
MANAGEMENT ACCOUNTING IN AGRICULTURAL ENTERPRISES – THE BUDGETING FUNCTION¹

Ivanka B. Dimitrova¹

Yordanka P. Velcheva²

“Angel Kanchev” University of Ruse, Bulgaria

E-mail: ¹*idimitrova@uni-ruse.bg*; ²*yvelcheva@uni-ruse.bg*

Abstract: The significance of the information created through management accounting and its limited use in the management of agricultural enterprises are the main motives for writing this article. We defend the thesis that if budgeting were implemented in agricultural enterprises, this would lead to more efficient management. The purpose of the paper is – on the basis of presenting the relationship between management and accounting – to outline the capacity of the planning and budgeting system for setting management objectives and parameters which acquire various quantitative and qualitative dimensions; this shall be achieved through managerial decisions. We propose a conceptual model of the planning and budgeting system at the agricultural enterprise which shall reflect its specific characteristics and create information for its future development; forecast its financial state, the results of the activity, the cash flows, the changes in the assets and the capital.

Key words: accounting, management, management accounting, budgeting, agricultural enterprise.

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Introduction

The managerial nature of information, which has been created by accounting as a system of reporting, is built in its essence – it is a managerial and controlling system. Management is an information process, whereas control is a permanent managerial function. It is namely those managerial characteristics of the accounting information which guarantee that accounting turns “... *from an information system of the past and present into the information system of the future*” (Pergelov, 2006, p. 129) and the implementation “*in the practice of the so-called futurological function of accounting.*” (Pergelov, 2006, p. 129). This confirms Jean-Baptiste Say’s words that “*history is useful not because in it we read the past, but because we see the future*” (in Pergelov, 2006, p. 14).

Accounting is a mirror of the economy and the brighter the reflection is, i.e., the created accounting information has better qualitative characteristics, the more reliable the information basis of management is. The role of accounting in management is indisputable and eternally relevant; this is proven by the numerous publications on the topic (Atanasova, 2016; Basheva, 2019; Galinova, 2016; Georgiev & Hristov, 2017; Dochev, Belousov, Sheluhina, Chipriyanova & Georgieva, 2015; Kraevskiy, 2014; Petrova, 2011; Stefanov, 2012; Trifonov, 2004; Chipriyanov & Chipriyanova, 2018, etc.). The specialized literature has also taken into consideration the sustainable development of the agricultural enterprises (Atanasova, Kostadinova, Zhelyazkov, Oztiburov & Gaydardzhieva, 2006; Bashev, 2016; Bashev, 2017; Koteva, 2016; Koteva, Sokolova & Toteva, 2018, etc.), which cannot have been achieved without high quality accounting information with its inherent features – usefulness and value.

The subject of this article is the accounting information created through management accounting. The researched object is the agricultural enterprise². The thesis which we defend is that *if budgeting were implemented in agricultural enterprises, similar to the implementation of the systematic and complex approaches, this would lead to more efficient management.* **The purpose** of the research is – on the basis of presenting the relationship between management and accounting – to outline the capacity of the planning and budgeting system for setting managerial objectives and parameters, which acquire different quantitative and qualitative dimensions; this shall be achieved through managerial decisions. In order to achieve the purpose, the following *tasks* shall be completed:

- to represent the relationship between management and accounting;

² The paper focuses on a plant growing enterprise, but basically, it could be implemented in the animal breeding enterprise as well.

- to develop a conceptual model of the planning and budgeting system of the agricultural enterprise and to propose a technology for its implementation.

In order to achieve the set objectives, we have structured the argument in two chapters – management and accounting and a conceptual model of the planning and budgeting system of the agricultural enterprise.

