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## THE WAYS OF IMPROVING THE RISK MANAGEMENT IN THE AGRARIAN SPHERE

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*Чернышова Л.И., Кривая Р.А. Шляхи удосконалення управління ризиками в аграрній сфері.*

У статті розглянуті актуальні проблеми агропромислової галузі України, які породжують ключові ризики сільськогосподарського виробництва, запропонований алгоритм дій для управління ними, що передбачає поетапне прийняття управлінських рішень з метою досягнення ефективних результатів.

*Ключові слова:* ризик, управління ризиком, алгоритм управління, агропромисловий комплекс, аграрна сфера

*Чернышева Л.И., Кривая Р.А. Пути совершенствования управления рисками в аграрной сфере.*

В статье рассмотрены актуальные проблемы агропромышленной отрасли Украины, порождающие ключевые риски сельскохозяйственного производства, предложен алгоритм действий для управления ими, предполагающий поэтапное принятие управленческих решений с целью достижения эффективных результатов.

*Ключевые слова:* риск, управление риском, алгоритм управления, агропромышленный комплекс, аграрная сфера

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The article is devoted to topical problems of agro-industrial sector of Ukraine, generating the key risks of agricultural production, considering the algorithm of management actions, involving the gradual adoption of managerial decisions with the objective of achieving the effective results.

*Keywords:* risk, risk management, management algorithm agro industrial complex, agrarian sphere

**A**gro-industrial complex is a vital component of every country's economy, related to the interests of each person. Rationally developing that and improving some aspects of management in this area, a solid foundation can be laid for the transition of our country to a new development level, which will be characterized by an acceptable level of economical stability.

Today, the agricultural commodity producers are facing the market chaos, when all risks of the agricultural production management, that have been in wide scale controlled by the state, became the natural attributes of those producers' economic activity and not irrational is that it should be considered in making management decisions. In this situation, questions related with minimizing and / or preventing those risks' occurrence obtain a special importance and urgency. To ensure the efficient economic activity producing positive economic results some improved ways should be taken while selecting appropriate risks management techniques in agriculture. The successful implementation of actions needed in this direction will ensure both balance and stability of the agricultural sector of Ukraine.

### Analysis of recent studies and publications

The works of Russian and foreign scientists, such as Babenko V., Borovik P., Veklenko V., Vitlinsky V., Kobylanskaya A., Nuzhnaya S., Svistunov A., Svoinski E., Shtuchko A. and etc. have been devoted to researching the risks in the agricultural sector. Their works are closely considering the concept of risks, risks typology in agricultural businesses activity, the processes of elimination the negative effects being specified and argued.

### Selected unsolved aspects of the problem

However, despite the variety of approaches to these issues, some questions related to the management side of risks study in the agricultural sector remain open requiring a more detailed research. Especially that concerns the activation of risk management problems in agriculture and the development of measures' set for their practical implementation. Currently, the risk management becomes an integral part to the strategic and operational management of successful growth in the agrarian sector businesses. From the conception of

«risk measurement», that implies an assessment model of risk level; of course, that tends moving to the concept of «risk management» - the development of management techniques contributing into risk assessment, according to the magnitude of the risk [1]. Therefore, the dynamic changes in agricultural production have necessitated the development of new approaches to the process of ensuring an adequate level of competitiveness and agricultural businesses development, prevention and overcoming the crisis in that sphere, closely associated with the risk factor.

The *aim* of this article relates to improving the risk management process, based on the development of the incremental actions algorithm to ensure a sustainable management of agro-industrial businesses under conditions of uncertainty.

### Main part

Of course, the risk represents a necessary concomitant component of any business because the real situation does practically never fully conform to the planned or desired parameters [2]. The agriculture a priori has a specific risk environment, which, for various reasons, has its own specific characteristics. This industry differs by the composition of involved production means, the specific life cycle, the social structure of production, the difficulty in introducing changes to the actions already taken, the purpose of the products, manufacturers' weak position in the market, large unpredictability of production climatic conditions etc.

