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## MONITORING AS A PHASE IN AGRICULTURAL INVESTMENT PROJECT CYCLE

### SUMMARY

The project approach in designing and realization of investment projects implies that projects need to pass specific phases of so-called project cycle in order to achieve project objectives as successfully as possible. This way the risks that the investment projects bear are minimized. The project cycle typically consists of six main phases, namely: Project Identification, Project Preparation, Ex-ante Project Evaluation, Project Implementation, Monitoring the Project Implementation and Ex-post Project Evaluation.

The fifth stage in a project cycle, Monitoring the Project Implementation, aims to successively monitor and control execution of project in accordance with the adopted project documentation (investment project or business plan), to identify circumstances that have changed during implementation of the plan and therefore, if necessary, to adjust the project to such changes. Monitoring the project contributes to the achievement of project objectives, as well as to the targeted spending of funds. The circumstances under which the project is implemented may differ to some extent from those envisaged at the time of identification, preparation and evaluation of the project. Monitoring phase also serves for the purpose of adapting the project to new, changed circumstances, if necessary.

Monitoring the project can be defined as gathering of all relevant information related to the project and its use by project management or independent controllers, with the aim to determine progress made in project implementation. Such information serves as a base for making decisions in a timely manner with aim to implement the project according to the envisaged schedule. Monitoring is an activity that has the task to measure investments (inputs) and initial results (output) in order to assist the project managers in the decision making process.

This paper analyzes monitoring carried out in practice on the example of apples orchards planting project in Vojvodina.

**Keywords:** project cycle, monitoring the project implementation, investments, agriculture, orchard.

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## INTRODUCTION

The role of investments in economic development is enormous. The direction, dynamics and degree of economic development is mostly conditioned by volume, structure and efficiency of capital invested into an economy. Use of capital has to be adequately elaborated and purposeful; otherwise it can be irrationally used. That is actually the reason why the world has adopted a practice of applying the project approach in implementation of development objectives. Every investment project has its development path from the very idea of investing to selection of project among several alternatives, preparation and implementation of project and finally monitoring the implementation and evaluation of achieved project effects (Vasiljević, 1992).

The project approach in designing and realization of investment projects implies that projects need to pass specific phases of so-called project cycle in order to achieve the project objectives as successfully as possible. This way not just the project mission, vision and objectives are achieved but also the risks that investment projects bear are minimized, since investments into fixed assets and permanent working capital and effects of their realization require longer time period. Principally, longer the investment period and investment exploitation period, the risk of failure in achievement of envisaged objectives and effects is higher. Implementation of projects through phases of project cycle significantly contributes to reduction of uncertainty in achievement of objectives and minimization of risks (Vasiljević, 1997).

The project cycle typically consists of six main phases, namely (Vasiljević, 1996):

- 1) Project Identification
- 2) Project Preparation
- 3) Ex-Ante Project Appraisal
- 4) Project Implementation
- 5) Monitoring the Project
- 6) Ex-post Project Evaluation.

Nowadays, it is almost a common practice in the world for investment projects to undertake all six phases during its implementation, especially since banks when granting loans for such projects insist on such procedure (Vasiljević, 1985). Considering that fulfillment of project cycle procedure and methodology is one type of a guarantee it ensures that the investor will implement project in accordance with the approved investment documentation. Therefore, the risk of potential failure to fulfill obligations towards banks, in their capacity of creditors, is reduced to minimum.

Many works on the first four phases of project cycle have been published in the literature (Sredojević & Vasiljević, 2004; Sredojević et al., 2006). However, that is not the case with the last two phases of project cycle, monitoring and ex-post evaluation of investment projects. In addition, the

practice shows that the last two phases of project cycle are far less common, since investors in principle deem them as unnecessary and tend to omit their implementation unless obliged by banks-financers or any different institutions involved in project implementation, i.e. if drawing of funds is not conditioned by positive reports on monitoring phase (Vasiljević, 1989).

