

Mechanism of project management of the industry sustainable development

Mecanismo de gestión de proyectos del desarrollo sostenible industrial

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Content

[1. Introduction](#)

ABSTRACT:

The purpose of this article is to develop a theoretical framework of management of the sustainable development of the food industry in a region based on the program and project approach. The sustainable development of the industry is treated as its movement along the appropriate trajectory while achieving the targets set, using the existing general economic mechanisms. To efficiently implement their effect, it is necessary to use a special mechanism operating in the industry and ensuring its sustainable development. The sustainability of the industry development is improved through implementing the programs and projects designed to eliminate a gap between the target state and the current state of sustainability. Due to the properties of an open nonlinear system inherent to the industry, its sustainability management mechanism is of the hierarchical and multipurpose nature. The mechanism of the program and project approach implements the functions ensuring the formation and performance of intra-industry relations and the quality of external economic relations between industry components and elements with regard to the principles for self-organization. The content of the basic functions and the structure of the management mechanism of the industry sustainable development based on the program and project approach are described in the article.

Keywords: food industry, industry sustainable development, sustainability management mechanism.

RESUMEN:

El propósito de este artículo es desarrollar un marco teórico de gestión del desarrollo sustentable de la industria alimentaria en una región basada en el enfoque de programas y proyectos. El desarrollo sostenible de la industria es tratado como su movimiento a lo largo de la trayectoria apropiada mientras que alcanza los objetivos fijados, usando los mecanismos económicos generales existentes. Para implementar eficazmente su efecto, es necesario utilizar un mecanismo especial que opere en la industria y asegurar su desarrollo sustentable. La sostenibilidad del desarrollo de la industria se mejora mediante la implementación de los programas y proyectos diseñados para eliminar una brecha entre el estado objetivo y el estado actual de sostenibilidad. Debido a las propiedades de un sistema abierto no lineal inherente a la industria, su mecanismo de gestión de la sostenibilidad es de la naturaleza jerárquica y multipropósito. El mecanismo del enfoque del programa y del proyecto implementa las funciones que garantizan la formación y el desempeño de las relaciones intrasectoriales y la calidad de las relaciones económicas externas entre los componentes de la industria y los elementos con respecto a los principios para la autoorganización. En el artículo se describen el contenido de las funciones básicas y la estructura del mecanismo de gestión del desarrollo sostenible de la industria basado en el enfoque de programas y

1. Introduction

The food industry is currently marked by a rather fast development rate. However, there are a lot of problems in the industry affecting the level of economic, social and environmental sustainability. These include among others the problems of larger process utilization of food enterprises and low labor productivity resulting in outsized costs per a unit of goods manufactured and thus poor performance of food enterprises. The proportion of unprofitable food enterprises in 2014 was at least 25%. The reproduction process of food enterprises is largely characterized by a low level of profitability, and a high inflation rate results in the depreciation of amortization funds of the industry players. Innovative development of food production, in its turn, with low profit is complicated by the lack of credit resources.

The industry development problems are currently determined by external factors rather than internal ones. These factors among others include sanctions also affecting the industry technology support and the increased consumers' demand for domestic food. Undoubtedly, the above factors along with the internal ones negatively affect the sustainable development of food industry. In these regard, the program and project approach to sustainability management in the industry as a self-organizing system in terms of industry import substitution strategy is of particular importance.

Within a market economy, any food-related enterprise creates and implements its own strategy and development trajectory. It is essential that its strategic aspirations fit the sustainable development principles and the sustainable development targets of the entire industry. This task is particularly peculiar to an industry management system. Within the program- and goal-oriented approach to managing the development of the complex self-organizing system, it is necessary to define the industry sustainable development as sustainability of the production and technological system.

Methods.

It is known that the term "sustainable development in industry economy" in scientific literature is mainly considered in terms of the definition of "the sustainability of economy movement". For example, Rosenberg G.S., when determining the industry as a certain structural formation, treats the industry sustainability as an ability to maintain the industrial structure as a more or less sustainable for a certain period and to resist external disturbances for self-protection purposes (Rosenberg, & Krasnoshchekov, 1995). Such a position does not take into account a number of properties of economic systems, such as an industrial sector. In particular, it is expected that an industry sector as a set of economic entities not only has a structural property in all its forms (financial, organizational, food, consumer etc.) but also a property of continuous dynamics, movement and development. This approach is related to determining the economic sustainability of the system as an ability to "meet its social responsibilities" (Znamensky, 2012). The same approach is used in other works. Thus, the business sustainability is determined as "adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future" (Deloitte & Touche, & International Institute for Sustainable Development, 1992).