Today the economic situation in the agricultural sector remains difficult. The low level of prices for the traded agricultural products, the lack of demand for products, essential competition from the imported ones side, the unsystematic reform of agricultural businesses caused a sharp decline in the productive capacity of agriculture in the whole and all sectors of the studied complex. And this is only the top of the iceberg. The main problems herein are following:

- weak development of processing industries of Ukrainian AIC, industrial infrastructure complex and problems with logistics. The average harvest volume in Ukraine is increasing, but the dynamics is not supported by an adequate infrastructure development. It is clearly demonstrated with an unsatisfactory level of engineering quality, late delivery of fuel and lubricants, the shortage of wagons for grain transportation (the state monopolist “Ukrainian Railways” has 8500 grain-carriers, which are not enough for the Ukrainian agricultural market), etc. [3];
- the destruction of material and technical base (aging of the machinery and tractor equipment, destruction of livestock farms);
- increase in energy, fuel and lubricants prices;
- land degradation (increased fertility of several regions does require significant capital investments with a long payback period, that significantly extends the term of the capital turnover);

- climatic conditions peculiarities in different regions of our country, zones of augmented-risk agriculture that exercise a huge influence on the final results of production. Uneven distribution and specialization of agriculture have the significant impacts onto the productivity of agricultural crops in Ukraine, and as a consequence are influencing the cost of production, sales volumes, profit margins and profitability;
- price disparities between agricultural and industrial products, caused by the lack of efficient pricing policy (minimum prices for agricultural products do not provide the necessary level of producers' profits and create price disparities; as a consequence most of funds do circulate in the service and industry sectors, leaving the agricultural producer in crisis);
- incapability for quickly changing the assortment of agricultural products according to the demand thus supplying on the market, and the unreality of increase in the production volumes depending on the “profitable” types of products at the moment;
- lack of a consistent system of agricultural production state support and the lack of governmental financing for agriculture. The state budget for 2013 is the toughest in regard to agriculture over the past seven years. To finance one of the major programs for agriculture producers, - support measures in agriculture. - this year 96.8 million UAH have been laid against 1.01 billion UAH. in 2012 [3];
- permanent tax innovations. The possibility of a complete revision of tax incentives for the AIC of Ukraine is under active discussions now. Also, Art. 10 of the Ukraine Law “On the State Budget of Ukraine for 2013” stipulates that the funds received from payment of 1.5% levy on the development of horticulture, viticulture and hop, will be credited to the general fund of the State Budget of Ukraine (in 2012 there was allotted a special fund ). Perhaps, some about 200 businesses will remain without significant financial support now. Only some of them will be able to find the necessary funding. In the first place, the industry will feel the deepening of the primary crisis. In 2012, due to non-payment of monetary compensation from the special fund, the landing campaign has been completely failed. In the future, the abolition of state subsidies evidently will not allow domestic grape growers and winemakers to survive in the open market after the WTO accession. [4]
- not regulated land lease and property relations. Registration of leases contract of agricultural land often turns problematic because of poor equipment and lack of staff in local bodies of land resources (from 1 January 2013, these functions are transferred to the Registration Service of Ministry of Justice). Another problem is embodied with land-utilization projects that are obligatory for all

farmers who cultivate more than 100 hectares. In Ukraine there are 18473 land users who cultivate agricultural land of 100 hectares area. The order of such projects creation by itself is quite confusing and, among other things, often there are difficulties at the stage of consultation with local authorities. However, today the 1961, or 10.6% of land users' in Ukraine total have already ordered the land development management projects that provide ecological and economic assessment of crop rotation and the land improvement, as from the beginning of this year their absence does impose fines. Total number of development projects contracts concluded: the Autonomous Republic of Crimea - 176 (representing 22% of projects number that need to be developed), Chernigov - 134 (22%), Zaporozhye - 226 (20%), Ternopil - 77 (20.4%), Sumy - 116 (21.5%), Poltava - 228 (19.7%) regions [5];