The fifth stage in project cycle, Monitoring the Project Implementation, starts during the Project Implementation and overlaps to great extent with the Implementation phase. Monitoring aims to successively monitor and control execution of project in accordance with the adopted project documentation (investment project or business plan), to identify circumstances that have changed during the implementation of the plan and therefore, if necessary, to adjust the project to such changes. Monitoring the project is sort of a guarantee that contributes to the achievement of project objectives, as well as to the targeted spending of own funds, as well as loan funds. The circumstances under which the project is implemented may differ to some extent from those envisaged at the time of identification, preparation and evaluation of the project. An important part of monitoring is possibility to adjust the project to new, changed circumstances.

Monitoring the project can be defined as gathering of all relevant information related to the project and its use by project management or independent controllers, with the aim to determine progress made in project implementation. Such information serves as a base for making decisions in a timely manner with aim to implement the project according to the envisaged schedule. Monitoring is an activity that has the task to measure investments (inputs) and initial results (outputs) in order to assist the project managers in the decision making process (Casley & Lury, 1982).

Monitoring is an important phase in project implementation. Notwithstanding the good identification, preparation and evaluation of a project, if monitoring is not implemented in a satisfactory manner, the envisaged plans and benefits will not be achieved. Actually, the monitoring phase ensures implementation in accordance with the project (Subić et al., 2008).

The circumstances under which the project is implemented may differ to some extent from those envisaged at the time of identification, preparation and evaluation of the project. An important part of monitoring is possibility to adjust the project to new, changed circumstances (Vasiljević, 1998). An important role of supervision and monitoring phase is also resembled in proper implementation of international and domestic tenders for execution of work and equipment procurement, controls in procurement of materials and provision of services financed by project funds, etc.

## **MATERIAL AND METHODS**

This paper applies combination of research methods. First of all, the project approach in planning and implementation of investment projects was applied. The accent was given to only one phase of project cycle, which is

monitoring the implementation of investment project. The sample was one agricultural project on growing perennial plants, in this case apple orchard. Therefore, the case study method was used, since an example of one case (in this case the apple orchard) was used for showing main characteristics of one phase in the project cycle and for deriving general conclusions.

Moreover, the analytic and synthetic research methods for the subject matter were used, as well as desk analysis of obtained results, together with comparison of obtained results with the projected ones, as well as with results that can be found in the literature.

In case of the subject project, monitoring included implementation of project on growing orchard on 128 ha, implemented in the Republic of Serbia, on the slopes of Fruska Gora (Reports on monitoring, 2010-2011). Monitoring included all necessary activities required for controlling the loan and Investor's own funds, as well as monitoring implementation of activities envisaged by the project in physical and financial sense. Independent Consultants (Controllers) were responsible for taking care of progress made during the implementation of project on planting orchard and problems that occurred during the investment phase. The Controllers were engaged by the Investor for the purpose of performing monitoring tasks and reporting to the interested institutions, primarily to Banks that awarded loans for financing the mentioned project.

Project implementation data, physical and financial, were gathered in several ways: through regular filed visits and introduction to the field conditions, through interviews with employees on the orchard and in the administrative offices of the Investor, and through access to the accounting and financial documents of the Investor. Moreover, the relevant scientific and professional literature of the subject area was also consulted (Andrić et al., 2005). The independent controllers were contractually obliged to inform, through monthly reports, the Investor and Banks-Creditors on their findings and opinions. The reports were delivered before 15th each month for the previous month.

The Investor also engaged a team of agrarian economists for monitoring the project on apple orchard growing. When needed, the team engaged experts in other fields (fruit engineers, plant protection officers, mechanization officers, etc...).

Monitoring was performed successively, starting in March 2010 and ending in February 2011. The Final Report on Project Monitoring was developed at the end of this period, subliming monthly analysis and obtained data, as well as opinions and proposals of independent controllers.

