SPECIFIC ECONOMIC EFFICIENCY INDICATORS OF INVESTMENTS IN AGRICULTURE
INDICATORI SPECIFICI DE EFICIENŢĂ ECONOMICĂ A INVESTIŢIILOR ÎN AGRICULTURĂ

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ABSTRACT

Worldwide, the beginning of the millennium has been marked by an economic crisis of major proportions, with impacts in all areas of activity, comparable to that of 1929-1933 (some economists believe that the current crisis was much stronger than that of the previous century and only the ability to respond promptly minimizes the devastating effects). In this context, one of the main modality for an economic revitalization is to increase business efficiency and rational use of resources, particularly in those fields which were not directly related to the global economic crisis. Of these, the crucial place is occupied by agriculture, considered as one of the most important vectors of welfare and economic development. In the context of increasingly limited resources and constantly multiplication and diversification of the requests, efficiency evaluation issues in agriculture, especially for investment processes, is vital to overcome the current situation.

The paper aims to analyze the efficiency of agriculture activities, focusing on the investment process. The authors present general indicators to assess the efficiency in agriculture, and specific indicators of investment.

Finally, there is a concrete case study of the specific indicators implementation.

Keywords : efficiency, investment, agriculture, effort, effect

ABSTRACT

Pe plan mondial, inceputul de mileniu a fost marcat de o criză economică de mari proporţii, cu efecte în toate domeniile de activitate, comparabilă ca efecte cu cea din 1929-1933 (unii economişti consideră că actuala criză a fost mult mai puternică decât cea din secolul trecut şi numai capacitatea de răspuns prompt a minimizat efectele devastatoare). În acest context, una dintre principalele modalităţi de revitalizare economică o reprezintă creşterea eficienţei activităţii economice şi utilizarea raţională a resurselor, cu precădere în acele domenii de activitate care nu au avut o legătură directă cu criza economică mondială. Dintre acestea, locul determinant este ocupat de agricultură, considerată ca fiind unul din cei mai importanţi vectori ai bunăstării şi dezvoltării economice.

În contextul unor resurse din ce în ce mai limitate şi al unor nevoi într-o continuă multiplicare şi diversificare, problematica evaluării eficienţei în agricultură, în special pentru procesele investiţionale din acest domeniu, este vitală pentru depăşirea situaţiei actuale.

Lucrarea îşi propune să analizeze problematica eficienţei activităţilor din domeniul agriculturii, cu accent pe procesul investiţional. Autorii prezintă indicatori cu caracter general de evaluare a eficienţei în agricultură, dar şi indicatori specifici procesului investiţional.

În final, este prezentat un studiu de caz concret de aplicare în practică a indicatorilor.

Cuvinte cheie : eficienţă, investiţiei, agricultură, effort, efect

DETAILED ABSTRACT

În contextual unei crize economice mondiale fără precedent, al unor nevoi într-o continuă multiplicare şi diversificare, criteriile de eficienţă şi eficacitate capătă o importanţă din ce în ce mai mare. Depăşirea perioadei actuale şi trecerea la o dezvoltare economică susţinută pentru economia mondială depind de o nouă abordare a conceptului de eficienţă în sectoare de activitate care până de curând nu constituiau un motor al dezvoltării.

Punctul de greutate al oricărei economii este format, fără îndoială, de întreprinderile mici şi mijlocii, singurele capabile să se adapteze în mod rapid la necesităţile şi fluctuaţiile unei pieţe globale. În cadrul sistemului competitive al pieţei libere, activitatea agenţilor economici este validată numai în măsura în care aceştia desfăşoară o activitate competitivă, dacă înregistrează un nivel ridicat al eficienţei cu care utilizează resursele; altfel spus, dacă obţin rezultate (produse şi servicii) superioare cu acelaşi volum de eforturi depuse (resurse consumate) sau aceleaşi efecte cu un volum mai redus de eforturi.

