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COMPUTER MODEL FOR EVALUATING PERFORMANCE AND ECONOMIC RISK AT THE LEVEL OF FARMS OF DIFFERENT SIZES

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Summary: *Computer Model for performance evaluation and economic risk is a model complex based on appropriate methodologies with specific indicators, necessary to administer the agricultural farm, management, efficient and increase its productivity. System of indicators is intended as a centralized source of information necessary to improve economic performance and efficient use of production factors by which to ensure the development of commercial farms, efficient use of input, raising yields and improve economic performance.*

Keywords: *computer model, agricultural management, economic and financial indicators, economic risk*

INTRODUCTION

The computer Model was developed as part of Project ADER 513 "Establish the profitability and economic risk assessment in the vegetal and animal farm under the pedo-climatic conditions in the South of the country", with the main purpose to stimulate farmers in the use of computer software for making strategic management options.

By using the computer model will increase the profitability of the agricultural exploitations because information on the mode of operation of the establishment and progress of business, which will result in a direct way, to streamline the exchange of information and reducing information-decision cycle.

At the same time, the computer model is a useful tool for management of farms of different sizes and shapes. This leads to identify the most effective solutions, carrying out financial and economic activity of the farm, the possibility of anticipating the likely success of the business, making proposals for financing agriculture.

Through systematic on-line accessibility of data-processing model, the research team wishes to increase the contribution of scientific research and environmental education to the development and competitiveness of agricultural holdings, to develop an interactive source for farmers, managers, students, researchers and consultants involved in the management of agricultural holdings.

