its conception AMFI has played a major role in developing the industry. Its mandate is to promote an enabling environment for the developing MFIs, clients and the business environment. AMFI is involved in four main activities.

**Policy Advocacy and Lobbying:** for appropriate changes in legal and regulatory environment to ensure its members operate competitively and to create awareness among policy makers, development partners, and the general public about the role of micro finance in poverty alleviation and employment creation in Kenya.

**Capacity Building:** of its members through programs to develop their skills and capacity to provide financial services to the poor.

**Network & Linkages:** to provide regular platforms for its members to enhance effective collaboration among themselves and with other development actors and stakeholders.

**Research & Knowledge Management:** to provide its members with research that helps them provide effective services.

Source: Adapted from AMFI (n.d.)

Networks and partnerships can (and should) be created and fostered for each of the elements of the framework and for each stage of the ARM cycle. This makes sense in terms of farm and business management as it contributes to greater efficiencies throughout the entire food and agriculture system. It also makes sense in terms of agricultural risk management. Effectively, these networks and partnerships act as safety nets which help create resilience to risk.

As noted earlier, networks and partnerships should also be promoted around risk management responses and tools as it is often difficult for a single farmer or business operator to adopt a risk management tool or strategy on his or her own.

*Mitigating risk* often requires adopting technologies and processes that are affordable only when sufficient numbers adopt them simultaneously or collectively.

Similarly, *transferring risk* is generally only possible when the risk market can pool risk and is sufficiently profitable for companies offering risk transfer instruments (e.g. insurance companies). Smallholder farmers and small-scale businesses, particularly those in more remote rural areas and those for whom the farm or business is the principal livelihood, are more vulnerable to risks. And yet because of their small scale of operation and their isolation from economic centres, they often have less access to risk transfer options. Group schemes are more readily established when farmers and/or business operators are organised in partnerships or networks.

*Coping with risk* has a long history of relying on social networks and safety nets – particularly those created at the micro-level (e.g. community). Most traditional cultures have long-standing systems and mechanisms to mitigate the effects of risks on vulnerable households during times of severe stress and during the occurrence of wide-scale unfavourable events. In many parts of the world, extended families, often with support from the wider community has been an effective coping mechanism in the face of risk. This is essentially locally-generated social insurance provided through kinship and cultural ties that enable households to access economic, social, and emotional support in times of need.

As effective as these traditional systems have been, they are increasingly unable to meet growing realisation of risk – particularly those related to climate change. The prevalence of HIV/Aids and its impact on productivity further exacerbates the situation. Thus, it is increasingly necessary for macro-level institutions, particularly national governments to intervene with state supported programmes that build upon and that augment, strengthen and supplement existing social networks.

An example of macro-level intervention is the case of the climate smart agriculture techniques in response to weather-related production risk (See Module 3) (FAO, 2013).

For climate smart agriculture to be effective, it needs to be implemented on a fairly wide scale and must be inclusive. That means it must be a realistic option also for the poorest and the most food insecure. However, the least food secure households are also those least likely to take up climate smart agriculture. Where communities are faced with food insecurity, climate change adds to the already complex set of interrelated risks. It often perpetuates cycles of poverty and increases vulnerability, unsustainable production systems, the overexploitation of natural resources and asset depletion.

Macro-level institutions will need to implement special interventions, such as social safety net programmes, to assist particularly vulnerable farmers or business operators by ensuring that they have access to a minimum amount of food and other essential social services as they take steps to adopt climate smart agriculture. Similarly, resource transfers can enable poor and food insecure people and communities to invest in climate smart agriculture which will, in the long-term, contribute to building resilience and the capacity to adapt, and ultimately enhance productivity.





## Networks for innovation

Innovation at the farm-level is occurring increasingly within network-like settings where farmers interact and learn from other farmers, input suppliers, traders, advisory service providers, etc. Innovation does not take place in isolation. One challenge is to identify effective coordination mechanisms and systems that can facilitate interaction and coherence among actors in value chains and innovation systems.

The two mechanisms being discussed and promoted are innovation brokers and innovation platforms.

**An innovation broker** is a person or organisation that can help overcome shortages of information about what potential partners can offer, and thus bring stakeholders together and create networks and linkages among them. Innovation brokers analyse and articulate demand, organise networks, and facilitate interaction. Innovation brokers can come from the public or private sectors including local, national or international agencies, farmers' and industry organisations, research and extension organisations, government organisations, and ICT-based brokers.

Innovation platforms are a practical approach for putting the agricultural innovation system into action. They are mechanisms that help stakeholders interact. They provide a space for information exchange, negotiation, planning and action, and bring together stakeholders at different levels in the innovation system to work towards a common goal.

Platforms are often set up at the local level to improve the efficiency of a specific value chain. They can be particularly useful in engaging the private sector in targeted innovation processes. Platforms at the national or regional levels often set the agenda for agricultural development and enable farmers, through their representatives, to be involved in policy-making.

Governments can support the establishment and functioning of these networks and platforms, for instance by convening meetings with key actors to influence regional political, policy and economic bodies. Networks should be designed not only to provide technical information but also to facilitate the flow of other types of information (e.g. commercial or managerial) among a wide range of actors. However, platforms should involve the private sector to integrate it into the innovation system.

Examples of global and regional levels include: The Global Forum on Agricultural Research (GFAR); the Global Conference on Agricultural Research for Development (GCARD); the Global Forum for Rural Advisory Services (GFRAS); and the Tropical Agricultural Platform (TAP) Networks and partnerships for innovation Source: Adapted from FAO (2014)

The role of extension workers in building networks and partnerships at the micro-level was discussed in Module 2. These networks can also be linked to the networks being created at the macro-level. Information concerning the nature and strength of the micro- and meso-level networks created to support ARM processes can be shared with macro-level institutions working to establish broadly-based networks and partnerships.



## SESSION 6

# Advocacy

Another macro-level function supporting ARM is advocacy. In general terms, advocacy related activities are meant to influence decisions, in this instance, regarding agricultural risk assessment and management. Key among potential advocacy issues is advocating for adequate provision for risk management tools and policy instruments, particularly in terms of political commitment. Another is raising the awareness of the need for ARM.

However, in each country or situation, the advocacy requirements will be determined by the particular issues faced by the stakeholders in the food and agriculture system. Thus, this learning task will focus on the process of developing an advocacy programme. The learning task was adapted from the UNICEF Advocacy Toolkit (2010).