Unul din cei mai importanţi vectori ai bunăstării şi dezvoltării economice este agricultura. Problematica evaluării eficienţei în agricultură, în special pentru procesele investiţionale din acest domeniu, este vitală pentru depăşirea situaţiei actuale. Lucrarea îşi propune să identifice principalii indicatori de eficienţă economică a investiţiilor în agricultură. Sunt prezentaţi succinct principalii indicatori cu character general de evaluare a eficienţei activităţii în agricultură (producţia agricolă, cheltuielile de exploatare, productivitatea muncii, rata profitului etc.), însă accentual este pus pe indicatorii specifici procesului investiţional din acest domeniu (investiţia specifică, termenul de recuperare a investiţiei, viteza de recuperare, coeficientul de înzestrare tehnică etc.)

De asemenea, este prezentat un studiu de caz sugestiv, care arată importanţa şi utilitatea acestor indicatori în evaluarea eficienţei.

INTRODUCTION

In agriculture, the economic results is determined by a multitude of factors of production The complex process of agricultural production on the one hand and the need for a singular measure of the effect of investment on the other hand, require taking into account both economic efficiency indicators of production and the economic efficiency of investment [2].

MATERIAL AND METHODS

The principal objectives of economic efficiency of investment in agriculture resulting just from the general tasks of the activity of production, namely [1]: increasing production; costs reduction of materials and labor; achieving a higher net production.

In this context, in the following we will have to deal with two categories of indicators, namely:

Economic efficiency indicators of production

Among specific economic efficiency indicators of production in agriculture, which in our view have a greater role, we can include:

1. Supplementary production volume.

Is one of the basic indicators of economic efficiency of production, which is achieved through investments in physical expression on the kinds of products and value expression, both globally and reported to the unit that produces. Can be expressed in physical units or in monetary units

2. Total net production volume

Another requirement of investment, in terms of satisfying the needs of consumer, is to ensure national domestic product growth and the level of economic and especially farms, increased production net, which is based on wages and accumulation. Accordingly, the investment made to meet the requirements of products should ensure the lifting and total net production volume, which is calculated using the relationship [9]:

$$\Delta Q_{in} = Q'_{in} - Q_{in}$$

$$Q'_{in} = Q'_i - C'_{in} \text{ and } Q_{in} = Q_i - C_{in}$$

and in which:

ΔQ_{in} - increase in net production value expression;

Q_{in}, Q'_{in} - net production in value expression before and after investment;

C_{in}, C'_{in} - spending materials before production and after investment;

i - the culture, or animal.

And the total net production volume can be calculated on the unit that produces, namely:

$$\Delta Q_{in} / S_i(N_i) = \frac{Q'_{in}}{S_i(N_i)} - \frac{Q_{in}}{S_i(N_i)}$$

where:

$\Delta Q_i / S_i(N_i)$

- increase in value of production net to hectare or animal.

The stated express the economic effects - production net additional value expression achieved following the investment of capital.

3. Production expenditures

Another important indicator of production obtained following investment is the cost of production, because increased efficiency is closely linked to the cost of production. In this case, the order of priority that aims by making new investments is to reduce costs of production.

The energy consumption coefficient

As it is known, agricultural energy consumption includes not only the consumption of fuel and electricity, heating etc. but consumption of all means of agricultural production or specific products in other branches of the national economy (tractors and agricultural machinery, fertilizers and other chemicals, etc.), converted into energy. Therefore, the economic analysis is advisable to use indicator coefficient of energy consumption, which expresses the correlation between effort total energy consumption on the one hand, and the effect obtained in the form of additional, on the other.

5. Supplementary profit

In practice, it has proved that the resumption of production on a large scale is subject to the volume of accumulation. Therefore, the investments should increase not only global production, but also the profit.

Farm profit is achieved from the sale of production, and is calculated by the difference between production value and cost of production. It summarized the results of production including the influence of new investment on these results, within a period of time (usually a year).

