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**METHODS OF RISK MANAGEMENT OF INVESTMENT AND  
CONSTRUCTION PROJECTS OF TERRITORIAL DEVELOPMENT**

*The article provides an overview of the methods of management of economic, social and environmental risks and the selection of the most efficient ones to use in the analysis of investment and construction projects for the development of a specific urban area.*

*Keywords: risk management, investment and construction projects, urban areas.*

**МЕТОДЫ УПРАВЛЕНИЯ РИСКАМИ ИНВЕСТИЦИОННО-  
СТРОИТЕЛЬНЫХ ПРОЕКТОВ РАЗВИТИЯ ТЕРРИТОРИЙ**

*Статья посвящена обзору методов управления экономическими и социально-экологическими рисками и выбора наиболее рациональных из них для использования в процессе анализа инвестиционно-строительных проектов, направленных на развитие определенной урбанизированной территории.*

*Ключевые слова: риск-менеджмент, инвестиционно-строительный проект, урбанизированные территории.*

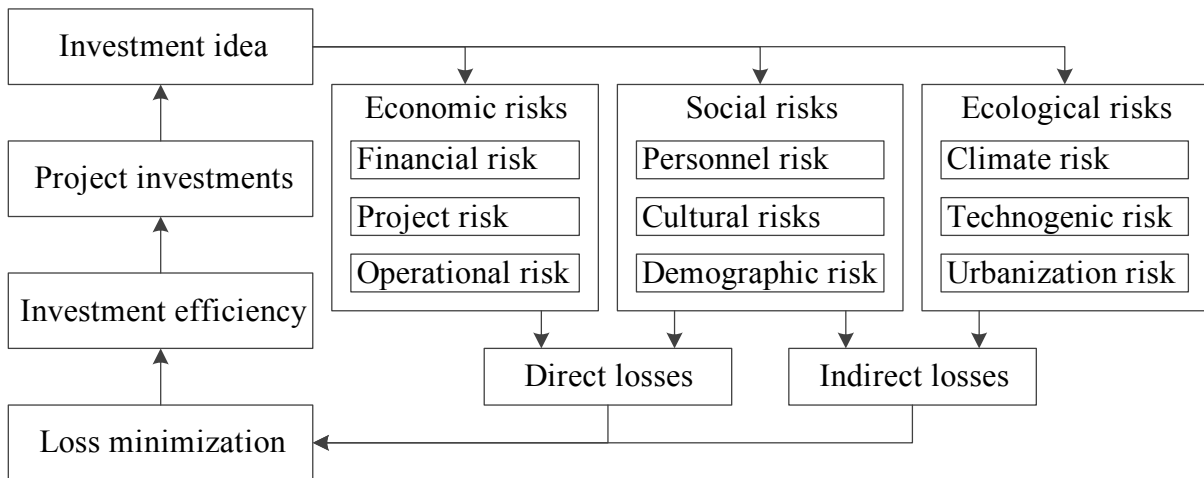
Implementation of investment and construction projects is a business with one of highest levels of risk. Project Risk Management – is an integral part of management of the project itself. The history of development of these areas is inseparably linked.

Project Risk Management is understood now as a complex preplanned activities aimed at identifying of probable adverse situations and reduction of their possible interaction on the project to acceptable level [1].

Risk arise from incomplete knowledge of all parameters, the circumstances of the situation for the optimal solutions, and also because of impossibility of accurate and adequate accounting of all even the available information; because of counteraction from the internal and external project environment (competitors, the authorities, employees, contractors etc.) due to the divergent interests, as well as due to the presence of chance. Thus, the risk of the investment construction project is defined as the possibility of the implementation of the project in adverse situations and consequences.

The risk management is understood as decision- making process under uncertainty, which leads to achievement of the goal, the unplanned income or loss [3]. Risk factor is considered to be the source of the uncertain situation occurring in the realization of development strategies. The risk management process is to neutralize the adverse effect of optimal risk factor

to the sustainable development. The structure of the risk management process of investment and construction projects of development of urban areas is show in Fig. 1.



**Figure 1 - Risk management structure of the investment projects.**

Each area is a valuable and limited by the quality of the complex spatial distribution of resources, ecological potential. At the same time, the area should be seen as a complex ecological-economic system, the target state is determined by the requirements of the final result of management activities. Socio-ecological- economic system can be defined as “a set of interrelated economic, social and environmental factor in the human world“[2]. Model development and management tools for sustainable territorial development must take into account multiple aspects of the activities of managed entities and, above all, their economic and environmental components. Reducing the environmental safety of territories, on the one hand, and the need for economic growth – on the other hand, form a basic contradiction in the implementation of the sustainable development model of socio-ecological-economic system.