In terms of defining the industry sector as an integral part of the economy consisting of a number of production and technological systems, it is necessary to determine internal (intrasystem) and external properties of sustainability. According to the law of conservation of energy, "the flow transmitted to the energy system is divided into two parts: formation or support of the system organization and direct resistance to the external environment

("flow/stock"). "Each of the sustainability objectives described by the System Conditions can be further divided into two basic mechanisms: dematerialization, i.e. reduction of material flows, and substitution" (Robert *et al.*, 2002).

It is possible to use different indicators and their relations as indicators of intra-industry sustainability: for example, equity capital/debt capital; profitability, etc. However, these relations are also typical for the sustainability of the production enterprise. It is evident that deterioration or improvement of these indicators will affect the overall performance of the industry development sustainability. The specific industrial indicator of industry sustainability is defined as a sum of relevant indicators of industry-oriented enterprises: economic, reproduction, technological and organizational, and managerial enterprises.

The industry economy should be regarded as internally sustainable in case of stability of basic characteristics of industrial situation without sacrificing the goals in all three areas (Labuschagne *et al.*, 2005). This statement is in full agreement with (Shannon, 1975). Besides, the internal structure of the industry may change. External sustainability reflects the relations of the system response to the external environment demands. In this regard, we can speak about changing the volumes, nomenclature, quality and cost of goods produced in the industry while transforming external conditions. Thus, economic sanctions can be treated as a new requirement of the external environment for the growth in production and expanded range of goods produced by the industry players. Internal and external characteristics of sustainability are in a complex relationship with each other, the type of which is rather hard to determine. The requirements of the external environment do not affect the industry as an integrated system. However, they affect the production enterprises included in this system and result in the change of the sustainability condition of the individual enterprises and the entire industry.

Based on the authors' approach to researching the industry as an open nonlinear system, it is suggested to consider both the sustainable development process and the mechanism for managing the industry sustainability using synergetics principles. In this case, the industry-related enterprises are certain attractors. In this regard, an external requirement or restrictions (for example, the need for import substitution, increase in sales, market expansion, etc.) determine the condition of its unsustainability or bifurcation, which may result in its quality transformation. This transformation may have both positive and negative consequences for the enterprise itself and the industry as a whole. The processes of implementation of import substitution microincentive projects are essentially the elements of reasonable management.

2. Results

Maintaining the sustainable development is mainly connected with such a factor of the market economy as competition which is the most important system self-organizing mechanism managing its sustainability. However, Paul Samuelson showed in his studies that "involuntary coordination" (competitive system) is efficient only if there are instruments restraining and balancing the self-regulating or self-organizing mechanism at a steady state. It is substantially referred to sustainable development mechanisms operating in the industry and providing support to industrial enterprises. Given that the industry sustainable development is determined as a movement or development along the appropriate trajectory while achieving the targets set, the system of the above mechanisms is the main factor ensuring the industry sustainability.

Shcherbenko E.V. in her work has provided a group of general economic mechanisms ensuring sustainable development of an industry:

- "- mechanism for equilibrium between the industry and international environment;
- mechanism for equilibrium between the industry and national economy;
- mechanism for equilibrium between the industry and entity environment;
- mechanism for the competition law;

- mechanism for economic cycles;
- mechanism for multipliers;
- mechanism for state regulation" (Shcherbenko, 2008).

It must be noted that the above mechanisms are of a general economic nature and ensure performance of the industry as a national economy subsystem. It is known that they have a complex structure of relations ensuring their integrated interaction. It is expected that to implement their impact on the industry economy a special mechanism is required which operates in the industry and ensures its sustainable development not only in economic but also in social and environmental respect. This means that the functions of general economic mechanisms are implemented through the mentioned mechanism. "Optimal decisions can only be made when the economic, social and environmental consequences are taken into consideration" (Hockerts, 1999).