Argument

1. Management and accounting

Historically, the relationship between management and accounting can be found as early as the establishment of accounting which is supposed to meet the specific demand for information by the enterprise's management. It is namely because of the necessity of constant correspondence between accounting and the demands of the enterprise's management of accounting information that it has undergone considerable development. Thus, in the 1950s in the USA, management accounting separates from financial accounting and is established as a separate field. An improvement is made on the approaches and the bases for allocating the indirect production costs, the costing methods (direct costing, activity-based costing); the method of standard costing is applied.³ Since its relative recent establishment, management accounting has undergone fast and dynamic development as a diverse and interdisciplinary science based on the achievements of various scientific fields – economics, finance, management, sociology, etc. (Georgiev & Hristov, 2017).

The qualitative characteristics of the useful financial information have been discussed in the specialized literature (Galinova, 2016; Grozeva, 2016; Popova-Yosifova, 2017; Stefanov, 2012, etc.) and have been an object of special attention in the Conceptual framework of financial reporting of the International Accounting Standards Board of 2010, whose key question is: for whom is accounting information intended and what information demands shall be met? The qualitative characteristics are represented in two major

³ The development of management accounting goes through several stages – *book-keeping of costs* (until the middle of the 17th century; in Italy), *cost accounting* (until the end of the 19th century; in England, France, Russia), *production accounting* (until the middle of the 20th century; in Germany, the USA), *management accounting* (from the middle of the 19th century – present; in the USA, North-west Europe).

groups – *fundamental* qualitative characteristics⁴ and qualitative characteristics which *increase the usefulness*⁵.

The creation of useful information and its purposeful utilization are characteristic of management accounting due to its specific features (Velcheva & Dimitrova, 2012, pp. 7-15). Management accounting information differs from reporting accounting information in relation to (see *Figure 1*):

- the scope – the object of attention is mainly the costs;
- managerial level – primarily intended for lower managerial levels;
- the period – it is created and is used mainly in short periods of time (on a daily, weekly, monthly basis);
- analytical level – it has a high degree of detail (with more analytical levels), the information about the costs of production and operative nature is particularly detailed (by operations, processes, activities, products, markets, centers of responsibilities, segments, etc.);
- degree of accuracy – what is used, to a larger extent, is approximate assessments;
- type of processed data – the information refers to past, current, and future periods, i.e., the processed data is accounting, normative and planned;
- methods of data processing – what is used is: accounting, statistical and mathematical methods; methods of economic analysis; methods of planning and control.

Management accounting information is defined as a totality of reports on the production and economic activity of the enterprise and the external competitive environment, which are collected, processed, and summarized in order to be provided to managers who shall make well-grounded decisions (Galinova, 2016). Regardless of its significance, and due to the fact that management accounting is not obligatory, the management accounting information is created and used in a limited manner. Research⁶ of the accounting practice in agricultural enterprises shows that:

⁴ *The fundamental* qualitative characteristics are: relevance – the information is relevant when it can influence the decisions made in its use as exit data for the purposes of forecasting; truthful representation – the information is truthful when it is complete, neutral and reliable (it does not contain errors). In order to be useful, the accounting information shall be relevant and truthful.

⁵ The qualitative characteristics that *increase usefulness* are: comparability – when making decisions, comparability allows selecting an alternative on the basis of comparisons to similar information from other enterprises and for other periods; the possibility of making a check – various observers who are independent and have the required knowledge could reach a consensus, although this does not necessarily mean full agreement that the particular presentation is truthful; timeliness – the information is timely when it is provided to decision-makers in terms which allow it to have influence on their decisions; clarity – the information is clear when it is provided in a clear and concise way.

⁶ On the basis of audit of agricultural enterprises and telephone surveying of agricultural enterprises of the Ruse region.

- the obligatory accounting information is created through financial accounting and costing is performed on the basis of factual direct production costs of some basic types of production;
- the planning and budgeting information is used partially – for production, for certain types of fertilizers, stuff, fodder, etc.;
- planning and budgeting systems are not built.

