

Platform
for Agricultural
Risk Management

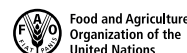
Managing risks
to improve farmers'
livelihoods



CAPACITY
DEVELOPMENT | 02

Introduction

Agriculture risk management in developing countries: a learning course for practitioners





PARM
PLATFORM FOR
AGRICULTURAL RISK
MANAGEMENT

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Risk Management

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Introduction

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 Introduction

This introduction 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.

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.

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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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Introduction

In most developing countries, agriculture plays a major, if not central, role in the national economy, in the livelihood strategies of a large percentage of the rural population, contributing to their food security and general wellbeing. Agricultural production affects the availability, accessibility and utilization of food, fibre and fuel. It also affects employment and spending patterns of most of the population. In such settings, when agriculture in all its facets is at risk, the economy of the country and region as well as the food security and the wellbeing of its population is also at risk. Thus, the assessment and management of agricultural risk is important to the agricultural sector, food security, and the broader economy of developing countries.

Understanding agricultural risk and its management is a fundamental element of good governance be it at a local, district, provincial or national level. Households, farmers, input suppliers, value-adding businesses, commodity and consumer organisations, economic and technical planners and policy makers all need to be aware of, understand and be able to participate in assessing agricultural risk and in developing and implementing agricultural risk management strategies in a coherent manner.

Agricultural risk assessment and management is more than the decisions made by farmers. It is more than what happens in a specific commodity value chain or even within the collective combination of value chains. It encompasses nearly every facet of a country, region or area's economy and supporting infrastructure. It impacts on natural resources. It influences market prices for more than just food, fibre and fuel – reaching deep into the economy. As such, agricultural risk assessment and management must be approached holistically.

Further, agricultural risk assessment and management is affected by several factors and constraints. Key among these are land tenure, the level of technologies and their availability, and climate and climate-change. Agricultural risk affects and is affected by domestic and international politics, labour markets and consumer markets, how economies are structured, where value-adding is located, the level of rural industrialisation, the nature and premise of urban industrialisation, the state of infrastructure and the ownership of the factors of production. And it is affected by such fundamental issues as education, who has a general.

Thus, it is critical that all relevant stakeholders are able to engage and intelligently rigorously in assessing agricultural risk and planning and implementing agricultural risk management policies and strategies – whether those parties be farmers and households (operating at the micro-level), role-players in and around the value chains and local communities (operating at the meso-level), or policy makers and decision-makers (operating at the macro-level). Thus, one of the primary purposes of this publication is to build the capacity needed to participate in identifying and assessing and planning, implementing and evaluating relevant risk management strategies.

Risk is a part of management

Risk represents a specially-focussed and important aspect of management in farming, business, policy making and daily lives. In many cases, agricultural risk is viewed largely from the point of view of the farm. However, in reality, agricultural risk also affects the broader agricultural system and sector. It affects households, farms, off-farm activities, actors in individual and collective agricultural value chains and broader agri-food systems. Thus, agricultural risk and risk assessment and management must be looked at holistically. In a holistic approach:

- the focus is not on a single farm activity, but rather on the whole farm or farm-household system;
- individual risks are not considered in isolation, but rather, the interrelationships among different types of risk are recognised and addressed as a whole;
- ARM strategies do not focus on a single tool, but on all tools available and relevant to address identified risks; and
- risk and its impact is from a broad perspective that involves a wide range of stakeholders - farmers, governments and value chain actors - as well as linkages and impacts on economic and production systems, social and cultural relationships, the natural environment; and political and institutional settings.

In this broad context, agricultural risks are taken to be any and all uncertain events that have the probability to cause losses somewhere within the agricultural system of an area, district, region or country - and, of course, at the level of the individual farm. At each of these levels, the element of uncertainty is present. As a symptom, yield volatility might be caused by the risk of a drought in a region or of an outbreak of pests or disease at district level.

It is important in the context of the learning presented in this publication that it be clear that there is a difference between a risk and a constraint, and between a risk and a trend. Constraints can be seen as systemic and perhaps persistent limitations in the agri-food system or even the wider economy that inhibit efficient operations. This might include less storage capacity than required, poor condition of infrastructure such as roads and telecommunications, or lack of knowledge and skills for critical functions within the agri-food system. These are predictable and known. Risk, on the other hand, relates to the unpredictability of issues related to one or more of the elements of the entire agri-food system. Risk can occur for the whole system, as well as for any of the individual elements within the system, including pre-production, production, post-production value adding, markets, support services (e.g. finance, roads, communications, research and agricultural extension). Risk (as opposed to a constraint) encompasses the presence of uncertainty and the probability of losses. Matters are less predictable; cause and effect are less clear. The element of certainty is not present.

Similarly, trends are different from risk - again, because they are known and generally predictable. Trends refer to changes in recognised patterns that occur within the agri-food system. For example, one pattern might be that if the rains are late, market prices for food crops increase. A trend might be that the rate of the increase of food prices (caused by late rains) has been decreasing (perhaps because of the availability of alternate sources of the food). Farmers can prepare for this. A risk related to such a trend would be an unexpected change in the trend - thus making it more difficult to prepare for.

The risk assessment and management cycle

This publication is generally organised around the risk assessment and management cycle as shown in Figure 1. The cycle has five stages: Identifying potential risks; Analysing Risk Data; Identifying Tools, Planning, Implementing and Resourcing; and Monitoring and Evaluating.

Figure 1: The risk assessment and management cycle



Each of these stages will be discussed in greater detail as the lessons are presented. Table 1 provides a very brief overview of each of these stages.