The sustainability of the industry development is improved through implementing the programs and projects the main purpose of which is to eliminate the gap between the target and current state of sustainability. The projects to a certain extent are included in the sustainable development program. Thus, there are two independent sets of projects (those included and not included in programs of different levels). Obviously, when the projects included in different programs mostly have resources, as provided by the program, another part of projects is mainly implemented using the resources available with the industry players. The tasks of the industry sustainable development mechanism are divided by this feature into two sets: a) management of the projects included in the programs and industry management tasks; b) those initiated by industry players and implemented through the reserves of the enterprises. This division of tasks entirely corresponds to the general authors' approach to the industry sustainable development mechanism.

The scientific literature offers a variety of definitions for the industry sustainable development mechanism. Thus, in certain studies this mechanism is considered as a category determining the organization of the system of connections and relations (Shcherbenko, 2008). In this regard, the general mechanism for the industry sustainable development is considered as the total of all the above mechanisms determining the nature of connections and relations. While generally accepting the reasonability of such an approach to the sustainable development mechanism, it is necessary to mention poor specifics of the methods and instruments for these mechanisms reflecting the content of the general market mechanism.

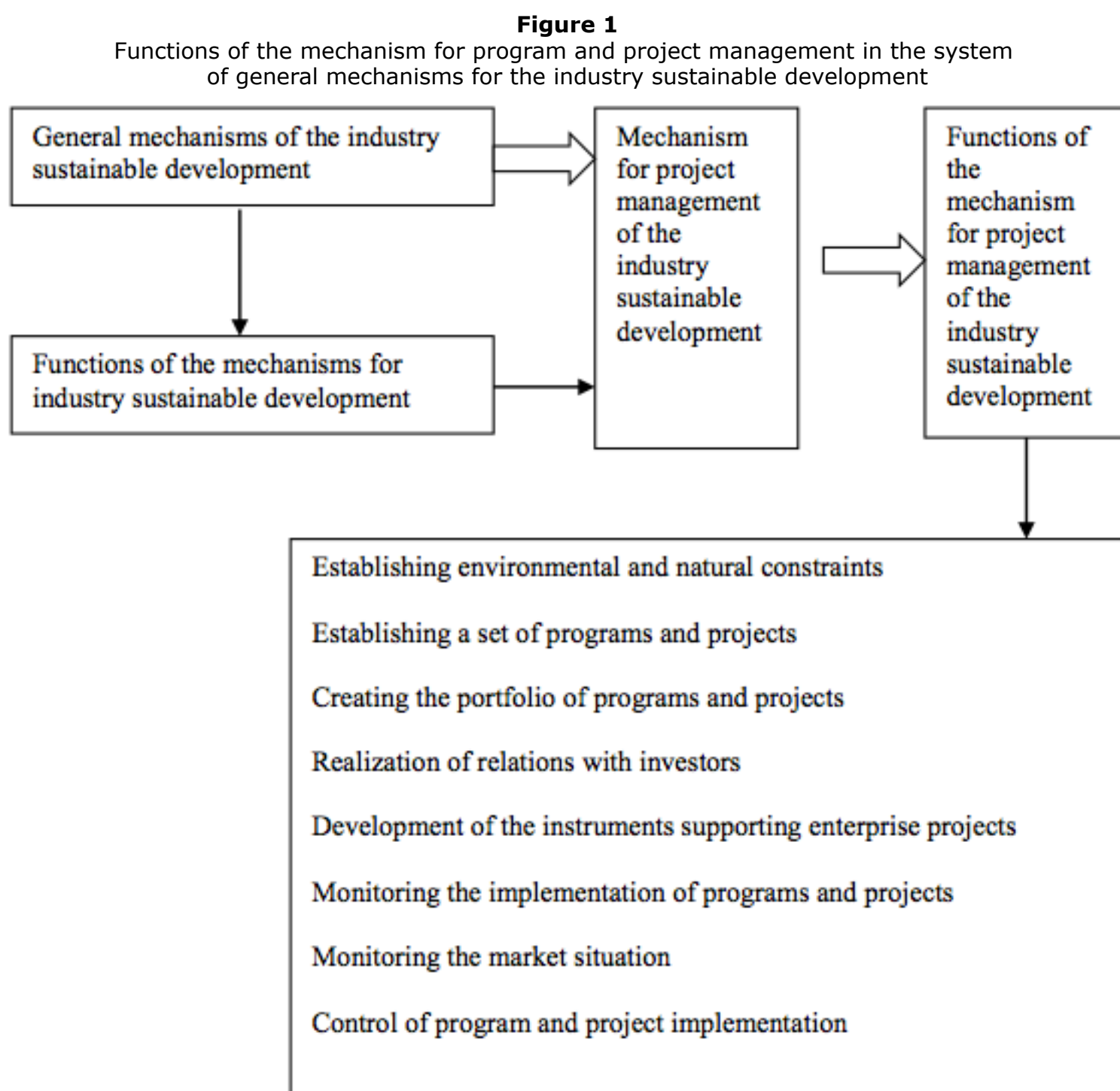
The comprehensive approach to determining the industry sustainable development mechanism is rather widely considered in works of Yepifantseva E.I. According to her research, "the optimal trajectory for the development of the system and the condition of its dynamic equilibrium can be achieved through coordinating development goals of its subsystems and components when each component acts simultaneously in its interests and interests of the system as a whole. It is ensured by the development of social and economic subsystems within environmental constraints" (Yepifantseva, 2003). In this regard, the industry is considered as a complex system comprised of various economic entities performing the industry-oriented activities. In this case, the self-organization factor (diversity of forms, freedom of choice, etc.) is of great importance, which acts at the microlevel of this system. Thus, the principle of distributed control (of the sustainable development mechanism) is established according to which coordination and setting the system (industry) development strategy are performed at the top level (industry management), while self-organization and self-government processes are implemented at the lower level (microlevel). Yepifantseva considers this conceptual approach with regard to an enterprise, though individual components of the suggested scheme of the sustainable development mechanism can be transferred to the industry level.