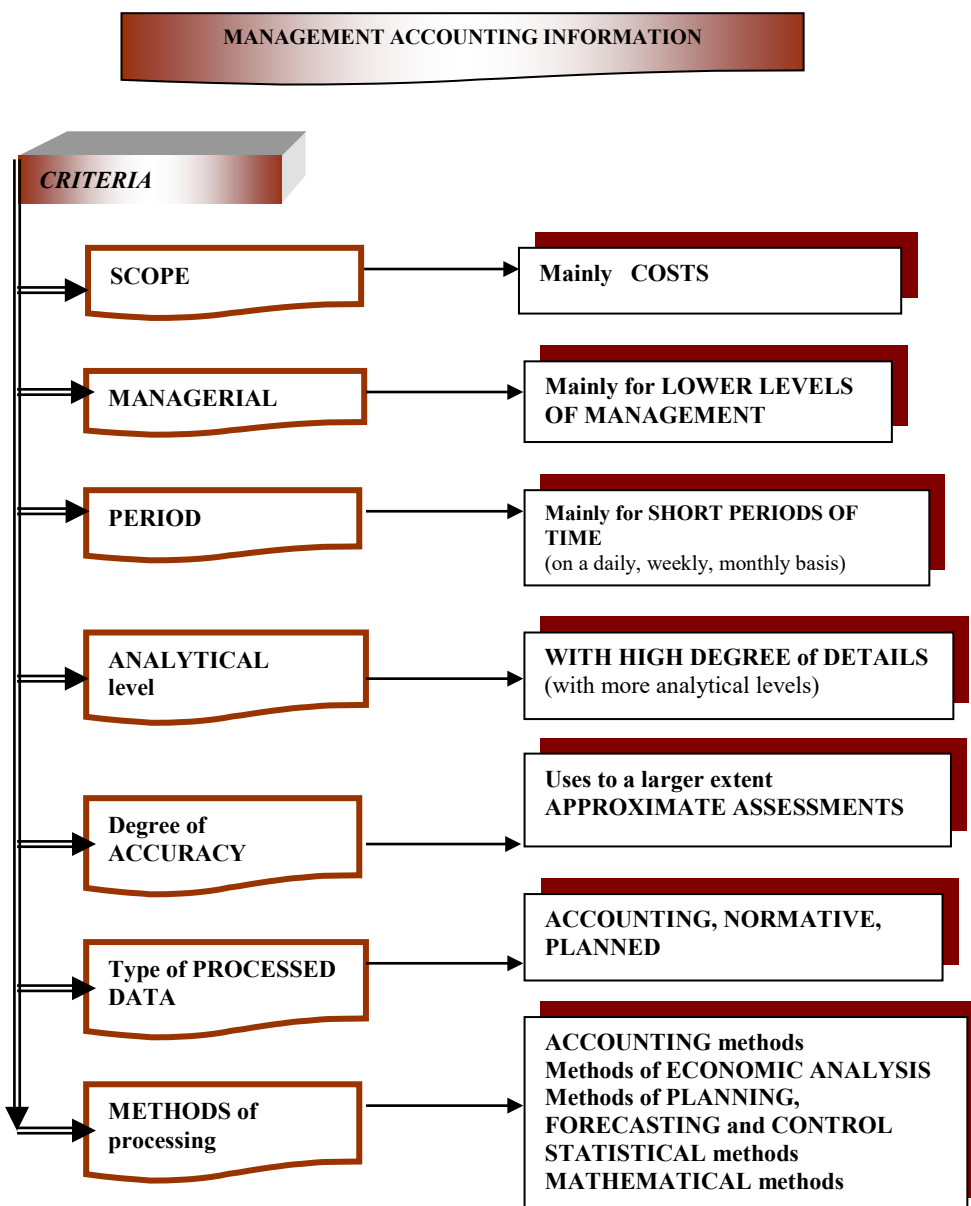


Figure 1. *Specific characteristics of management accounting information*

2. Conceptual model of the planning and budgeting system of the agricultural enterprise

The functions of management accounting are also characteristic of any management and any managerial discipline – *organizing, planning, reporting and control, analysis, and regulation*. In management accounting the function of *planning* is realized through **budgeting** – the creation of **financial forecasts and plans, also called budgets**. Budgeting is most often related to the planning within one year and consists of developing detailed plans for the achievement of the main organizational objectives in reporting the changes in the environment. In the conditions of strong competition, budgeting shall be viewed from a different angle – as a process of determining the sales, production, investment, cash inflows and payments, etc., whose end product is the budget.