Sometimes, farms use another indicator for evaluating the efficiency of production, namely the increase of net income [3]. Net income of the farm, as surplus value is obtained by the difference between production and freight costs incurred. It includes farm profits, plus taxes and fees paid by the state.

The profitability rate

The profitability rate reflects the intensity of the use for the costs of production. In most cases, which relate to farming, the rate summarizes the correlation between the increase profit, on the one hand, and total production costs, on the other.

Labor productivity

It is another indicator of economic efficiency of production, which should be taken into account when making new investments. The labor productivity growth can be expressed in accordance with the formula:

$$\Delta W_i / (\text{Ø}\ ), (M), (\text{L}\ ) = \cdot$$

$$\frac{Q_i'}{(ZO_i'), (M_i'), (SL_i')} - \frac{Q_i}{(\text{Ø}\ _i), (M_i), (\text{L}\ _i)}$$

in which:

ΔW_i - increase labor productivity;

$\text{Ø}\ _i, ZO_i'$ - day-man before, respectively after investment;

M_i, M_i' - the average number of workers before, and after the investment;

$\text{L}\ _i, SL_i'$ - the average number of employees before, and after investment;

i - the crop or animal.

Economic efficiency indicators of investments

Specific indicators for economic efficiency of investment in agriculture differ in certain cases.

Thus, unlike industry branches, in agricultural establishments the most important part of the investments is allocated to a development or enhancement of the production. Hence that, for new industrial economic units we may take into account the whole economic effects, as a result of the investment. While in agriculture, for a fair assessment of the economic efficiency of investment projects, we must take into account only the additional economic effect, related to the investment.

Among the most significant indicators of economic efficiency of investments in agriculture are found following:

1. The specific investment indicator.

This indicator summarizes the correlation between investment effort on the one hand, and the effect obtained in the form of additional production capacity, on the other. Specific investment can be calculated, both in terms of production expressed in physical units, and depending on the production value expressed in units, using the following relationship:

$$s_i = \frac{I_i}{\Delta q_i} \quad \text{or} \quad s_i = \frac{I_i}{q_i' - q_i}$$

namely

$$s_i' = \frac{I_i}{\Delta Q_i} \quad \text{or} \quad s_i' = \frac{I_i}{Q_i' - Q_i}$$

s_i - specific investment;

I_i - capital investment;

Δq_i - the production further expressed in physical units;

q_i, q_i' - production expressed in physical units before and after the investment;

ΔQ_i - the production of additional value expressed in units;

Q_i, Q_i' - production expressed in units of value before and after the investment;

i - variation of the plantation animal.

Depending on the purpose of the farm and on the particularities of the sector to which it relates, the investment will be reported differently:

- in the production plant: 1 converted hectare (irrigation, greenhouses, plantations of trees or alive, etc..);
- in animal production: the place / animal; place / number in shelters, where on the surface of the shelter is running several series of chicken or animal fat; per m2 of construction, etc.;
- at investment for the means of production for agriculture and agricultural products: per tone storage capacity; per m2 warehouse; m3 per tone or stored etc.

2. Specific depreciation

Relationship of calculation is:

$$a_s = \frac{AM_i}{S_i'(N_i') - S_i(N_i)}$$

where

$$AM_i = \frac{V_{0i} - V_{ni}}{n} \quad \text{(linear form)}$$

in which:

a_s - specific depreciation;

AM_i - the annual depreciation, determined by linear method;

S_i, S_i' - crop area before and after the investment;

N_i, N_i' - the number of animals before and after the investment;

V_{0i}, V_{ni} - baseline, and the final amount of fixed capital;

n_i - duration of the planned exploitation of fixed capital (1, 2, 3, ..., n - years).

The payback time of investments

It is one of the basic indicators of economic efficiency of investment, which in the case of agriculture shows the number of years the amount of new investment is recovered based on the additional annual profit. The payback time of investments is shown by the formula [5]:

$$T_i = \frac{I_i}{\Delta P_h} \quad \text{or} \quad T_i = \frac{I_i}{P_h' - P_h}$$

Where:

T_i - the payback time of investment;

ΔP_h - increased annual profits (or product);

P_h, P_h' - Annual profits obtained before and after investment;

i - the culture, or animal.

