# INFORMATION SYSTEMS EFFICIENCY IN AGRICULTURAL HOLDINGS PROFITABILITY ANALYSIS

# EFICIENȚA SISTEMELOR INFORMATICE ÎN ANALIZA RENTABILITĂȚII EXPLOATAȚIILOR AGRICOLE

**ELENA COFAS[1]**

***[1]University of Agricultural Sciences and Veterinary Medicine, Bucharest, Romania; cofasela@yahoo.com***

***Abstract:*** *In agriculture, as in almost any other field, we hear a question that already has become a criterion for evaluating our entire business and that is: "it is profitable, it is efficient!"? In market economy conditions, profitability tracking is a right for any trader. It constitutes a prerequisite to the very existence of economic units. Problems profitability will never miss the forefront of theoretical and practical approaches of all types of structures that carry out economic activities.*

***Key words:*** *profitability, efficiency, information systems, agriculture*

## INTRODUCTION

Any modern agricultural unit, regardless of size, shape, profile property and socio-economic space in which operate, requires a management style based on flexibility, dynamism and foresight, which is inconceivable without an operative information, complex and quality to provide the basis to take decisions.

To improve the management practices to ensure product quality and competitive skills, farms will have to adopt methods of decision support and management accordingly. In these circumstances, farms that want to become and/or to stay competitive they need resources as appropriate: financial resources, materials, energy, human and not least the information. In order to increase competitiveness of agricultural products on the internal

and external markets is urgently necessary to improve information flows at the existing branch and provide substantiation for business methods and the use of information technology innovation in order to the field, taking into account the strategies defined at european level.

## MATERIALS AND METHODS

Improving competitiveness requires that any farm to develop a particular project for production management, which will include both the flow of production factors and the flow of information relating to the scope. In this context, informational systems have a great contribution to the purposess of the informatization management issues of complex problems and in particular for the apriori analysis of data elements of managerial problems, particularly for the analysis of profitability and production factors.

Information systems for agricultural farms can be characterized by a set of economic and functional features, to prove their effectiveness and use.

1. Functional characteristics, express the capcity of an agricultural farm, to respond quickly and efficiently to the requirements of information necessary to ensure decisions ann economic optimum.
2. Economic characteristics reflect the effects resulting from the new system design, these features are influenced by organizational, technical and information specific to the beneficiary units.

Recommend methodology for two groups of indicators for economic efficiency of information systems: effects of economic indicators and synthetic indicators. They identify the direct and indirect results occurred in agricultural activity and current farm works is found in:

- the annual rise of production, goods,
- the annual economy obtained on the basis of annual reduction of production costs,
- the annual direct savings obtained by reducing the costs of operation of the information system, as a result of the introduction of the technique of electronic data processing.

Economic efficiency of any computer system, included the ones managing farms, shall be determined based on technical and economic indicators, assessing the efforts made and the economic facts arising from the placing of the information system.

**The effort** made to create the informatical system can be measured by the sum of all costs incurred for the implementation and maintenance of a computer system. In this connection are quantified in volume and/or value of informational materials, resources, energy and human economic.

**The effects** for introduction of information systems contribute to the determination of their efficiency. From this point of view, the efficiency of the system can be viewed under two aspects:

- *economic efficiency*, direct-to-user, which lay in the estimated savings, whereas the costs of realization (initial cost) and operating system software;
- *economic efficiency* is determined by the indirect increase of quality information, as well as the effects of what is achieved through the use of new information provided by the computer system.

$$\varepsilon = \frac{effect}{effort} \rightarrow \textbf{\textit{maximum}} \qquad \text{or} \qquad \varepsilon = \frac{effort}{effect} \rightarrow \textbf{\textit{minimum}}$$

## RESULTS AND DISCUTIONS

The role of processing data, which together with the organization and communication system constitute the computer system is to cover mainly the following requirements:

- to satisfy most needs of farm processing, the existence of as many applications;
- to provide information required for the system object, synthetic or analytic, if is applicable;
- be technically efficient, reliable and quality required by standards;
- be cheap;
- contain the necessary equipment, properly sized processing requirements;
- to ensure operation in "real time" and secure ordering process, where applicable;

• provide necessary data storage and archiving;
• to work in the specific agricultural environment;
• the abillity to work on subsystems
• be developed both in terms of hardware and software;
• to ensure data integrity and security;
• provide the processing needed to transmit the necessary information communication systems;
• be easily implemented and exploited;
• be close to the user;
• lead to increased farm efficiency and overall management of all processes in particular.

Analysis of the agricultural units is subject to the range and depth of system indicators used and capacity information of each indicator is a numerical expression of an economic process or phenomenon, defined in time and space and can be characterized by absolute size, relative sizes, size average indices and coefficients.