Table 1: Risk Assessment and Management Cycle elements

Stage	Main operation and function of the stage
Identifying Potential Risks	Identifying potential risks relevant to the agri-food system through gathering quantitative and qualitative data
Analysing Risk Data	Analysing data gathered in the risk identification stage to determine the likelihood and estimate the impact of the identified risks
Identifying Tools	Identifying, assessing and selecting risk management alternatives (tools, strategies and policies) to reduce the likelihood and/or impact of risk
Planning, Resourcing & Implementing	Developing actionable plans that incorporate the identified tools, providing resources for, implementing and monitoring the plans that have been developed.
Evaluating	Evaluating the effect of the risk management plans that were implemented.

Each of these stages has a number of steps or processes to follow. The various lessons in this publication address these processes and provide tools and instruments to use to carry them out.

A framework for understanding the complexity of ARM

Agricultural risk management is complex and covers a wide spectrum of stakeholders, domains and activities. To be able to embrace this complexity in a holistic fashion requires a clear but comprehensive framework.



The holistic approach

The holistic approach to agricultural risk assessment and management covers two broad aspects: assessing and managing a wide variety of risks with respect to each one, separately; and assessing and managing risk with respect to the system.

Applying a holistic approach with respect to the risks

Once risks have been identified, it is tempting to assess and manage each risk individually. On the surface this should be a 'simple' task, but in the real world, risks rarely present themselves individually, and rarely are they fully independent of one another. Thus, applying a holistic approach with respect to the risks requires:

- Analysing all sources of risk (not just individual risks) and how they collectively affect the farm or value chain business; and
- Analysing all potential tools and strategies and how they collectively address the occurrence and/or impact of risk.

This is particularly important when assessing and managing risk for a single farm, value chain business, commodity or other singular element within the agri-food system.

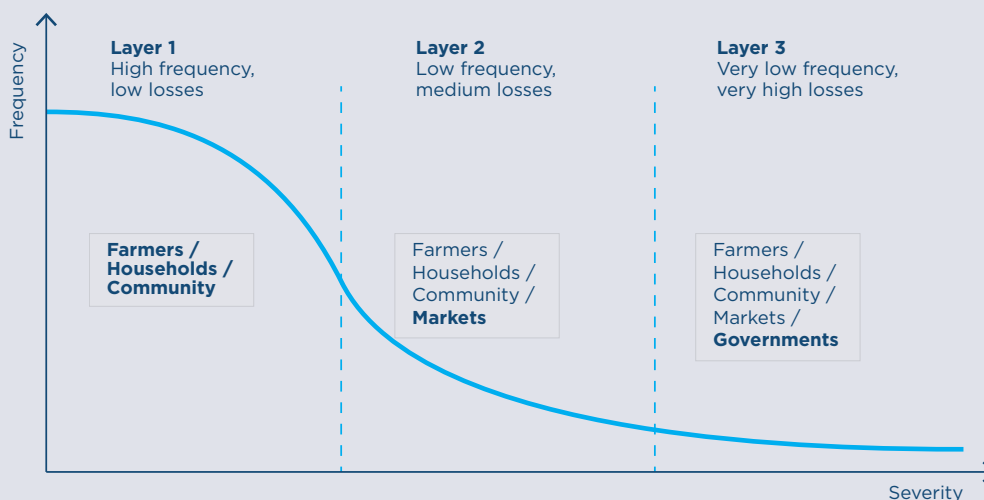
Applying a holistic approach with respect to the system

While it is important that risk is assessed and managed at the level of a single element of the agri-food system, it is also important to assess and analyse risk as it relates to multiple levels in the system. This requires:

- Defining different layers of responsibility for risk assessment and management depending on the nature of the risk as determined by likelihood (frequency) and severity (potential for damage)

The diagram below indicates three layers:

- Frequent, low-damage risks that are the responsibility of farmers and value chain business operators;
- infrequent but very damaging and systemic risks that are beyond the capacity of farmers and value chain business operators, markets and communities to cope; and
- The 'middle layer' in-between that can be managed through market tools.



Source: Author's elaboration, adapted from Choudhary *et al.* (2016)

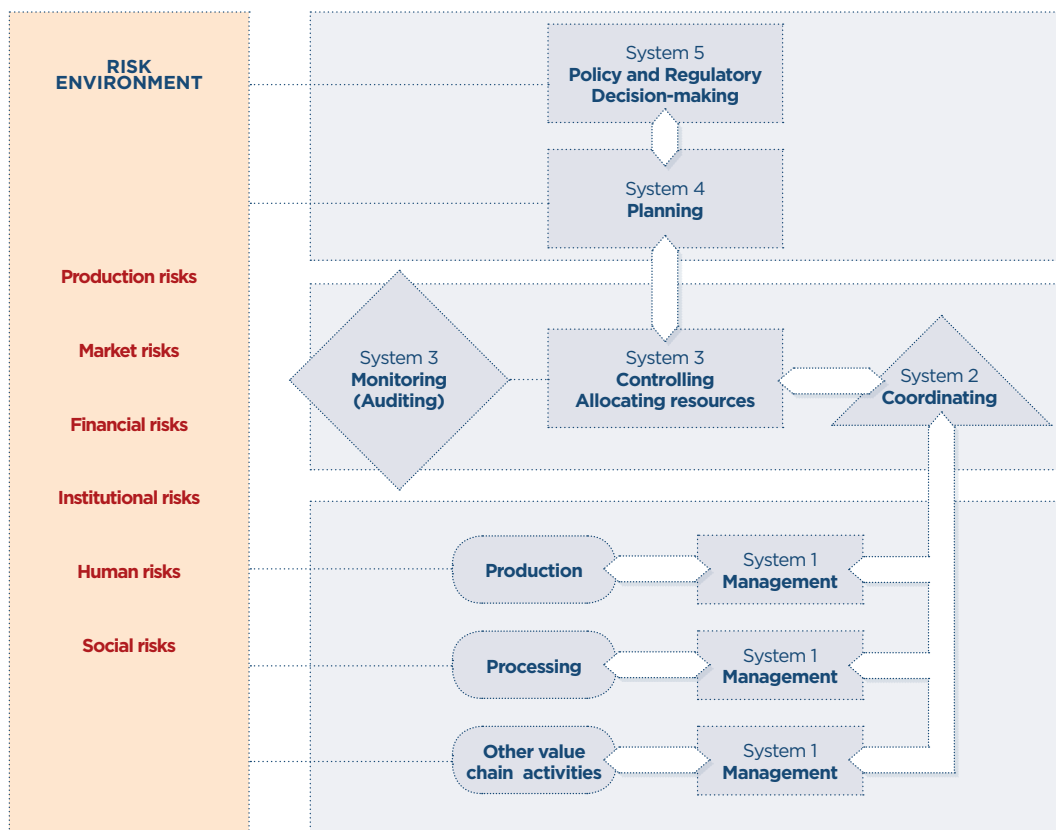
A useful way to look at the framework for agricultural risk management is by adapting Beer's Viable Systems Model VSM (Espejo and Gill, 1997), see Figure 1. The VSM consist of five systems each with a critical function in the overall system – which, in this case, is the agri-food system of an area (e.g. municipality, district, region or country). The five systems operate at three distinct levels of systems within an overarching system as follows:

- System 1 operational systems including production, processing and other value chain activities;
- System 2 & 3 coordinating and managing systems such as cooperatives, extension and advisory services, information services.
- System 4 & 5 intelligence and governing/policy-making systems such as boards of directors, government ministries.

Each of these three levels of system interact with an external environment which, among other things, represents the spectrum of risks encountered by the overarching system.

The three levels of systems correspond with the framework of three levels used in this publication: the micro-level; the meso-level; and the macro level. These three levels are important distinctions; role-players and other stakeholders in each of these levels of operation will have a different perspective on agricultural risk management and will have different motivations and strategies to manage agricultural risk. Let us look at each of these levels in greater detail. Bear in mind that, while you as a learner may fit into one particular level, it is important that you understand how your position fits into the wider picture so that your decisions are coherent with the overall agricultural risk management programme.

Figure 2: Viable Systems Model



Source: Beer, 1984

As a practical illustration of this concept, consider this statement from the World Bank (World Bank, 2011): “For governments, the fiscal implications of social safety net payments or the rebuilding of damaged infrastructure can be serious. For insurers, sudden losses suffered by a large number of policyholders places a strain on their reserves and financial stability. For farming communities, there is often no other option than to sell assets, normally at distressed prices.” In this instance, “governments” are macro-level role-players, insurers are meso-level role-players, and farmers are micro-level role players. Each level is affected and concerned about different aspects and impacts of agricultural risk. Each level will develop agricultural risk management strategies in response to these risks.

While each of these levels has a role to play in the full spectrum of identifying and analysing risks and planning, implementing and evaluating risk management strategies, as the learning unfolds in this publication it will become evident that the primary focus broadens as the level increases. The micro-level focuses primarily on risk mitigation. The meso-level looks at risk mitigation and risk transfer. And the macro-level embraces risk mitigation, risk transfer and coping strategies. The concepts of mitigation, transfer and coping are discussed in detail in Module 1.

Micro-level

The micro-level comprises those actors in the system that operate on the ground, producing products or delivering products or services as defined by the organisation's primary function. Farmers operate at this level – with their primary function being to produce food, fibre and/or fuel. Households also operate at this level – with their primary function in this context being to ensure the livelihood and food security of the family. Individual businesses that process, transport, store and/or package products also operate at the micro-level. Similarly, businesses that provide genetic material, production inputs such as fertilisers and pesticides, and production equipment and tools also operate at the micro-level.

The primary concern of actors at the micro-level is the survival of their respective farms and businesses. They will assess and plan for risk primarily from the perspective of how it will affect their ability to fulfil their primary function. The fundamental aim of assessing risk is to identify those risks that will impact directly on their production activities – or in the case of household, on their ability to maintain the family. They will look into the environment in which they interact – the natural environment, the economic environment, regulatory environment, etc. – to identify the range of risks and the potential impact they would have on their operations and objectives. Having determined which are the most 'dangerous' risks, they will make plans to manage them. They will look for ways to avoid some of the risks and for ways to limit the impact of others.

While they may be aware of the bigger picture, and will understand they have a role to play in the wider agricultural risk management environment and processes, their primary focus will be at their 'micro' level and how risk will affect the immediate space in which they operate.



Farmers in Thailand worry about input and product prices

Smallholder farmers in Thailand were asked to identify the most important sources of risk to their farms. They identified two: the uncertainty of input prices; and the uncertainty of product prices. These risks directly affect their farm incomes. The prices of their major cash crops (rice, cassava and sugarcane) are unstable and are dependent on supply and demand in both local and international markets. The prices of the major farm inputs also fluctuated greatly. In both cases, the risk was out of the control of the farmers. In response to this, the farmers felt that production and financial strategies were more important managerial responses to risk than marketing strategies. The main production strategies were storing feed and seed reserves and having a farm reservoir for water supplies in the dry season. The main financial strategies were holding cash, liquidating assets and working off farm to supplement household income.

Source: Aditto, Gan and Nartea (2012)

Meso-level

Still using the VSM, we see the next level of role-players and stakeholders as those who provide some level of coordination and/or collective management of activities or the wider operational environment in which the micro-level role-players operate. The primary function of meso-level actors is facilitation and communication. They will gather and interpret data from the perspective of the whole system. For example, a farmers' association may look at the changes in weather and climate to determine how it will affect the overall performance of its members.

