

ALGORITHM APPROACH TO THE ANALYSIS OF PROJECT TASK AND DECISION ON INVESTMENT BUILDING

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Abstract: Decision on making investment programme should be brought prior to the construction, investor engages appropriate capacities that are his own or that belong to appropriate institutions or agencies in order to develop investment programme, project task, and technical documentation. Then, he should obtain approval for construction and cede the building of an object to the contractor selected. Besides this, he is obliged to take care of the quality, building terms (appropriate supervision) and coordination of all participants in building. After the building is done, building inspection is required (if it is not required by the contractor), and taking-over and ultimate taking-over are performed with the contractor and, in the end, it is sought for an approval for use and putting the object into operation.

1. INTRODUCTION

Investor (Germ. *Investor*) is a legal or natural person who invests its own or borrowed resources into a job in present, expecting the profit in future. According to the principle of effectiveness, heights (costs) of own or borrowed resources should be less than the height of the profit expected. Investor bears all positive or negative impacts of investing.

Figure 1 shows the overview of possible algorithm of investment project implementation.

Investor is one or more social, cooperative or private enterprises and other natural and legal persons, who wish to contract the building of the object with all facilities and equipment for their needs. He is the owner of financial resources necessary for building the investment object, and which were obtained through a bank loan or from its own sources. Investors can be enterprises or business associations, administration bodies, republics, regions and other legal and natural persons, who invest their funds in order to build an appropriate investment object.

Decision on making investment programme should be brought prior to the construction, investor engages appropriate capacities that are his own or that belong to appropriate institutions or agencies in order to develop investment programme, project task, and technical documentation. Then, he should obtain approval for construction and cede the building of an object to the contractor selected. Besides this, he is obliged to take care of the quality, building terms (appropriate supervision) and coordination of all participants in building. After the building is done, building inspection is required (if it is not required by the contractor), and taking-over and ultimate taking-over are performed with the contractor and, in the end, it is sought for an approval for use and putting the object into operation. [1, 4-10].

2. STARTING PROJECT TASK

In the form of the project task, the potential investor expresses his intention to build the investment object [9, 10].

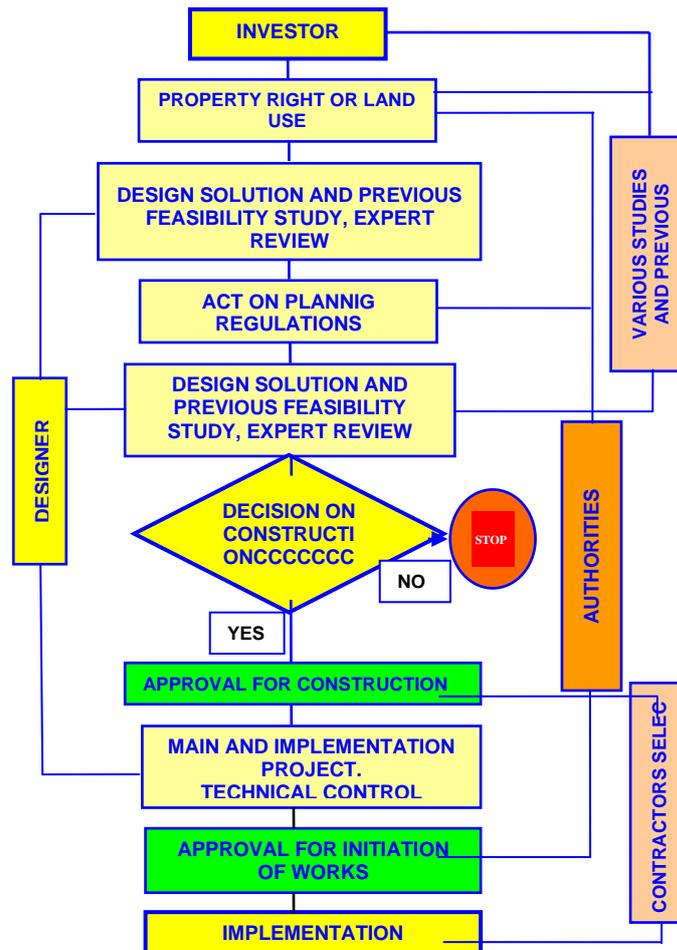


Figure 1: Possible algorithm of investment project implementation [9]

Project task is a starting point for developing all the phases of technical documentation and it consists of:

- Objectives and purpose of project development,
- Subject of the project (general data on object, location, development stages, connections with the environment, etc.),
- Requirements of the appropriate spatial-planning and urban documentation and results from previous phase of technical documentation,
- Bases for the designing (legal bases for documentation development, necessary previous works and research for the appropriate phases of technical documentation, coordination and cooperation of participants on developing technical documentation),
- Structure of the process of technical documentation development, composition and equipment of technical documentation for collective and individual documents,
- Project completion deadlines (partial and final), contents of inter-phases and inter-deadlines for decision-making and
- Special conditions for the procedure of expert and technical control.