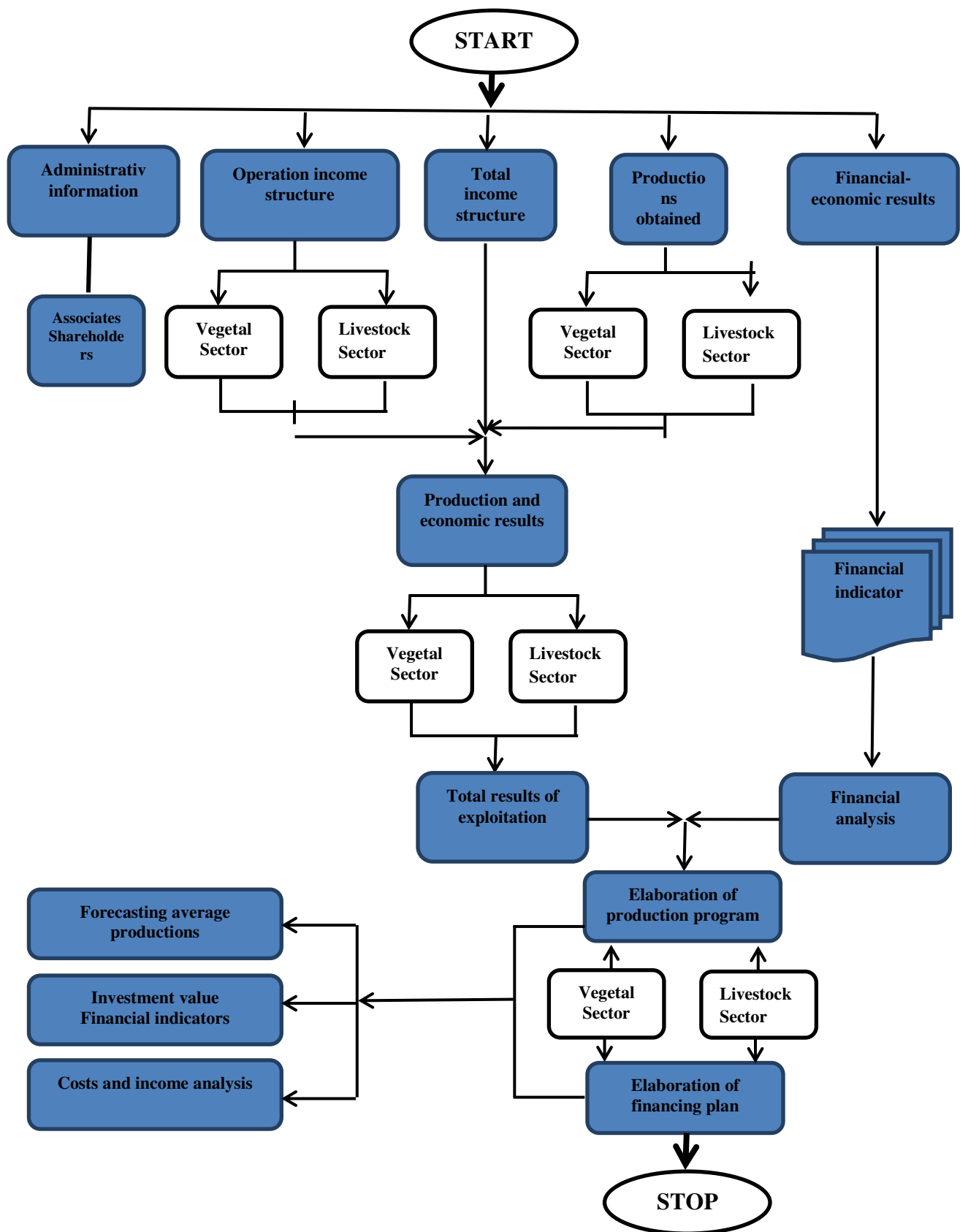
MATERIAL AND METHOD

The computer model was designed based on an overall analysis of the components of plans and programmes, the identification of the necessary indicators and their applicability in the boundary area. As a result, it is seen as a unitary system, which manages data and information, with a large utility in the decision-making process.

The computer model has the support of a collection of tables, organized in such a way as to ensure the possibility of manufacturing records and, at the same time to establish a common data source for all applications in the system subsystems.

For an understanding of how to work within the computer model we present further linkage between Windows (sheet) in their logical sequence of usage:

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Flow chart - flow of information

To organize the tables by computer model components and to allow this procedure to be permissible under the agreement, it had the following features:

- table-size must be equal to the size or total number of the registered information;
- the degree of activity-refers to the number of records that are processed when running the system that uses a specific table;
- mobility-refers to the elimination of doubles records and the opportunity to delete or insert information into the table.

With regard to the processing of records in a table are the following basic processes:

- sequential processing where input data is grouped and sorted in order to follow the sequence of entries in the table, the records being processed in sequence, as are entered;
- processing random data is used for the processing of entries in the order in which they appear.

Program structure clarified the following:

- in order to run correctly, you must firstly declared administrative information, followed by the income structure, the structure of production and the economic-financial results for a period of 3 years;
- the model allows you to enter information and generate data for both crop production and livestock production.

RESULTS AND DISCUSSION

Computer-model application program developed included:

- A.** data entry in the system (inputs),
- B.** system constants (information taken from the parts lists and tables),
- C.** data output from the system (outputs or reports)

A. Data entry in the system (inputs)the information input by the user of the system:

- administrative information;
- information about the structure of operating income sectors;
- information about the structure of total revenues;
- information about the plant - crop, area, total production, total expenditure, subsidies, production value etc .;
- information about livestock - animal category, total, total expenditure, subsidies, production value etc .;
- information relating to financial results etc.