A commodity marketing organisation will be concerned about the overall supply and demand for their commodity and how fluctuations in market prices might affect their sector of the industry. A government- or NGO-run extension service working with smallholder farmers may be concerned about how farmers will be affected by climate change or unanticipated changes in markets and in technologies.

Similarly, insurance companies and credit providers will look at agricultural risk both as micro-level role-players, as well as meso-level role-players. At the micro-level, they will assess what risks will impact their profitability. At the meso-level, they will also be concerned about the impact of risk throughout the sector in which they are involved. They will have keen interest in ensuring that farmers are taking steps – and perhaps helping them to do so – to identify and then avoid or reduce the impact of risks. While a farmer may take out insurance to protect himself against a particular risk, the insurance company will want to look to ways to reduce the number and value of claims they might have to pay out.



Risks related to producer organisations and the market: farmers' organisations and the market in Mali, Rwanda, Uganda and Ethiopia

Producer organisations and farmer cooperatives are traditionally the prime movers in strengthening the market position of smallholders in both their capacity to meet market needs and their negotiating power. Being democratically organised voluntary organisations, the governance structures of the various farmers' organisations reflect the educational level of the farmers who volunteer for board functions. Even when programmes to train board members have been set up, regular elections make training a recurring effort. Union structures mitigate the governance risks by their institutionalised capacity-building activities and supervisory functions. For chain actors, especially the off-takers of farm produce, producer organisations are a valuable conduit for improved farm supplies and farm finance. In these programmes both parties want to be certain that the producer organisation can perform its functions. Several risks are related to the strength of the producer organisation since the producer organisation will use its negotiating power to mitigate the market risks through trade arrangements with chain actors.

Source: Food & Business Knowledge Platform & Platform for Inclusive Finance (2014)

Macro-level

Macro-level role-players are those organisations and agencies that are responsible for strategic planning and policy making for whole sectors and groups of sectors. Government is a good example. While government is interested in what is happening in the agri-food sector, it will, at the same time, be interested in what is happening in other sectors of the economy for which it is responsible. And, it will be interested in how these sectors influence each other. Macro-level actors are the over-seeing agency that attempts to balance what is happening within the whole system with the all-encompassing environment in which that whole system operates.

Other critical stakeholders at the macro-level are social and agricultural researchers and research institutions as well as national (or international) commodity boards that control, promote production, and support marketing, trade and farm incomes for specific commodities. These boards may be public or private entities, parastatal entities or jointly public/private partnership entities – each with varying levels of autonomy.

Risk assessment and development of risk management strategies depend on reliable data across a wide range of disciplines. Agricultural research will, logically, investigate ways for producers to reduce their vulnerability to risks that threaten their ability to produce. Similarly, economists, climatologists and marketing specialists will investigate the potential risks themselves – covering such issues as price fluctuations, climate events and changes in domestic and international markets. Welfare economists and allied researchers will look to anticipate the impact of the many identified risks. And while each of these areas will have a line of research on which they focus, sound agricultural risk assessment and management will require that the information generated by these separate lines of investigation are integrated to create a holistic picture of the potential risks and their concomitant potential impacts. Together, the macro-level actors will take a lead in identifying and analysing risk across the agri-food sector and in planning, implementing and evaluating risk management strategies aimed at sector-wide impact.



The 2014 Sahel Humanitarian Plan to response to the risk of widespread food insecurity

Agriculture is the main source of food and income for the majority of the population in the Sahel. Agricultural and livestock productivity is dependent on volatile weather conditions and the poorest rural households tend to sell their labour instead of working their own land in order to ensure minimum revenue, making them highly dependent on markets.

(...)

(...) Refugees and internally displaced populations in the Sahel are at particular risk of food insecurity. Along with host populations, they will continue to need food and livelihood assistance to avoid falling into crises and reaching emergency levels. Households under stress of food insecurity remain highly vulnerable and will require support to protect their livelihoods. They may also require emergency assistance during the lean season.

The 2014 Sahel Humanitarian Response Plan was a 3-year plan (2014-2016) that reflected a new approach to humanitarian response in the Sahel, adapted to the challenge of building the resilience of the most vulnerable population to recurrent crises. It covered nine countries: Burkina Faso, Northern Cameroon, Chad, The Gambia, Mali, Mauritania, Niger, Northern Nigeria and Senegal. The response plan included:

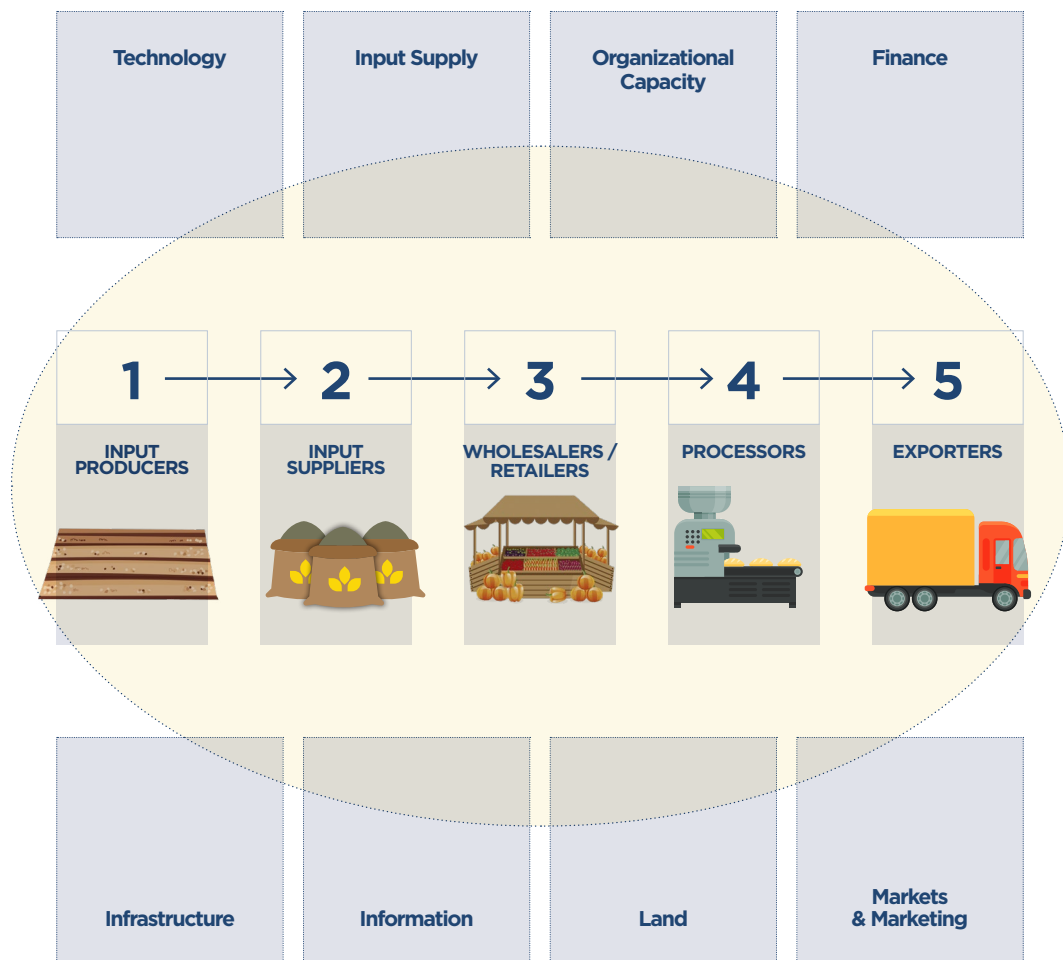
- Collecting data on risks and vulnerabilities and analysing and integrating the results into humanitarian and development programmes.
- Supporting vulnerable populations to better face shocks by responding to early warning signals, reducing the length of post-crisis recovery and reinforcing national actors' capacities.
- Providing coordinated and integrated life-saving assistance to people in emergency situations.
- Enhanced inter-agency cooperation and coordination to create cross-sectoral synergies among agriculture, food assistance, nutrition and water-related activities.

Source: FAO (2014)

The framework for learning

To help create coherence of learning, this publication has adopted a number of frameworks for learning. The VSM is one. Another is set out in Figure 2 which has been adapted from the Agricultural Extension Learning Carousel (Worth, 2014).

Figure 3: The Framework for Risk Assessment and Management at the micro-level (Worth, 2014).



As seen in Figure 3, the framework covers eight elements or activities associated with managing the core business of a farm or value chain business: information management; organisational capacity; finances; markets and marketing; input supply; infrastructure; technology; and land. These are generally common to all actors in the agricultural system. These elements and the risks associated with them will be covered specifically in more detail in Table 6.

While these activities can be looked at individually, the approach taken in this book is, again, holistic. The focus is not, for example, on a single farm activity, but on the whole farm or farm-household system and all stakeholders involved in the agricultural sector, and system of risks and their relations.

All agricultural undertakings exist for a purpose. Farms generally exist to produce food for the household, to generate income for the household through the sale of agricultural products, or for a combination of both. Similarly, businesses in the value chain(s) and in the agricultural support sector also contribute to production of food, fibre and fuel in a geographic area – be it local, district, regional or national.

Most farms and related businesses (especially smaller-scale enterprises) will focus on risk related to the primary activity of the enterprise. Farmers direct most of their attention to production activities. When assessing the risk of their farms, farmers are often pre-occupied with risks that affect yield. Similarly, packinghouse owners direct their attention to the activities directly related to processing, packaging and distribution. Other businesses in the agricultural sector will do likewise.

However, experience has shown that there are other areas that impact on the health of the farm or business and that are also exposed to risk – and for which risk management strategies are needed. Therefore, in addition to the usual areas of risk assessment and management, this publication addresses risk from a wider perspective. Thus, one perspective is risk related to managing the farm or value chain business.

A second perspective is risk related along the eight elements of the Carousel throughout the whole of the agri-food system. While farmers will be concerned with risk in each element as it relates to his or her farm (i.e. at the micro-level), at the other end of the spectrum, policy-makers will be concerned with risk in each element as it relates to the system as a whole (i.e. the macro-level).

The framework employed here is applicable for all three levels (micro, meso and macro). As already noted, it lends itself to a commodity specific value chain in which farmers may find themselves, the agri-food system, and the agricultural system as a whole. It also lends itself to meso- and macro-level risk assessment and planning by enabling these two higher levels to target risk in whole areas of operation, including the impact of risks in the agri-food system on other aspects of the locality or country such as health, education and the overall economy. For example, while a farmer might be concerned about risk related to markets for the farm, a policy-maker will want to look at the risk in marketing agricultural products within the system as a whole. Import/export of agricultural products are often embedded in broader regional trade agreements – and changes in these create risks beyond the immediate reach of individual farmers and value chains. Similarly, an agricultural bank looking to establish debt protection policy, will be concerned about unexpected changes in macro-economic policies and organisational capacity amongst its intended clients. And, finally, social welfare planners and those dealing with wider economic planning, infrastructure planning and fiscal planning will be concerned about how risk in agriculture and its management will impact the decisions made in these areas.