The developed model (see *Figure 2*) presents the scope and the decomposition of the planning and budgeting system of the agricultural enterprise. It encompasses *operative* and *financial* budgets and establishes the relationship between them and the consistency in their development. **The operative budgets** comprise *the budgets of sales and production, the budgets of production and non-production costs, the budget of the operative financial result*. **The financial budgets** comprise *the budgets of investment and financing, the forecast of the cash flows and the budget statement of the cash flows, the budget income statement, the budget balance sheet*.

The starting point in building the system is determining the key parameters which shall express the restrictive conditions and the objectives of the enterprise for the budget period. The factor which restricts the scale of the activity of the enterprise during the budget period is defined as key and restrictive. Such a restrictive factor may be: the market, the access to financial resources, the production capacity, the possibility for securing raw materials and resources, skilled labor force, etc.

A specific restrictive resource in agricultural enterprises is arable land, as well as certain requirements for ratio between autumn and spring crops. A restrictive factor is also the consumer demand for certain types of agricultural produce.

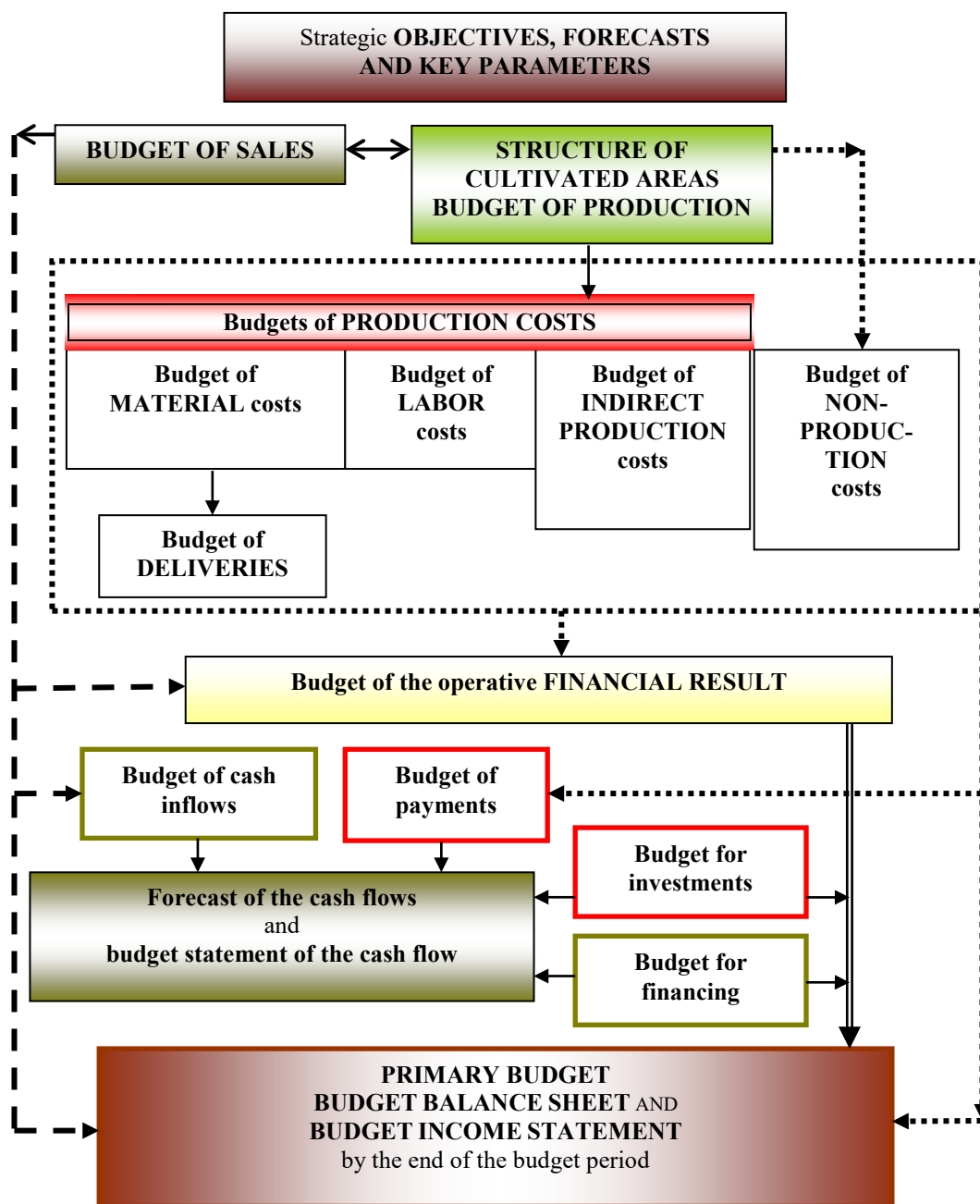


Figure 2. Conceptual model of the planning and budgeting system

A specific characteristic of budgeting in agricultural enterprises is the fact that the **budget of sales** is developed parallel to determining *the structure of the cultivated areas* and the development of *the budget of*

production. On the basis of the forecast information about the demand for certain types of agricultural produce, the expected yields and prices, a variant is developed which concerns the structure of *the cultivated areas* and *the volume of production*. This initial variant may be improved in the criterion “income” by developing a simulation model using spreadsheet software following the method “what-if”. As recalculations are carried out, numerous variants are generated regarding the structure of the areas – the most appropriate one is selected for the specific conditions.⁷