## **RESULTS AND DISCUSSION**

The basic idea of the investment project analyzed in this paper was to establish a modern 128 hectare apple orchard with the most contemporary way of growing and protection systems (irrigation system (drop by drop), anti-hail system, anti-frost system, etc...) on the southern slope of Fruska Gora, northern part of Srem. This is to be followed by the second phase of this project, which

would include construction of a modern cooling chamber with a controlled atmosphere and capacity of 4,500 tons. The project was developed in accordance with standards applicable in Italian region South Tyrol, which is known for application of the most modern apple growing system. This is one of the biggest apple orchards in the region.

Southern slopes of Fruska Gora represent a very attractive location for fruit growing. It is located at the same geographic latitude as Verona, the most famous nursery terrain in this part of Europe, as The Champagne region in France or as California in USA, thus, in simple words, this is a particularly favorable location for fruit growing.

Out of 128 hectares, the project envisaged planting of 475,000 apple trees on 122 hectares with five different sorts: Red Delicious, Golden Delicious, Grenny Smith, Gala – red mutation and Fuji. The remaining 6 hectares are planned for construction of cooling chamber and access roads to the plain, as well as for accompanying facilities and internal infrastructure, whereof roads take 2 hectares.

It was envisaged to use combination of apple assortments (3 red, 1 yellow and 1 green) demanded by market, which have different harvesting periods expanded to the period of 2 months, ensuring that way an optimum organization of agricultural works and use of agricultural machinery. This is also favorable for future use of cooling capacities (after establishing a cooling chamber in the second phase of project implementation), where optimum amounts of products are to be stored on daily basis, ensuring that way the best storage method for the produced fruits.

The amount of 12.5 million Euros was invested into establishing the apple orchard. The orchard includes all facilities required for a good and high quality yield and for minimizing risks of detrimental natural effects. This primarily implies existence of a modern irrigation system “drop by drop”, installation of an anti-hail network which has double purpose – protects against natural disasters (hail), but also reduces excessive impact of sunrays and occurrence of sunburns on fruits, and finally installation of an anti-frost protection system which prevents from long-term negative consequences in case that frosts occur during fruit flowering period.

Fruit seedlings (biennial) were imported from Italy and their advantage is the fact that even in the first year after the planting they bear yield, although rather small. The maximum yield is expected in the fourth year and on this plantation it is to amount to more than 7,500 tons. The cooling chamber, which is to be built on the very location of the orchard, was intentionally projected with capacity slightly higher than the Investor’s needs in order to provide possibilities for local population to store their own products in this cooling facility. This will contribute to the local population who will recognize potentials in this type of production and use the assistance of the Investor’s company to place their products onto the market. The plan is to export majority of apple production to

Russian market, since they have been in recent years a very important buyer of this type of fruit.

Several facts are important from the aspect of monitoring the apple orchard growing, which also contributed to better implementation of the project, as well as to risk reduction, and they are the following:

- Monitoring team had asserted that the business plan, which was a base for approving the investment's implementation, required revision, since it did not take into account all facts and specific features of agricultural production (in this case fruit production). This was accepted by the Investor and undertaken.

- Certain loan installments were paid after adoption of periodic reports prepared by independent controllers, which resulted in permanent contacts and cooperation between the teams of Investor, Bank-Creditor and independent controllers, for the purpose of fulfilling the deadlines set for particular stages in establishing the orchard. This has proved to be very good and has justified existence of the monitoring phase.

- It was not possible to envisage certain investment items during the business plan development, regardless the undoubting expertise of the team responsible for investment elaborate, since certain facts were unknown or impossible to predict at the time when the investment documentation was elaborated. Nevertheless, the monitoring phase reveals such uncertainties and eliminates them, so as for the project not to be in delay and not to be affected in case of their occurrence. For example, the project on establishing apple orchard envisaged construction of 5 irrigation wells, but it was noticed during the project implementation that such number of wells does not provide water capacity during the entire year that would be sufficient for irrigation of apple trees. Therefore, the monitoring team proposed construction of the sixth well. Such change increased pre-calculated investment value, but this was necessary so as for the project to undisturbingly operate in the exploitation phase. Moreover, the business plan did not envisage fence around the seedlings, but because of more frequent thefts it was necessary to put fence. Similar examples occurred during the entire project and whenever it was justified to deviate from the original business plan, the Investor and Banks-Creditors agreed to adopt such proposals of the monitoring team and agreed to such changes, i.e. inclusion of new items into the pre-calculated investment value.

