

Romanian agriculture and weather index insurance - new risk management technique

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Abstract: The intensification of the agricultural crisis, caused by the more and more frequent weather changes, mainly, the excessive drought, floods on extensive areas, powerful storms, represents the main cause of Romanian agricultural damages. The global warming and extreme phenomena lead to the decrease of arable land, migration of the population, but especially the reduction of Sweetwater reserves. The lack of investments in this domain, the unsure support of the state for agriculturists, the refuse of the insurance companies to ensure certain catastrophic risks led to a major impasse in agriculture. This thing represents a danger for the internal food in the following years. The prognoses of the experts show that yearly the weather changes will be more drastically. What is to be done in this context? In this paper, we would like to find and present new solutions for the risk management afferent to catastrophic phenomena of Romanian agriculture.

Key words: weather index insurance, traditional insurance, risk management, catastrophic risk

1. Introduction.

Agriculture is a sector which has a special economic and social importance for Romania [1]. The intensification of the agricultural crisis, caused by the more and more frequent weather changes in Romanian (mainly, the excessive drought, floods on extensive areas, powerful storms), represents the main cause of Romanian agricultural damages. The lack of investments in this domain, the unsure support of the state for agriculturists, the refuse of the insurance companies to ensure certain catastrophic risks as drought and floods led to a major impasse in agriculture.

Drought and floods destroy annually in Romania thousands of cultivated hectares so that the food provided by internal resources is diminishing. The prognoses of the experts show that yearly the weather changes will be more drastically. The specialists of the National Meteorological Administration (NMA) have conducted a study on weather changes in the past 100 years at the national level. If hitherto there were two or three years of drought or floods every decade, “from 2003 onwards each year was either extreme drought, either floods, so that we have no longer term of comparison in the past, but we know for sure that hereafter it could happen of one of these catastrophic risks. There is no year without these in agriculture.” [2]. Moreover, drought and floods led to the reduction of arable land, migration of the population, but especially to the reduction of Sweetwater reserves: “Water will become the keystone of our development. In 2007, Romania had 7,000 cubic metres available of Sweetwater per capita, but in 2025 will be only 5.125 cubic meters. Given that agriculture uses 65% of available water, we will have big problems ”[3], says Cristian Hera, from the Academy of Agricultural and Forestry Sciences.

The impact of weather changes on agriculturists is a major one, and the European Community will extend its support for agriculture only if Romania is preparing for the part of profile insurance. “The agriculture of Romania depends a lot on weather (...). There are three types of risks in Romania: the common regional, price and production risks. Romania is still very exposed to price risks, as well as production risks. The drought and floods in the last years have greatly influenced the agricultural production. Therefore, there should be adopted strategies made for catastrophic risks and introduced assistance programs in the case of risk, as well as agricultural insurance” [4], specified Blarel Benoit, World Bank Country Manager for Romania.

What is to be done in this context? As I said, through this paper, we intended to find and to present new solutions for managing relevant risks of catastrophic phenomena from the Romanian agriculture.

2. Types of risks in agriculture.

In daily work, the agriculturists deal with a variety of risks that require agricultural insurance. In this category are included both the risks caused by nature and those caused by humans.

Fig.1 Types of risks in agriculture

Category of risks	Manifestation form
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Climatic	hail, frost, drought, floods, wind, fire, snow, ice etc.
Biological	diseases, epidemy, invasions of pests, etc.
Geological	earthquake, landslides, volcanic eruptions, etc.
Market	internal and international variation of prices, changes required by quality standards, etc
Caused by humans	war, financial crisis, defective management, etc.

Source: personal overwork of the author

Certain agricultural risks are over the control power and intervention of agriculturists (natural disasters, international financial crisis, etc.) and others are totally or only partially controllable (debits variations of some watercourses, diseases, invasions of any insects, etc.).

The appearance or occurrence of such events is not always predictable and therefore the agriculturists are not always prepared to manage the risks. From this perspective, the agricultural insurance benefits are indisputable.

The risk can be managed before or after an event. In this sense there can be identified two main approaches: the reduction or mitigation of risk effects (ex-ante) and subsequent risk control (ex-post).

The risk reduction may be performed through the diversification of the sources of income, such as: the obtainment of income from other activities than the agricultural ones (or the use of personal savings), the migration towards less risky agricultural areas, through the investment in superior technology that may be less affected by the producing of certain risks as the performant irrigation systems or seeds resistant to the attack of some specific harmful pests.