- expensive loans. High bank interest rates – from 20% - make it a nominal source of funding for agricultural. In 2013, according to the minimal support from the government sector, lack of alternative in utilization funds will be especially noticeable;
- a high level of self-employment of the rural population in private farms to the prejudice of more productive economic activity forms;
- underdeveloped areas of activity and people employment outside the agricultural production (small business, recreation);
- lack for the development of social infrastructure, reducing the availability of rural population vocational education services, health care and culture.

As can be noticed, the appearance of these or other risks is largely dependent on the specifics of our political, scientific-and-technical, socio-economic and environmental conditions that determine the functioning and development of agro-industrial companies in Ukraine. This creates a rising to the allocation of specific risks types, such as: industrial, business, banking, credit, investment, innovation, pricing, insurance, environmental, information, weather. Each of them is more or less pronounced and influences the maintenance and agricultural production.

Proceeding from rich economic practices and theoretical basis already established we can reasonably assert that the economic entities, which in the course of its operation are influenced by different types of risks, can manage them. A certain pattern is often used in selecting risk management techniques, combining the experience and knowledge in the processes activity and servig as the basis of automatic skills to work. The presence of stereotyped action allows acting promptly and in the best way under certain standard situations. In the absence of typical situations it is convenient to move from the stereotypical decisions to the search for optimal

solutions that are acceptable for elaborating and taking the risky decisions. This is significant for the agricultural sector.

The effectiveness of risk management organization is largely determined by the possibilities to use a variety of measures that allow in certain way to predict the risk events, including the location, sphere and time, and to neutralize or minimize the extent of its influence on the functioning of agricultural enterprises. That is why the basic actions algorithm has been created for more effective, in our view, agricultural production risk management (Fig. 1). In our opinion the most effective is a step by step decision-making under uncertainty conditions, as it allows to make adjustments in our current actions, or, in the case of insufficient information content to accept the interim operational solutions, to review the previous steps.

Each of the proposed stages involves a full-scale information collecting and transmitting to the next level, as the follow-up depends on its volume and the quality (accuracy, precision). Information provision is based on the collection and analysis of statistical, commercial, and other types of information. And if the volume is insufficient to make a particular decision it is advisable its further accumulation or, under some certain restrictions that do not allow that, the administrative decision should be taken on the basis of information already available. The result will have the chance of success, which depends entirely on the quality and volume of information collected and processed at each stage of the algorithm.

Let's consider in more details the proposed stages:

1) *Environmental monitoring and operation of risk forming factors.* This stage involves the systematic monitoring of using the agricultural lands on the basis of their purpose and permitted use, analysis and assessment of their quality status according to the influence from the side of risk forming factors': natural and man-made. It should be noted that risk forming factors affect the specific risks selectively, and are able to exert a complex influence on the whole groups of risks. Moreover, their classification is immeasurably more difficult to classify risks. Thus, developers of the risk management system «Mark To Future» company Algorithmics argue that market risks are derived from 50 to 1,000 risk factors, the credit risks are affected with from 50 to 200 risk forming factors, 20 - 500 risk factors affect the risk of asset management [6].

Therefore, at this stage it is recommended to determine the levels of risk forming factors (macro- and micro-levels) for the subsequent formation of regulatory leverage. The work should be aimed at clarifying the list of these factors for specific risk types, and on the choice of rational methods in assessing these factors' impact on the relevant risks' dynamics.