Advocacy in ARM is generally needed when systems or decision-makers are not functioning adequately to enable stakeholders to accurately assess and plan for risk, or when stakeholders are not sufficiently aware or adequately prepared to address risk. Careful planning adequacy programmes are correctly focused, help ensure that resources are used effectively, and ensures that advocacy is aligned with other programmes and initiatives.

Extension workers will, of course, develop their own advocacy programmes as required, as part of their ARM processes with farmers and business operators, and at the meso-level. They can also contribute to macro-level advocacy programmes. They need to be aware of any macro-level advocacy programmes that might affect their own programmes to ensure that there are no mixed messages and that there is no duplication of effort.

They can also participate in planning advocacy programmes by sharing knowledge from the grassroots and giving advice on key issues and audiences. And they can participate with the implementation and evaluation of the advocacy programmes.

The process of developing an advocacy programme involves nine questions:

**Question 1:** What do we want?

**Question 2:** Who can we make it happen?

**Question 3:** What do they need to hear?

**Question 4:** Who do they need to hear it from?

**Question 5:** How can we make sure they hear it?

**Question 6:** What do we have?

**Question 7:** What do we need?

**Question 8:** How do we begin to take action?

**Question 9:** How do we tell if it's working?



## Broad aspects to consider in shaping an advocacy strategy

When shaping a strategy for advocacy, the key elements will shift for different issues in different locations. The basics to review are:

**Context:** Every political environment is different. Each presents its own opportunities and constraints. Governments have varying degrees of legitimacy and power vis-à-vis civil society, the private sector, transnational and international organizations and institutions. Political decisions are made differently depending on the nature of the state, politics, media and strength of civil society. In some places, the legislature has more authority. In others, the Minister of Finance dominates policymaking.

Countries have different levels of freedom and access to the public sector. People use these opportunities differently depending on literacy, poverty and social relationships. A society's culture, religion, ethnicity, race and economic development affect the level of tolerance and openness to social change. In some countries, advocacy at the local or the international level may be more feasible than at the national level.

**Timing:** Each moment in history presents distinct political opportunities and constraints. International economic trends may make a country tighten or expand political space. Elections or international conferences may provide opportunities to raise controversial issues. At some moments, a march or demonstration will draw attention to an issue. At others, a march may provoke repression.

**Organisation:** In designing the strategy, it is important to be aware of the comparative strengths and weaknesses of the ARM programme. How broad and strong is potential support? Do you have well-placed allies? Is there a strong sense of common purpose among the leadership? Is decision-making efficient and responsive? What resources can you rely on? Are your aims clear and achievable? Can you draw on organizational history for learning and inspiration? Are advocates and participants open to viewing initiatives that didn't succeed as valued opportunities for learning? Are there stories that can be used within the specific organisation and wider system?

**Risk:** Not all advocacy strategies can be used universally. In some places, a direct action aimed to reach a key decision-maker may be politically dangerous, or may weaken or reduce the potential for long-term change. In some countries, pushing for change that affects cultural beliefs may provoke a harsh backlash. Sometimes involving individuals who are usually excluded, like children and women, may cause family, social and community conflict.

Challenging relationships that affect power dynamics will, more likely than not, generate conflict. Organisers have a primary responsibility to find ways to navigate through opposition without taking on undue risk. In more closed environments, advocacy often takes the form of community action around basic needs and is not publicly referred to as 'political' advocacy. Whatever the context, sometimes risks need to be taken because there are no other options. In these cases, everyone involved must understand the potential risks.

Source: Adapted from Miller (1994)

**Question 1: What do we want?**

The process starts with understanding the situation. It is necessary to understand the problems, issues and solutions. Among these solutions, or results, some distinctions are important. The following needs to be determined:

- long-term goals and interim outcomes;
- content outcomes, for example, policy change; and
- process outcomes, for example, building community and trust among participants.

These goals and outcomes may be difficult to establish, but defining them at the outset will draw support to the advocacy initiative, set up an effective launch and make it more sustainable over time.

Having applied the ARM cycle, there will already be a clear picture of the risk management issues and will have prioritised them. However, to develop an advocacy programme, it is essential to be clear about the particular challenges that the ARM processes might face. Is there a principal weakness or threat that constrains the ARM process? Is the weakness or threat related to a stakeholder? To a system? To a decision-maker?

Once this is clear, what needs to be advocated will emerge. There will likely be a list from which priorities can be established.

**Question 2: Who can make it happen?**

Once it is clear what needs to be advocated, it is necessary to understand the people and institutions to mobilise to make it happen. This includes those who have formal authority to deliver the goods (legislators, for example) and those who have the capacity to influence those with formal authority (e.g., the media and key constituencies, both allied and opposed). In both cases, effective advocacy requires a clear sense of who these audiences are and what access points are available and what is needed to mobilise them.

Again, there will already be a very clear picture of the full range of stakeholders. Profiles will have been developed for each of them and their capacity assessed to contribute to each of the stages of the ARM cycle. It will be necessary to tie up the information in these profiles with the advocacy issues that have been prioritised. This will help with assigning the advocacy 'message' to specific stakeholders.

**Question 3: What do they need to hear?**

Once the target audiences for each of the prioritised advocacy issues are known, the next step is to establish what exactly the relevant stakeholders need to hear, and then to draft a message specifically for each of the target stakeholders.

Obviously, these messages must always be genuine and truthful. However, the messages will need to be tailored to different audiences to suit the target stakeholders. In most cases, advocacy messages will have two basic components: an appeal to what is right; and an appeal to the particular stakeholder's 'stake' in the issue. For example, perhaps the main advocacy issue is to increase the awareness of accurately assessing risk. Knowing that farmers are primarily

concerned with ensuring their farms survive and making profits, the message to them about risk assessment will focus on how assessing risk will help them achieve that goal. However, the meso-level government may be more concerned about ensuring a stable economy and reducing disaster management budgets. In this case, the message to them about the importance of assessing risk would focus on that outcome.

#### Question 4: Who do they need to hear it from?

The aim of this question is to identify the right messenger for each target stakeholder. The same message can have a very different impact depending on who communicates it. Who are the most credible or relevant messengers for each stakeholder?

Who will farmers listen to? Who will commodity organisations listen to? Who will traditional leaders or other local decision-makers listen to? At this point it may be helpful to develop a simple matrix as shown below.

The advocacy issue	The general message	The stakeholder	The specific message	The appropriate messenger
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

#### Question 5: How can we make sure they hear it?

This question seeks to identify processes, opportunities and entry points to deliver the message and ensure that it is heard.