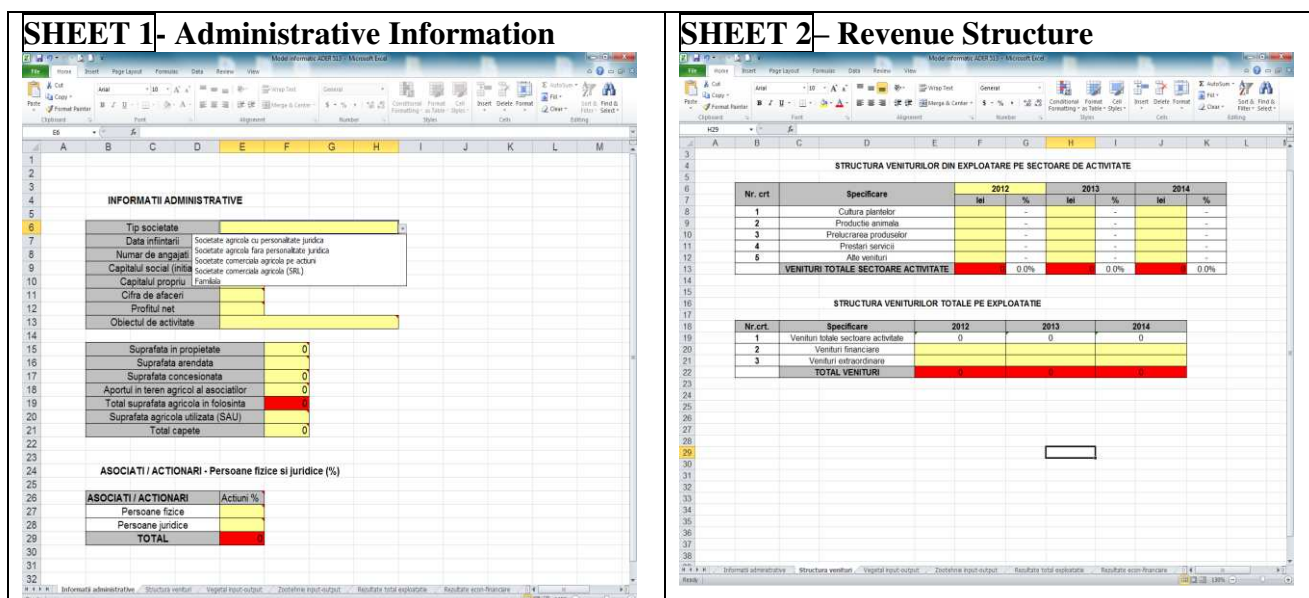
B. Constants system is information taken from lists and tables that can be achieved by classifying farms by economic size, the type of crop and animal species, determining the economic dimension in euro SO per farm (total standard production - SO euro), you can make judgments on economic indicators - those holding's financial.

C. Output datafrom the system are those reports that it generates system after loading the input data and constants, based on the calculation algorithms specific to each module designed:

- vegetable sector - the average yield, total physical production expenses per hectare, cost of production, crude, average selling price, etc;
- livestock - average yield, total physical production, livestock expenses, cost of production, crude, average selling price, etc;
- total expenses, total revenues, profit or loss, the rate of profit;
- forecasting average production;

- variations of production structures;
- analysis of revenue and expenditure in the previous period and the year in which the program is;
- financial projections for a period of three years from the receipt of financial assistance;
- basic indicators and calculation efficiency indicators etc..

Below are images and exemplified during the development / use computer model developed:



- SHEET-ul 1 „*Administrative Data*” -the user enters the data on the agricultural holding. There is a button for selecting the type of society that allows one choice, depending on user's choice.
- SHEET-ul 2 „*Income structure*” - the user enters the value in lei in operating income sectors. There selector button that allows the user the choice of year 1, then year 2 to year 3 (written automatically in ascending order).

The following spreadsheet (sheets) of the application require differentiation by sector of activity (plant and animal). Each module allows the user to enter the holding activity-specific data, respectively to obtain, through the automatic calculation, information on the results of economic and productive results. Thus:

- SHEET-ul 3 ”*Input-Output Plant*”
 - Cultivated land and acquired productions"-for the select (series of 3 consecutive years). In this section the user can enter data on existing crop cultivation: in the suite (there is a button for selection of vegetable crops in the database created), the area in hectares and total production in tonnes for each of the selected crops.

The data entered and the values obtained through calculations specified results are obtained for production and economic results, which will be displayed in the same sheet, table, as follows:

 - "Production and economic results" - select years (range 3 consecutive years). In this section the user enters data on: total expenditure (lei), grants (lei), the production (lei) for each crop in the system
- SHEET-ul4 ”*Livestock Input-Output*”
 - “Effective animals and yields obtained” - selected years (range 3 consecutive years). In this section the user enters data on: existing categories of animals on their premises (there are buttons for selecting the category of animals created database), total number of heads yields obtained for each animal category selected.

The data entered and the values obtained through calculations specified results are obtained for production and economic results, which will be displayed in the same sheet, table, as follows:

- o "The production and economic Results"-selected years (series of 3 consecutive years). In this section the user can enter data: total expenditure (lei), subsidies (lei), the production value (lei) for each category of animal is introduced into the system.