In the following images are presented a series of technical and economic indicators (both vegetable agriculture and livestock sector) are calculated and generated automatically by a computer system for analysis of farm profitability. Basically, you can see how the computer system illustrated provides flexibility, modularity and high data consistency, which is a very favorable technical prerequisite for good management, supported by a real analysis of profitability and efficient use of factors production.

| | **Indicatori tehnico-economici** | | |
|---|---|---|---|
| | Productie estimata: Vaci de lapte 3000 | | |
| | | | Zona geografica: Siloz |
| | | | Sistem: Campie |
| | | | |
| | | | |
| Nr crt. | Indicatori | UM | Valoare |
| | | | |
| I | Indicatori specifici | | |
| | Cost unitar de productie | Lei | 113,805 |
| | Pret unitar de vanzare | Lei | 116,2 |
| | Productie medie (randament pe cap) | UM/cap | 30 |
| | MARJA BRUTA | Lei | 1102,371 |
| | MARJA BRUTA PE CAP | Lei/cap | 11023,712 |
| | RATA MARJEI BRUTE | % | 0,026 |
| | | | |
| II | Indicatori de rezultat | | |
| | Cifra de afaceri | Lei | 37771,2 |
| | Productia marfa | UM | 300 |
| | Valoarea productiei marfa | Lei | 34860 |
| | PROFIT BRUT / PIERDERE BRUTA | Lei | 718,365 |
| | PROFIT NET / PIERDERE NETA | Lei | 603,427 |
| | PROFIT NET / PIERDERE NETA, inclusiv subventii | Lei | 5883,427 |
| | | | |
| III | Indicatori ai rentabilitatii | | |
| | Valoarea adaugata | Lei | 37771,2 |
| | Excedent brut de exploatare | Lei | 41189,7 |
| | Rezultatul exploatarii | Lei | 12218,268 |
| | Rezultatul curent brut | Lei | 12110,478 |
| | Rezultatul net | Lei | 11995,54 |
| | Capacitatea de autofinantare | Lei | 14498,957 |
| | | | |
| IV | Marje de rentabilitate | | |
| | Marja costurilor de productie | Lei | 2,395 |
| | Marja costurilor variabile | Lei | 9,442 |
| | | | |
| V | Rate de rentabilitate | | |
| V.(1) | Rate de rentabilitate a resurselor consumate | | |
| | Functie de venitul impozabil | % | 2,1 |
| | Functie de venitul net si subventii | % | 17,23 |
| V.(2) | Rate de exprimare a rentabilitatii veniturilor | | |
| | Rata rentabilitatii veniturilor (rentabilitate comerciala) | % | 31,76 |
| V.(3) | Rate de rentabilitate economica si financiara | | |
| | Rata marjei asupra valorii adaugate | % | 109,05 |
| | Rata marjei brute de exploatare | % | 109,05 |
| | Rata marjei nete | % | 31,76 |
| | Rata marjei brute de autofinantare | % | 38,39 |
| | | | |
| VI | Evaluarea riscului din exploatare | | |
| VI.(1) | Pragul de rentabiliate (punctul critic) | | |
| | Exprimat in unitati valorice (cifra de afaceri prag) | lei | 5061,109 |
| | Exprimat in unitati fizice | UM | 43,555 |
| | Exprimat in unitati de timp | zile | 48,238 |
| VI.(2) | Alti indicatori de evaluare a riscului | | |
| | Coeficient de flexibilitate (indicator de pozitie absolut) | | 32710,091 |
| | Coeficient de volatilitate (indicatorul de pozitie relativ) | | 6,463 |
| | Coeficient de levier (coeficientul de elasticitate) | | 1,155 |

Generating indicators of profitability (e.g. dairy - plains, silo)