There are many ways to deliver an advocacy message. This could include individual face-to-face session, public meetings, posters, publications, social media, radio and television, and other media. The appropriate method(s) and channel(s) will vary depending on the interests and circumstances of the stakeholders. In some stakeholders, simple presentation of information will be sufficient. For others, it may require extensive negotiations and lobbying.

The key to deciding is to evaluate the advocacy goals, the specific messages, and what is known about the stakeholders.

#### Question 6: What do we have? & Question 7: What do we need?

Essentially, these questions ensure that the process integrates any new advocacy programmes with existing advocacy programmes and is aligned with other related policies. This is to ensure that stakeholders do not receive mixed or conflicting messages.

These questions also ensure that there is no duplication of effort. They identify gaps that can be filled by the new advocacy programme.

Finally, these questions ensure the process conducts a SWOT analysis relative to delivering the proposed advocacy messages. They will help with refining the message and the delivery methods and channels.

**Question 8: How do we begin to take action?**

This question ensures that a comprehensive and strategically logical implementation plan is developed. This is particularly important when planning more than one advocacy programme at the same time, or when the new programme is being developed while others are already being implemented.

The following need to be considered:

- What is the most effective way to move the strategy forward?
- What will bring the right people together?
- What will create the context of the larger work ahead?
- What is needed to lay the groundwork for reaching the advocacy goal?

This will involve setting goals, interim outcomes and activities. It will generally require participatory planning and budgeting.

**Question 9: How do we tell if it's working?**

As with every programme, advocacy programmes must also be monitored and evaluated. Monitoring allows corrections to be made as the programme is being implemented.

Another simple way to do this is to periodically revisit each of the 'Nine Questions'. This will make it possible to (perhaps in a more qualitative than quantitative way) see if the prioritised message is getting through and having the intended impact.

## SESSION 7

# Developing and implementing ARM strategy

The initial part of this learning task will look at the nature of ARM strategies at the micro-, meso- and macro-levels. It will then go on to discuss issues related to planning and implementation, including challenges and the need to mainstream ARM.



### 7.1. The nature of ARM strategies at the micro-, meso-, and macro-levels

As discussed frequently in this publication, ARM can be viewed from three different levels: the **micro-level**, which is the level of the farmer and value chain business operator; the **meso-level**, which comprises the role-players in and around the value chains; and the **macro-level**, which comprises policy makers and decision-makers operating at regional or national levels.

#### ARM at the micro-level

This publication has not focused on the farmer or business operator as the locus of the ARM cycle. They have been positioned as beneficiaries who are partners in the assessment, planning, implementation and evaluation processes. Naturally, each individual farmer and business operator should methodically work through the ARM cycle for his/her own farm or business. Ultimately, each individual (and perhaps small collective such as a local cooperative or business chamber) needs to develop an ARM strategy.

However, it is often the case that micro-level actors do not have the personal or institutional capacity to address risks individually. It is rare that risks are truly idiosyncratic (i.e. confined to a single farmer). Thus, the majority of the risks faced will be the same risks faced by peers at the micro-level. Similarly, many of the risks will be systemic risks that no single farmer or business can manage in isolation.

Thus, a farmer or business operator will have micro-level ARM strategies to address those risks that can be addressed individually, but will also participate in developing ARM strategies for a wider (perhaps at the meso-level) collection of strategies. As noted in a previous section in this lesson, sometimes the constraints in the value chain or elsewhere in the food and agricultural system will limit his/her choices of ARM strategies. Thus, it may occur that the ARM strategy is linked to development strategies aimed at removing or overcoming constraints – thereby affording the farmer or business more opportunities and more choices of ARM strategy options.

## ARM at the meso-level

As mentioned in the introduction, the general perspective of this publication has been that of the meso-level, represented here by an extension service operating and serving a geographic area such as a district or sub-region. The premise has been that extension workers in such a position would be concerned about the risk farmers and value chain business operators in their areas face, and would work to analyse that risk and to plan risk management strategies to be implemented by those farmers and business operators at the micro-level. The extension workers would work simultaneously on all three levels. They would use participatory approaches and methods to walk the micro-level actors through the ARM assessment and management cycle. While accompanying farmers and business operators, he/she would be conscious of their capacity to engage with each of the stages of the cycle, and develop and implement plans to strengthen their capacity

Simultaneously, they would be aware of the capacity of other role-players and stakeholders at the meso-level who can contribute to one or more of the stages in the cycle. Where possible and relevant, the extension worker would also work to build capacity of these meso-level partners to participate in the identification and assessment of risks, and the planning, implementation and evaluation of ARM strategies.

At the same time, the extension workers will need to be aware of ARM processes at the macro-level. They will need to know about relevant legislation and policy that demarcate the theatre of operation and set the limits for action. They will also need to know who the macro-level stakeholders and role-players are who will influence the meso-level and micro-level ARM processes.

## ARM at the macro-level

For the purpose of this discussion, 'macro-' will be considered national or sectoral, although, depending on the degree of subsidiarity within a particular state, it could also be a province or state or other such geo-political configuration.

National ARM assessment and management necessarily takes much wider, more aggregated and more holistic view of risk in the food and agriculture system. While it will make plans to facilitate mitigating risk, transferring risk and coping with risk, it will also be the source of public investments, legislation and policy that will impact meso- and micro-level processes and ARM choices and decisions.

The World Bank (2016:52) states: "Macro-level actions are implemented at a national level whereby ARM strategies are incorporated into sectoral growth and investment and policy decisions".

Macro-level ARM planning will revolve around four categories of action:

- Relief (immediate response to a sudden crisis)
- Community development (usually in the form of projects)
- Sustainable systems development (addressing structures and systems underlying problems); and
- Human resource capacity building (addressing long-term changes in society and human capacity).

It is immediately apparent that **relief** responses are those that are designed to help farmers, business operators and other stakeholders cope with catastrophic risk after the event. They are the contingency plans for disasters, whether those disasters be material disasters, such as floods and earthquake, or they be economic disasters, such as the collapse of markets or market prices, or the failing of credit institutions or of sections of the value chain, such as input supply. In such cases, the national ARM strategy will provide relief.

Related to 'relief' strategies, are strategies designed to prevent or at least minimise catastrophic events. This might include building dams or levies to contain potential floods. It might also include the introduction of subsidies or other market interventions aimed at creating stability and smoothing income. It may include introducing border actions to prevent the introduction of pests.