When comparing several possible investment variants, we must choose as the optimal variant which payback time is shortest.

The speed of investment recovery

The indicator for the speed of investment recovery has a very important role.

This indicator is calculated as the ratio between the effective functioning period of the investment and the payback time :

$$RI_i = \frac{D_e}{T_i}$$

R_i - the speed of recovery of investment in the version i.

Therefore, how effective duration of operation is higher and payback time is smaller, the speed of recovery increases. Obviously, respectively calculating indicator of several possible investment variant, will be the preferred the option for which speed is higher.

The coefficient of investments economic efficiency

Taking into account the specifics of agricultural production, this indicator summarize the correlation between the increase of annual profit achieved in the following investment on the one hand and effort invested capital, on the other. The coefficient of economic efficiency of investment is determined as follows [8]:

$$e_i = \frac{\Delta P_h}{I_i} \quad \text{mean} \quad e_i = \frac{1}{T_i}$$

where:

e_i - the coefficient of economic efficiency of investments in the version indicator i.

This expresses additional annual profit to obtain a monetary unit of new capital invested, and if possible more investment options are opting for the version in which the coefficient of economic efficiency of investment is the largest. The coefficient of economic efficiency should be at least limit the coefficient of efficiency normalized, which reflects the average industry or field of activity.

Savings from a monetary unit of investments

In situation in which investment refers only to the savings achieved by reducing the cost of production, use savings to flag a monetary investment, which is calculated using the formula:

$$e_{\dot{e}} = \frac{E_{\dot{r}}}{I_i} \quad \text{where}$$

$$E_{\dot{r}} = \sum_{i=1}^{n} q_i'(c_i - c_i')$$

where:

$e_{\dot{e}}$ - the economy a monetary investment;

$E_{\dot{r}}$ - the savings achieved by reducing the cost of production;

q_i' - production expressed in physical units after investment;

c_i, c_i' - the unit cost of production before and after investment, thus calculated, the indicator reflects savings in the form of reduced cost of production, which is obtained from a monetary unit of new capital invested.

In principle, this indicator is specific for those investments who reduce the relative costst, such as tractors and agricultural machinery, or whose effect is measured by avoiding losses in manufacturing such as warehouses, silos or even the stables. It prefers variant of the investment for which the indicator is the highest.

Technical endowment coefficient

During the transition period, existing agricultural structures will suffer mutations required to adapt to the market economy, the modernization of the technical device determines improvements productive capacity of land, more efficient use of employment and ultimately achieve some important shares production. In this regard, the energy of agriculture is the main component of which depends on the functionality of new agricultural structures. Providing farms with tractors and agricultural machines is determined in time for the performance of agricultural work. Adequate mechanization of agricultural work permits, in addition to others, saving labor and ease employees (farmers).

Therefore, the effects of useful expressions for the mechanization of agricultural work will use the technical rate, which ensure comparability between the capital invested for agricultural mechanization and the number of employees (farmers). Relationship of calculation is:

$$k_{\hat{i}ti} = \frac{I_{mai}}{N_i - NF_i'}$$

where:

$k_{\hat{i}ti}$ - technical factor;

I_{mai} - the amount of capital invested for agricultural mechanization;

N_i - the number of farmers (more than) before agricultural mechanization;

NF_i' - the number of farmers (lower) after agric mechanization.

The indicator expresses how many currency units - effort

invested capital return on an employee (farmer), the agricultural mechanization. When we compared several possible investment variants, we may choose the version that presents the highest coefficient.

