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### Issues to Improve the Cost of Production of Environmentally Clean Products

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#### Abstract

This article describes the need to create a concept of environmental quality. The need to research the theory and methodology of accounting for the costs of ensuring the ecological quality of the product has been scientifically explained. The views of economists on the category of quality have been studied. It also highlighted the importance of considering quality as an ecological category. The description of the concept of ecological quality is presented. On the basis of the analysis of economic literature and the study of practice, the author's approach to the ecological quality of the product has been developed. Six main aspects of environmental quality: social, technical, legal, economic, aesthetic and environmental aspects have been studied in detail. Due to the directions of improving the ecological quality of the products, the composition of the costs of ensuring ecological quality and the objects of accounting were determined.

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**Enter.** Due to the deterioration of the environment all over the world, the issue of production of environmentally friendly products is becoming a very urgent issue. Because the quality of products determines the lifestyle of people, serves as a social, economic and ecological basis for the successful development of society and individuals. Therefore, the development of systematic measures for the replacement of environmentally harmful technologies with environmentally friendly ones and their investment support is of great importance in the modern economy. Also, in the conditions of the modern market economy, the production of quality products is the main condition for maintaining people's health.

Today, consumers prefer to buy environmentally friendly products in order to protect their health and

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protect the environment. Another reason for the increased attention of consumers to the quality of products is that the variety of products has increased and the market is saturated with products. This makes the environmental quality of the product one of the driving forces of production.

Accounting is a system of forming complete and reliable information that serves as a basis for making management decisions at the level of economic entities and the country. The current accounting system does not adequately reflect the impact of economic entities on the environment and human health. This makes it necessary to research the theory and methodology of cost accounting for environmental quality of the product.

Another important issue that should be paid attention to today is that the current accounting system does not fully satisfy the needs of interested users for information about the impact of economic entities on the environment and human health. This requires the development of theoretical rules and practical recommendations for the organization and improvement of the method of calculating the costs of environmental quality of the product.

Also, the problem of quality in the market economy is an important factor in strengthening the standard of living of the population and economic, social and environmental security. In this regard, there is a need to introduce a new concept of "Ecological quality".

In the conditions of modern economy, the concept of "Ecological quality of the product" is becoming more and more important. However, researchers still do not pay enough attention to this issue. This creates the need to determine the composition of the environmental quality costs of the product and, accordingly, to determine the accounting objects of the environmental quality costs.

#### Analysis of literature on the topic

Analysis of economic literature has shown that there are many definitions of quality today. In particular, the following definition of quality has been formulated by the European Quality Control Organization: "If a product can be designed and restored on the basis of the condition of minimal costs during its life cycle, minimal energy and other resource consumption, and an acceptable (acceptable) level of impact on the environment and society ( if it serves the health and joy of life of people engaged in (reuse) as much as possible, then it is considered a quality product". This definition determines the relationship between the problem of product quality and other issues that are important for people - environmental protection, rational use of natural resources, and the impact of economic activity on the living conditions of future generations [1, p. 11].

The Academy of Quality Issues has provided a conceptual definition of quality. According to him, quality is one of the main categories that determine the lifestyle, economic and social basis for the effective formation of individuals and society [1, p. 11]. This approach to defining the essence of the concept defines the importance of quality improvement activities, but does not fully reveal the essence of the concept.

The international standard ISO 8402 gives the following definition of quality: "Quality is a set of characteristics of an object related to its ability to meet specified and expected needs" [2].

DSTU ISO 9000-2015 "Quality management systems. In the main order and dictionary, the quality is defined as follows: "Quality is such a degree that the sum of properties of an object satisfies the requirements imposed on it" [3].

In our opinion, the definitions of the concept of quality presented above do not fully reveal the essence. Determining the essence of product quality is an important issue. Because it allows to improve the production, evaluate the results, plan the production of new types of products, determine

the needs of customers and solve other problems of ensuring the required quality of the product.

For a long time, the concept of "Quality" was defined according to the technical characteristics of the product. In fact, these features are one of the important features of quality and indicate the technical perfection of the product [4, p. 2].

According to the results of the research, it can be concluded that the majority of scientists from the economic point of view, the concept of "Quality" means the complex of product characteristics that lead to satisfaction of customers' needs. A group of economists has studied such qualities. In particular, L. M. Tkachuk, T.K. According to Kalugaryan [5], product quality is a complex of multifunctional, economic and aesthetic features that meet the specific needs of customers; A. Feigenbaum [6] noted the technical, technological and operational characteristics of the product; Yes. A. Fiintseva [7, p. 128] distinguished the parametric, operational, consumption, technological and design features of the product.

