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## **RISK MANAGEMENT IN ORGANIC FARMING**

### **Abstract:**

Considering organic production as a system of specific breeding or production of plants and animals, plant or animal products, processing and marketing, the paper discusses risk management in organic farming as a major task in sector development and management on different levels. The questions of risk management are concerned by the point of view that there should be a clear understanding of different sources and kinds of risks, as well as of the complexity of actions and responses. The study presents a summary of the risks in organic production, the relationship risk-profit and the process of risk management in organic farming.

### **Keywords:**

risk classification, risk management, risk communication, organic farming

**JEL Classification:** P49, P49

## Introduction

The recent and ongoing processes of business globalization, changes in governmental infrastructures, structural changes in business, new and fast changing technology show that globalization causes not only positive trends but challenges and risks as never before. Discussing challenges of globalization processes regarding food and agricultural non-food products' quality and safety, the questions on the safe production requirements and the international trade opportunities should be considered taking into account the fact that there are greater risks along with bigger advantages. The competition on international markets concerning security issues is bigger than ever before, as well as requirements regarding environmental protection and human health which impose higher investments and greater concerns on state, business and society levels. When discussing that topics from the point of view of agricultural sector, and organic farming in particular, the problems are not only in achieving satisfaction of consumers' demand but of assuring life standard of producers in rural areas, protection of traditions, history and local culture.

The agricultural production sector is a subject of many uncertainties having stronger consequences than in industrial sector. The question of understanding risks, assessing, treating and managing them is one of the questions being put special attention to in organic production too laid down in standards and rules approved and developing. The agricultural produce is a subject to many influences some of which are identified as threats or risks which in their essence are the same for conventional and organic farming but the commonly accepted opinion is that they are greater in organic because the peculiarities of that production method. The main notions in organic risk handling are the following: risk analyses (identification and evaluation of threats, their distribution and consequences), control (reducing the events' frequency and consequences) and management (the process of decision making and undertaking effective measures for decreasing the dangers and their effects/damages to the minimum). Taking into consideration that risk management is directed towards decrease in risk probabilities and use of organization opportunities to overcome the threats, the understanding of the nature of risks would allow the implementation of long-term sustainable practices in organic production. 'Organic' is a guarantee for quality and safety of produce through the all-embracing process of monitoring and control all over the whole production and trade chain. Thus risk management in organic production is a logic and systematic method of identification, analyses, evaluation, treating, monitoring and communication of risks in all the activities, functions and process in a way that reduces the risks to their minimum and balances profit and lost probabilities. Risk is being determined as the probability of an activity directly or not to damage environment, human health and life and is regarded in the relation exposition-effect and uncertainty conditions. On the other hand, communication is becoming more and more important in risk management processes which is concerned in the paper when dealing with the issue in organic production and especially in connection to the jeopardy of undertaking inadequate measures in result of misinformation and misunderstanding.

The questions discussed in that paper could be dealt with in different aspects from different points of view and on different levels. Special attention is put on crisis threats in assuring food security in agricultural production in conditions of general globalization and fast developing processes of urbanization. In fact, the organic standards, international and national strategic and legislative documents and standards all imply more or less risk assessment and management. In the discussion below the focus is put on the significance of risk management on different levels and on the need of having a clear understanding of different sources and kinds of risks, as well as of the complexity of actions and responses. The worst risk is to think that there is no risk, and doing nothing to prevent it (Radovic, 2012).

## Understanding risks' nature in agriculture

Organizations of any kind face internal and external factors and influences that make it uncertain whether, when and the extent to which they will achieve or exceed their objectives. The effect this uncertainty has on the organization's objectives is „risk”<sup>1</sup>. The risk may be defined as the potential deviation between expected and real outcomes. While this deviation may be positive or negative, a negative outcome has greater importance from a practical point of view and is usually the focus of decision-makers<sup>2</sup>. Thus, risk analysis should have a strong empirical base (Martin, 1996).

Agriculture is a sector facing particularly large risks, resulting mainly from natural factors outside the control of farmers. Among the special points when addressing risks in agriculture are<sup>3</sup>: volatility in agriculture is expected to increase; the responsibility to manage risks is increasingly in farmers' hands; agricultural producers will need to rely more heavily on market-based tools; for the sake of environmental sustainability, thus long-term food security, it is important to reward farmers for delivering public goods; public policy could be most useful in increasing the risk management ability of farmers.

