METHODOLOGY AND SOFTWARE APPLICATION FOR CREATION OF BUSINESS PLAN IN ANY AREA OF AGRICULTURAL PRODUCTION

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ABSTRACT
The current economic situation in the Republic of Serbia and the Government's recommendation to activate all national resources, including science, in the direction of recovery of the economy, imposed a need for scientific and research activities that would, among other things, result in significant economic and organizational effects in the field of agricultural production. In this research, emphasis was put on the methodology and software application for creation of business plan in the field of livestock production, and as a representative example a bullock fattening project was selected. The assessment of the economic effectiveness of the project was done using static and dynamic methods, as well as methods for assessing investments in conditions of uncertainty. The obtained results of the assessment of the effects of the project show justification of the investment, which is through the realization of the project, not only the price of the source of financing was covered, but above it the profit was made.

KEYWORDS: *economic efficiency, investments, business plan, software application, agriculture.*

JEL CLASSIFICATION: *O13, Q14*

1. INTRODUCTION

In the current context of an informational explosion and a very large capacity for automatic data processing, in the economic literature there is a large number of software that deals with business plan issues. These include: LivePlan, PlanMagic, BizPlan Builder, Ultimate Business Planner, Business Plan Pro etc (figure 1 contains the logos for these software examples).

These IT products address a wide range of domains, being designed to meet all requirements and take into account all the particularities encountered. Moreover, these software programs are intuitive, have a user-friendly interface and help the user / the beneficiary in the process of undertaking the business plan (in figure 2, we present an example).

Generally, building a business plan through specialized software is based on the questionnaire method, by which the computer interrogates the beneficiary on the issues needed to draw up the plan in a wide range of areas that will form in the chapters of the plan: details regarding the company, the presentation of the product or service covered by the business plan (opportunity, competitive advantage etc.), presentation of the sales market (consumer needs, main customers, competition, market growth trends, etc.), management plan, production plan, marketing (pricing, how to promote and distribute the product or service), financial plan, annexes etc. Very often, the beneficiary can customize the business plan structure by removing those aspects that are considered irrelevant to the field.

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Figure 1. Logos of different software for business plan
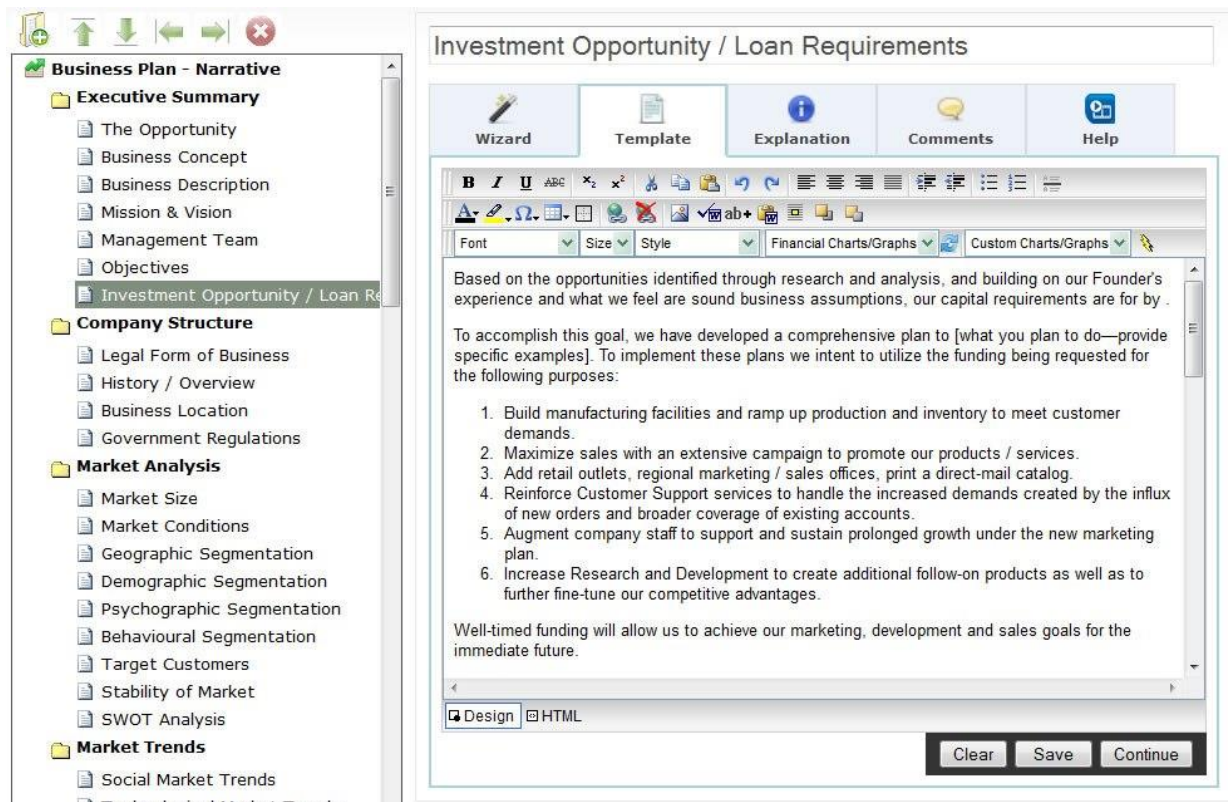*Source*: authors