L. Berdnikova and T. According to Popova [8], the concept of "Quality" should be understood as the level of interaction with the conditions set according to its intended purpose, F. Crosby [9] notes that quality is the conformity of the company to the requirements set for its product. Such approaches to quality interpretations do not fully reveal the essence of the "Quality" concept, because the conditions that the enterprise sets for its product, as well as the characteristics of the product according to its intended purpose, may not meet the needs of consumers.

Economist-scientist A. A. Anfalov [10] (quality is one of the main features that shape the demand for products and is very important for increasing and strengthening competitiveness) and V. Deming [11] (quality as a result of the interaction of 3 elements: the product, the customer and the way the product is used and the services related to the service of the product) presented by Deming [11] is economically correct, but does not fully reveal the content of the definition, we think that

Thus, all the definitions given above are not considered a comprehensive definition of the quality term, but only represent some of its aspects. Also, their analysis leads to the idea that quality is one of the complex categories. In our opinion, the different interpretation of this term stems from the fact that the term "Quality" means a large number of specific characteristics of objects and events.

To fully understand the essence of product quality, to effectively develop social production by comparing and comparing its various types, and to accurately evaluate its results, to design and predict the development of new products, to accurately determine production and individual needs, to study demand, and to solve other problems of achieving the necessary product quality. it is important to do [1, p. 10].

It is especially important to consider quality as an ecological category today. This situation is determined by the effect of quality on the body of consumers and the effect of the production process of a certain product on the ecological situation of the region and the country.

As can be seen from the above, there is currently no single definition of quality. The reason for this is that scientists' views on determining the essence of this category have changed and are being improved under the influence of scientific and technological progress and economic development.

Since the environmental component of product quality has not been sufficiently studied by scientists, we believe that it is necessary to scientifically justify the issue of the impact of the product on the health of consumers and the environment. For example, X. I. Shtyrhun defines the indicators of product quality improvement as follows:

1. Technical - introduction of a modern technical and technological base, application of scientific

achievements, implementation and improvement of current standards and technical conditions.

2. Organization - introducing the use of modern forms and methods of organization of production and management; improvement of control methods at all stages of production; strengthening financial relations between producers and consumers; use of modern local and foreign experiences in order to increase product competitiveness.

3. Economic - creating a concept of product quality modeling and planning; approval of product prices that satisfy producers and consumers for different categories of consumers; to create effective ways to motivate the company's employees.

4. Implementation of social and effective personnel policy, formation of necessary working and living conditions for company employees [12, p. 328].

Thus, modern approaches to enterprise management are aimed at improving the quality of products in order to increase the competitiveness and profit of the enterprise. The management of the enterprise sometimes does not pay attention to environmental problems in the country.

Therefore, in our opinion, it is necessary to form a new term "Ecological quality".

#### Research methodology

This article uses methods of scientific abstraction, expert assessment, induction and deduction, comparison, and systematic analysis.

#### Analysis and results

Product quality is versatile. The analysis of economic literature and the study of practice showed that environmental quality is determined by six main aspects. For example, the social aspect of environmental quality refers to the relationship of society or an individual subject to a specific object. The technical aspect is related to compliance with standards and specifications during the production process, ensuring functional suitability. The legal aspect of environmental quality is determined by compliance with the requirements established in regulatory legal documents and production standards. The economic aspect represents the level of satisfaction of the needs of consumers, while the aesthetic aspect shows that the appearance of the object meets the demand, and it should also satisfy the human need for optimal and harmonious functioning. The ecological aspect shows the effect of the production process on the consumer organism, as well as on the ecological situation of the country. If at least one aspect of the above is not fulfilled, there can be no question about the ecological quality of the product.

Thus, taking into account the characteristics described above, we offer the author's definition of the concept of "Product environmental quality". According to it, the ecological quality of a product is a set of characteristics of products produced in compliance with production standards and/or technical conditions, which meet the needs of consumers and do not have a negative impact on the health of consumers and the environment, and do not conflict with regulatory legal documents.

The main characteristics of the concept of "ecological quality" are presented in Figure 1.

