MODERN AGRICULTURE AND EFFICIENT PLACEMENT OF INVESTMENTS

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Abstract

The present paper simpli and directly the problem of the optimum placement of the production capacities, which is a direct outcome of the feasibility study of the investment project (the most optimum variant) baset on a thorough technical, economic and financial analysis, closely correlated to the factors which can influence it.

In the author's opinion, the optimum choice of the production capacities in various places (settlement/placement units) can also constitute the economic motivation of either a measure for creating certaim capacities – if these do not exist – or, of development or on the hand restraint of capacities, in order for these to become more efficient.

INTRODUCTION

The selection of the investment objective's location that has economical, social and ecological implications has an important role.

The optimum placement creates the premises of the getting closer of the investment efficiency to its maximum level from the viewpoint of both the national economy (branches, sectors) and economical agents.

Two aspects need to be taken into account when establishing the location:

- first, the decision of location establishment is irreversible (once the accomplishment of the objective is started on a certain location, it cannot be change, only if high amounts of money are spent);
- second, a location is favorable from some criteria viewpoint and less favorable from some other criteria viewpoint.

The issue of choosing the location of the investment objectives becomes an issue strictly connected to the economic efficiency; for this reason, to accomplish it, more variants need to be taken into account.

CRITERIA OF LOCATION SELECTION

The establishment of the optimum location imposes the analysis of a complex of factors and criteria that influence the efficiency of the future economic objective.

These criteria are divided in:

1. Economic criteria
2. Technological - functional criteria
3. Social criteria
4. Strategic criteria
5. Natural factors

1. **Economic criteria** – according to these criteria, an objective is located advantageously if there are achieved the expected results with small labor expenditures (investment expenditures, production expenditures, transport expenditures) if the complex and complete usage of the human, financial, material resources are provided.

The economic criteria can be analyzed at both a macro economical and micro economical level.

At a macro economical level – these criteria have in view the general development of the national economy that allows the presence of our country on the international market with high-efficiency and competitively products.

- to provide the complete exploitation of the natural resources and the attraction of investors.

At a micro economical level, the reduction of the total effort with the investment and production will be had in view.

For this, there will be actions in the following directions:

a) the drawing near of the future objective to the raw material resources, materials, fuel – mainly it is imposed for the great economical units that consume huge quantities of raw materials;
b) the attraction in the economic circuit of the local resources, the rational usage of the labor force in the area;
c) the drawing near of the consumers of finite goods accomplished by the next objective, especially in the case of the products that need special conditions for packaging and manipulation;
d) the existence of some industrial platforms that could allow the common usage of some utilities: water sources, energy, railways and railway stations, industrial road networks and highways, repairing and maintenance centers, social-sanitary facilities;
e) the possibility to locate some economic objectives is also influenced by the existence in the area of some traditions related to the accomplishment of those products;
f) the reduction of the surfaces for the location of the future objectives by extending vertically, where possible, the buildings and the limitation of the future objectives horizontally.

2. **Social criteria** – have a special significance on the national economy level and they make reference to the provision of a balance increase of the economy in all the counties, the mobilization of the sources and local resources, the prevention of the environmental pollution, the increase of the technical and cultural level of the population.

3. **Functional – technological criteria** – result from the location of the objectives, so that it could lead to their inclusion in some industrial areas that could make easier the cooperation with the units in the respective area.

Within the categories of these criteria, we may include:

- cooperation as regards the provisioning in common with raw materials when it is made on long distances;
- cooperation in mutual accomplishment of some component parts of the products;
- common participation in the accomplishment of some problems regarding the wastes and residues.

4. **Restrictive-strategic criteria** – these criteria refer to the existence of the development conditions of the respective activities.

In the category of these criteria, we may include:

- the existence of some utilities and means of communication;
- restrictions imposed by the areas that have a touristic character;
- restrictions imposed by the national defense;
- provision of some safety conditions in exploitation.

5. **Natural factors** – a series of aspects imposed by the national conditions must be had in view when choosing the investment placement/location, such as:

- provision of environmental protection'
- provision of water flows necessary for the development of the production process;
- favorable climate.

A multitude of aspects that needs a selection and ranking must be had in view when choosing the location of the future economic objective.