Some of the ARM strategies will be project based; meaning that they will be time-bound and will have the specific function of delivering a viable outcome. For example, the national government may have identified that a particular part of the agricultural economy is changing and that the change will marginalise smallholder farmers. A good example is the wool and mohair project undertaken in Lesotho, which essentially entailed provision of infrastructure, training, grading services, and institutional development to enable even remote producers to comply with the International Wool Textile Organisation (IWTO) standards – without which the wool producers would have lost their market.

One of key spheres of operation for national level ARM strategies will be strategies to address sustainable systems development. The concept of “smart” subsidies is a good example of a systems-based strategy. As listed in Table 13, there are a number of policy interventions that the government could implement to create risk markets (e.g. insurance) or to modify risk market incentives. One of the most common strategies is to ensure stable macroeconomic policies and a stable business environment. Similarly, as listed in Table 12, there are a number of policy interventions that could be implemented to reduce risk by strengthening farmer links to the market.

An example of this is South Africa's National Regulatory System which focuses on managing risks associated with animal and plant diseases, food safety and the use of genetically modified organisms. Under this system, for example, the National Department of Agriculture, Forestry and Fisheries, entered into an agreement with the European Union to introduce measures to ensure that South African fresh produce complies with the EU's maximum residue level for pesticides to further ensure that the South African fresh produce growers continue to have access to the EU markets. The initiative includes research into alternative chemicals and production practices and creating awareness about the requirements among the country's so-called emerging farmers.

Finally, National ARM strategies will also entail initiatives that are primarily focused on Human resource capacity building. Again, referring to Table 13 and Table 14, we see risk management strategies, such as risk management training and information to farmers; supporting farmer training on good agricultural practices for quality enhancement and food safety; training firms in contract design and management; and training farmers on their rights and obligations.



As with other macro-level initiatives, extension workers can contribute in a number of ways. Of course, when planning and implementing micro- and meso-level ARM strategies, extension workers will need to be aware of and take into account any macro-level ARM strategies being planned or implemented. They will want to avoid counter-productive or redundant ARM initiatives. Secondly, planning macro-level ARM strategies requires information from the micro-level to ensure that the proposed strategies are relevant to farmers and business operators operating at the micro- and meso-levels. Extension workers can supply this vital information and advice. Thirdly, it is very likely that extension workers would be called upon to help with implementing (and evaluating) macro-level ARM strategies as they apply at the meso- and micro-level. Here, their knowledge of the situation on the ground and their access to key stakeholders would be invaluable.



## 7.2. Planning and implementing national (macro-) level ARM strategies

This learning activity, and the two that follow, are included to make extension workers aware of the kinds of processes that are followed in implementing macro-level ARM assessment and planning processes. It will enable extension workers to participate and to contribute intelligently to the process when called upon to do so.

As will be seen, the process followed at national level will be very similar to the process outlined in Module 2. It will help to review the relevant Learning Tasks in that module.

The World Bank (2016) proposes that at the national level, an agricultural sector risk assessment (ASRA) process should be followed. It involves five stages as shown in Figure 6:

1. Risk Assessment
2. Solutions Assessment
3. Operationalising and Mainstreaming Risk Management
4. Implementation
5. Risk Monitoring

**Figure 3:** ASRA Sequential Flow Process

The assessment should be led by an ASRA team of 3-5 members depending on the size of the country and logistical arrangements – particularly those related with the required field visits. The members of the team should be agricultural specialists with broad agricultural sector experience along the value chain and in the wider food and agriculture system. Specifically, a crop specialist, livestock specialist and value chain specialist are needed. In many cases, these specialists may be frontline or meso-level extension workers.

The function of this team is to coordinate the entire data gathering, both secondary and field data (from interviews with stakeholders), to analyse the data, prioritise the risks, generate a long list and then filter it to a short list of prioritized risk management solutions.

The World Bank (2016) also proposes six “generic steps” to the “solution process” :

1. Assistance of experts
2. Discussion with stakeholders
3. Evaluation of action options
4. Creation of a risk management strategy
5. Development of an implementation plan
6. Implementation.

### Assistance of experts

Different from the ASRA team that identified the short list of solutions, a “new” team led by experts specialized in each topic related to the short list of solutions can be formed.

### Discussion with stakeholders

Extensive consultations and broader and more formal stakeholder discussions can be held in which the team shares the preliminary proposals with stakeholders, including universities and specialized nongovernmental organizations (NGOs).

### Evaluation of action options

The ASRA often results in a “laundry list” of possible activities that could be undertaken to manage the identified risks. During the risk solutions assessment, an exhaustive list of all possible actions to manage the priority list should be developed. This should be followed by detailed evaluation of the selected options and the current management practices and supporting programs and policies (in addition to the stocktaking of projects and programs carried out during the first phase). This exercise will help to consolidate the initial proposal and bring forth operational issues, trade-offs, possible overlaps, and technical complexities.

Along with this, it is important to analyse underlying policy or institutional bottlenecks that could hamper the achievement of desired objectives and to suggest measures to overcome bottlenecks

### .Creation of a risk management strategy

On the basis of this evaluation, the next step is to identify the strategic actions, objectives, and institutional implications. Rather than a stand-alone strategy, this should be an integral part of the broader sector development strategy.

### Development of an implementation plan

A detailed implementation plan, with clear milestones, time lines, sequencing of activities, and outcomes, is required to operationalize the strategy. This implementation plan should have clear action items for the public and private sector and should be developed with a broad consensus.

### Implementation

The government will lead implementation of the plan, which will require a coordinated effort from all stakeholders. The process will involve generating and allocating resources, allocating responsibilities for implementation, monitoring regularly to track progress, and developing indicators to measure the sector's reduced vulnerability to risks.