The production budget is developed on the basis of the land allocated to each crop and the expected average yields. It is prepared for each individual product *in kind and value*.

The quantity of each (j-th) kind of agricultural product (Q_j) is the result of the *land* (the amount of decares) for each (i-th) kind of crop (D_i) and the *forecast average yield* of the j-th kind of produce of the i-th crop (q_{ij}). The volume of production in *value* (N_j) is the valued at market price (p_j) amount. The expected total volume of production is the sum of the volumes of production of each crop which has been planned for growing.

A sample budget of the production in kind and value is presented in *Table 1*.

Table 1

Sample budget of the production in kind and value

<i>Kinds of produce</i>	<i>Land (da)</i> D_i	<i>Average yield (kg)</i> q_{ij}	<i>Amount (t)</i> Q_j	<i>Price (BGN)</i> p_j	<i>Value (BGN)</i> O_j
Wheat	16,000	480	7,680	325	2,496,000
Barley	3,000	450	1,350	330	445,500
Sunflower	7,000	250	1,750	600	1,050,000
Corn	4,000	700	2,800	350	980,000
	30,000				4,971,500

On the basis of the information of the budget of production and the forecast prices of the various kinds of production, the **budget of sales** is developed. In order to determine *the amount of production* of each kind available *for sale* (Q_j^s), the produced amount of production (Q_j) shall be increased by the available production at the beginning of the period (Q_j^n)

⁷ It is also possible to develop and apply an optimization model with purposeful function – maximization of income or profit.

and shall be increased with the internal consumption of this production (if such is available) (Q_j^{vp}) and the amounts expected to be left at the end of the period (Q_j^k).

$$Q_j^s = Q_j + Q_j^n - Q_j^{vp} - Q_j^k \quad (1)$$

The sales (income from sales) (S_j) are the result of the amounts intended for sale (Q_j^s) and the forecast prices for each corresponding kind of produce (p_j).

A sample budget of sales is presented in *Table 2*.