Considering dependence of environmental and natural factors difficult to be influenced on or controlled, agriculture is a very risky business. Additionally, volatility of markets of agricultural produce implicates the need of an adequate response to market fluctuations. The economic stability of an entire rural area can be jeopardized by crises caused by different types of natural disasters, from climatic events to livestock or plant diseases. The economic situation of farms can be subject to strong variability due to a number of reasons (Bielza *et al.*, 2007): policy reforms, marked by trade agreements and market liberalization and the consequent reduction of prices paid to farmers; an unbalanced relationship between retailers, generally well organized to put a strong pressure on prices and farmers; sanitary measures and risk of animal diseases.

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<sup>1</sup> AS/NZS ISO 31000:2009. Risk management - Principles and guidelines.

<sup>2</sup>Risk management in agriculture. Towards market solutions in the EU. Deutsche Bank Research, September 2010.

<sup>3</sup>*Ibid.*

Another interesting point is the relationship risk- profit usually accepted that bigger risk implies bigger profit (Table 1). But this relationship is not so simple in fact, as well as the question of qualitative vs. quantitative approach in risk assessments.

**Table 1. The accepted presumption of the relationship risk - profit**

Profit probability \ Risk	Risk		
	small	medium	big
small	+		
medium		+	
big			+

The conclusion is that the requirements of market-orientation and sustainable development impose bigger responsibilities for both farmers and states and competent authorities. Along with knowledge and skills in agriculture and production technology, agricultural producers need managerial knowledge and skills, particularly in risk understanding, assessment and management.

## Risks' classification in organic farming

An important role for public policy is to empower farmers to take their own informed risk management decisions among a diversity of instruments and strategies<sup>4</sup>. That's why the question of understanding risks is very important, especially when handling different kind of risks, infrequent or frequent, regular or not, etc. The classification of risk into business (or production and price) and financial risk allows the impact of each of these sources of risk on the farm operation to be clearly monitored by observing their influence on yield, output prices and input costs, and residual cash flows to equity owners. However, it may obscure the subtle forces which impact on these yields, prices and residual cash flows (Martin, 1996). Apart from being categorized according to their sources, risks can be classified according to the frequency of the occurrence of negative events and the magnitude of their impact<sup>5</sup>. The question of making a clear classification of risk sources and risks in agricultural, and in organic production in particular, is a very tricky tasks but it is very important because of risk interconnections and interrelations and the need of considering different aspects in risk assessment and management (Arabska, 2014). The study presented in the paper proposes a classification considering all the risks as business (Table 2) embracing agricultural (production and technological) and non-agricultural risks (managerial and social).

<sup>4</sup>*Ibid.*

<sup>5</sup>*Ibid.*

Price risk and production risks are usually considered the most important in agriculture<sup>6</sup> but the study adds communication and profit risks to that notion too.

**Table 2. Interconnected and interrelated risks in agriculture and organic production in particular<sup>7</sup>**

Business risks									
Agricultural / Technological				Communication risks	Non-agricultural			Profit risks	
Yields risks	Production risks				Managerial risks	Social risks			
	Specific primary production risks				Institutional and regulatory risks	Informational risks- information shortage, misinformation, etc.			
	Climatic risks	Environmental risks and disasters			Management and organization risks – incl. human resources risks	Seasonality risks			
		-weather conditions - temperature, rain, sun, etc. and climate change -extreme weather events - frost, droughts, floods, storms, etc.				Research, development and knowledge transfer risks			
	Sanitary risks	Ecological risks			Market and marketing risks  Incl. Price risks – inputs and outputs	Society risks			
		-pests, diseases and weeds risks -epidemic diseases -GMO risks -Pollution risks (land, water, etc.)							
	Input risks, incl. supply risks				Administrative risks	Local development risks			
	Post-harvest production risks	Processing risks			Financial and investments (land, facilities, equipment, technology and other) risks	Life standards and purchasing power risks			
		Storage risks							
Sorting and packaging risks			Unfair competition risks		Intentional or non-intentional violations risks- incl. theft, warfare, terrorism, etc.				
Transport and distribution risks									
Price risks									

<sup>6</sup>*Ibid.*

<sup>7</sup>Modified from Arabska E. (2014) Organic production – innovations and sustainability challenges in development framework and management. Lambert Academic Publishing, ISBN 978-3-659-56379-9.