SHEET 3- Input-output Plant

Area under cultivation and the production obtained for the select (series of 3 consecutive years)

Nr. crt.	Culturi vegetale	2012			2013			2014		
		Suprafata (ha)	Productia totala (t)	Productia medie (kg/ha)	Suprafata (ha)	Productia totala (t)	Productia medie (kg/ha)	Suprafata (ha)	Productia totala (t)	Productia medie (kg/ha)
1	Stele comune									
2	Papara de sotani/ alte Crage									
3	Cartofi medii									
4	Potiruti medii									
5	Potiruti mari									
6	Trandafiri pentru rosii									
7	Trandafiri									
8	Trandafiri									
9	Trandafiri									
10	Trandafiri									
11	Trandafiri									
12	Trandafiri									
13	Trandafiri									
14	Trandafiri									
15	Trandafiri									
16	Trandafiri									
17	Trandafiri									
18	Trandafiri									
19	Trandafiri									
20	Trandafiri									
21	Trandafiri									
22	Trandafiri									
23	Trandafiri									
24	Trandafiri									
25	Trandafiri									
26	TOTAL									

SHEET 3- Input-output Plant

Production and economic Results for the select (series of 3 consecutive years)

Nr. crt.	Cultura	2012										2013										2014														
		Suprafata (ha)	Productia Standard Tona/ha	Productia Totala (t)	Cheltuieli (lei)	Cheltuieli la ha	Suporturi (lei)	Cost de productie (lei/ha)	Valoarea productiei (lei)	Produs brut (lei/ha)	Preț vânzare (lei/kg)	Profit sau pierdere (lei/ha)	Rata profitabilit. (%)	Suprafata (ha)	Productia Standard Tona/ha	Productia Totala (t)	Cheltuieli (lei)	Cheltuieli la ha	Suporturi (lei)	Cost de productie (lei/ha)	Valoarea productiei (lei)	Produs brut (lei/ha)	Preț vânzare (lei/kg)	Profit sau pierdere (lei/ha)	Rata profitabilit. (%)	Suprafata (ha)	Productia Standard Tona/ha	Productia Totala (t)	Cheltuieli (lei)	Cheltuieli la ha	Suporturi (lei)	Cost de productie (lei/ha)	Valoarea productiei (lei)	Produs brut (lei/ha)	Preț vânzare (lei/kg)	Profit sau pierdere (lei/ha)
27	TOTAL																																			

SHEET 6- Economic-financial Results

Nr.crt	Indicator*	2010	2011	2012
1	Stocuri			
2	Active circulante			
3	Active curente			
4	Active fixe			
5	TOTAL ACTIVE			
6	Capital social			
7	Capital permanent			
8	Capitaluri proprii			
9	Total datorii			
10	Datorii curente			
11	Datorii pe termen mediu si lung			
12	Credite bancare pe termen mediu si lung			
13	Dobanzi aferente creditorilor bancari pe termen mediu si			
14	Dobanzi restante penalizatoare, pentru credite			
15	Cifra de afaceri			
16	Productia vanduta			
17	Vanzari din vanzarea marfurilor			
18	Vanzari din exploatare			
19	Prestari servicii tertii			
20	Venituri financiare			
21	Venituri extraordinare			
22	Total venituri			
23	Cheltuieli pentru exploatare			
24	Cheltuieli cu servicii prestate			
25	Cheltuieli financiare			
26	Cheltuieli extraordinare			
27	Total cheltuieli			
28	Profit brut			
29	Impozit pe profit			
30	Profit net			

SHEET 6- Economic-financial Results

Anul	2010	2011
Indicativ		
Productia totala		
Cheltuieli		
Profit		
Valoarea adaugata		
Productia economica		
Capital		
Capital permanent		
Capitaluri proprii		
Datorii		
Datorii curente		
Datorii pe termen mediu si lung		
Credite bancare pe termen mediu si lung		
Dobanzi aferente creditorilor bancari pe termen mediu si		
Dobanzi restante penalizatoare, pentru credite		
Cifra de afaceri		
Productia vanduta		
Vanzari din vanzarea marfurilor		
Vanzari din exploatare		
Prestari servicii tertii		
Venituri financiare		
Venituri extraordinare		
Total venituri		
Cheltuieli pentru exploatare		
Cheltuieli cu servicii prestate		
Cheltuieli financiare		
Cheltuieli extraordinare		
Total cheltuieli		
Profit brut		
Impozit pe profit		
Profit net		