Table 2

Sample budget of sales

#	Products	Amount (t) Q_j	Initial difference (t) Q_j^n	Internal consumption (t) Q_j^{vp}	End difference (t) Q_j^k	Volume of sales (t) Q_j^s	Price (BGN) p_j	Income from sales (BGN) S_j
1.	Wheat	7,680	0	0	1,400	6,280	325	2,041,000
2.	Barley	1,350	0	300	150	900	330	297,000
3.	Sunflower	1,750	0	0	350	1,400	600	840,000
4.	Corn	2,800	300	500	250	2,350	350	822,500
								4,000,500

The amount of the income from sales of each individual kind of produce forms the main amount of the income from the activity (S_d).

The same table calculated with Microsoft Excel has the following representation:

Table 2A

Sample budget of sales with Microsoft Excel formulae

Products	Q_j	Q_j^n	Q_j^{vp}	Q_j^k	Q_j^s	p_j	S_j
Wheat	=E4	0	0	1,400	=C11+D11-E11-F11	325	=G11*H11
Barley	=E5	0	300	150	=C12+D12-E12-F12	330	=G12*H12
Sunflower	=E6	0	0	350	=C13+D13-E13-F13	600	=G13*H13
Corn	=E7	300	500	250	=C14+D14-E14-F14	350	=G14*H14
							=SUM(I11:I14)

The budget of sales provides information which is used in the preparation of the budgets for the production costs (of the material costs, the labor costs, the indirect production costs), the budget of cash flows and the budget income statement.

The budget of material costs is prepared on the basis of information about the structure of the areas (the land in decare intended for each particular crop), the technological norms of the costs for materials per decare or per 1,000 decare and the forecast prices of materials.

The cost of materials in kind (M_{ki}) of a particular kind (k-th) for an individual crop (i -th kind) is the result of the land for each (i -th) kind of crop (D_i) and the cost ratio of the material for the crop (m_{ki}). Determining the cost of materials in value (MR_{ki}) the amount of material in kind (M_{ki}) is valued with the forecast price of the material (p_k). The total amount of each material in kind (M_k) and in value (MR_k) is the sum of the costs for materials in kind (M_{ki}) and in value (MR_{ki}) for all crops.

A sample form of the budget for material costs by months (there is no simplified index per month) is presented in *Table 3*.

Table 3

Sample form of the budget for material costs

Kinds of materials	Mea- sure	Crop	Area (da) D_i	Month 03			Month 11		Total
				Norm m_{ki}	Amount M_{ki}	Norm m_{ki}	Amount M_{ki}	Norm m_{ki}	Amount M_{ki}	
Ammonium nitrate	Kg	Wheat								M_{ki}
	
Total for material	Kg									M_k
Price	BGN									p_k
Value	BGN									MR_k
.....	
TOTAL	BGN									MR

Developing the **delivery budget** (M_k^d) is based on data about: the amounts of the necessary materials in kind (M_k) set in the budget for the material costs; the available amounts of the material at the beginning (M_k^n);

the amount of the reserve in the end (if there is a requirement for maintaining a certain reserve) (M_k^k).

$$M_k^d = M_k + M_k^k - M_k^n$$

(2)

Due to the seasonal nature of agricultural produce and in relation to the development of the forecast of the cash flows it follows that this budget shall be prepared *by months*.

For the services provided (external and internal) related to the growing of crops, the **budgets of services** are prepared; they are analogous to those of the material costs – what is also used is technological norms by kinds of services and estimated prices for them.

The budget of the labor costs⁸ is prepared similarly to the budget of material costs (on the basis of information about the structure of the areas, the technological norms of the labor costs per decare or per 1,000 decares and the estimated prices).

The labor cost in kind (man-hours or man-days) (T_i) per each crop is the result of the area per each (i -th) kind of crop (D_i) and the costs norm for labor per each crop (t_i). In order to determine the *labor cost in value* (TR_i), the amount of labor in kind (T_i) is valued with the estimated prices (r). The total amount of labor in kind (T) and in value (TR) is the sum of the labor costs in kind (T_i) and in value (TR_i) for all crops.