### 7.3. Challenges to planning and implementing ARM strategies

The World Bank (2016) notes that there are challenges to developing and implementing ARM processes as a part of mainstream planning activities. In particular, they influence the way data is collected and analysed. This, in turn, influences the way risk is assessed and eventually addressed – especially what and who is given priority in the overall process. Some of the key challenges include:

- **Historical bias:** Most assessments analyse risk solely from a historical perspective which can limit assessing new risks that might occur in the future – risks that have not occurred in the past. Climate change has created real possibility of the appearance of new types of extreme events and/or events that are new an area. Being new, these unknown events may cause drastic losses with their first appearance. Historical analysis will not contribute in such instances and new methods and mechanisms will be required to incorporate potential risks.
- **Data limitations:** Accessibility and reliability of good quality, disaggregated, time series data on key variables (such as those discussed in Module 2) are often very limited. This negatively affects the ability to conduct a thorough risk assessment, which, in turn, negatively affects the ability to plan strategies.
- **Subjective bias:** Despite using quantitative data where possible, much of the ARM processes are qualitative and, therefore, subjective – particularly the prioritisation of risks and risk management tools. Further, each stakeholder involved in the ARM process will have its own agenda, perspectives, concerns and priorities. These biases can influence the assessment as well as the tools and strategies selected – for example, insurance specialists might be biased toward risk transfer, whereas agricultural extension specialists might be biased toward risk mitigation. The best way to deal with potential bias is to ensure the processes work with as much objective data as possible, especially when setting priorities.
- **Risk appetite:** Poorer producers and business operators have fewer buffers and, therefore, tend to have low risk appetites. Often the ARM strategies they can employ lead to lower returns on their assets than might otherwise be possible. Households would otherwise enjoy. Building resilience and improving the asset base is often required to enable these actors to engage meaningfully with ARM processes.
- **Attribution:** Analysing (particularly historical) risk management data is often made difficult because it is not always possible to attribute losses to a single cause. In most cases there are multiple events and the impact of each cannot be known for certain. Being unable to establish the proportion of losses and attributing them to any of the multiple risk events impacts on the risk assessment processes – including selecting risk management strategies.
- **Stakeholder expectations:** When ARM processes are truly participatory many stakeholders will be involved. Some of the stakeholders may develop expectations, some of which may be unrealistic. Realistic or not, all of the expectations are dependent on the political will of the government and others in positions of authority to translate the ARM proposals into concrete strategies and budgets.



## 7.4. Mainstreaming

In this context, mainstreaming refers to making the processes and activities related to ARM a routine, planned part of the development and investment programmes for the food and agriculture system. The aim of mainstreaming ARM is to develop resilient and sustainable agricultural and food systems – and through that, ensure the sustainability of the livelihoods of those in the wider system, as well as the sustainability of provision of food, fibre and fuel to consumers.

Effective risk management typically requires a combination of measures. Some measures will be designed to remove underlying constraints; others will be designed to address risk directly. The choices are often determined by what resources are available.

Further, as has been frequently discussed, risk management actions (assessment, planning and implementation) generally need to be implemented at the micro-, meso-, and macro-levels. Micro-level actions will be undertaken by individual producers or a community, often with the assistance of actors at the meso-level. Macro-level actions are implemented at a national or sectoral level.

Similarly, some risk management strategies necessitate collaboration between two or more actors in the food and agriculture system, such as sharing market information and establishing better contractual relationships and information sharing. As we have seen, risk management assessment and planning involves actors in the public, private and NGO sectors.

This context highlights the importance of governments following a holistic, integrated and coherent approach – part of which includes mainstreaming ARM into the government's development and investment programmes for the food and agriculture system.

Mainstreaming ARM also benefits the food and agriculture system (and its stakeholders) as a whole by making ARM interventions more strategic. It makes sure that ARM processes are aligned with other policies and processes. And it helps ensure that resources are available to support ARM processes and interventions.

Further, one of the great benefits of mainstreaming ARM is that it can improve the impact of development programmes. Mainstreaming ARM will help make development interventions more responsive to risk conditions and commitments. This is particularly true for the food and agriculture system where successfully mainstreamed ARM processes help identify and prioritise critical areas in which risk-responsive actions can enhance growth, contribute to poverty reduction, and strengthen resilience to external shocks.

Finally, resource availability will often determine what is possible. This is one of the main reasons it is important that ARM processes be mainstreamed. This will also foster integration of assessment and strategies. Integrated risk management programmes are more effective than stand-alone programmes. And ARM strategies are even more effective when they are incorporated into sectoral growth and investment and policy decisions.

There are, however, a number of factors that may inhibit mainstreaming ARM:

- In many countries, ARM is viewed and implemented separately from other mainstream governance processes;
- It is often the case that the ARM processes themselves are not coherent or integrated;
- Countries or regions within countries may lack in expertise and capacity in ARM;
- There is often a lack of interaction and knowledge exchange between stakeholders and practitioners, resulting from a siloed approach to government, research and other activities related to ARM; and
- A tendency to see investment planning primarily from the perspective of constraints (as opposed to risks).

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Mainstreaming essentially involves two aspects: Mainstreaming ARM planning and implementation processes; and mainstreaming budgeting for ARM processes and strategies.

## Mainstreaming ARM planning and implementation

Mainstreaming ARM planning and implementation, requires:

- An integrated operational approach to agricultural resource management that is embedded in development and investment planning;
- Expertise and capacity in ARM; and
- Interaction and knowledge exchange by stakeholders and practitioners to break down any existing siloed approaches to addressing agricultural risk. (This includes widening the processes to encompass more than the food and agricultural value chains and to ensure that the whole of the food and agriculture system is addressed)

Obviously, the first step in mainstreaming ARM is to agree on an integrated process such as the ARM discussed in learning activity 4.4.6-1. Then it is a matter of making the ARM processes a formal and routine part of planning throughout the food and agriculture system. It is important to stress here that, while the macro-level institutions will most often drive the mainstreaming initiative, ARM needs to be mainstreamed at all levels and with all relevant stakeholders.

A key part of mainstreaming involves bringing together a broad group of stakeholders from the public, private, and NGO sectors to facilitate exchanging knowledge, setting priorities, and aligning policies and programmes to support development objectives for the whole food and agriculture system. This includes incorporating the findings of ARM assessments into government policies and plans.

The mechanisms for mainstreaming will vary from country to country. Each country, as sometimes each region within a country, has its own decision-making process that takes place in a unique political economy. In short, one size does not fit all; but the principles and individual practices and tools of ARM planning and implementation as discussed in this publication can generally be applied universally – as can the basic ARM cycle.

## Mainstreaming budgeting for ARM processes and strategies

Concomitant with incorporating ARM processes into the established processes driving the development and investment programmes for the food and agriculture system, is the need to ensure both the risk assessment and planning processes and the resulting risk management strategies are resourced adequately. As shown in these modules, ARM activities are extensive. They involve many people and require time and material resources. Each government and each level of government may have unique mechanisms and policies delineating the budgeting processes. What is critical is that funds are available not only for the eventual risk management strategies. Adequate funds must also be available for building the human, institutional and infrastructural capacity to plan and implement agricultural risk management processes. A substantial element of this is ensuring that support systems, especially information gathering and dissemination systems, are adequately funded and made available, accessible and affordable to all relevant stakeholders.