Picture 1. Description of the concept of "ecological quality"\*



Source. [13]

Today, the ecological feature of the product is considered as the main condition for ensuring the competitiveness of the product. It should be noted that an important component of the production of quality products is the regulation of product costs, taking into account the minimization of costs without reducing the characteristics of the product.

The objective need to improve product quality is as follows:

1. product quality is one of the main conditions for increasing production efficiency and actively forming the economy;
2. the production of low-quality products leads to negative economic results at the scale of enterprises and the national economy;
3. the psychology of consumers and their requirements for product quality have changed;
4. product quality is one of the main factors of product competitiveness in the conditions of increasing competition for sales markets.

The main reasons for the decrease in product quality may be the low quality of raw materials, outdated technology, the organization of production and the skills of workers, non-rhythmic production, etc. [7, p. 128].

Product quality improvement is one of the forms of gaining and maintaining positions in the competitive struggle and in the market. High quality not only increases sales volume, but also



increases product demand and revenue at the expense of higher prices and profitability. In fact, in the conditions of the open market economy, where competition is necessary, the quality of the product is determined by measures related to ensuring the integrity of the product manufacturers, the efficiency of its activities, and the necessary conditions for the economic well-being of the state [7, p. 128].

In general, it is possible to ensure efficient operation of enterprises by increasing the environmental quality of products and achieving competitiveness of enterprises in domestic and foreign markets.

In the market economy, the problem of quality is an important factor in improving people's living standards, ensuring economic, social and environmental security. Therefore, it became necessary to introduce a new concept called "Ecological quality". According to him, environmental quality is characterized by six main aspects: social, technical, legal, economic, aesthetic and ecological. The main one is the environmental aspect, which means not to have a negative impact on the health of consumers and the environment.

Thus, the level of environmental quality of products and services is affected by multifaceted factors that can be grouped into six groups: technical, organizational, economic, social, environmental, aesthetic and legal factors.

The reflection of the operations related to the environmental activities of the enterprise in the accounting accounts allows to form information about the environmental management of the enterprise and to inform the public about the results of such activities. This is ultimately one of the factors of business image formation and helps to strengthen economic security. Therefore, the lack of a quality information system, that is, the lack of development of the procedure for accounting for the environmental quality of the product, prevents further improvement of research in the field of economics and ecology.

Management of the environmental quality of products in accordance with the principles of sustainable development requires the development of accounting and analytical support. Accounting is a subsystem of the management of the economic entity, where information about the ecological quality of the product is formed.

The cost of ensuring environmental quality of products is an understudied object in accounting. Business entities ignore its importance and try to reduce this type of expenses to the minimum level. This can lead to the deterioration of the environmental quality of the product, and this, in turn, can have a negative impact on the health of consumers, the environment and the competitiveness of the enterprise.

Effective organization of environmental quality cost accounting allows the enterprise to effectively use its resources, as well as to identify negative factors that affect the production process and the activities of economic entities in general. The effectiveness of accounting for environmental quality costs mainly depends on the correct definition of the components of environmental quality. In this regard, it is necessary to determine the composition of costs that make up the ecological quality of the product and to determine the accounting objects.

Today, in the period of improvement of technological processes and rapid development of society in general, supply does not shape demand, on the contrary, demand shapes supply. Quality is the most important criterion for choosing a product by the consumer. One of the main requirements of consumers for the quality of consumer goods is their safety, that is, the product should not have a negative impact on the health of consumers and the environment. These aspects are the basis for the formation of the concept "Environmental quality of the product".

The composition of environmental quality costs and accounting objects can be determined based on the directions for improving the environmental quality of products.

The grouping of environmental quality costs by economic elements is presented in Table 1.

Material costs include raw materials, materials, purchased semi-finished products and packaging materials (eco-packaging) used in the production of environmentally friendly products.

The essence of the concept of "ecological quality products" implies that such products are produced in accordance with approved rules (standards) that provide for reducing the use of pesticides, synthetic mineral fertilizers, growth regulators, artificial food additives and prohibiting the use of genetically modified organisms [14].

When raw materials containing genetically modified organisms are used, they should be a separate accounting object. The spread of genetically modified organisms is one of the problematic issues in the formation of mechanisms for the development of an ecologically safe environment. Independent studies have shown that genetically modified organisms cause oncological diseases, infertility, allergies, toxicoses, obesity, death and morbidity of newborns, genetic damage, reduction and disappearance of many animals and plants, and biosphere destruction.