As a conclusion, we could observe that the ability of agriculturists to maintain or even obtain additional income from the agricultural activities depends on the efficiency of risk management strategies that are used and on their degree of adaptation to the typology of risk

3. Limits of traditional insurance

The traditional agricultural insurance with multi-risk (refers to a variety of risks) or with unique-risk (refers to only one risk), present a series of limitations, becoming more and more avoided by the potential buyers. As results from fig.2, the main limits of traditional agricultural insurance are:

Name	Explanations
informational asymmetry	the successful insurance programs require the insurer to dispose of adequate information (appropriate enough) about the nature of the risk to be insured. This is very difficult for insurers because the agriculturists will always know more about their potential productions than any expert of insurance company;
unfavourable selection (the opposite)	It is possible that due to the involvement of the public sector, the private insurance companies to pay attention especially to "good" risks, letting the "bad" ones uncovered and implicitly in the care of state;
administrative costs	The more deficient (lacunal) is the information related to agricultural exploitation, the more higher the costs of risk inspection are;
moral hazard	all risks determined by people behavior represent moral hazards. The degree of attention, honesty or level of education of the policyholder (but not only) can influence its assumed moral hazard. For example, he can fire its own harvest and then pretend that it was burned, etc.

Source: personal overwork of the author

4. Weather index insurance (WII)

In recent years, internationally, a variety of new financial mechanisms have the ability to solve many of the problems of agricultural insurance traditional schemes. New instruments function on the basis of the payment configuration of insurance compensation so it will only be paid at the time of reaching a certain threshold determined by statistical calculations called "index". The origins of WII come from the international market of weather derivatives, where the big corporations cover their weather risks. The interest for WII application in the agricultural domain increased starting from the belief that the traditional insurance products were not viable for the developing countries

The basic index has to be based on an objective measure (as precipitation, wind speed, temperature), showing a strong correlation with the variable of interest (in this case, the crop yield). In addition, the weather variable that can form an index should have the following properties: to be easily observed and measured, to be objective, to be transparent, to be reported in good time, to be constant over time and to manifest itself over a large area.

Given the above mentioned requirements, the most used weather index-based are drought and temperature. The risk of hail and fire do not lend themselves to weather index insurance because they are small and localized risks.

Fig.3 Applications and experience in index-based insurance at international level – especially in developing countries

Micro - level	Weather index insurance for small agriculturists, intermediated by rural financial institutions e.g.: India, Nicaragua, Malawi, Thailand, Honduras
Meso - level	Weather index insurance for rural financial institutions that grant loans to poor agriculturists e.g.: India, Malawi, Vietnam
Macro - level	Weather index insurance or credit lines conditioned by weather index for governments or international organizations that provide security to the poor. e.g.: Ethiopia, Malawi, Mexico

Source: personal overwork of the author

In international practice there are two different types of index-based agricultural insurance: weather index insurance and surface index-based insurance.

Weather index insurance – the insurance compensation will be paid by the insurer under the conditions of a predetermined trigger mechanism called “index”. The index can be formed by a variety of weather indicators, such as: the volume of rainfalls, temperature, humidity, wind speed or the number of sunny days, each of them being validated by an independent third party and correlated with the individual damages registered as a result of the event occurrence.

Surface index-based insurance – insurance compensation payment is made in the moment of harvest surface decreasing (and implicitly of the agricultural production) as a result of a sinister (drought, flood, etc.) under a certain percentage determined in function of the climatic characteristics of the area. The insurance is sold in standard units (for example, monetary units or "units") afferent to a policy or certificate for each unit purchased. The insurance premium is the same for each customer, ensuring an equal compensation if the insured event is going to happen.

The buyers are free to purchase as many insurance units they want. The emergence of a sustainable system of insurance weather index-based will boost productivity and international competitiveness of the Romanian agricultural producers, processors, exporters and other businesses exposed to weather risks. They can support the preparation of Romania for fiscal shocks caused by major weather events - drought, floods and can facilitate the identification of segments of the population most vulnerable to weather change and the implementation of effective plans for adapting to such changes.

5. Conclusion.

The agriculturists complain that no company of insurance in Romania assumes the catastrophic risks in agriculture, in that it refuses to insure drought and floods. At the same time, the insurance companies motivate that drought is a sure risk that occurs annually in Romania and the insurers do not have the financial strength to take such risks.

No insurance companies in Europe ensure Romanian cultures for drought: "most of insurance companies in Europe do not take the catastrophic risks such as those in Romania because it represents a sure risk," said the President of FATA Insurance.

Under these conditions the chance of Romanian agriculture consists of the adoption of complex measures on several levels: crop insurance in cases of extreme risk or even setting up special funds for disasters to be attended by all the "main players" (the Government, insurance companies, agricultural producers), by public-private partnership.

Other solutions would be the Governmental support in the form of subventions, the unification of agricultural areas in larger exploitations and the attraction of communitarian funds.

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