Taking into account the research topic and the above-mentioned, we can present the industry sustainable development mechanism as a hierarchical and multipurpose system designed to address two sets of tasks: program project management and enterprise project management.

The first set of tasks is addressed through the principles of centralized management. The second one is addressed using the principles of self-organization.

The key aspect in establishing the industry sustainable development mechanism is determining the position of the environmental component in industry management. While Yepifantseva refers environment-oriented function to the industry level (Yepifantseva, 2003), in terms of industry management the author suggests to consider this function at both the industry level and the enterprise level. In particular, basic environmental and natural constraints and environmental protection priorities, which must be considered both in implementing the projects and in production activities of economic entities, should be established at the industry level. The violation of the principles of centralized management (coordination, target formation, strategy development, feedback, etc.) results in implementing self-organization processes in an indiscriminate way, inconsistent with the goals of the system (industry). Addressing the second set of tasks of the mechanism for project management of the industry sustainable development is designed to pursue this aim.

The functions of the mechanisms ensuring the industry sustainable development are shown in Figure 1.



It is obvious that the sustainability of such a socio-economic system as an industry is ensured by general economic mechanisms ensuring industry performance in the market. The program and project management mechanism, in its turn, ensures the industry sustainability through

implementation of programs and projects at different levels. The above-mentioned general sustainability mechanisms and program and project management mechanism perform their relevant functions only, which in their turn ensure development and performance of intra-industry ones as well as the quality and content of external economic relations between components and elements of the industry. In this regard, the industry sustainability management is of "rational" nature and combines closed, open and coordinating methods of sustainable development management.

The vector of the industry sustainable development will change depending on goal orientation of projects. The sustainability of the entire industry system is ensured only when the goals of the enterprise are harmonized with the industry ones. The implementation of the enterprise project is a bifurcation and pulsating process of the transition of a system (in this case of an enterprise) into a new quality. Other industry enterprises will also leap into a new condition through implementation of their projects, which will ensure the nucleation property for the industry system. According to the theory of self-organization, the system (industry) structure will change if the project-based behavior of enterprises acquires mass character. This means that import substitution for industry players should become one of the strategic priorities for enterprises. In this case only the industry becomes sustainable with increasing external influence (sanction pressure).

3. Results and discussion

A set of projects developed and implemented in the region and at the enterprises of the industry "can be presented as a certain dynamic time- and space-distributed system with the features of complex diversity and openness. It should be noted that this system is extremely unsustainable and nonequilibrium in a number of properties. In this case, a variety of programs and projects or the system can be identified as a certain dissipative (dispersed and transformed into another condition) structure" (Zarubin *et al.*, 2015).