Target Audience and assumptions applied in this publication

This publication is intended for three groups of audiences (1) Farmers/Operators in value chain businesses (micro-level); (2) Extension, associations and service providers in the serving the agri-food sector and other stakeholders in the broader agri-food system (meso-level) including commercial farmers with vertically integrated operations and value-chain businesses operating at more than just a local level (e.g. regional or national companies); and (3) Policy-makers and agencies that create the environment in which the agri-food and other systems function (macro-level).

While aimed at these three audiences, the ARM training material will be useful to farmers, extension workers, agricultural service providers and university students (to complement university textbooks and manuals with more practical material). However, it is important to note that the training offered is aimed at practitioners, not academics.

The learning obtained through this publication is self-directed. To facilitate this, the lessons are presented generally at the level of a qualified Extension Worker who has had some exposure to the principles of farm business management. However, the material has been developed in such a way that the reader need not have any particular training in farm business management. It provides terms, definitions and explanations about ARM concepts so that even the novice should be able to engage intelligently with agricultural risk assessment and management at the micro-, meso- and macro-levels.

Further, the general perspective of this publication is that of extension workers operating at the meso-level level, serving a geographic area such as a district or sub-region. The premise is 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.

To ensure consistency of learning, the term 'extension worker' is used throughout the publication. However, the learner could just as easily be an agricultural advisor, an agri-business consultant or a rural development officer working with smallholder farmers, or any similar agent working at the micro-level, but most likely attached to an agency that operates at the meso- and macro-levels. These agencies could include public or private sector extension and advisory services, private sector business service providers and NGO's.

The training materials are deliberately simplified, with exercises focusing on qualitative analysis with some quantitative analysis relying on limited data. The aim of the training is not specifically to develop capacity to conduct quantitative assessments. It is assumed that in low-medium income countries small and medium enterprises (SMEs) will not have the capacity to adopt sophisticated processes. Therefore, the programme aims at giving them skills and tools to make effective decisions based on qualitative and limited quantitative data.

The operating assumption is that each country will have its formal ARM processes and technical professionals. The self-learning training programme seeks to improve the ability of the target audience groups to engage more effectively with those processes and professionals – it does not seek to create professional technical competence in ARM among the target audience. It will enable the target audience groups to engage intelligently with technical risk assessment and strategy development.

Objectives:

- The publication should enable extension workers and other agents to assess farmers' exposure to risk and vulnerability whilst developing and implementing relevant ARM tools to deal with these risks.
- The publication should enable the extension service, service providers, farmers and other relevant stakeholders to engage intelligently with other agencies and processes in the development of a wider ARM strategy for a sub-sector or value chain.
- The publication should enable policy makers who are not trained professionals in ARM to engage with trained ARM professionals and formal ARM processes and to contribute intelligently to the development of ARM strategies for the agricultural sector or sub-sector as a whole or alternatively for an area - territory, region or locality.

Learning mode

This publication is designed to support self-directed independent learning, as well as form the basis for a training programme. All assessments have been developed as self-assessments which the trainee completes to monitor his or her own progress. In most cases the learning assignments can be done individually (independently) but some will require engaging others to obtain information or make observations.

While it is not specifically designed for this purpose, as noted above, the materials are also suitable for 'classroom-based' learning facilitated by an experienced facilitator with a background in farm business management and/or a related field. To this end, it is anticipated that this ARM training material will be used as support material for the ARM training of trainers (TOT) course (5-day course) that the Platform for Agricultural Risk Management (PARM) is building in partnership with universities and research centres in selected countries. The course aims to target extension workers and university students that could themselves be trainers of other extension workers, farmers and farmers' organisations.

Further, it is anticipated that this material will serve as a reference point to anyone who is dealing with agricultural risk management in a development context. To the best of our knowledge, there is no comprehensive material on the subject that is holistic and covers all parts of the risk management cycle.

Limitations of the course and the scope

Agricultural risk management is a complex field of study and operation. It can often involve highly sophisticated assessment and planning methods and tools across a range of disciplines, including agricultural management, agricultural economics, welfare economics, population dynamics, infra-structural analysis, climatology, and market analysis.

Another aspect of the complexity of agricultural risk management is the dynamic environment in which it is carried out. Risk assessment is an inexact science, and agricultural risk management is not fool-proof. Lack of access to useful data and information, varying views on the nature of markets and the responsibility of the state in the economy, varying levels of willingness to take risks and/or plan for risk on the part of a wide range of stakeholders, the inter-relationship of numerous dynamic factors influencing risk all make it impossible to fully measure and manage all the risks faced by the actors in the value chain and by others in the wider arena affected by agricultural risk.

It is beyond the scope of this learning book to address all of these methods and tools or to delve too deeply into these complexities. The book will, however, help the learner develop a basic understanding and provide some fundamental skills to enable him or her to engage intelligently in agricultural risk management.

Using these materials as training materials in a classroom or other more formal settings

This publication has been developed as a self-learning programme. As discussed earlier, the lessons are aimed primarily at people working at the meso-level – specifically agricultural extension practitioners. This category of agent covers a broad field including the more traditional extension workers, extension workers specialising in farm business management and/or entrepreneurship, as well as advisors who serve other actors (e.g. business operators) in the value chain or support services.

Each Module starts with a statement of learning outcomes and is then divided into lessons generally along the lines of the learning outcomes. Each Lesson is divided further into learning tasks. This arrangement of the learning materials facilitates using these lessons as a curriculum for a more formal course on agricultural risk management.

The exercises could be expanded to include local cases and/or to include case studies showing different contexts. Further, the exercises can be used as group activities to foster collective and collaborative learning. Finally, the exercises can be taken into the field where other stakeholders can participate in the learning process. And the results from the exercises can be used as a basis for individual and/or group presentations.