For this reason, the establishment of the determinant criteria is necessary, essential for the analyzed activity, such as:

- fuel for the power stations;
- labor force for the light industry;
- market for the fragile and perishable goods.

OPTIMIZATION METHODS AND MODELS OF THE OBJECTIVE'S PLACEMENT

The methods and models for choosing the optimum location of an industrial objective is based on the minimization of all the expenditures connected to the production processes and circulation processes, including also the investment processes.

1. Methods for the location selection of a new objective

The methods used for the optimization of an objective's location refer mainly to the accomplishment of some minimum expenditures for both the transport of the raw materials and transport of the finite products.

a) Correlation between the transport of the raw materials and the transport of the finite products:

The minimization of the transport expenditures is important for the factories in the processing industry whose activity imply the transport of some important quantities of raw materials and finite products.

If the processing unit may be located in some points of a territorial surface, the optimum solution of selecting the point depends on the ratio between the total cost of the raw material transport(C_{tr1}) and total cost of the finite product transport(C_{tr2}).

The optimum selection of the location will be made as it follows:

1) when (C_{tr1}) is greater than (C_{tr2}), the new unit will be located as closer as possible of the provisioning sources with raw materials (e.g. sugar factory)
2) when (C_{tr1}) is equal to (C_{tr2}), the unit will be located in the middle of the shortest distance between the source of raw materials and the destination place for the finite products (other factors will be also taken into account, such as: labor force, means of communication)
3) when (C_{tr1}) is smaller than (C_{tr2}), the location is favorable in the proximity of the destination point for the finite products (e.g. fertilizer factories close to the cereal areas).

b) The summation of all the transport expenditures on variants.

This method is applied when the location of an objective could be possible in one of more localities.

We consider the case of three localities placed on the top of a triangle:

$$(1) \qquad CT_1 = \sum_{k=1}^{p} \sum_{j=1}^{n} akj \bullet tkj \bullet dij, \quad j=1,2,\ldots,n$$

- CT_1 - total transport expenditures in locality i
- akj - quantity of material or product k
- dij - distance between localities I and j
- tkj - transport cost per km
- p - number of the assortment that is going to be transported
- n - number of localities from which or to which transport takes place
- m - number of localities under study

The variant that minimizes the total transport expenditures will be chosen/selected.

c) The minimum of the annual exploitation/production costs

For the summation of the investment and processing expenditures, it is used their assimilation with the help of the recalculated specific expenditure indicator.

$$(2) \qquad C = (S \bullet e_n + c) \bullet q + p \bullet M + t - M \bullet d \ldots\ldots\ldots minim$$

- C - represents the volume of total costs
- S - specific investment for the delineation of the objective
- e_n - the coefficient of the investment's economical efficiency
- c - expenditure per product unit for the processing of the raw material
- q - capacity of the annual production of the factory
- p - unitary price of the raw material (with no transport costs)
- M - quantity of necessary raw materials
- t - transport cost per t – km
- d - distance from the source of raw materials to the processing factory

MODEL OF LINIAR TRANSPORT PROGRAMMING

The location variants of the new production facilities are substantiated scientifically, the link between the objective's place of construction and the sources of raw materials as well as the consumption centers of the finite products being motivated.

In the location model, it is taken into account:

1. the sources of raw materials; in this case the transport costs are not significant
2. consumption centers; in this case the transport costs are modified insignificantly.

The optimum variant, achieved as a consequence of solving the problem, offers us information regarding:

- the rational and efficient location points of the processing factory, taking into account the consumption centers of the finite products;
- the most rational production facilities of the processing factories for each location;
- the minimum total amount of money of the production and transport costs for the finite products and the investment costs.

CONCLUSIONS

To find the optimum solution, it is recommended as more variants to be calculated, by changing each time the localities, totally or partially, for each variant it will correspond a partial optimum size of the production capacity.

Among the analyzed variants, there are chosen those for which there is recorded the lowest level of the production, transport and investment costs.

The optimum production capacity is a direct result of the feasibility study of the investment project (the most optimum variant) based on a detailed technical, economical and financial analysis in close correlation with the factors that can influence it.

The optimum selection of the production facilities in different localities (location points) can represent the economic motivation of some measures for either the creation of some capacities (that doesn't exist) or for the development and limitation of the capacities, to make them more efficient.

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