- Monitoring team concluded that project was mostly implemented in accordance with the revised business plan. It resulted in introduction and expansion of new technology of apple growing in this area, increased employment in two municipalities in Vojvodina, employing qualified agricultural engineers on permanent basis, as well as season workers engaged for few months during a year on works related to planting, cutting, harvesting, intercrop lawn mowing, etc...

- Taking into consideration the positive results and evaluations of monitoring phase in apple orchard planting, the Investor and Banks-Creditors also requested monitoring for the second phase of the project, which relates to establishing of a

cooling capacity for storage of apples. Namely, it was proven that this phase is very useful for all participants in the project implementation, since it contributed to better project implementation, especially since significant funds were invested into this project. It is expected that this project will contribute to better supply of high quality fruits to local market, as well as to further increase in export to Russian market (Reports on monitoring, 2010-2011).

## CONCLUSIONS

One of the most common ways to implement development objectives is investment of funds in accordance with well designed investment projects. The project approach in implementation of development objectives implies going through a series of steps or phases from the idea to the project effectiveness, which nowadays has a widely accepted term “a project cycle”.

In principle, a project cycle consists of six main phases, which are: Project Identification, Project Preparation, Ex-ante Project Evaluation, Project Implementation, Monitoring the Project Implementation and Ex-post Project Evaluation.

The first four phases have been described in scientific and professional literature, whilst the last two phases, Project Implementation (Monitoring) and Ex-post Project Evaluation have less writings. Even the practice has no rich experience in this regard, considering that investors generally tend to avoid these phases, unless forced otherwise by Banks-Creditors or different institutions involved in project implementation.

Agricultural projects have their own characteristics and specific features in respect to all project cycle phases, thus in respect to monitoring too. Therefore, it is very important that professional people, who are familiar with the nature of agricultural production and agrarian investments, deal with such tasks.

The example of planting an apple orchard on the slopes of Fruska Gora in accordance with the most contemporary technology, which also implies high investment costs and therefore a need to minimize unnecessary investment risks and to constantly monitor investment implementation and continuous elimination of emerged problems, proves the necessity of this phase in a project cycle and its usefulness to all projects, especially to large-scale agricultural projects. It also proves that its effects are higher than costs made during its organization and implementation.

It is very important to emphasize that monitoring of investment project implementation is not a phase useful only to Banks-Creditors, being their way of supervising and controlling the investment of loan funds, but is also very useful to investors too. It reveals problems and omission in investment implementation on time, helping to relatively quickly eliminate project bottlenecks and to avoid bigger problems and expenditures.