Figure 2 Example of business plan structure
Source: Business Power Tools. http://www.businesspowertools.com/project/business-plan-software-template-cloud-based-online-apple-mac-macintosh/

The complexity of such programs is based on the multitude of disciplines that compete for a business plan: project management, marketing, financial management, risk management, human resources management, production management etc.

In the following, we will focus our attention on using specialized software to develop a business plan for agriculture in the Republic of Serbia

The data of the Census of Agriculture in the Republic of Serbia (realized in 2012) point out the fact that the education at the level of family agricultural holding is very poor (both, education of the holder and members of the farm), where the knowledge is mostly based on personal experience from the practice (SORS, 2012). In the conditions of financial assets deficiency, unfavorable and technically more demanding crediting conditions, as well as low public financial support, family farms are forced to deeply reconsider all basic elements of sustainable development, not only through the adoption of new economic and organizational skills, training turned to financing, marketing, risk hedging and insurance, but also through computer literacy.

In the context of EU integration and harmonization of national legislation with the EU Common Agricultural Policy, from science is expected to make a transfer of necessary knowledge and skills to agricultural, primarily family holdings. After their adoption, holdings would be in position to plan, organize, finance and manage the production process more efficiently, as to make certain savings in used inputs, produce a larger volume of safe food and successfully realize their products on the local, regional and EU markets. Consequently, to agricultural holdings in Serbia are imposing the need for better impacting, not only the strengthening of produced products competitiveness, but also the sustainability of their overall business.

The main goal of this research is improvement of farmers' computer literacy and defining the methodology for business plan in any field of agricultural production development. On the other hand, research has also identified several specific goals, which are primarily related to: improvement in livestock production elements planning – needed inputs and agro-technical measures (in our case, in production line of bullocks fattening), achieving of better business effects by the use of proper methodology for business plan creation (as adequate decision making and management tool); better information about the available financing sources; raising the level of farmers financial literacy (by adoption of certain economic knowledge, techniques and skills) according to planning and financing of agricultural production, business risk control, as well as improving of final products trade; comprehensive productivity growth of agricultural production and support to sustainable development of agricultural holdings, with a positive impact on rural-to-urban migration and better employment of rural population.

2. METHODOLOGY AND DATA SOURCES

Considering the agro sector in Serbia, it is evident that it has been developed for decades within the system of partially planned economy. After the transition to a fully marketed orientation, it was imposed the need for farmers to acquire new knowledge, primarily from the field of agricultural products marketing, bookkeeping, production financing, investment and risk management.