# Exercises & references





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**EXERCISES LESSONS I & II**

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**EXERCISES LESSON III**

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**EXERCISES LESSON IV**

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**EXERCISES LESSON V**

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**SELF ASSESSMENT**

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**REFERENCES**

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## EXERCISES LESSON III



### 3.1.

For this exercise, use the same ARM Strategy that was used for the exercise at the end of Lesson 4.1 and do the following.

1. Identify a part of the strategy you can develop as a project.
2. Develop an implementation plan using whatever system is used by your organisation, making sure that it addresses at least the following:
  - The overall aim of the ARM strategy
  - The specific objective of each of the tools
  - The results expected from each of the tools and overall
  - The activities required to implement the strategy
  - The resources (materials and human resources) required
  - Timeframes for activities and resources.
3. For at least one of the outputs of the plan, develop an activity plan including activities, resources, and budget.
4. Identify the structures needed to implement and monitor the plan.
5. Identify the systems needed to implement and monitor the plan including:
  - The monitoring indicators;
  - The methods to be used;
  - How feedback will be given; and
  - How the monitoring results will be used.
6. Consolidate an implementation timeline showing the activities and review dates.
7. Develop a consolidated monitoring plan using the template presented at the end of the lesson.









## 5.2. Regulatory and enabling environment

1. Identify regulations and policies in your country that improve the access of farmers to essential inputs and services that increase their productivity in an environmentally sustainable manner.
2. Identify regulations and policies in your country that help smallholder producers to raise their socio-economic well-being while facilitating their integration with value chains.
3. Identify regulations and policies in your country that facilitate entrepreneurs and agribusinesses to thrive in an economically, socially and environmentally responsible way.
4. Identify regulations, policies and systems in your country that are meant to ensure the safety and quality of agricultural goods and services.
5. Identify the commodity market policies in your country and determine how these policies answer the following questions:

What incentives do producers get from the set of market price policies and other direct support for the major commodities?

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What is the impact on producer incentives of policies toward input markets?

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How do border policies contribute to the level of incentives afforded by other price policies?

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6. Identify structural policies in your country (e.g. factor in market policy and expenditure on infrastructure) and determine how these policies answer the following questions:

Does the government influence the signals coming from the labour market in a way that taxes or subsidises agriculture?

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Does the government stimulate investment in the agricultural sector by making capital available at a concessionary rate?

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Does the land market inhibit agriculture, and if so, do government policies address such inhibitions?

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Do government policies provide adequate roads, electricity, water and other infrastructure in rural areas?

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What share of the consumer or export receipts reaches the farm sector, and how do policies affect that share?

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7. Identify non-agricultural policies in your country that might potentially affect the agricultural sector and determine how these policies answer the following questions:

Is there a bias against tradable goods, such as agriculture in the misalignment of exchange rates?

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How much does the level of protection in the non-agricultural sector influence the profitability of agricultural enterprises?

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Does the policy toward inflation and price stability encourage or discourage the farm sector?

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8. Research the situation in your country and identify any policies that regulate food quality and safety and answer the following questions:

What government regulations are in place to promote appropriate quality control and ways of helping farmers to meet the standards demanded by the market?

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What government measures are in place to participate in international trade as well as to protect domestic producers?

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What government measures are in place to help farmers participate in international trade as well as to protect domestic consumers?

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What government environmental measures are in place for farmers to run their enterprises in a way that does not degrade the environment?

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9. Research the situation in your country and identify any policies that regulate research and the deployment of technology and answer the following questions:

What government research policies are geared towards the needs of domestic agriculture?

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What government advisory service policies are geared towards the needs of domestic agriculture? .....

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What government technology policies are geared towards the needs of domestic agriculture?

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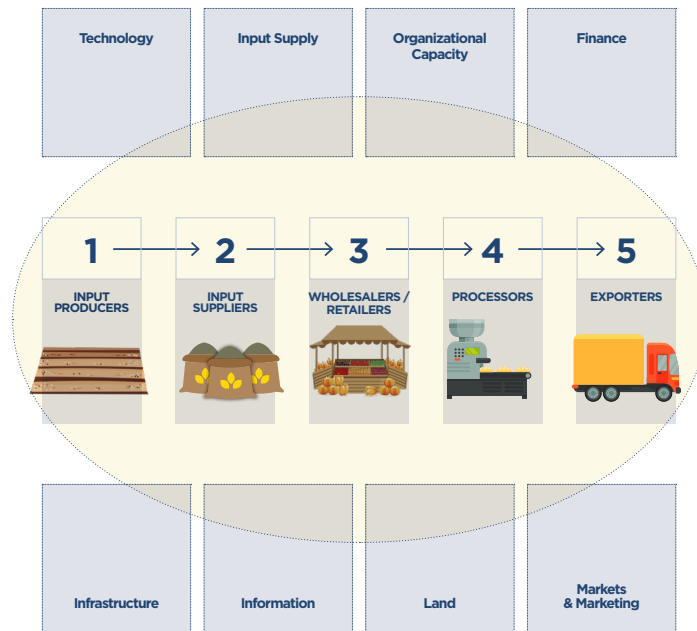
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### 5.4. Understanding the impact of constraints in the food and agricultural system on ARM

Choose any one of the Risk Management Tools presented in Module 3. Assess any constraints that are common in your country that might limit the ability of farmers to adopt the tool. To do this, use the following diagram to organise your assessment and consider the constraints of any farmer would be facing in terms of capacity regarding knowledge, skills, opportunity and institutional constraints in terms of structures and systems.



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### 5.5. Evaluating existing subsidies

Identify and evaluate subsidies in your country that impact ARM using the following criteria:

- 1. Stabilising food supply
- 2. Reduced agricultural imports.
- 3. Stabilised agricultural infrastructure (including land)
- 4. Provide Steady Income to Farmers
- 5. Government Intervention in the market place
- 6. Disadvantages farmers face in countries without subsidies
- 7. Lack of product diversity
- 8. Discrimination of other farmers/business operators
- 9. Harm to the environment
- 10. Targeting specific farmers
- 11. Market-based solutions
- 12. Exit strategies

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# SELF ASSESMENT

## LESSON I



### 1.1 Identifying tools for a farm-level risk management strategy



#### Exercise 2

Indicate if the following statements are True or False.