- SHEET-ul 5 "Total Results Holding" -it shows the information related to the production and economic results, the economic size of the holding and its classification corresponding to each year of production achieved for vegetable and animal sector. Classification of agricultural holding is handle according to The Standard Production SO (SO euro/expl.) and according to economic size (ESU/expl.).
- SHEET-ul 6 "Economic and Financial Results" -the user can enter data from the balance sheet and the profit and loss account. The accounts provide information on the State of assets, financial situation and results of the enterprise in a fiscal year.
- SHEET-ul 7 "Financial Indicators" - based on the data from Sheet 6 - "economic and financial results" are automatically calculates financial ratios for selected years (three years in

succession) and the risk of bankruptcy for the last year selected. These indicators is calculated usually for farm accounting who organized under the laws in force. Financial indicators are calculated automatically by specific formulas, and according to the obtained model enables information analysis and interpretation. Using the scoring method to automatically analyze the risk of bankruptcy for the last year selected, using the data from Sheet 6 - "economic and financial results"

SHEET 7- Financial indicators

Nr.crt	INDICATORI FINANCIARI	2010	2011	2012	Profiit zero
1	Solvabilitate financiara	eroare	eroare	eroare	
2	Rata lichiditatii curente	eroare	eroare	eroare	
3	Lichiditate globala (generala)	eroare	eroare	eroare	
4	Lichiditate redusa (intermediara)	eroare	eroare	eroare	
5	Lichiditate imediata (Testul acid)	eroare	eroare	eroare	
6	Securitate financiara	-	-	-	
7	Rata datorilor	eroare	eroare	eroare	
8	Solvabilitate	eroare	eroare	eroare	
9	Rata de solvabilitate	eroare	eroare	eroare	
10	Solvabilitate financiara	eroare	eroare	eroare	
11	Rata autonomiei financiare	eroare	eroare	eroare	
12	Viteza de rotatie a stocurilor	eroare	eroare	eroare	
13	Rotatie activelor fixe in cifra de afaceri	-	-	-	
14	Rotatie activului total in cifra de afaceri	-	-	-	
15	Rotatie activelor circulante in cifra de afaceri	-	-	-	
16	Rata grevii veniturilor de datori	-	-	-	
17	Margi de profit	-	-	-	
18	Rata rentabilitatii financiare	-	-	-	
19	Rata rentabilitatii economice	-	-	-	
20	Rata rentabilitatii activelor totale	-	-	-	
21	Rata rentabilitatii generale	-	-	-	
22	Rata profitului	-	-	-	
23	Perioada de rambursare a datorilor (zile)	-	-	-	
24	Praguri de rentabilitate	Profiit zero	Profiit zero	Profiit zero	

SHEET 7- Financial indicators

METODA SCORURILOR - se utilizeaza in analiza riscului de faliment

Anul 2012

Varianta - Metoda Altman $Z = 3,3 \times T1 + 1,0 \times T2 + 0,6 \times T3 + 1,4 \times T4 + 1,2 \times T5$

Z	T1	T2	T3	T4	T5
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Interpretare:
 <-1,5 Situatii critice, spre FALIMENT
 1,6-3,0 Riscul de faliment este inferioara MARJA NORMALA
 >3 Riscul de FALIMENT MINIM

Varianta - Metoda Conan și Holder $Z = 16 R1 + 22 R2 - 87 R3 - 10 R4 + 24 R5$

Z	R1	R2	R3	R4	R5
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Interpretare:
 <0 Probabilitate faliment >80%
 0-1,5 Probabilitate faliment 75-80%
 1,5-4 Probabilitate faliment 70-75%
 4-8,5 Probabilitate faliment 50-70%
 8,5-9,5 Probabilitate faliment 35-50%
 9,5-10 Probabilitate faliment 30-35%
 >16 Probabilitate faliment 10%

The next stage of processing model involves the elaboration of production program, which includes:

- SHEET-ul 8 "Forecasting average production" for selected years (range 3 consecutive years) both for crops (kg/ha) and for livestock (kg/animal head or l/cap animal), based on the values of the average production the last 5 years after production. To achieve forecasting average production, farm requires the results of production data in recent years. Forecasting average production will be done using methods that correspond, for each crop or animal categories, their evolutions in the previous period.