Due to the growing demand for ecologically clean products, special stores selling this type of food products have appeared in the world. They sell products that do not contain genetically modified components, pesticides, mineral fertilizers and other additives of artificial origin.

**Table 1. Grouping of environmental quality assurance costs by economic elements**

No	Expenses element i	Inclusion of costs in the relevant elements
1 .	Material costs	- raw materials and materials (main and auxiliary) used in the production of ecological quality products; - packaging materials used in the production of environmentally friendly products (eco-packaging)
2 .	Labor costs	Incentive and compensation payments to employees engaged in the production of environmentally friendly products, expenses incurred by the enterprise for employee training and internships
3 .	Social deductions	Allocation of single social contribution sums for the wages of employees engaged in the production of ecological quality products, allocations for individual insurance of workers and other social measures
4 .	Depreciation	Depreciation of fixed assets, other non-returnable tangible assets and intangible assets directly related to the production of environmentally friendly products

5 .	Other operating expenses	<p>Expenses that are not included in the elements specified in lines 1-4 of the table, in particular:</p> <p>1) costs related to production management:</p> <ul style="list-style-type: none"> <li>- business trip of employees of the production of ecological quality products and employees of the management apparatus ;</li> <li>- participation in seminars related to production of eco-quality products ;</li> <li>- obtaining licenses and other special permits related to the production of eco-quality products ;</li> </ul> <p>2) costs related to conservation and use of nature protection funds;</p> <p>3) costs related to product testing , product quality control, spare parts, components set standards or technical conditions;</p> <p>4) other costs related to ensuring the ecological quality of the product</p>
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Source. [13]

At the same time, the infrastructure of the market for organic products is not yet sufficiently developed, so producers are limited in applying marketing approaches to bring more products to the markets. In addition, one of the main problems of the production of environmentally friendly products is the lack of improvement of the regulatory framework and certification system.

Labor costs include incentives and compensation payments and penalties for employees engaged in the production of environmentally friendly products. Incentive payments can effectively motivate enterprise employees to improve the environmental quality of products. Compensation payments must be paid to employees who work in harmful conditions in the enterprise. Fines should be imposed on workers who cause environmental degradation of products.

If we touch on the issue of allowances for social events, social allowances are allocated to employees engaged in the production of environmentally friendly products.

Other costs of environmental quality of products should include costs that are not included in the elements specified in lines 1-4 of Table 1. To them:

1) costs related to production management, namely:

- business trip expenses of environmentally friendly products production staff and management apparatus;
- costs of participation in seminars dedicated to the production of environmentally friendly products;
- costs of obtaining licenses and other special permits related to the production of environmentally friendly products;

2) costs related to conservation and use of nature protection funds;

3) costs of product testing, product quality control, standards or specifications for spare parts, components;

4) includes other costs related to ensuring the ecological quality of the product.

The grouping of costs of environmental quality of products by economic elements serves as a basis for planning the working capital of the enterprise, as it allows the analysis of costs in the current reporting period.

However, grouping by economic elements will not be sufficient, because it does not provide sufficient information about the assignment of costs, their relevance and relation to the volume of production.

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Also, it does not allow control and analysis of target costs in the production process. In this regard, it is necessary to group costs to ensure the environmental quality of the product and other classification features (Fig. 1).

It should be noted that all considered areas of classification of costs of environmental quality of products are interrelated. For example, when dividing costs into fixed and variable costs, classification by elements and calculation items is used. The division of costs into types such as effective and ineffective is related to the production of products and related to the classification of accounting period costs. The division of costs within the limits of the norm and deviation from the norm divides the costs into basic and overhead, direct and indirect, regulated and unregulated, etc. used in conjunction with classification. It should be noted that in the practice of enterprises, cost classification is mainly used for the purpose of calculating the planned and actual cost of products (services).