The real economic effect

In connection with the evaluation of the economic efficiency of investment in agriculture, there is a very major issue, which is sufficiently well clarified in theory, but, unfortunately, not applied in practical work. It is the assessment of agricultural land, because even the equal of capital investment, the land presents a different fertility [6]. Therefore, practice requires that in determining the economic efficiency of investments to take into account (in addition to the price of land, including land in the fixed assets and economic implications appropriate) earlier use, namely net income of the previous use of land. In this context, be included in net income of the previous use in calculating the economic efficiency of investment in tree-planting vines, land improvements and construction agro-zoo-technical, so as to determine the rationality location depending on the natural and economic conditions. If there are several possible investment are opting for the version in which the real economic impact is greatest.

If which establishes Vineyards, or fruit trees, to curb the use of the use of land plane (which are lower investment) is diminishing net income obtained from the plantation to the previous use (the when the land slope and that virgin does not meet net income of the previous use). The effect thus obtained represents the effect of real economic plantation, which the maintenance of land under plantation that field can be calculated in the second state, namely:

Given that net income of previous use (hayfields or pasture) was maintained at a relatively constant level over the entire period in the previous use of the land concerned, the relationship of calculation that plays real economic effects of plantation is:

$$E_{fri} = VN_i' \times D_{\dot{e}} \times S_i - N_i \times (d_i + D_{\dot{e}}) \times S_i$$

In case it is considered that production and, earlier net income of the previous use recorded increases from one year to another, with a yearly average pace, relationship for calculating the indicator in question will be:

$$E_{fri} = VN_i' \times D_{\dot{e}} \times S_i - N_i \times \frac{(1+r)^{d_i + D_{ei}} - 1}{r} \times S_i$$

Symbols of relations presented above have the following meanings:

E_{fri} - real economic effect of plantations;

VN_i', N_i - net income of the plantation, and net income of the previous use, achieved annual ha;

$D_{\dot{e}}$ - the duration of effective use of the plantation;

d_i - the duration of the execution of plantation;

r_i - pace average annual growth of net income as a result of increased production in the previous use;

S_i - the area which will establish the planting, expressed in meters;

i - variant plantation (vine or fruit trees).

Sometimes, you may experience situations with plantings of fruit trees are identical when the economic efficiency, in terms of considering the previous use of agricultural land, differ depending on the use of land under plantation, reflecting the emergence following cases [4]:

a) the use of land under plantation continue as meadows (or in one case and pasture), only during the execution (d), or the entire period of existence of the plantation (D + De). In such situations, real economic effect will be computed as follows:

To use the land under plantation in the meadows during the execution:

$$E_{fri} = VN_i' \times D_{\dot{e}} \times S_i - N_i \times (d_i \times S_i' + D_{\dot{e}} \times S_i)$$

mean

$$E_{fri} = VN_i' \times D_{\dot{e}} \times S_i - N_i \times \left[\frac{(1+r)^{d_i} - 1}{r} \times S_i' + \frac{(1+r)^{D_i}}{r} \times S_i \right]$$

that:

S_i' - the area of land around the trees maintained that field (ha), in the version of plantation .

To use the land under plantation meadows as long as existing, namely:

$$E_{fri} = VN_i' \times D_e \times S_i - \Delta N_i \times (d_i + D_e) \times S_i'$$

mean

$$E_{fri} = VN_i' \times D_e \times S_i - \Delta N_i \times \frac{(1+r)^{d_i + D_e} - 1}{r} \times S_i'$$

b) The use of the plantation land for agricultural cultivation of plants (usually potatoes or vegetables without haulm, in order not to prevent the use of technical means) in the making (d), when added to net income of the plantation's net income placed under plantation crops and losses are deducted from net income of previous use. Relations calculation in this case are, namely:

$$E_{fri} = VN_i' \times D_e \times S_i + VN_i'' \times d_i \times S_i'' - \Delta N_i \times (d_i + D_e) \times S_i$$

mean

$$E_{fri} = VN_i' \times D_e \times S_i + VN_i'' \times d_i \times S_i'' - \Delta N_i \times \frac{(1+r)^{d_i + D_e} - 1}{r} \times S_i$$

where:

VN_i'' - net income of crops, produced annually to ha, in the version of the plantation;

S_i'' - the area occupied by crops (ha), in the version of the plantation.