3. PROJECT TASK FOR DESIGN PROJECT AND FEASIBILITY STUDY

In a project task for design project, the investor states all conditions and requirements that are relevant for development of design project and feasibility study based on the results of development and evaluation of the general project and previous

feasibility study. If the audit commission presents certain criticism in the report, which should be eliminated by the investor, i.e. his designer in the following phase of technical documentation, the investor will also include those criticisms in project task.

New or reconstructed objects meant for premises of facilities where the technological process is performed in open space oblige the investor to provide the appropriate project task with defined parameters of work conditions and safety at work for the designer (enterprise or agency that develops the project) [2, 9, 10].

Design project is a technical development of basic concept and disposition determined in general project, with the aim to determine the optimal solution and micro-location of the objects from the standpoint of economic, functional, technological and technical requirements, as well as the requirements of environmental protection. It serves as basis for developing feasibility study for object construction, developing programmes and projects of possible additional works for the phase of the main object, as well as for development of the main project. It can also be used as basis for developing a regulation plan, i.e. urban project on the basis of which, the urban permit is obtained.

Content of design project consists of the data on:

- Micro-location of the object,
- Technical, technological and exploitation characteristics of the object,
- Preliminary calculation of stability and safety of the object and calculation of installations (water supply and sewerage, electrical wiring, heating and ventilation etc.),
- Solution to the foundation of the object,
- Technical, technological and organizational elements of object construction,
- Measures for preventing or reducing negative impacts on the environment,
- Design solution of infrastructure and
- Comparative analysis of alternative technical solutions from the standpoint of the properties of location and land, functionality, stability, evaluation of impacts on the environment, natural and immovable cultural property, rationality of building and exploitation, height of the costs of construction, transport, maintenance, energy supply etc.

Regulation on the contents and scope of previous works and on content and preparation of technical documentation defined, by relevant provisions, a detailed content of design project for individual types of objects. Development of design project can be done by the enterprise, i.e. agency that has a certificate on meeting the conditions for developing technical documentation (a licence), issued in accordance with the Regulation on the contents and procedure of determining whether the conditions for developing technical documentation and object construction are met. For design projects, which are subject to expert review of Revision Commission, in the licence there must be mentioned that the enterprise (designer) meets the conditions for developing all parts of technical documentation, for all or individual types of objects for which the building permit is issued by competent ministry.

Chief designer for the objects, for which building permit is issued by competent ministry, can be a person with a university degree in the appropriate discipline, with at least three years of experience and with authorization to design, and chief designer of one part of the main project can be a person with college degree, with at least three years of experience and with authorization to design [1, 3, 5, 8, 9].

Content of feasibility study is closely prescribed by the Regulation on content and scope of previous feasibility study and feasibility study. Feasibility study is a document that is very important for the investor, because on the basis of the conclusion in feasibility study, the investor makes a decision whose consequences can be success or great material loss, and for that reason the development is entrusted to proven experts or institutions.

4. INVESTOR'S DECISION ON INVESTING

Design project and feasibility study, with the report of Revision Commission on expert review of that documentation, are the basis for investor's decision-making on continuing the further realization of investment (approaches to development of the main project) or quitting the investments into technically and technologically impracticable or socially or economically unjustifiable implementation of construction [9, 10, 11].

5. METHODS OF MAKING INVESTMENT DECISIONS

There are a few methods that are used in making investment decisions [9, 10, 11]:

- Critical point method (production scope that covers business costs),
- "decision tree" model (selection of the best alternative) and
- Efficiency model (recovery time less than exploitation time of the object).

Modern investment decision-making is based on choosing the best alternative among many offered or possible, from investment idea, pre-investment studies and investment documentation.

Figure 2 shows the overview of one alternative of the algorithm of investment decision process, with the help of a computer [9, 10, 11].

Possible alternatives of investment project can be classified into four categories:

- 1) Alternative technologies,
- 2) Alternative periods of completing the investment project,
- 3) Alternative sizes of production capacity and
- 4) Alternative locations of production object.

After selecting the particular technology, it is necessary to make a decision on equipment selection, which is preceded by a detailed analysis of equipment market (domestic and foreign). Analysis indicates the following factors:

- Reputation of equipment manufacturer,
- Deadlines and delivery of equipment,
- Equipment quality,
- Possibilities of obtaining commodity loans,
- Equipment prices and
- Equipment maintenance etc.

Equipment selection is done on the basis of competition or tender (offer accepted).

Required investment funds (financial dimension), consist of the funds for:

- 1) Preparation of investment building,
- 2) Investment building and
- 3) Preparations of investment object exploitation.

Required time of investment (time dimension) consists of the time for:

- 1) Preparation of investment,
- 2) Investment building and
- 3) Preparations of investment object exploitation.

Object construction can be divided into following phases:

- Location preparation,
- Site preparation,
- Construction works,
- Equipment installation,
- Selection of contractors and

- Contracting the works.

Supervision aims for the construction of investment object to be completed in due time, following technical documentation and taking the quality into account. If there is a necessity to eliminate the impact of some factors, which would endanger the terms and amount of investments, the supervision takes the responsibility in leading the process of solving the newly-emerged situation.