## Indicatori tehnico-economici

Productie estimata

Sistem:Neirigat
Productia principala: 4000.00
Productia secundara: 0.00

| Nr crt. | Indicatori | UM | Valoare |
|---|---|---|---|
| | | | |
| I | Indicatori specifici | | |
| | Cost unitar de productie | Lei/kg | 0,186 |
| | Pret unitar de vanzare | Lei/kg | 3 |
| | Productie medie (randament la hectar) | kg/ha | 4000 |
| | MARJA BRUTA | Lei | 56672,705 |
| | MARJA BRUTA LA HECTAR | Lei/ha | 11334,541 |
| | RATA MARJEI BRUTE | % | 0,944 |
| | | | |
| II | Indicatori de rezultat | | |
| | Cifra de afaceri | Lei | 60000 |
| | Productia marfa | kg | 20000 |
| | Valoarea productiei marfa | Lei | 60000 |
| | PROFIT BRUT / PIERDERE BRUTA | Lei | 56289,425 |
| | PROFIT NET / PIERDERE NETA | Lei | 51173,375 |
| | PROFIT NET / PIERDERE NETA, inclusiv subventii | Lei | 51203,375 |
| | | | |
| III | Indicatori ai rentabilitatii | | |
| | Valoarea adaugata | Lei | 60000 |
| | Excedent brut de exploatare | Lei | 59747,89 |
| | Rezultatul exploatarii | Lei | 56352,51 |
| | Rezultatul curent brut | Lei | 56319,425 |
| | Rezultatul net | Lei | 51203,375 |
| | Capacitatea de autofinantare | Lei | 51208,375 |
| | | | |
| IV | Marje de rentabilitate | | |
| | Marja costurilor de productie | Lei | 2,814 |
| | Marja costurilor variabile | Lei | 2,832 |
| | | | |
| V | Rate de rentabilitate | | |
| V.(1) | Rate de rentabilitate a resurselor consumate | | |
| | Functie de venitul impozabil | % | 1517 |
| | Functie de venitul net si subventii | % | 1379,93 |
| V.(2) | Rate de exprimare a rentabilitatii veniturilor | | |
| | Rata rentabilitatii veniturilor (rentabilitate comerciala) | % | 85,34 |
| V.(3) | Rate de rentabilitate economica si financiara | | |
| | Rata marjei asupra valorii adaugate | % | 99,58 |
| | Rata marjei brute de exploatare | % | 99,58 |
| | Rata marjei nete | % | 85,34 |
| | Rata marjei brute de autofinantare | % | 85,35 |
| | | | |
| VI | Evaluarea riscului din exploatare | | |
| VI.(1) | Pragul de rentabiliate (punctul critic) | | |
| | Exprimat in unitati valorice (cifra de afaceri prag) | lei | 374,219 |
| | Exprimat in unitati fizice | kg | 124,74 |
| | Exprimat in unitati de timp | zile | 2,245 |
| VI.(2) | Alti indicatori de evaluare a riscului | | |
| | Coeficient de flexibilitate (indicator de pozitie absolut) | | 59625,781 |
| | Coeficient de volatilitate (indicatorul de pozitie relativ) | | 159,334 |
| | Coeficient de levier (coeficientul de elasticitate) | | 1,006 |

Generating profitability indicators
(e.g. hemp for fiber- non-irrigated system, plain)

## CONCLUSIONS

Particularities process of the agricultural process determines that the economic (organisation/holding/farm) and manager (director/Chief /farmer) to deal with complex problems in design and execution of background activity and implementation of decisions, which involves a special skill in selecting particular issues arising during an agricultural year. It must take into account, also the nature of the phenomenon, in order to ensure the greatest possible approximation of economic reality, but also a solution of the problems.

The benefits of a computer system for analysis of profitability and efficient use of production factors in agricultural holdings are:

- use of information technology in support of specific activities on the agricultural sector is a matter of great topical interest, under the terms of a society increasingly based on informatization, where markets are becoming more competitive, with consumers;
- increase production efficiency and quality proposed as essential role in dealing with the integrated system based on data analysis and management
- ensuring oprimizare process of agricultural management and planning in territorial, with automatic data processing means;
- the use of a significant volume of information, accurately determined and designed so as to ensure functionality and mathematical models and getting the correct and efficient solutions,
- application of an important technological alternatives in determining the technical and economic parameters for obtaining various agricultural products;
- the need for a large number of technologies, taking into account the fact that the technological variants differ not only from one product to another, but also the territorial level, according to natural and economic resources available to each unit;
- exploitation of software to assist in the farm activities can lead to increased sales (profit) or to lower costs and greater customer service (beneficiaries of agricultural products);

- increase the profitability of using the software makers due to the information in real time, on the functioning of the agricultural unit and on doing business, which will lead directly to efficient exchange of information and reduce information cycle - decision.

Thus, any system must provide the means to draw together the management, information technology and production, essentially, a tool that will make information more accessible and improve the quality of decisions.

## REFERENCES

1. BERNARD DEL'HOMME – „Information and decision in agriculture: how relevance in management diagnosis is improved by an Expert System", First European Conference for InformationTechnology in Agriculture, Copenhagen, 15-18 June, 1997, www.dina.dk/efitaconf/program/paperspdf/vi_b_2.pdf.
2. COFAS ELENA - „Eficiența sistemelor informatice în analiza rentabilității exploatațiilor agricole", Editura Ars Academica, Bucureşti, 2009, ISBN: 978-606-8017-11-2, pg. 46, 73
3. TOMA ELENA, COFAS ELENA., DRAGOMIR W. – "Design system for agricultural holdings management", Ed. Do-Minor, 2008, pg. 183.
4. URSĂCESCU M. - Sisteme informatice - O abordare între clasic şi modern, Editura Economică, Bucureşti, 2002, pg. 65.