One of the crucial problems encountered by family farms in Serbia is certainly the acute lack of financial resources. Unfavorable terms of crediting of commercial banks, inadequate availability of agricultural loans and poor information about credit availability and terms of crediting, weak adjustment of credit lines to the business conditions related to agricultural holdings are just some of the limitations for business improvement, primarily at the family agricultural holdings.

Besides the bank credits, agricultural holdings have also at their disposal credit lines subsidized by the official public institutions (which are granted under more favorable (privileged) conditions). However, their amount is not sufficient to meet the all needs of agricultural holdings (especially family farms), which have not adapted yet to market conditions and more rigid customer demands.

As a candidate country for the EU accession, the Republic of Serbia is entitled on use of pre-accession funds. On the other hand, in order to use assets from mentioned funds it is necessary to prepare

appropriate documentation, to comply with the prescribed procedure and to provide own assets for projects financing.

Computer illiteracy or small and rare use of computers is the limitation for the largest part of farmers (or rural population at all), what greatly prevents timely access to the significant information for their business. The unfavorable age structure of agricultural holdings management (in particular, holders of the family agricultural holdings) is another limiting factor that affects the improvement of computer literacy level at farms. The analysis of the data from the Census of Agriculture shows that the largest share of family farms holders is aged over 65 (more than 32% of the total number of managers at the family farms in Serbia), (SORS, 2012).

By the use of the excel software application developed for business plan creation in any line of agricultural production, intention was consolidation of methodologies (Ćejvanović et al., 2010; Kuzman, 2006; Subić et al., 2008; Subić, 2010; Vasiljević, 2007) that are in line with the methodologies of developed European countries, as well as to transform them into the MatLab software application suitable for data processing and displaying, in order to simplify and adapt them for the domestic agricultural holdings (physical and legal persons), (Subić, 2017).
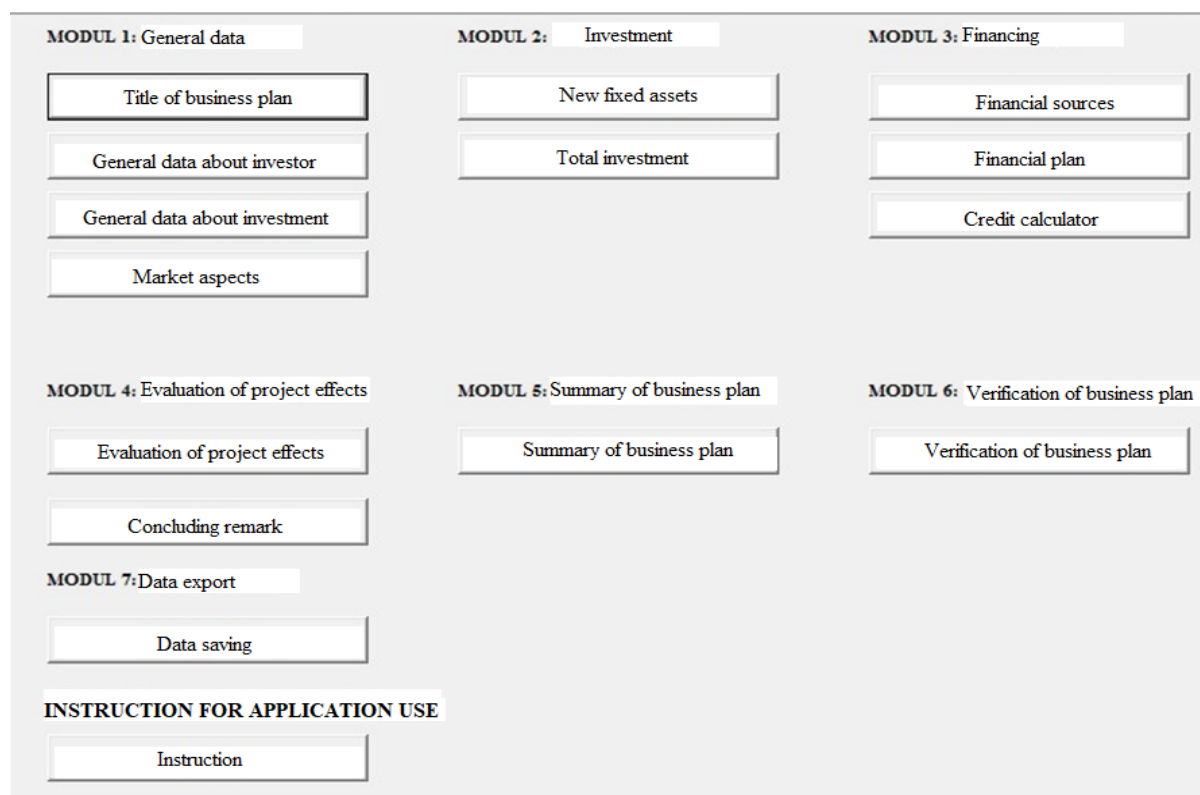