The budgets of the indirect production costs (NPR) in agricultural enterprises are of great significance as those costs have a high relative ratio in the cost price of agricultural produce. Those are the costs of mechanized tillage, agrotechnical activities, crop harvesting, etc. Those budgets are prepared by kinds of auxiliary activities (exploitation of agricultural machinery, repair workshop, transportation activity, etc.). On the basis of the technological norms and the planned areas for each individual crop, we can determine the costs for the corresponding activity and set the cost price per provisional unit. The provisional unit is selected on the basis of the kind of cost and may be area in decares, machine-hours, ton-kilometer, amount of production, decare of shallow plowing.

The NPR_{ri} of a particular kind (r -th) for a certain crop (of the i -th) is the result of the number of provisional units (the volume in kind) of the NPR of the r -th kind for the i -th kind of crop (Q_{ri}) and the ratio which shows the

⁸ The budget is prepared only for manual labor. The cost for mechanized labor and other types of labor is entered in the budgets for auxiliary activities – for the indirect production costs.

NPR of the r-th kind for a provisional unit (K_r). The ratio K_r is received as the NPR of the r-th kind (NPR_r) is divided into the total amount of provisional units of this kind (Q_r). The total amount of the indirect production costs for a particular crop (NPR_i) is the sum of all kinds of indirect production costs (NPR_{ri}).

For instance, a separate budget may be prepared for the costs for deep plowing. It shall involve all kinds of material costs – fuels, lubricants, spare parts, auxiliary materials, labor costs for mechanics, depreciation costs, the due part of the indirect production costs, etc. Those costs are divided into the total cultivated area – the result is a ratio which represents the costs for deep plowing per one decare cultivated area.

$$K_{do} = \frac{\text{Costs Deep plowing}}{\text{Areas}}$$

Each crop is allocated the amount of costs for deep plowing (NPR_{do_i}) which equals the areas intended for it D_i .

$$NPR_{do_i} = K_{do} \cdot D_i$$

The cost price budget is developed through the kinds of agricultural produce on the basis of the production costs by crops (PR_i) which are the result of: the material costs budget (MR_i); the labor costs budget (TR_i); the indirect production costs budget (NPR_i). The first two budgets present the direct production costs, whereas the third budget shows the indirect production costs.⁹

$$PR_i = MR_i + TR_i + NPR_i$$

(3)

In order to determine the cost price of a unit of main production (SEB_j) the production costs for the crop (PR_i) are divided into the budget amount of the main production (Q_j).¹⁰

The budget of the non-production costs (NR) involves the costs for covering administrative activities and sales costs. In order to prepare it, data from the past years shall be used; this data is adjusted to the changes throughout the budget period – changes in activities, personnel, salaries, prices, etc. The non-production costs may be determined by a norm ratio of BGN 1 of income.

⁹ In determining the cost price, we shall follow the rules of calculation in the availability of additional or coupled production.

¹⁰ If there is additional production – its sales value is used to reduce costs. If there is more than one main production, the costs are shared among them on the basis of the expected income from sales.

In preparing the **budget of the financial result of the operative activity**, data from the following budgets shall be used: budget of sales – it provides data about the budget income from the sales of agricultural produce (S_d); we shall add to it (if expected) income from lease, services and other sales – the result is the income from the activity (Pr_D); the budget of cost price – it provides information about the production costs (PR_D); the budget of non-production costs – it provides information about the non-production costs (NR).

The *accounting financial result* (FR_s) or the gross financial result of the operative activity is received by subtracting the production costs (PR_D) and the non-production costs (NR) from the income from the activity (Pr_D).

$$FR_s = Pr_D - PR_D - NR$$

(4)

The forecast of the cash flow is prepared by using information from:

- **the budget of cash inflows**, which is prepared on the basis of the budget of the income from sales and other income, detailed by months, and the scheme of encashing the generated income;

- **the budget of cash payments**, developed on the basis of the budget of the deliveries of materials and other costs and the scheme for their repayment;

- **the budget of investments**, which involves investment projects for acquiring real and financial investments and disposing of such assets, as well as the expected financial income and cash receipts from them;

- **the budget of the capital**, which involves the expected changes in the share capital, the bank loans, the lease, and the repayment on their principal, as well as the expected financial costs and repayments on interest and dividends.