Agricultural Risk Assessment and Management can be carried out at any level.

True       False

Agricultural Risk Assessment and Management can be carried out by an individual farmer or business in the value chain.

True       False

Agricultural Risk Assessment and Management cannot be carried out by a group of farmers or businesses as a collective effort.

True       False

Agricultural Risk Assessment and Management cannot be carried out by agencies operating at the meso-level or by national agencies and structures at the macro-level.

True       False



#### Exercise 2

What are the two ways one can compare risk management tools?

a .....

b .....





### Exercise 3

Review all of the ARM Tools presented in Module 3. Which ones mitigate risk? Transfer risk? Copes with risk? At what level would the tool be applied? Add your answers to the following matrix.



### Exercise 4

Identify 5 more ARM Tools. Which ones mitigate risk? Transfer risk? Copes with risk? At what level would the tool be applied? Add your answers to the following matrix.

Risk Management Tool	Risk Mitigation	Risk Transfer	Risk Coping	Application Level
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				



### Exercise 5

Identify 5 more ARM Tools. Which ones mitigate risk? Transfer risk? Copes with risk? At what level would the tool be applied? Add your answers to the following matrix.

<b>Factor</b>
What it evaluates
Key Questions

<b>Factor</b>
What it evaluates
Key Questions

<b>Factor</b>
What it evaluates
Key Questions

<b>Factor</b>
What it evaluates
Key Questions

<b>Factor</b>
What it evaluates
Key Questions





## Exercise 6

Complete the following table for the Feasibility Factor for evaluating ARM tools

Resource	Question	Evaluation process
Human		
Systems		
Financial		
Physical		
Time		
Political will		

## LESSON II



### 2 Identifying tools for a farm-level risk management strategy



#### Exercise 1

What are the factors used to determine how easily an ARM Tool can be scaled-up and made available to multiple beneficiaries? Explain them.

Factor	What it means



### Exercise 2

How do you assess the capacity of an institution to be a partner in the ARM processes?

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### Exercise 3

Outline the steps to be followed when identifying and assessing policies that will aid you in implementing your ARM strategy.

Step	Explanation





## Exercise 4

Outline the steps to be followed when identifying and assessing policies that will aid you in implementing your ARM strategy.

Design Step	Explanation
1	
2	
3	
4	
5	
6	
7	
8	
9	

## LESSON III



### Implementing and monitoring a farm-level risk management strategy



## Exercise 1

Identify and explain the three things that need to be place in preparation for implementation

To be put in place	Explanation



## Exercise 2

What is required to make participatory implementation of a project effective?

1

3

4



## Exercise 3

Indicate if the following statements are True or False.

One of the challenges of project implementation is that circumstances on the ground may change in the time that has passed between project design and project implementation.

True  False

As you enter a project's implementation stage, it is not necessary to reconfirm that the situation that gave rise to the ARM strategy has not changed so much that the strategy is no longer relevant.

True  False

As you enter a project's implementation stage, you do not want to start a new round of negotiations, but you do want to make sure you can proceed with implementation.

True  False

Based on the outcome of the reconfirmation process, it may be necessary to make some adjustments to the ARM strategy and/or the implementation plan.

True  False



### Exercise 4

What is essential to determine when applying a participatory implementation approach that involves less formal and resourced structures such as farmers' organisations?

1

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### Exercise 5

What are some of the methods involved in conducting participatory monitoring?

1

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### Exercise 6

Indicate if the following statements are True or False.

A participatory approach is not generally slower than more administratively efficient (top-down) methods

True  False

A participatory approach is generally more sustainable and effective over the duration of the project.

True  False

A key element of finding the balance between efficiency and effectiveness is good communication.

True  False





### Exercise 3

Indicate if the following statements are True or False.

Evaluations look at the plan vs. the actual.

True  False

Evaluations are meant to be much more than a process of ticking boxes of achieved or not achieved

True  False

The quantitative aspects of an evaluation are more important than the qualitative aspects of an evaluation.

True  False

Many of the aspects of an evaluation will be the same as or similar to many of the aspects of monitoring.

True  False

The evaluation of a project's success will vary based on whose value judgement is used.

True  False

To truly understand the value of a project and the impact it has had, it is not necessary to embrace all views.

True  False



### Exercise 4

What is the key difference between monitoring and evaluation?

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### Exercise 5

Why is the difference between monitoring and evaluation important?

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### Exercise 6

Explain formative and summative evaluations and the key question they each answer to.

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**Formative Evaluation**

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**Summative Evaluation**

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### Exercise 7

Explain process, outcomes and impact evaluations, including their function and the types of questions they address.

Evaluation Type	Function	Types of questions
Process evaluation		
Outcomes evaluations		
Impact evaluations		



## Exercise 8

Name at least 5 possible objectives for an evaluation.

1

2

3

4

5

6

7



## Exercise 9

What are the aspects you need to cover when gathering data for an evaluation?

1

2

3

4

5

6

7

8



### Exercise 10

What are the three aspects you need to cover when analysing data gathered for an evaluation?

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1 .....

21 .....

3 .....



### Exercise 11

Identify and briefly discuss the six stages of an evaluation: plan; capture; analyse; report; utilise; and assess. For each stage, explain its purpose, how it is carried out and what is produced at the end of the stage.

#### Stage 1: Plan

Explanation .....

Purpose .....

How is carried out .....

Product .....

#### Stage 2: Capture

Explanation .....

Purpose .....

How is carried out .....

Product .....



**Stage 3: Analyse**

Explanation

Purpose

How is carried out

Product

**Stage 4: Report**

Explanation

Purpose

How is carried out

Product

**Stage 5: Use**

Explanation

Purpose

How is carried out

Product

**Stage 6: Assess**

Explanation

Purpose

How is carried out

Product

# LESSON V



## Exercise 1

Indicate if the following statements are True or False.

Governments are charged with fostering the wellbeing of all the individuals and families residing within its jurisdiction.

True       False

The development of farming businesses and markets for agricultural risk do not require macro-economic stability and a secure legal framework.

True       False

The presence or absence and the strength or weakness of these government-level measures do not affect the environment in which agricultural risk assessment and management are carried out.

True       False

Governments are responsible for preparing and implementing plans for catastrophic .