The assessments can be set and used as tests. They can also be used as collective learning exercises where answers from individuals in a group are discussed in that group to enhance learning. Additional assessments can be created (e.g. short papers) to give learners the opportunity to present their learning using their own words and in greater detail.

In many cases, references are provided including websites that provide the opportunity for more in-depth reading, investigation and study. These can also be used for additional assessments.

Particularly useful would be sessions where learners are able to talk with various actors in the agri-food system about how they assess and manage risk. Such sessions could focus on any or all of the three levels used in this publication. For example, at the micro-level learners could meet with farmers or value chain business operators to learn from them about how they address risk. At the meso-level, learners could meet with various agencies (e.g. extension and advisory services, commodity groups, NGOs, etc.) to learn from them how they engage their respective 'clients' with assessing and managing risk. And, at the macro-level, learners could meet with agencies responsible for various aspects of agricultural risk management such as policy-makers, agencies producing weather data and/or market data, etc. In each case, they could test to see how the concepts and tools presented in this publication are applied in a real world setting.

Using these materials for different audiences

As mentioned earlier, these materials have been developed from the perspective of an extension worker operating at the meso-level whose primary involvement with ARM is at the micro-level. However, the materials can be readily adapted for other audiences. Some ideas are presented below.

Extension Students / Trainee Advisors

Many educational and training programmes for agricultural extension workers and rural advisors have broadened their curricula to include topics related to farm management – an important part of which is ARM. This publication can be used as a text book or as reference material for such programmes. It provides clear and practical exposure to ARM. The exercises can be used as assignments for independent study by individuals or groups. By adding details of submission requirements, the exercises can be used as guidelines for short research papers or case-study projects. The assessments can be used as tests or incorporated into examinations. Where possible, the lessons in this publication could be augmented with field visits to and/or classroom discussions with farmers and value-chain operators.

Frontline Extension Workers /Production Advisors

Many frontline extension workers often serve almost exclusively as production advisors. They are able to help with technical issues regarding crop and livestock production. Often they do not have much training in other aspect of managing a farm enterprise. This publication can help train these workers and given them sufficient knowledge and skills to assist farmers assess the risks they face and develop appropriate strategies. The materials can as a training manual much in the same way as they might be used as a text book. The exercises will be particularly applicable as, with minor adjustments, they can be tailored to the extension workers' current programmes and activities. The lessons could be augmented with classroom discussions with other officials and service providers involved in ARM in their area, and also by classroom discussions/guest lectures from officials operating at the macro-level – particularly with respect to policy.

Agribusiness specialist Extension Worker

Presumably, most of the material in this publication would be familiar to an extension worker specialising in farm management or agribusiness. However, the materials can be used as a basis for refresher training in ARM. Given that these extension workers will already know the terms and concepts, Module 1 could be condensed to a short review. The rest of the modules could be used generally as presented, but with the addition of accommodating input from the extension workers' experience in the field. For example, exercises could be added to have the extension workers explain how the different stages of ARM are carried out in their organisation or area.

Planners and Policy-makers

Planners and policy-makers usually have a particular area of expertise or sectoral focus – and they generally work at the macro-level working to effect change across a broad front. This publication can help planners and policy-makers appreciate some of the complexities of ARM and the kinds of challenges faced by farmers, value-chain operators and those who assist them with the very practical aspects of ARM. The materials can provide them with insight into how their plans and policies might impact at the micro-level and how they might need to adapt their plans and policies to accommodate the realities on the ground to ensure they can be implemented as intended, with minimal unintended consequences. One simple contribution is that the materials can help ensure that common terminology and concepts are used. The materials are well-suited to short-courses or workshops to achieve some of these possibilities. The materials can easily be made into succinct audio-visual presentations; and in the workshops extension workers and perhaps even farmers can bring case-study stories of ARM from the frontline.

Outline of Modules, Lessons and Sessions

Each Module and its corresponding lessons has clearly stated learning objectives. The lessons are divided into Sessions in which content relevant to the objectives is presented. The lessons also provide practical exercises to reinforce learning. At the end of the lessons, self-assessments are provided to test how much has been learned.

MODULE 1

Understanding the risk environment in agriculture

This Module provides a broad and detailed understanding of the scope of agricultural risk assessment and management outlined. The module provides an overview of concepts and terminologies used in risk management and a typology of risks. It goes on to describe the risk environment that farmers face, which is holistic covering the entire agro-food system. The learning moves on to look at agricultural risk assessment at household level showing how livelihood strategies are affected by decisions made at the meso- and macro-levels. The module concludes with a section on the position of women in agricultural risk assessment and management. The module uses the Agricultural Risk Assessment and Management Cycle as the context for learning. This module addresses the first stage of the cycle: identifying potential risk.

The module is structured as follows:

LESSON I

Concepts and terminology In risk

SESSION 1	Definition of risk and uncertainty and related concepts
SESSION 2	Different types of risks
SESSION 3	Characteristics of risk
SESSION 4	Risk preferences of actors in the system and risk aversion
SESSION 5	Risk assessment
SESSION 6	Vulnerability and risk management

**LESSON
II**

Risk environment in agriculture

SESSION 1	The nature and role of risk in agriculture
SESSION 2	Consequences of risk in the food and agriculture system
SESSION 3	Major stakeholders in agricultural risk management
SESSION 4	Holistic approach to risk management
SESSION 5	The role of information in helping to prepare stakeholders to deal with risk

**LESSON
III**

Agricultural risk assessment at household level

SESSION 1	Agricultural risk assessment at household level
SESSION 2	Addressing the unique situation of women in relation to ARM planning


 MODULE
2

Assessing risk in agriculture

This Module explores developing risk profiles on the micro-, meso- and macro-levels, including assessing and building capacity of institutions within and related to the agriculture and food system to respond to risk. Learners are taught how to assess risks commonly encountered by farmers and how to rank or prioritize them on the basis of their impact on the farm revenue and farm family wellbeing. This module addresses the second stage of the cycle: analysing risk.