The support of project activities of enterprises, control and monitoring of project-based goal orientation is essentially the basic function of the mechanism for the sustainable development management (establishing nucleation areas for the industry development) (Zarubin, & Khadzhirokov, 2014). Structural changes in the industry which cause an increased sustainability can occur only if there are a lot of such projects in the industry (corporate behavior of enterprises will be insured to increase the level of development sustainability). In this case, only the industry as a system acquires "the capacity for irreversible self-development; simultaneous suppression of growth or reorientation of anti-purpose subsystem; active effect of synthesizing structural and functional synchronization of subsystems at different hierarchical levels and establishing their corporate behavior, which causes formation of a new organizational integrity" (Kapitsa *et al.*, 2001).

An industry-related enterprise independently implements a set of projects ensuring its sustainable development. In this case, the self-organization mechanism is activated. Thus, implementation of import substitution projects, which do not contradict the interests of the industry, will result in sales market expansion, manufacturing innovative products and output and sales expansion. The mechanism for the management of the industry sustainable development cannot be discussed without specifying the instruments and specific control factors, which directly allow managing the industry sustainable development.

4. Conclusion

The basic features of the socio-economic environment under modern conditions demonstrate themselves in the growth of crisis trends, increasing destabilization of political, economic, social and other processes. The experience of successfully developing countries shows that project management as a special management technology is an efficient tool addressing the above-mentioned issues in a context of uncertainty, increasing the complexity of socio-economic

systems at different levels, resource shortage, increased number of economic entities, changes in requirements and challenges in the social environment.

The socio-economic programs under current conditions are a basic tool to address the issue of strategic development in the regions. These programs essentially are the sets of program and project activities tied with deadlines, resources and executors, i.e. the system of socio-economic projects, the implementation of which is the concern of not only certain economic entities but also of the region management system, local communities and population of the region as a whole.

Implementation of the project approach to the management of the industry sustainable development including the import substitution factor boosts the level of competitiveness and balancing economic, social and environmental components of the general development process. In addition, when creating the industry project system, it is necessary to take into account the interests of both the industry management system and those of individual enterprises and organizations implementing import substitution projects. The project management is focused on ensuring successful implementation of the import substitution policy, optimization of budget expenses and establishment of a balanced structure of the industry reproduction. In terms of sustainable development management, the initiation stage of import substitution projects is the most important one as the industry strategy of import substitution is developed at this stage as well as the basis for its implementation is created. From a functional point of view, the mechanism for the management of industry sustainable development is considered through implementation of functions of project management taking into account the factor of import substitution.

The tasks addressed by the project system of industry management are as follows:

- providing the competitive goods corresponding to industry specifics;
- increased GRP;
- generating the income of employees in the industry encouraging the growth of effective demand;
- searching for the ways to optimize the use of both internal resources of the enterprise and natural resources for the industry development purposes;
- increased tax base;
- increased environmental payments.

The strategic function of the mechanism of management of the industry sustainable development involves activities to develop the strategy of the industry sustainable development taking into account the factors of import substitution, monitoring the compliance with the sustainable development principles at project development and implementation stages. These tasks may be addressed as a part of industry programs on transition to the sustainable development.

Creating the portfolio of import substitution projects involves activities on implementation of specific industry strategic goals for certain aspects of sustainability. For example, reducing emissions of industry-oriented enterprises; reducing energy intensity of products; reducing the production costs; increasing the competitiveness of products; developing and manufacturing new types of products, etc.

The condition of sustainability of a socio-economic system (industry) generally depends on the aggregative factors of a political, economic, social or environmental nature. The factor developed and acting in the external environment in the system, highest in hierarchy, directly affects the condition of sustainability of integrated subsystems. The principles of the sustainable development are implemented at all the levels of economic system management: macro-, meso-, and microlevels. It is obvious that basic tasks of the sustainable development of socio-economic systems are divided depending on the management hierarchy.

- The tasks of the project management mechanism at the mesoeconomic level (industry and region management) involve addressing key issues in implementation of import substitution:
- determining strategic directions in terms of ensuring industry competitiveness to provide infrastructural conditions for the implementation of import substitution projects;
 - coordination and target harmonization of industry priorities, development processes for certain economic entities and import substitution projects of various levels;
 - selection and evaluation of import substitution projects of the regional and micro-economic level;
 - development of regional mechanisms for financing and implementing the import substitution projects.
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