Figure 3. Excel software application for the business plan creation in any field of agricultural production (Menu for selecting the module)
Source: Subić, Ivanović and Todorović (2016)

Excel software application for the business plan creation in any field of agricultural production (Subić, Kuzman, 2016) could greatly facilitate the work in business planning, defining of strategic priorities and decision making in investment processes at the Serbian agricultural holdings. Application launching provides detailed insight into the form and content of the business plan. After opening the menu Project theme, by the click on the bar for the application for the business plan creation in any line of agricultural production, it has to be selected the main menu, and then in the menu for module selection start with data entry (Module 1 to Module 7), (Figure 3). Data entry has to be done only in adequate fields marked in green, while in other fields displayed values are automatically calculated based on previously entered values. After the process of data entry is completed, data has to be recorded in appropriate folder (Module 7), (Subić, 2017).

By the use of the module selection menu is enabled not just simple and quick use of excel software application, but the very easy and efficient mastering of the methodology for business plan in any field of agricultural production development. The module selection menu has the following structure:

Module 1: General data
- Title of business plan
- General data about investor
  - Data about agricultural holding
  - Business orientation of agricultural holding
  - Ownership and structure of property
  - Business activity and organization
  - Structure of labor force at the holding
  - Fixed assets in use
- General data about investment
  - Short description of business idea - project
- Market aspects
  - Sale market
  - Supply market

Module 2: Investment
- New fixed assets
- Total investment

Module 3: Financing
- Financial sources
- Financial plan
  - Total income creation
  - Structure of costs
- Credit calculator

Module 4: Evaluation of project effects
- Evaluation of project effects
  - Cash flow
  - Economic flow
    - Static evaluation of the project [according to following indicators: economic efficiency of production, rentability of production, profitability of investment, (pre-calculated value of investment), payback period of investment]
    - Dynamic evaluation of the project [according to following indicators: net present value, internal rate of return, payback period of investment]
    - Break-even point of profitability [according to following indicators: break-even point, break-even point by value, margin of safety]
  - Concluding remark

Module 5: Summary of business plan
- Summary of business plan

Module 6: Verification of business plan
- Verification of business plan

Module 7: Data export
- Data saving

In paper are used field data collected at the family agricultural holding located in the Danube basin region (Ivanović, Todorović, 2016).

The selected farm wants to invest in fattening of 50 bullocks per one cycle (total investment amounts 8,880,000.00 RSD; the average exchange rate of the National Bank of Serbia (on 17.11.2016.): 123.2137 RSD = 1 EUR), motivated by large production volume of maize and alfalfa, which can be successfully

used for cattle feeding, so in that way to achieve a higher value added production, in other words to use cheap forage in livestock production. According to that, part of area under the corn would be used for the production of maize silage, as the cheapest, but high quality feed for the ruminants (in our case, bullocks). According to above mentioned, within the structure of meal will be dominated a silage of a whole corn plant, what will enable the minimization of feed costs. Besides the maize silage, meal will also include alfalfa hay, corn grits and sunflower meal. Costs of animal feed will be calculated at market prices. On that way will be avoided a subjective estimation of full feed costs (costs of feed production). Besides, use of market price allows a real insight into what will happen if fodder (maize, alfalfa, etc.) that could be sold on the market is used in process of fattening.