## REFERENCES

- Andrić, J., Vasiljević Zorica, Sredojević Zorica (2005): INVESTICIJE – OSNOVE PLANIRANJA I ANALIZE, Poljoprivredni fakultet Univerziteta u Beogradu. /Investments – Basic Planning and Analysis, Faculty of Agriculture, University of Belgrade/
- Casley, J.D., Lury, A.D. (1982): MONITORING AND EVALUATION OF AGRICULTURE AND RURAL DEVELOPMENT PROJECTS, The John Hopkins University Press, Baltimore and London.
- \*\*\* (2010-2011): IZVEŠTAJI O PRAĆENJU (MONITORINGU) REALIZACIJE PROJEKTA RAZVOJA VOĆNJAKA JABUKA – RUDNAP AGRAR DOO BEOGRAD./Reports on monitoring the project on development of apple orchard/
- Sredojević Zorica, Vasiljević Zorica (2004): EKONOMSKA ANALIZA INVESTIRANJA U MELIORISANJE ZEMLJIŠTA, u tematskom zborniku radova sa Naučnog skupa s međunarodnim učešćem »Kapital u poljoprivredi«, Ekonomski fakultet – Subotica, Institut za ekonomiku poljoprivrede – Beograd i Poljoprivredni fakultet – Novi Sad, Palić 12-13. November 2004, pg. 55-61. /Economic analysis of investments into melioration of soil, thematic collection of works from the international Scientific Conference “Capital in agriculture”, Economic Faculty – Subotica, Institute for Economic Agriculture – Belgrade and Faculty of Agriculture – Novi Sad/
- Sredojević Zorica, Vasiljević Zorica, Čejvanović, F. (2006): EKONOMSKI MODEL INVESTIRANJA U PODIZANJE VIŠEGODIŠNJIH ZASADA, u zborniku sažetaka sa naučno-stručnog savjetovanja agronoma Republike Srpske, "Proizvodnja hrane u uslovima evropske zakonske regulative", Poljoprivredni fakultet Banja Luka, Poljoprivredni fakultet Istočno Sarajevo, Poljoprivredni institut Republike Srpske – Banja Luka, Društvo agronoma Republike Srpske, Teslić 13-16. marta 2006., str. 64./Economic model of investments into growing perennial plants, collection of abstracts from the scientific-professional conference of agrarians of Republic of Srpska, “Production of food under European legislation”, Faculty of Agriculture Banja Luka, Faculty of Agriculture East Sarajevo, Agricultural Institute of Republic of Srpska – Banja Luka, Association of agronomists of Republic of Srpska, Teslić, 13 -16 March 2006, pg. 64/
- Subić J., Vasiljević Zorica, Ivanović S. (2008): PROCENA BUDUĆIH INVESTICIONIH ULAGANJA U POLJOPRIVREDI NA PODRUČJU GRADA BEOGRADA, International Scientific Meeting: “Multifunctional Agriculture and Rural Development III - rural development and (un)limited resources”, 4-5th December 2008, Faculty of Agriculture in Zemun - Belgrade, knjiga I, str. 268-275; ISBN 978-86-82121-59-6, COBISS.SR-ID 153619724, CIP 338 (497.11) ”2001/2009”; 631 . 1 (497.11) ”2002/2007”. /Assessment of future investments into agriculture in the area of Belgrade/
- Vasiljević Zorica (1985): PRAĆENJE EKONOMSKIH EFEKATA INVESTIRANJA U JUGOSLOVENSKOM AGROKOMPLEKSU – NA PRIMERU KORIŠĆENJA SREDSTAVA MEĐUNARODNE BANKE, magistarska teza, Univerzitet u Beogradu, Ekonomski fakultet, Beograd.