True       False

In addition to making economic adjustments, governments need to invest in research and development, increasing the flow of, and access to information and, above all, building human capital to meet the future

True       False



## Exercise 2

How can extension workers contribute to the development of macro-level policy?

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### Exercise 3

Name the three practical things governments need to do to provide an effective regulatory and enabling environment for all actors and stakeholders in the food and agriculture system.

1 .....

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3 .....

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### Exercise 4

Name the 6 indicators to measure the regulations governing agricultural businesses.

1 .....

2 .....

3 .....

4 .....

5 .....

6 .....



### Exercise 5

Briefly explain each of the following policy areas in the context of ARM..

Policy area	Explanation	Types of questions
Commodity Market Policy		
Structural Policy		
Macro Environment Policy		
Regulatory Environment		
Policy regulating research and the deployment of technology		



### Exercise 6

Identify at least 5 strategies that governments can use to target the poor:

1 \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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5 \_\_\_\_\_

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### Exercise 7

Explain how constraints influence risk assessment and management.

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### Exercise 8

Explain the role of extension workers with regard to constraints in the agri-food system.

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### Exercise 9

Identify the four things government must ensure with regard to providing relief in the wake of disasters.

1

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### Exercise 10

Explain the role of extension workers with disaster relief.

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### Exercise 11

Complete the following table about government investments in infrastructure to reduce risk in the value chain:

Supply Chain Specific Production, Marketing, Processing		External to the value chain		
Production	Marketing, Processing	Support Service Providers	National	International
Risk Reduction or Mitigation				
Risk Coping				



## Exercise 12

Indicate if the following statements are True or False.

Technology can facilitate the adaptability that will be increasingly required as climate change and other forces drive the future.

True  False

ICTs can help take innovations to farmers and business operators and provide them with a range of information that can be used in value chain processes as well as in risk assessment and manages.

True  False



## Exercise 13

Complete the following table Government investments in technology to reduce risk in the value chain.:

Supply Chain Specific Production, Marketing, Processing		External to the value chain		
Production	Marketing, Processing	Support Service Providers	National	International
Risk Reduction or Mitigation				
Risk Coping				



### Exercise 14

List the four key constraints that limit farmers' access to markets:

1 .....

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### Exercise 15

Complete the following table outlining public and private options for strengthening farmer links to the market.

Issue	Public sector		
	Public Investments	Policy Environment	Private Sector
Lack of access to markets			
Weak technical capacity			
Lack of market information			
Meeting quality standards			
Meeting contract conditions			
Farmer exposure to risk			





## Exercise 16

Why is government intervention and support in risk management needed in most countries?

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## Exercise 17

Identify some of the potential roles of government in agricultural risk management for each of the following:

Market creation	
Modifying market incentives	
Risk reduction and mitigation	
Coping with risk	



## Exercise 18

Define subsidies and explain their pros and cons.

Definition	
Pros	
Cons	



### Exercise 19

Identify and explain the three design principles for 'smart' subsidies. .

Principle	Explanation



### Exercise 20

Explain the role of extension workers with regard to subsidies information systems.

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### Exercise 21

What are "information systems" and why are they important to ARM?

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**Exercise 22**

Explain the role of extension workers within information systems.

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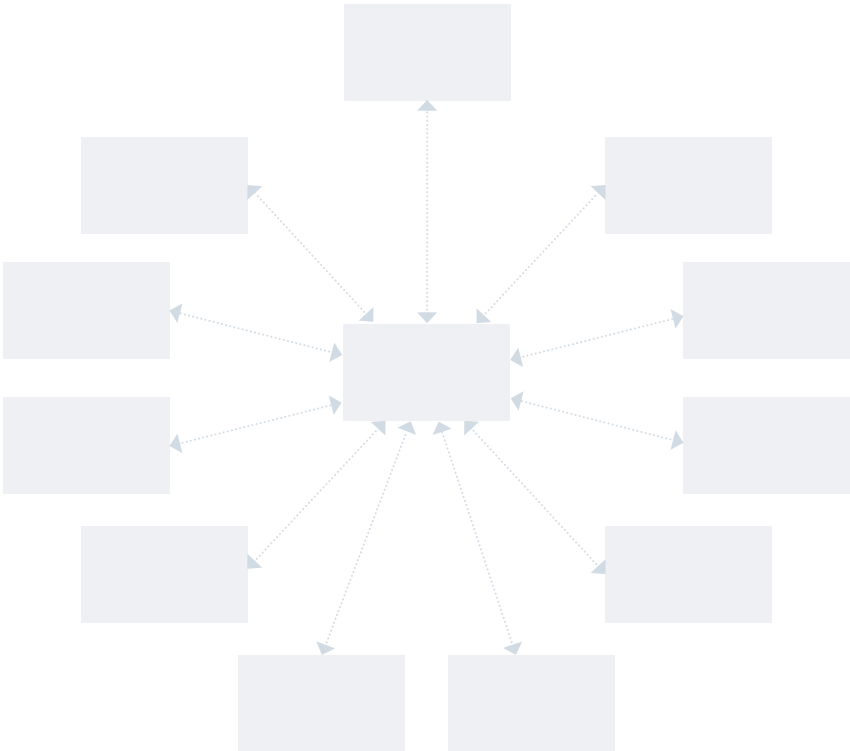
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**Exercise 23**

Complete the following diagram about developing flexible information systems.





### Exercise 24

Explain each of the following information systems and why they are important to ARM.

**Production Information Systems**

Explanation

Importance to ARM

**Market Information Systems**

Explanation

Importance to ARM

**Weather Forecast and Early Warning Systems**

Explanation

Importance to ARM



### Exercise 25

What is the underpinning of sustainability?

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### Exercise 26

Explain the following terms in relation to developing human capacity.

Knowledge	
Skill	
Opportunity	



### Exercise 27

Explain the role of extension workers with regard to building human capacity at the macro-level.

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### Exercise 28

Why are partnerships and networks important for ARM?

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### Exercise 29

How do partnerships and networks help with risk mitigation and transfer?

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### Exercise 30

Explain the role of government in strengthening social networks in relation to ARM.

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### Exercise 31

Explain the role of extension workers with regard to building partnerships and networks at the macro-level.

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### Exercise 32

What is advocacy and why is it important to ARM?

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### Exercise 33

Identify and explain the 9 steps to developing an advocacy programme.

Step	Explanation
1	
2	
3	
4	
5	
6	
7	
8	
9	



### Exercise 34

Explain the role of extension workers with regard to advocacy at the macro-level.

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