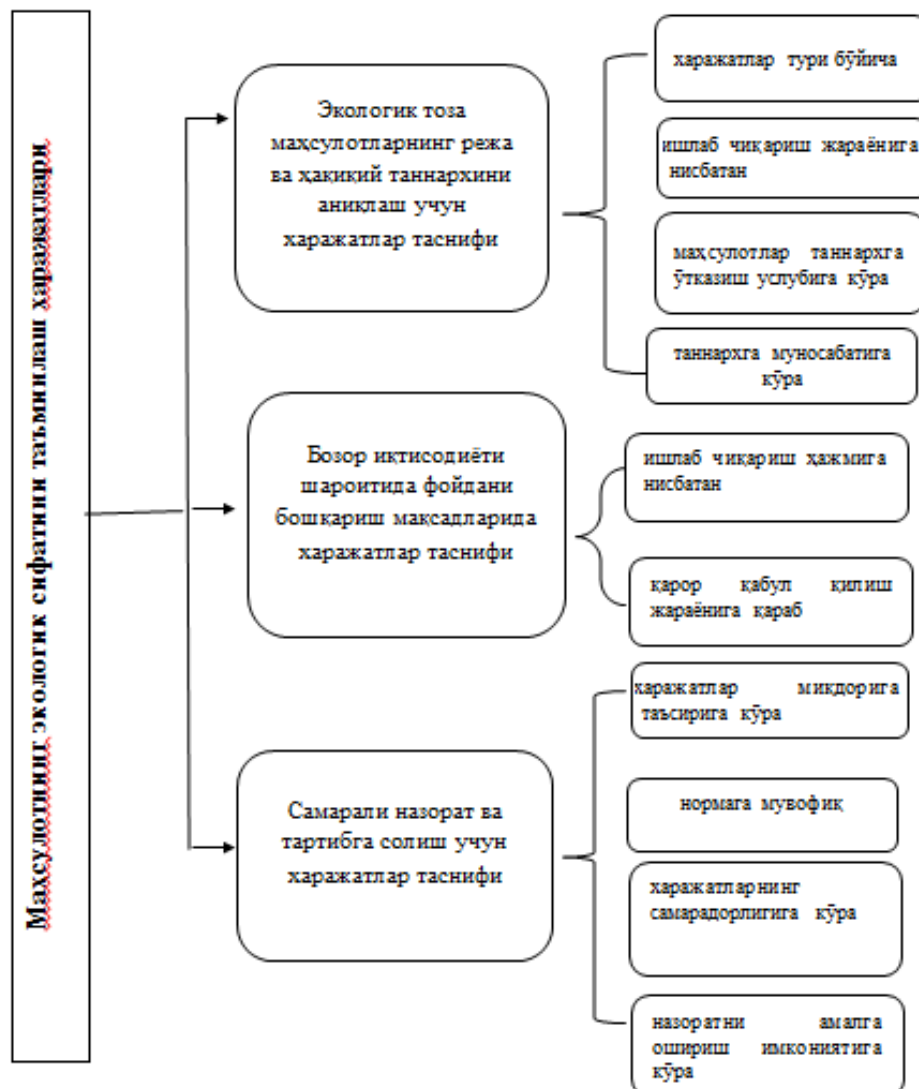


Figure 2. Environmental quality of products cost classification\*

Note: \* summarized by the author based on existing cost classifications.

## Conclusions and suggestions

As a result of the research, it can be concluded that the current accounting system does not adequately reflect the impact of economic entities on the environment and human health. This determines the need to develop a theory and methodology for accounting for the costs of ensuring the environmental quality of the product.

In the market economy, the problem of quality is an important factor in improving people's living standards, ensuring economic, social and environmental security. Therefore, it became necessary to introduce a new concept called "Ecological quality". According to him, environmental quality is characterized by six main aspects: social, technical, legal, economic, aesthetic and ecological. The main one is the environmental aspect, which means not to have a negative impact on the health of consumers and the environment.

Thus, the level of environmental quality of products and services is affected by multifaceted factors that can be grouped into six groups: technical, organizational, economic, social, environmental, aesthetic and legal factors.

Effective organization of environmental quality cost accounting allows the enterprise to effectively use its resources, as well as to identify negative factors that affect the production process and the activities of economic entities in general. The effectiveness of the organization of environmental quality cost accounting mainly depends on the correct definition of the components of environmental quality. In this regard, it is necessary to determine the composition of costs that make up the ecological quality of the product and to determine the accounting objects.

The grouping of costs of environmental quality of products by economic elements serves as a basis for planning the working capital of the enterprise, as it allows the analysis of costs in the current reporting period.

Integrated use of all considered costs in management allows to create the most effective cost management system to ensure environmental quality of products.

Based on the results of the research, a classification of costs of environmental quality of products for management purposes was proposed. This allows to create an accounting methodology aimed at forming complete and reliable information on the volume of production and sales of products containing genetically modified organisms, as well as costs for the supply of ecological quality products.

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