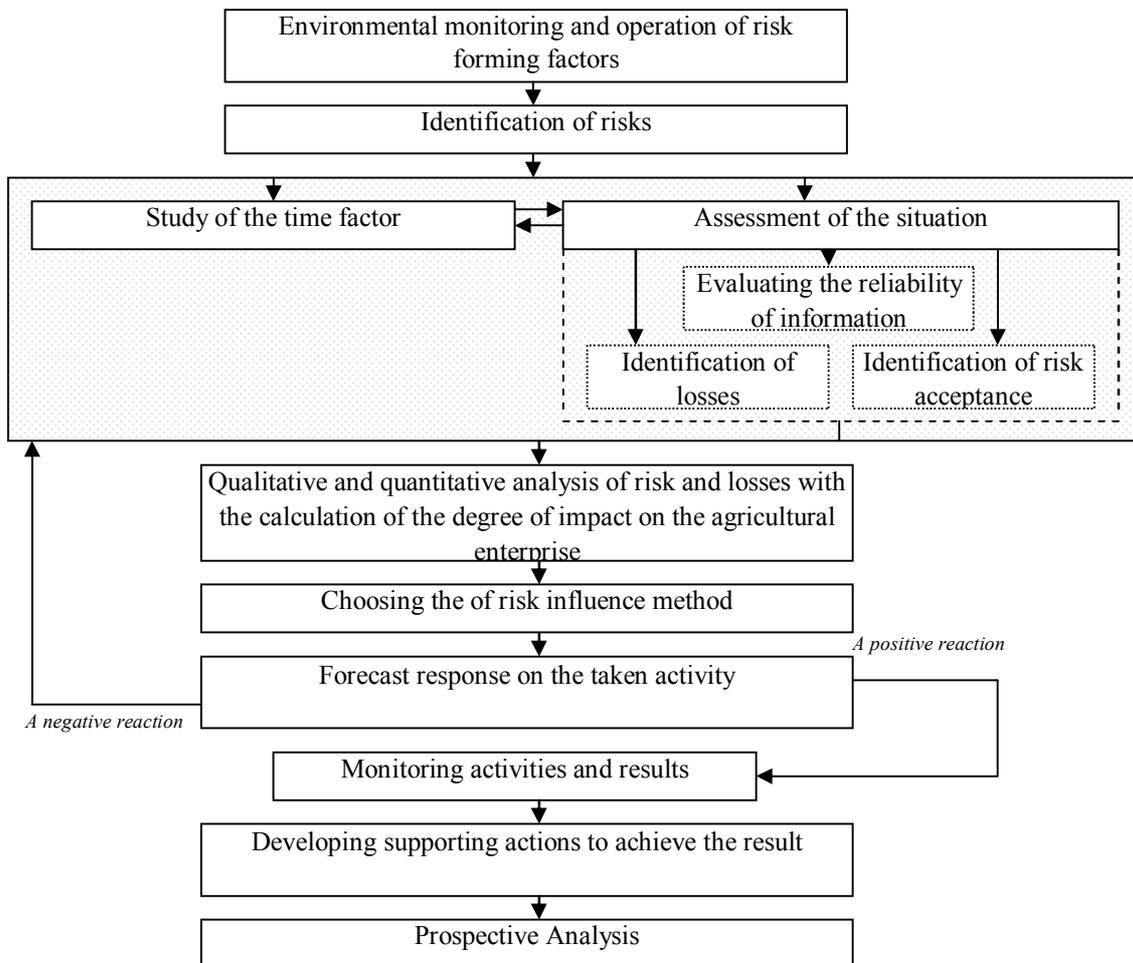


Fig. 1. Sequence of actions to manage the risks of agricultural production

2) *Identification of risks.* At this stage it is necessary to determine the type and kind of risk that can affect on agricultural production, and to fix its characteristics documented. Identified risks should be described in sufficient detail. In this list a simplified risks structure can be used, for example: an event may occur that will have an impact, or if the event occurs, which will have a consequence. In addition to a list of certain risks for the clarity their origins may be indicated (as shown earlier). These are the fundamental conditions or events that can trigger the onset of one or more specific risks. They can be documentary registered and used to help in identifying the future risks, in the developing and use of risk management programs.