## Risk management in organic farming

Risk management in agriculture is important on several grounds: even if reducing farming risk does not always improve farmers' welfare, failure to manage risks has direct repercussions on farmers' incomes, market stability and potentially food security<sup>8</sup>.

Risk management can be applied across an entire organization, to its many areas and levels, as well as to specific functions, projects and activities<sup>9</sup>. Risk management can be viewed as a range of techniques and tools which can be applied in order to avoid or minimize losses and to utilize opportunities<sup>10</sup>. Discussing agricultural production, and organic in particular, it could be implemented on different levels: on-the-farm or in community (state and society), local, national, regional or international level. Farmers have a wide variety of options to manage risk, ranging from strategies to reduce risk (for example through appropriate production technologies) through approaches to mitigating risk (e.g. through diversification and various market instruments such as insurance and futures markets) to possibilities for coping with risk (mainly through financial instruments) (Tangermann, 2011). This is one of economic branches with high impact of state through risk-related policies and risk management activities, especially assuring food safety and assessing probabilities and possibilities of emergencies, making decisions and communication and involving many agencies and services. Several key factors should be considered when selecting risk management options during a food safety emergency<sup>11</sup>: capacity issues; uncertainty about the nature of the risks; public expectations and perceptions; legal considerations; industry considerations; international considerations; other considerations. Risk-related policies should adopt a holistic approach, rather than dealing with individual risks separately; risk management should be clearly distinguished from farm income support (Tangermann, 2011).

In search for a common framework, there should be mentioned that ISO 31000 is a family of standards considering risk management and providing common principles and guidelines (Table 3).

**Table 3. The family of standards in relation to risk management according to the International Organization of Standardization <sup>12</sup>**

ISO 31000:2009	ISO/TR 31004:2013	ISO Guide 73:2009	IEC 31010:2009
Risk management – Principles and guidelines	Risk management – Guidance for the implementation of ISO 31000	Risk management - Vocabulary	Risk management -- Risk assessment techniques

<sup>8</sup>Risk management in agriculture. Towards market solutions in the EU. Deutsche Bank Research, September 2010.

<sup>9</sup> AS/NZS ISO 31000:2009. Risk management - Principles and guidelines.

<sup>10</sup>Risk management in agriculture. Towards market solutions in the EU. Deutsche Bank Research, September 2010.

<sup>11</sup> FAO/WHO guide for application of risk analysis principles and procedures during food safety emergencies. Food and Agriculture Organization of the United Nations and World Health Organization, Rome 2011

<sup>12</sup>According to the International Organization for Standardization: <http://www.iso.org/>

The processes of risk management and treatment in organic sector is considered as very complex and interacting (Arabska, 2014) and presented on Table 4. The accent on the presented table is on the sequence 'assess-protect-confirm' (referred also as 'plan-do-check' (Siegel, 2009) by ISO management system standards), and the importance of planning and feedback, as well as risk communication.

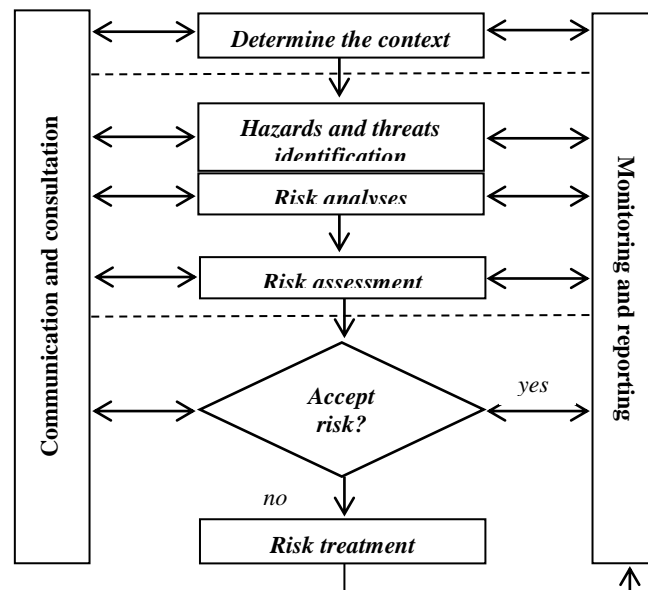
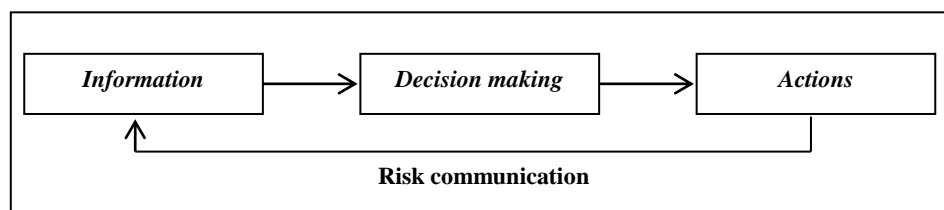
**Table 4. The process of risk management and treatment in organic sector**