The analysis of the current state of socio-ecological-economic system show that so far in the development of management decision on the sustainable development of the territories we have to deal with quantitative criteria (rental income, cadastral value), that help define the cost of territorial resources [5]. Thus, there is no certainty about the sources to cover the requirements to the quality of territories, as well as environmental, social and economic impacts of management activities.

The main principle of management of socio-ecological-economic system consists in the need of measurement of effectiveness of the management activities in quantitative (standard of living) and qualitative (quality of life) aspects. In this case, the environmental component is integral quality areas (risk of failing the target state of the system).

Development of effective management decisions for sustainable development of territories is based on the idea of the simultaneous consideration of profitability (income) and risk of financial transaction. However, the classical problem of decision-making within considered problem area should take into account the failure of the planned level of sustainable development of territories. Thus, there are two main objectives: hedging risk on the basic of their evaluation in the form of money and decision making on the basic of the preferred option of many compromises opportunities for sustainable developments of the territories.

Currently there is a wide range of the generally accepted methods of risk management; the main task is to define correctly how this technology fits into the management of investment construction project.

The method of control over risk is a technique or system techniques of separate operations in the risk management process. Along with the methods realized in the form of the special software, there are public methods of control over risks.

Imitating modeling refers to method of forecasting, which is the modeling and analysis of uncertainty in the estimates of the basic parameters of the project (monetary costs and time expenses).

Method of analysis includes control lists of sources of risks, which are structured lists of sources of risks which are based on historical information about incidents that occurred during the implementation of previous investment construction projects.

One of creative methods is the Brainstorming method. That is discussions on which experts in risk management with use of methodical grants discuss all aspects of this mechanism, and are carried out planning, identification, an assessment, processing, control and documenting of risks.

One of creative methods is “the Brainstorming”. That is the debate in which experts in risk management using teaching aids discuss all aspects of this mechanism, and the planning, identification, assessment, processing, monitoring and documentation of risks are implemented.

The method of obtaining information include risk assessment by independent experts, which is a method of interviewing and / or questioning of experienced risk managers, who act experts and not the participants of the estimated investment and construction project.

In our country the most popular recommended method relating to the methods of assessment is a method of calculating of the probable losses, based on the calculation of the expectation of loss for each risk separately and for the whole project [4].

After risks are identified and assessed, it is necessary to process them and select the most appropriate option for the investment of the construction project.

Now there are 4 main ways of processing of risks: risk mitigation, acceptance of risk, evasion of risk, transfer of risk. And in Russia there is a tendency to a mitigation choice as main way of processing of risks, often without taking into consideration other three ways.

Let's see what ways of processing mean. The acceptance means itself following: confirmation of the possibility of a negative situation and a conscious decision to accept its consequences and to compensate for damages from its own funds, this situation often occurs after mitigation. For successful acceptance of risk the following conditions are satisfied: creation of reserves of the main resources (money, time, equipment, materials etc.); planning, in the event of unforeseen circumstances.

The evasion is the complete elimination of certain threat or source of risk through changes in the organization of ways to construction, safety, environmental protection etc.

The mitigation means reduction of probability of occurrence of possible losses from the occurrence of a negative situation, it helps to minimize the impact of risk. Thus, the source of risk is not eliminated.

The transfer means transferring of responsibility for managing risk in the other participants of investment and construction projects without elimination of source of risk. There are some ways of transfer of risk: as a part of the contractual agreement (arrangement) which distributes either financial responsibility or the activities related to the risk; or transfer of risk to the professional carrier the insurer. In our country, unlike in the West, the first way of transfer in the construction industry is used more often. Moreover the contracts can be actively used in the transfer of responsibility for the risks that side which is better equipped to regulate their system level. So that such transaction was effective, the parties should be informed on the terms of the contract, and the transfer of risk should be financially compensated in relation to the additional expenses that are expected from this risk.

In the West the second way is more common – insurance, that is transfer of financial responsibility for risk at the time of occurrence of the insured event and usually is an obligation

of the insurer to pay the damages. Since insurance is a contractual transfer of risk, the types of incidents and events must be carefully negotiated. The way of insurance is rarely used in practice in Russia, as construction projects are among the most difficult types of investment projects, and so it is quite difficult to calculate with precision probabilities of risks, and their value.

Control of their implementation and documentation is carried out after selecting a method of processing. It is necessary to notice that before choosing one of method of processing it is necessary to carry out the impartial analysis of all processes and determine the most appropriate option for the conditions of this investment construction project.

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