- /Monitoring economic effects of investments into Yugoslavian agro-complex-example of using funds from international bank, master thesis, University of Belgrade, Faculty of Economics, Belgrade/
- Vasiljević Zorica (1996): METODE OCENE EKONOMSKE EFEKTIVNOSTI INVESTICIJA I NJIHOV UTICAJ NA DONOŠENJE INVESTICIONIHL ODLUKA U POLJOPRIVREDNOJ PROIZVODNJI, doktorska disertacija, Univerzitet u Beogradu, Poljoprivredni fakultet, Beograd. /Methods for assessment of economic effectiveness of investments and their impact to investment decision making in agricultural production, PhD dissertation, University of Belgrade, Faculty of Agriculture, Belgrade/
- Vasiljević Zorica (1998): EKONOMSKA EFEKTIVNOST INVESTICIJA U POLJOPRIVREDI, Zadužbina Andrejević, Beograd. /Economic effectiveness of agricultural investments, Andrejevic heritage, Belgrade/
- Vasiljević Zorica (1992): PRAĆENJE I EX-POST OCENA EFEKATA ULAGANJA KOD POLJOPRIVREDNIHL INVESTICIONIHL PROJEKATA, u zborniku radova sa nacionalnog naučnog skupa "Strategija investiranja i metodologija ocenjivanja investicionih projekata u praksi", Fakultet organizacionih nauka u Beogradu, Beograd. /Monitoring and ex-post evaluation of investments into agricultural investment projects, collection of papers from the national scientific conference "Investment strategy and methodology for evaluation of investment projects in practice", Faculty of Organizational Sciences, Belgrade/
- Vasiljević Zorica (1989): METODI PRAĆENJA I OCENE EFEKATA EKONOMSKE OPRAVDANOSTI INVESTICIJA NA PRIMERU MELIORACIJA ZEMLJIŠTA, u publikaciji "Ekonomika porownactwa rolnictwa", Instytut ekonomiki rolnictwa i gospodarki zywnosciowej, Warszawa, str. 50-59. /Methods for monitoring and evaluation of investment economic justification effects on the example of land melioration/
- Vasiljević Zorica (1997): METHODS OF INVESTMENT ECONOMIC EFFECTIVENESS APPRAISAL AND THEIR INFLUENCE ON THE INVESTMENT DECISION MAKING IN AGRICULTURAL PRODUCTION, Journal Review of Research Work at the Faculty of Agriculture (Vol. 42, No 1), Belgrade, pp. 77-95.

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## **MONITORING KAO FAZA PROJEKTOG CIKLUSA KOD POLJOPRIVREDNIH INVESTICIONIH PROJEKATA**

### **SAŽETAK**

Projektni pristup u kreiranju i realizaciji investicionih projekata podrazumeva da projekti treba da prodju određene faze tzv. projektnog ciklusa kako bi uspešnost ostvarenja ciljeva postavljenih projektom bila što je moguće veća. Na taj način se minimizira rizik koji sobom nose investicioni projekti. Projektni ciklus po pravilu sadrži šest osnovnih faza, a to su: Identifikacija projekta, Priprema projekta, Ocena projekta ex-ante, Realizacija projekta, Praćenje realizacije projekta (Monitoring) i Ocena efekata projekta ex-post.

Peta faza u projektnom ciklusu Praćenje realizacije projekta (Monitoring) ima za cilj da sukcesivno prati i kontroliše da li se projekat izvodi prema usvojenoj projektnoj dokumentaciji (investicionom projektu ili biznis planu), da konstatuje izmenjene okolnosti u realizaciji u odnosu na plan i da prema njima vrši izmene projekta ukoliko se za to ukaže potreba. Praćenje (Monitoring) projekta doprinosi postizanju ciljeva projekta kao i namenskom trošenja predviđenih sredstava. Okolnosti pod kojima se ostvaruje projekat mogu u izvesnoj meri odstupati od okolnosti sa kojima se računalo u vreme identifikacije, pripreme ili ocene projekta. Faza monitoringa služi i tome da se projekat prilagodi novim, izmenjenim okolnostima, ukoliko se ukaže potreba da se preduzme takva aktivnost.

Praćenje (monitoring) projekta se može definisati kao prikupljanje svih relevantnih informacija o projektu i njihovo korišćenje od strane menadžmenta projekta ili nezavisnih kontrolora, sa ciljem da se utvrdi koliko se napredovalo u realizaciji projekta, da bi se na bazi tih informacija donele blagovremene odluke kako bi se projekat realizovao prema predviđenoj dinamici. Monitoring je aktivnost koja ima zadatak da meri ulaganja (inpute) i inicijalne rezultate (outpute), s ciljem da se pomogne menadžerima projekta u procesu donošenja odluka. U ovom radu je analizirano kako se u praksi realizuje faza monitoringa na primeru projekta podizanja voćnjaka jabuka u Vojvodini.

**Ključne riječi:** projektni ciklus, monitoring realizacije projekta, investicije, poljoprivreda, voćnjak