3) *The time factor study.* For agro-industries characteristic is the large time lag between the initial investment cost and production of agricultural products. The time factor leads to increasing the market risk, which is largely due to high the price elasticity of the food market.

Therefore, at this stage the “time of the identified risk occurrence” and “the time of the identified risk detection” should be related. Time of occurrence is mainly due to the life cycle of products. At each stage of the life cycle, there are specific causes of appearing

the risk, ways to avoid it, ways to overcome the possible consequences.

Three periods can be divided by the detection time (with regard to the production of agricultural products): the past, present and future.

The risk of previous period excludes the cost of production, forming only the costs of a market research, development of new agricultural products, etc.

Detection of risk in the course of production can seriously undermine the financial condition of the agricultural enterprises, especially when not demanded is the product, having a significant share in the total production of the enterprise.

Critical is the process of detecting the risk after agricultural products collecting and processing that is related with the lack of demand on it, especially when the production cycle is completed. This can lead to pre-crisis state, or even bankruptcy.

This group involves the formation of a specific administrative decision for every time period. In the first period it may not initiate manufacturing risk products replacing the planned volume by other types of products; in the second you can still make changes to the price of the product accordance to the consumers wishes, and the third is to think only about

maintaining the financial stability of the agricultural firm. This requires an accurate assessment of the current situation.

4) *Assessment of the situation.* The basis of this stage is the quality and completeness of the information base. Just these two properties influence on the effectiveness of the ongoing risk management policy.

Another required step is the assessment of possible resource losses in the implementation of agricultural activities. That does mean not the consumption of resources that is objectively caused by the nature and scope of the business activities, and the random, unpredictable, but the potentially possible losses arising from the real progress deviation of agricultural production from the planned scenario. To estimate the certain losses probability due to events' development by unexpected option, first of all it should be known all kinds of losses and therefore required is to calculate or measure them as probable forecasted values in advance. It is proposed to integrate the loss mathematically into a single index, by transferring them into a comparable expression system. We should pay attention to the validity of the losses level, relating them to the level of acceptable risk. In order to achieve a certain goal always there exists a solution, providing some compromise level of risk, which is called acceptable and which corresponds to a specific balance between the expected benefit and the risk of loss. A large analytical work at this stage of the algorithm, and special mathematical calculations with elements of probability theory [7, 8], conducted in the next phase, contribute to identify acceptable risk.

5) *Qualitative and quantitative analysis of risk and losses with the calculation of the degree impact on the agricultural enterprise activity.* This stage suggests a comprehensive analysis of identified and documented fixed risks and their degree of impact onto manufacturing activities.

The qualitative analysis allows determining the importance of risk thus choosing the way of reaction by standard methods and tools (methods for assessing the probability of emergence and impact of risks, the risk factors matrix, the risk trends analysis, the analysis of interconnection between the identified risks and business activities of agricultural producers, etc.).

Conducting the quantitative analysis will complement the qualitative one helping to rank the risks by priority with the required prompt response and more attention to them, thus allowing to determine the impact of their effects onto the activity results, and to identify the possibility of achieving the goals. For this, we can recur to the means of mathematical modeling, linear programming, sensitivity analysis, etc.

Risk amount or degree can be measured by two criteria, averaging the expected value and the variation of the possible outcome. The first parameter value is associated with an uncertain situation and measures the results that are expected on average. The second parameter will show the degree of deviation

from the mean by calculating the coefficient of variation.