The author's works considered necessary to form a detailed presentation of the effect of real economic indicator (E_f) in the two state above due contribution in the original calculation methodology.

The new approach proposed by the author enhances the power of economic analysis of the indicator, highlighting the following issues:

- income amounts are calculated on the duration of the event (classical approach) and the areas of reference (hint author);
- calculating the effect of real economic indicator can be differentiated depending on the evolution of relatively constant or increasing trends, from year to year, the level of production;
- may be an indicator of further said depending on how specific the use of land under planting with fruit trees, as follows:

◦ for meadows - only during the execution (d), or the entire period of operation of the plantation with fruit trees ($d + D_e$);

◦ for agricultural cultivation of certain plants, especially potatoes and vegetables during the execution (d).

Where which replaced the ninth planting a plantation house it is necessary that the total economic impact of new plantations (E_{f1}) to decrease the economic effect of which could have him realizes planting house (E_{f0}), a period in which would be achieved net income. As a result, real economic effect (E_{fri}) can be calculated using the relationship: $E_{fri} = E_{f1} - E_{f0}$;

Also may be intended capital investment and land improvements, when the calculation of economic efficiency investments should be taken into account the actual annual amount of damage, which was recorded on lands that have been performed this work. In such cases, specialists recommended to calculate, on a case by case, indicators such as:

Annual average actual damage to the period studied, including years without disaster;

Actual damage in the disaster maximum period studied,

The average annual damage of the years with effective disaster period studied.

The indicator is the annual loss earlier of the land improvements (p_{mhi}) added to net income growth of crops and improved land use (ΔN_i), obtaining the effect of economic (E_{fri}) for the situation, namely: $E_{fri} = \Delta N_i + p_{mhi}$.

Loss of agriculture net income

This indicator stood unrealized revenues as a result of the removal of the circuit area of agricultural land fertile and can be calculated in the second state, namely:

a) if the net agricultural income remains at a relatively constant level over the entire period for which the land is disposed. Relationship of calculation is:

$$Y_i = \Delta N_i \times D_i \times S_i$$

where:

Y_i - loss of net farm income in the version of investments;

N_i - net income produced annually in the investment option;

D_i - during removal of land from the agricultural circuit (d + De), the variant and investment;

S_i - that area will be removed from the agricultural circuit (ha), in the version of investments;

b) in case it is considered that the agricultural production and agricultural default net income will increase from one year to another, with a yearly average pace. Formula for calculation will be:

$$Y_i = N_i \times \frac{(1+r)^{D_i} - 1}{r} \times S_i$$

N_i - net income in the first year of release from the agricultural circuit;

r_i - Average annual growth in net income for the land in question;

i - investments.

No matter what variant of the cases presented above, the indicator stood at the loss of net income for the period as the area of agricultural land is removed from the economic circuit. Calculating the indicator for several possible investments, the preferred option is the one where the loss of net farm income is minimum.

For situations in which achievement itself the target of investment requires removal for the duration of the execution (d), a larger area of the agricultural circuit (work of organizing the construction site), the calculations are differentiated for the area removed from the circuit on the entire range ($D = d + D_e$) and then the area for additional affected only the period of execution (d) the objective.

Regardless of the form in which the indicator is calculated assessed value should be obtained compared with the objective of the investment would place elsewhere, and then select the optimal location (in which net income loss is minimal).

Case study:

At the periphery of a city, to build a commercial objective is required removal from the economic circuit of an area of 10 hectares of agricultural crop land. From this area 7 hectares are temporarily disabled as long as the objective of investment is achieved the $(d = 2 \text{ ani})$ and other 3 hectares will be set aside for the duration of operation of economic objective $(D = 5 \text{ ani})$

To build the commercial objective, there are 2 alternatives available : in the north of the city (where the net income from the agricultural activity is $N_1 = 1.715$ €/ hectare) and in the south of the city (where the net income from the agricultural activity is $N_2 = 1.572$ €/ hectare).