Farm will buy Simmental calves of around 150 kg and fattened them to the final weight of up to 550 kg. In average, planned daily yield of bullocks is about 1,100 gr/head. Process of fattening will last 350 days. Planned period between the two cycles of fattening is 15 days, and in that period is made necessary cleaning and disinfection of facilities (stable). Average market prices will be used for calculation of sold fattened heads value, as well as for the calculation of purchasing costs of calves.

Bullocks fattening is planned in open-type facility (the south side of stable will be opened, where the windshield net will be used during the winters). This type of facility is chosen in order to decrease the total investment, as to improve the cattle health. The floor in stable is solid and slanting, and bullocks are moving freely within the boxes. The facility will be adequately equipped (water tanks, nipple drinkers, bulkheads, etc.). It is also planned a purchase of mills, equipment for manure removing, mixing trailer and other necessary equipment. It was reconsidered a building of trench silo for a prepared silage, concrete damp and pool for liquid manure (by that stable facilities will not have a negative impact on the environment), as well as other auxiliary facilities necessary for feed preservation and preparation. Costs of buildings will be brought to the minimum, as all family members will work on their construction.

Besides the investment in fixed assets (facilities and equipment), investment in permanent working capital in amount of around 20% of the investment in fixed assets are also needed.

Sale of fattened bullocks will be directed to appropriate slaughterhouse, which will enable the state subsidies reimbursement in amount of 10,000 RSD per fattened head of cattle (the average exchange rate of the National Bank of Serbia (on 17.11.2016.): 123.2137 RSD = 1 EUR.).

For the process of bullocks fattening will be engaged the owner of the farm and his family members, so there will be no need for externally paid workers. As there are no external employees, and as the members of the household will be rewarded for their work from the potentially gained profit achieved in bullocks fattening, in calculations are not planed labor costs.

In line to previously mentioned, it should be noted that the planned investment will not lead to any negative environmental impacts, while the engaged labor force (holder and members of the family farm) will respect all occupational safety rules.

4. RESEARCH RESULTS AND DISCUSSION

Having in mind the defined research goals, use of MatLab software application for data processing and displaying (transformed excel software application for the business plan development in any line of agricultural production) is primarily directed to the evaluation of economic effectivenes of investments. In our case, the assessment of the investment project effects is focused on cattle (young bullocks) fattening.

The first page of the mentioned MatLab software application contains a menu for the selection of graphical display of the processed data, static and dynamic indicators of the assessment of the economic efficiency of the investments in bullocks fattening and conclusion (summary of the indicators for determine of the project's acceptability - its ability to cover all financial obligations), (Figure 4).

Figure 4. Main menu of MatLab software application for data processing and displaying
Source: Subić (2016)

By selecting a graphic display, there is an option for a detailed insight into the data related to total investments, sources of financing, forming of total income (optionally for the third or fifth year of the project exploitation), or total costs (optionally for the third or fifth year of the project exploitation), (Figure 5).

Figure 5. Menu for graphical displaying of data
Source: Subić (2016)

Obseving the third year of the project, displayed results (gained after the data processing using the excel software application for development of business plan in any line of agricultural production) indicate the following (Figure 6): total investement (in fixed assets and permanent working capital) is 8,880,000 RSD; the share of fixed assets within the structure of total investment is 83.33%, while the share of permanent working capital amounts 16.67%; within the souces of financing, the share of own capital amounts 40.88%, while the share of external capital is 59.12%; sales revenues are 6,737,500 RSD; expected public subsidies are 500,000 RSD; material costs are 5,349,000 RSD; and immaterial costs are 824,536.16 RSD.