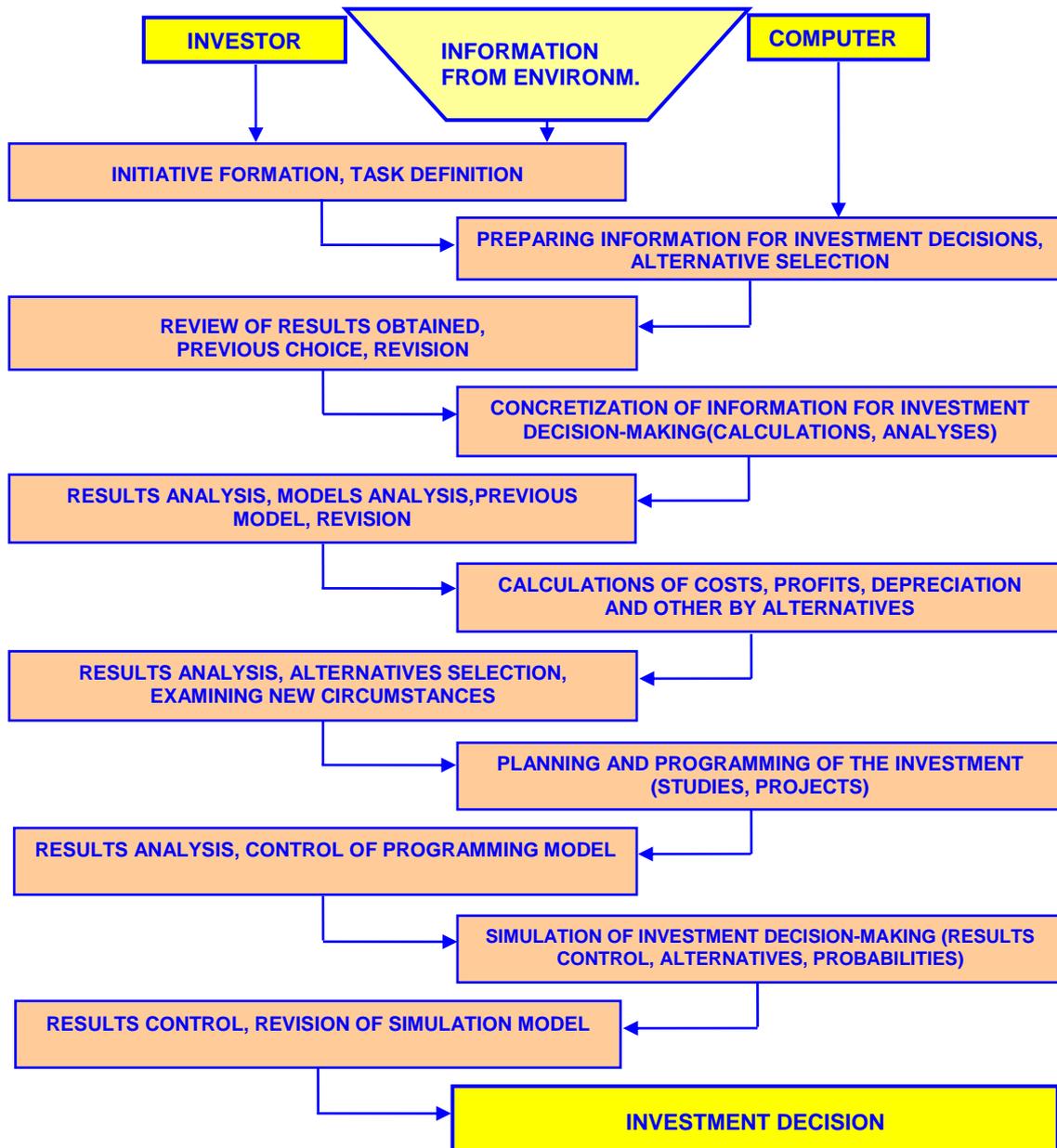


Figure 2: One possible alternative of the algorithm of investment decision process [9, 11]

When the construction of investment object is completed, the final calculation is done. After obtaining the occupancy permit, the object is handed over and final calculation is done, because without permit the object cannot be released in either trial or regular production.

Release of production facility to operation is done through three phases:

- 1) Verification of individual equipment, built in and assembled in production facility,

- 2) Examination of individual lines and objects as a whole and
 - 3) Releasing the object into operation in production conditions (projected conditions).
- Besides the conditions mentioned, development of policy and strategy of production facility's performance in the market also precedes.

6. CONCLUSION

Content of investment programme depends on the type, size and character of investment object, which is to be constructed; in this paper it is predicted that the capacities should be adapted to the population and the size of area, which needs to be covered. The Law predicts basic elements, which should be included in investment programme, and thus we will suggest the project for building the facility for use and disposal of solid municipal waste, i.e. describe what should be predicted when developing a concept:

- Description of investment object with information on its purpose, production programme, capacities i.e. exploitation, pre-calculation value of the entire investment etc.;
- Analysis of conditions for building and exploitation of investment object on the basis of geological, geotechnical, seismic, energy, hydrological and other studies and collected urban, irrigation, transportation, fire protection and other protection conditions and
- Analysis of energy sources, according to the type of investment object's needs and way of providing it, etc.

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