We must determine which is the best placement for the commercial objective, if it is known that the commercial objective investment cost is 145.000 € in the first year, 100.000 € in the second year, the annual profit for the commercial objective is $P_{h1} = 73.000$ € (for the north part of the city), $P_{h2} = 81.000$ € (for the south part of the city) and the discount rate is $r = 5\%$.

First of all, we can calculate the loss of agriculture net income.

In both the relationship will be used for calculation:

$$Y_i = N_i \times \frac{(1+r)^{D_i} - 1}{r} \times S_i$$

So, we can calculate the loss by Net farm income for the area removed from the economic circuit for the entire period of operation of investment objective:

$$Y_1 = 1.715 \times \frac{(1+0,05)^5 - 1}{0,05} \times 3 = 111.022 \text{ €}$$

and

$$Y_2 = 1.572 \times \frac{(1+0,05)^5 - 1}{0,05} \times 3 = 109.769 \text{ €}$$

Then, we calculate the loss of net farm income for the area removed from the economic circuit during the execution of investment objective:

$$Y_1' = 1.715 \times \frac{(1+0,05)^2 - 1}{0,05} \times 7 = 24.610 \text{ €}$$

and

$$Y_2' = 1.572 \times \frac{(1+0,05)^2 - 1}{0,05} \times 7 = 22.668 \text{ €}$$

As a result, total loss of net farm income is calculated by totaling the two results obtained on the basis of the

proposed alternatives: $Y_{t1} = Y_1 + Y_1'$ respectively $Y_{t2} = Y_2 + Y_2'$, so we have:

$Y_{t1} = 111.022 + 24.610 = 135.632$ € and the final solution $Y_{t2} = 109.769 + 22.668 = 132.437$ € leads to the conclusion that the optimal placement of the investment is the II, because in this case the loss of net farm income is lower.

In addition, we may determine the payback time for each alternatives.

$$T_i = \frac{I_i}{\Delta P_h} \quad \text{or} \quad T_i = \frac{I_i}{P_h' - P_h}$$

We must mention that in the total investment value was included, in addition to the direct investment, the loss as a result of removal from economic circulation of the land. Therefore, for each alternatives, the calculations are as follow :

$$T_1 = \frac{I_1}{\Delta P_1} = \frac{(145000 + 100000) + 135632}{75000}$$

$$= \frac{380632}{75000} = 5.08 \ years$$

and

$$T_2 = \frac{I_2}{\Delta P_2} = \frac{(145000 + 100000) + 132437}{81000}$$

$$= \frac{377437}{81000} = 4.66 \ years$$

As a conclusion, we can say that the proper alternative is represented by the south part of the city.

CONCLUSIONS

In assessing the economic efficiency of investment in agriculture we started from classical methodology and indicator's system specific to assess the economic efficiency of any investment process. In detail, starting from the indicators such as specific investment, recovery period, coefficient of economic efficiency, there were identified the characteristics of investment process in agriculture and we have built specific evaluation indicators

From all the indicators presented above, some are volume indicators (ex. loss of agriculture net income; real economic effect), other are economic efficiency indicators (the specific investment, the payback time of investments, the speed of investment recovery etc.). Without neglecting the importance of the first, we consider that efficiency indicators are vital in determining the optimal option, as quantified both the effects and the efforts in the same indicator. Consequently, they are determinants in assessing the efficiency of investment in agriculture.

Undoubtedly, the issue of efficiency of investment process in agriculture is more complex. Starting from this article, we can identify more specific indicators of different subdomains of agriculture : viticulture, horticulture, zootechnical area etc. In this paper we present only issues we have considered it significant, following that in a future work to analyze the impact that agriculture has on other economic sectors.

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