Figure 6. Graphical display of processed data in third year of investment project
Source: Subić (2016)

Comparing to third year, in fifth year of project exploitation are recorded changes in processed data, or it comes to decrease in immaterial costs, which currently amount 654,094.40 RSD (Figure 7).

Figure 7. Graphical display of processed data in fifth year of investment project
Source: Subić (2016)

By clicking on the bar static or dynamic indicators, appears an option for detailed insight into the data related to static indicators (optionally in the third or the fifth year of the project exploitation), such are: economic efficiency of production, rentability of production, profitability of investment and payback period of investment; or dynamic indicators, such are: net present value of the project, internal rate of return and payback period of investment; or indicators for economic effectiveness assessment under the uncertainty, in other words break-even point of profitability (break-even point and margin of safety), (Figure 8 and Figure 9).
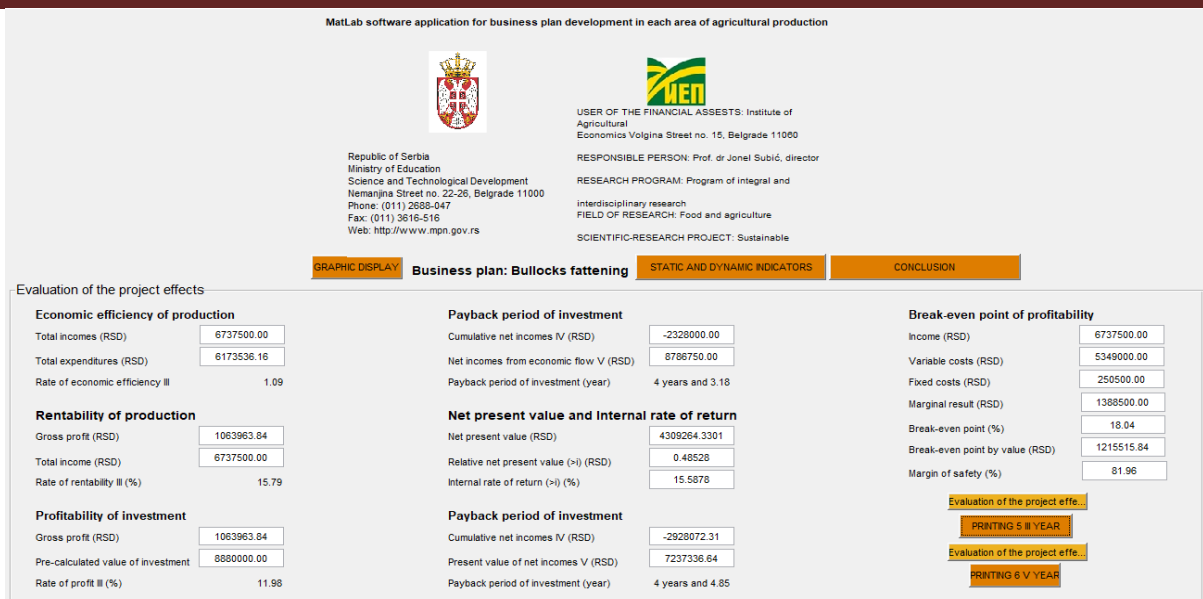
Figure 8. Assessment of investment economic effectiveness in third year of the investment project, from the aspect of static and dynamic indicators and under the uncertainty conditions
Source: Subić (2016)
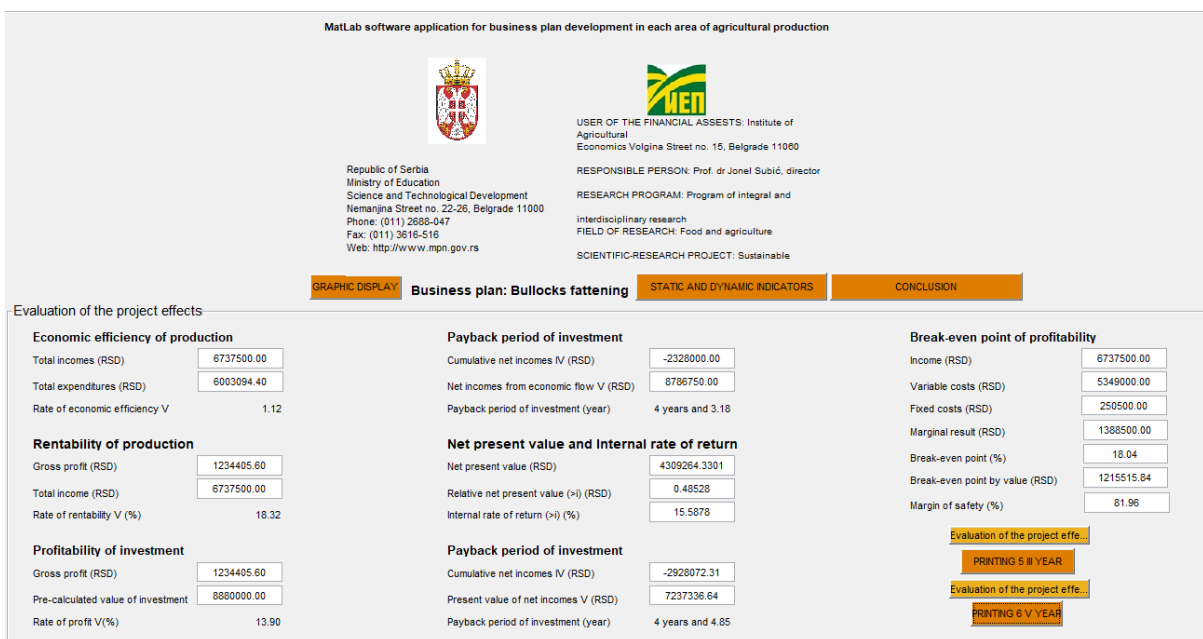
Figure 9. Assessment of investment economic effectiveness in fifth year of the investment project, from the aspect of static and dynamic indicators and under the uncertainty conditions
Source: Subić (2016)