The module is structured as follows:


 LESSON
I

Assessing the farm and household level risks

SESSION 1	Measuring risk and its impact
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SESSION 2	Key concepts related to risk assessment
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SESSION 3	Qualitative risk assessment tools
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SESSION 4	Quantitative risk analysis
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 LESSON
II

Assessing local and national level risks and risk mapping

SESSION 1	Local and national risk assessments
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SESSION 2	Types of information for risk assessment
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SESSION 3	Information needed for assessing agricultural risk
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SESSION 4	Risk mapping
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SESSION 5	Examples of country risk assessment
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Agricultural risk management tools

This Module provides a menu of 12 risk management tools and strategies which can be considered after assessing risk. Some of these tools are, in fact, collections of tools that offer means by which to manage risk; as is the case with climate smart agriculture, which has several elements (e.g. minimum tilling) which can also be considered risk management tools in their own right.

In most cases, responding to risk requires developing an overarching strategy which will involve combination of risk management tools such as those presented in this, as well as other measures (e.g. policies and development programmes) designed to address constraints and broader issues that create the context in which risk occurs.

The module is structured as follows:


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How to deal with risks

SESSION 1 **ARM strategy and context**

SESSION 2 **ARM strategy and actors**


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Agricultural Risk Management Tools

SESSION 1 **Risk Mitigation Tools**

SESSION 2 **Risk Transfer Tools**

SESSION 3 **Risk Coping Tools**



ARM strategy decision-making process

SESSION 1 **Need for coherent and comprehensive ARM strategy**

SESSION 2 **Farm business management tools for ARM strategy decision-making process**

SESSION 3 **Support and follow-up for ARM strategy**

MODULE 4

Planning, implementing and evaluating ARM strategies

This module addresses the third, fourth and fifth stages of the cycle: planning risk management strategies; implementing risk management strategies; and evaluating risk management strategies. This module is written from the perspective of service providers (e.g. extension and rural advisory services) operating at the meso-level.

The module is structured as follows:

LESSON I

Identifying tools for a farm-level risk management strategy

SESSION 1

Selecting risk management tools and integrating into ARM strategies

LESSON II

Implementing and monitoring a farm-level risk management strategy

SESSION 1

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

SESSION 2

Getting technical and financial help to implement farm-level strategies

SESSION 3

Tailoring learning tools for farmers in specific locations

LESSON III

Implementing and monitoring a farm-level risk management strategy

SESSION 1

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

SESSION 2

Implementing the strategy

**LESSON
IV****Evaluating a farm-level risk management strategy****SESSION 1** Evaluation and why it is important**SESSION 2** Evaluation methods and tools**SESSION 3** Designing an evaluation of an ARM strategy**SESSION 4** Applying evaluations at different levels**SESSION 5** Examples of ARM evaluation plansels**LESSON
V****The Role of Policy in the ARM process****SESSION 1** The role of government: providing context**SESSION 2** Relief in the wake of disasters**SESSION 3** Investments to overcome technical barriers (Infrastructure)**SESSION 4** Addressing enabling systems**SESSION 5** Building Capacity within the Food and Agriculture System**SESSION 6** Advocacy**SESSION 7** Developing and implementing ARM strategy

REFERENCES

- Aditto, S, Gan, C & Nartea, GV. (2012) Sources of Risk and Risk Management Strategies: The Case of Smallholder Farmers in a Developing Economy. In: Risk Management - Current Issues and Challenges", Creative Commons <https://www.intechopen.com/books/risk-management-current-issues-and-challenges>
- Beer, S (1984) The Viable System Model: Its Provenance, Development, Methodology and Pathology. *Journal of Operational Research Society*, 35(1): 7-25.
- Choudhary, V.; D'Alessandro, S.; Giertz, Å.; Suit, K.; Johnson, T.; Baedeker, T.; Caballero, R. 2016. Agricultural sector risk assessment: Methodological guidance for practitioners. Agriculture global practice discussion paper no. 10. (Washington, D.C., World Bank Group). Available at : <http://documents.worldbank.org/curated/en/586561467994685817/Agricultural-sector-risk-assessment-methodological-guidance-for-practitioners>
- Espejo, R., & Gill, A. (1997). The viable system model as a framework for understanding organizations. http://www.moderntimesworkplace.com/good_reading/GRRRespSelf/TheViableSystemModel.pdf
- FAO (2014) Situation Update: The Sahel crisis. FAO, Rome. http://www.fao.org/fileadmin/user_upload/emergencies/docs/SITUATION%20UPDATE%20Sahel%20Janv%202014_310114.pdf
- Food & Business Knowledge Platform & Platform for Inclusive Finance (2014) Finance for Smallholders: Opportunities for risk management by linking financial institutions and producer organisations - Summary Report. https://agriprofocus.com/upload/Summary_Report__Finance_for_Smallholders1430244415.pdf
- World Bank (2011) Agricultural Risks and Risk Management, In: Weather Index Insurance for Agriculture: Guidance for Development Practitioners. World Bank: Washington DC.
- Worth, S (2014) "The facilitated learning agenda and the extension carousel" Paper presented at the Annual Conference of the Association for International Agricultural and Extension Education, Miami, FL, USA, May 2014, supplement to the *Journal of International Agricultural and Extension Education*, 21(2): 90-93. doi: 10.5191/jiaee.2014.21207



Module 1
Understanding the risk environment in agriculture



Module 2
Assessing risk in agriculture



Module 3
Agricultural risk management tools



Module 4
Planning, implementing and evaluating ARM strategies





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