Assess - Protect - Confirm (Plan - Do - Check)				
Organic Sector Vulnerability & Volatility	<i><b>Risk assessment</b></i>	<i><b>Risk strategies</b></i>	<i><b>Preparedness &amp; Resilience</b></i>	<i>Avoid risk</i>
	Risk identification	Risk planning		<i>Accept risk</i>
	Risk analyses	Risk treatment		<i>Remove source</i>
	Risk evaluation	<i>Revision, monitoring and evaluation</i>		<i>Change likelihood</i>
	<i><b>Risk communication</b></i>			<i>Change consequences</i>
	<i><b>Risk attitude &amp; perceptions</b></i>			<i>Share risk</i>

The above-discussed questions impose the significance of preparedness, especially in cases of emergencies. Preliminary planning steps and availability of information are very crucial for initial steps of identification of a risky/crisis event, response activation and subsequent revisions, evaluations and monitoring. Considering that risk assessment has limitations and uncertainties, the latest should be in the focus of every one strategy independently of the level- on farm or in community. Thus, the risk management process in organic farming on-the-farm could be presented in a few steps embracing: establishing aims and objectives, threats and risks identification, risk analyses and grouping, risk assessments, identification of alternatives and choice of risk management methods, implementation, monitoring, changes and control (Fig. 1).

Among the most significant implications in risk management, and the process of decision-making in particular, are those of providing enough and quality information and of the effectiveness of communications. Risk communications embrace the whole processes entity of information provision and analyses, decision making, actions and feedback (Fig. 2)

Discussing risk management on-the-farm, the strategies in risk management are usually divided in production, marketing and financial- all of them targeted at control risk exposure and/ or risk impact (Arabska, 2014). Some of them are summarized on Table 5.

**Figure 1: Organic risk management process on-the-farm****Figure 2: Model of risk communication****Table 5. Risk management strategies on-the farm**

Risk management strategies			
Production   Marketing   Financial			
Risk-sharing strategies and tools		Control risk exposure	Control risk impact
Risk-sharing contracts (Meuwissen, 2001)			
<ul style="list-style-type: none"><li>- Share-tenancy</li><li>- Production contracts</li><li>- Marketing contracts</li><li>- Insurance</li><li>- Financial leverage</li><li>- External equity financing</li></ul>			
Crop Diversification	On-farm activities diversification		
Production technology	Resistant varieties		
Hygiene and sanitary measures			
Lowering costs	Lowering production		
Off-farm investment	Off-farm employment		
Networking			



One of the most frequently used strategies of handling risks is risk-sharing. There are many benefits for farmers and society of sharing risks. But risk-sharing contracts by themselves can lead to the introduction of new risks. There are no universal rules about which risks to share and which ones not. Only in a few cases it is not completely up to the farmer which risks are managed and by what type of strategies (Meuwissen et al., 2001).

## Conclusion

Risk management in organic production is a complex issue embracing risk assessments and risk management with special focus on planning and risk communications. It should be viewed from two different points- commons with risk management in agriculture as a whole, and considering peculiarities of organic production methods and broader sustainability goals. The questions of risk vulnerability, risk identification, risk occurrence/likelihood, risk analyses, risk prevention, risk recovery, feedback, evaluation and monitoring, etc., are addressed by risk management strategies and risk management plans on different levels, as well as their implications in the management system of all the kind of organizations. So, organic risk management is laid down into organic standards and organic sectoral strategies and plans on national and international level. What is important however is the risk handling by organic stakeholders on the lower levels. The accepted notion (even without scientifically, mathematically and economically substantiated) that risks are bigger in organic could lead to withdrawal of organic sector and low levels of motivation. That's why the need of profound quantitative investigations in organic risks and management issues is very prominent. The most important are the ways of doing research, development and knowledge transfer, especially using the opportunities of networking and involving stakeholders in innovation processes. Thus current study could be scrutinized as putting the basis of further research into quantitative assessments and modelling in organic risk management, and innovations risks in particular.

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