At the end, by the choosing of bar conclusion in the menu, detailed insight into the comments involved into the concluding remark of the project would be got (Figure 10).

Figure 10. Concluding remark of the investmen in bullock fattening
Source: Subić (2016)

Although the data were processed and displayed both for the third and fifth year of the project, conclusion contains just analysis of gained results in the representative (fifth) year of the project (year of the full capacity).

5. CONCLUSIONS

Taking into account all results gained from the assessment of the economic effectiveness of investment in bullocks fattening, the following conclusion could be drown.

First of all, *the rate of economic efficiency* is greater than one, or the total income is greater than the total expenditure. Therefore, it can be stated that this project is economical (investment is profitable). Then, *the rate of rentability and rate of profit* are greater than 3,96% (assumed weighted price of the capital). In this context, it can be concluded that the investment is accumulative and profitable (means that the price of the source of financing is covered during the project exploitation, and additionally some profit was achieved).

According to static assessment, the investment project will be paid off for 4.26 years. Therefore, *payback period of investment* is 4 years and 3.18 months (0.26 x 12 months).

Another interesting conclussion is that the investment would allow the investor a *total profit increase* in amount of around 4,309,264.33 RSD, recalculated by the discount rate (i = 3.96%) on the initial moment of exploitation (n = 0), during the five-year period of exploitation. Furhermore, the investment is profitable because *the internal rate of return* is higher than the interest rate (15.59%> 6.00%), or the discount rate (15.59%> 3.96%).

According to the dynamic assessment, the investment project will be paid off for 4.40 years. Therefore, *payback period of investment* is 4 years and 4.85 months (0.40 x 12 months). In all years of the project exploitation, the volume of production should not fall below 18.04% (realized sales revenue should not be below 1,215,515.84 RSD).

The last, but not the least, in all years of the project exploitation, it is allowed a decrease in production volume for 81.96% (realized sales revenue should be reduced for 5,521,984.16 RSD).

ACKNOWLEDGEMENTS

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