6) *Choice of the risk influencing method.* The previous stage results represent the basis for selecting appropriate methods for risks managing, some of them are the following:

- avoiding risks - the rejection of risky agricultural activities, the effectiveness of which causes even some doubts. However, possible are the activity stagnation, losses of competitive position and business ties, up to crisis conditions;
- limitation - as establishing the maximum expenditure limit per transaction, investment rules into a single object, limits of competence in making financial decisions, etc.;
- hedging – as a form of insurance against possible losses by the conclusion of counterbalancing transaction (transfer of risk of price changes from one person to another). Hedging market risks can be done through off-balance sheet transactions in financial derivatives - forwards, futures, options and swaps;
- diversification – as a way to reduce the total risk exposure by allocating the investments and / or liabilities. In agricultural practice the allocation of funds to different assets is possible (depending on the products or activity) to reduce the maximum possible losses in a single event, but the number of risks' kinds that must be controlled increases.
- allocation of risk – method based on partial transfer to the business partners so that the possible losses of each participant become relatively small. The degree of risk-sharing, and, consequently, the level of neutralizing them is the subject of contract negotiations with partners;
- self-insurance – method based on the resources reservation by the agricultural enterprise, that allows to overcome the negative consequences. The main forms of this direction to neutralize the risks are: creating insurance reserves of raw staff, materials and components, the reserve monetary funds, creation of potential suppliers and customers databases, etc. The main objective is the operational overcoming the temporary financial and economic difficulties;
- insurance – as activity performed by insurance companies. Today in Ukraine, into crop insurance engaged are around 12-15 insurance companies (whereas in 2005-2008 there were about 60). Such dynamics is associated with the termination of the state program of subsidized insurance, lack in the adequate allocation of financial resources for training agents and creating separate unit for agricultural insurance in a staffing structure of insurance companies. The volumes of insurance are also negligible. In summer 2011-2012 the farmers have insured about 500,000 hectares of crops, accounting for about 2-3% of the total area under crops in the country. In practice, the total insurance contracts number for the spring-summer period is usually around 1600-1800. The average premium rate for the season is about 3.5%, but for

some crops the average premium rate is slightly higher (sunflower - 3.55%, corn - 4.2%, sugar beet - 3.6%, spring barley - 5.3 % soybean - 4.6%) [9]. Such low premium rates are explained by the fact that mortgage crops farmers usually choose insurance contracts with an unconditional franchise at the level of 40-50%, which only provides compensation for catastrophic losses. In the last 4 years in Ukraine introduced are new insurance products where the deductible does not apply. Instead franchise agreements the recovering is used. The sum of insurance with a part of risk that is hold by assured is negotiated in making the contract by covering.

7) *Forecast response on the taken activity.* This phase involves the development of the future changes in the state enterprises, according to the previously selected step methods of influencing the risk. A feature of this stage is also an alternative behavior that determines the different versions of the state agricultural enterprises based on emerging trends. Forecasting can be performed both on the basis of the past into the future extrapolation, with the trends expert assessment, and on the basis of direct change prediction. And if the positive response to the taken activities for the risks neutralization, it should be moved on the next step of the proposed algorithm. Otherwise, the return is required to re-assess the situation through a more detailed behavior study of the organization in spatial and temporal terms.

8) *Monitoring activities and results.* That does mean the internal and external environment control. It

can lead to a range of alternative programs of action, the adoption of adjustments, their alterations to achieve the goals.

9) *Development of supporting actions to achieve the result.* It involves the formation of supportive action to prevent escalation of planned program activities in out-of-program.

10) *Prospective Analysis.* Analysis of the current and past experience in risk management in order to take it into account in its future activities.

### Conclusions

From the above it can be concluded that present day for the normal functioning of the agro-industrial companies important is the ability of operative response to these or other issues that arise in the course of the agricultural business. And exactly the turn-based risk management system, which represents a complex, logical process, allows simplifying and systematizing the decision-making process in this area, to identify the level of readiness to risky situations, to identify the weak position and to conceptualize the further work onto implementation of radical changes in the processes of the organization activity. After passing this way, every agricultural enterprise will be able to secure the conditions for an effective system of governance.

Future work consists of more detailed examination of the algorithm selected stages separately, because each of them has a high degree of significance in making appropriate management decisions.

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