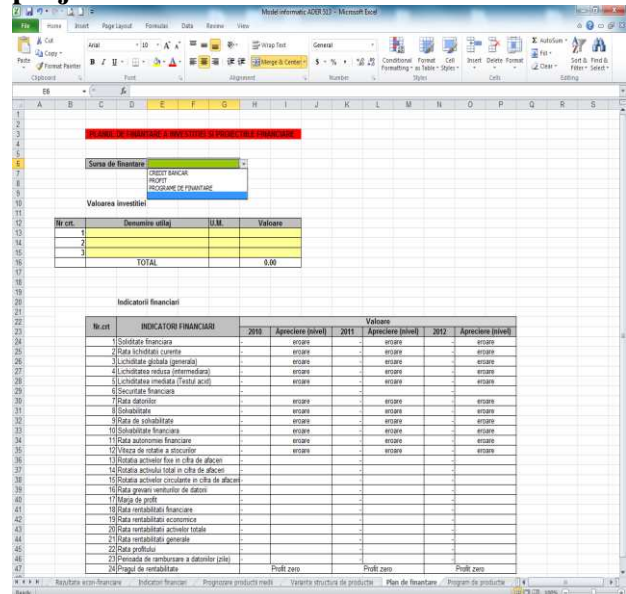
SHEET 8- Forecasting average production

SHEET 9- Variations production structure

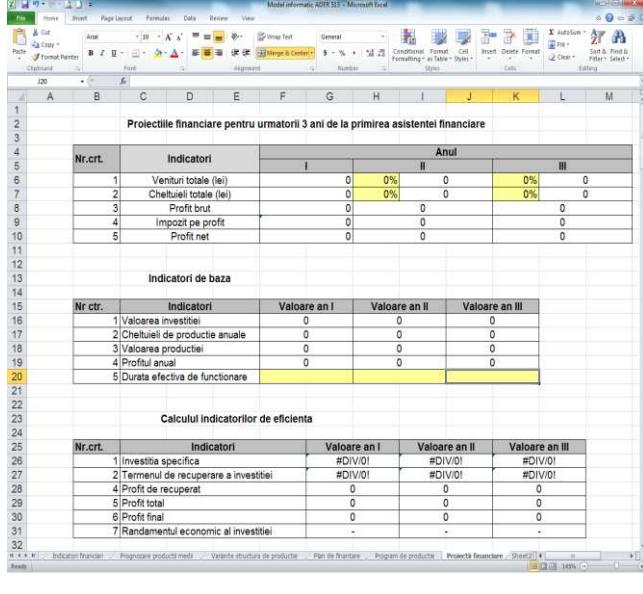
- SHEET-ul 9 "Variations production structure" for crops - Making variants of the structure of production plant, the calculations in the appropriate "version 0" and "variant n". The user has

the possibility through successive attempts, changing culture surfaces selected last year to get other versions of production structure.

SHEET 10 – Financing plan and financial projections



SHEET 12 – Financial projections



- SHEET-ul 11 "Program production. Analysis of expenses and income "as version 0 and the year in which elaborate production program (version n).
- SHEET-ul 12 "Financial Projections" - The computer allows financial projections for the next three years of receiving financial aid, assessment of basic indicators (the investment, production costs/year, production value, profit/year) and the indicators efficiency (specific investment, payback period, profits recovered, total profit, total profit, economic ranadamental investment). The specific calculations of these indicators are specific formulas that are inserted into the appropriate cells and taken for each value of the three-year financial projections.

CONCLUSIONS

Documentation economic analysis - financial information prepared using model generates a series of very important information and conclusions to substantiate production programs so that it can be considered a useful tool at the hands of managers who can make a major contribution to decision-making steps necessary farm management.

Evaluation of computer model

- providing economic model developed information that are not processed by the accounts, such as: Production Total Standard OS euro, Economic Size Unit production cost per unit of product, record, calculate and analyze farm-specific indicators over a period of three years etc.
- preparing the mid-term evaluation of the work already indicating items that should be reached or transformed (influencing the decision);
- projected path of evolution of farm management to see what the current functioning of the farm;
- describe developments that may have a farmer to improve farm management;
- developments states that the farmer can have them in connection with the use or adaptation of machinery for mechanization.

Efficiency and utility computing model is a means:

- stimulating farmers managing vegetable farms and animals in using computer applications at farm level for the evaluation of production;
- the complexity of the process of agricultural production (practical guidelines);
- communication between farmers, the main beneficiaries of project and agricultural research.

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