The forecast of the cash flows allows comparing the expected disposable cash for each monthly period (at its end) to the expected short-term payments and forecasting and controlling the *absolute liquidity of the enterprise*. The *expected disposable cash* in the current account at the end of each month (PN_k) is determined as an algebraic sum of the *balance in the current account at the beginning of the period* (the balance in the current account at the end of the previous period) (PN_n) and the *net cash flow for the period* (PP).

$$PN_k = PN_n + PP$$

(5)

By summarizing the information from the forecast of the cash flows, in compliance with the structure of the statement of cash flows, **the budget**

statement of cash flows and the cash budget are prepared. This budget is very useful in identifying the reasons for the changes in the liquid funds which may be changes to the receipts and debts from the operative activity, increase of investment, new funding, etc. The indicators of the budget of cash flows, presented by months, are summarized for each year, and are restructured in compliance with the statement of cash flows. The disposable cash at the end of the year is determined as an algebraic sum of the disposable cash at the beginning of the year and the annual total net cash flow.

The budget income statement reflects the planned financial results of the activity of the enterprise throughout the budget period. It is different from the accounting income statement as it does not include tax debts. This budget serves to determine the financial result – the accounting profit or loss, as it encompasses data from the budget of the financial result of the operative activity and the budgets of the financial income and costs (correspondingly, the budgets of the investment and capital/funding).

The budget balance reflects the expected throughout the budget period changes in the assets, liabilities, and owner's equity, i.e., it provides information about the future property and financial state of the enterprise at the end of the budget period. It is developed on the basis of data from: initial accounting balance; the production budget; the deliveries budget; the investment and capital budget (funding); the budget statement of cash flows; the budget income statement.

All developed budgets, as elements of the complex budget system, contain specific target indicators, whose meeting is the effort that shall be made by the enterprise's management. The control of executing the budgets requires the creation of accounting information about each budget indicator and an analysis of the deviations from it. This allows the timely detection of trends and reveals the influence of the factors which determine it; this leads to the restriction and cease of the negative impacts and to the expansion of and strengthening the positive impacts.

Conclusion

In conclusion, we may point out the following results of the paper:

- we have researched the interaction between management and accounting as the basis for the establishment and development of management accounting; it also outlines the specific characteristics of the information created by management accounting;
- we have applied a systematic and complex approach in the realization of the function of budgeting by creating and proposing a conceptual

model of the planning and budgeting system which reflects the specific nature of the agricultural enterprise;

- we have outlined the possibilities for developing the budgets by using Microsoft Excel spreadsheet without any requirements of specific software and training.

Those results confirm the thesis that if agricultural enterprises apply budgeting by using the systematic and complex approach, this will increase the usefulness of the accounting information and the managerial efficiency.

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Ivanka Dimitrova is a lecturer at the Department of Economics, the Faculty of Business Management – “Angel Kanchev” University of Ruse. She holds a doctoral degree in Political Economics and is an associate professor in Accounting, Control and Analysis of the Economic Activity. Her **research interests** are in the fields of financial and management accounting, accounting analysis.

ORCID ID: 0000-0002-5191-8351

Yordanka Velcheva is an associate professor and a long-term lecturer in Accounting and Finance at the Faculty of Business Management – “Angel Kanchev” University of Ruse. She is also a certified accountant. Her **research interests** are in the fields of financial and management accounting, accounting analysis, independent financial audit, organizational financial management.

ORCID ID: 0000-0001-5417-2594

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Editorial address:

2, Emanuil Chakarov street, Svishtov 5250
Prof. Andrey Zahariev, PhD – Editor-in-Chief
☎ (+359) 889 882 298
Deyana Vesselinova – technical secretary
☎ (+359) 631 66 309, e-mail: nsarhiv@uni-svishtov.bg
Blagovesta Borisova – computer graphic design
☎ (+359) 882 552 516, e-mail: b.borisova@uni-svishtov.bg

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