EVALUATION OF THE GREEN SUPPLY CHAIN MANAGEMENT FOR ORGANIC PRODUCTS - THEORETICAL AND EMPIRICAL APPROACH

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ABSTRACT

The considerations undertaken concern the green supply chain for organic products. The goal of the discussion is to indicate the theoretical basis for the construction of the green supply chain, with particular emphasis on the specificity of organic products. Theoretical considerations are accompanied by the results of empirical research. As the research method were used: the analysis of literature, documents, methods of descriptive and mathematical statistics (as ANOVA analysis).

Keywords: green supply chain management, ANOVA, evaluation, indicators.

1. INTRODUCTION

The analysis of organic agricultural production shows that it has increased in importance in recent years. Empirical studies indicate (Willer & Lernoud, 2019), more than 180 countries have already done so and the organic production area has increased by 20 per cent in the last three years. This clearly demonstrates the high level of interest on both the supply and the demand side.

The implementation of the green supply chain strategy and its management is possible with the use of many activities, the most frequently used of which include the use of recycling, reverse logistics, supplier selection using ecological criteria, green planning (design), the use of advanced technologies as well as appropriate scientific instruments, measures and indicators to measure the greening of the chain. Taking such actions is particularly important, especially in a situation where core business is organic production. The purpose of the following considerations is to indicate, on the basis of empirical research carried out and the Framework created, whether and to what extent organic production companies use management tools to assess their supply chains' environmental performance.

The basic research gaps identified by the authors on the basis of the literature research carried out should be included: (1) the existing theoretical framework for GSCM, (2) the multiplicity of research instruments and tools used may lead to an excessive scattering of methods, (3) the overly mathematised nature of GSCM in the literature does not support economic practice Research gaps largely relate to the theoretical aspect, while research questions relate to empirical research.

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2. THEORETICAL BACKGROUND

2.1 Organic production on the world – trends and directions of development

Conventional production and conventional supply chains contribute to a significant negative impact on the environment. Organic farming can play a key role in feeding a growing human population in a sustainable way (Muller et al, 2017). Organic farming supported by green supply chains can be crucial in this respect.

Organic production in most cases yields less, but balances sustainability objectives and contributes increasingly to global food security (Lernoud & Willer, 2019). Ponisio et. al. (Ponisio et al, 2015) on the basis of studies indicates that the yields of organic production are 19.2% lower than those of conventional production..

Analyzing the latest data (Lernoud & Willer, 2019) concerning organic agricultural production, it should be noted that in 2017, 69,8 million ha were under organic agricultural management worldwide. However, this represents only 1.4% of the World's farm land.

The largest single market for organic product is the USA, followed by the EU and China. An interesting fact, interpreting data from the market of organic agricultural production, is that over 84% of producers of such food are located in Asia, Africa and Latin America.

2.2 Green supply chain for organic products - conceptual framework

World literature analysis indicates that the green supply chain is defined as an extension of the traditional supply chain to reduce the environmental impact of a product throughout its life cycle. (Beamon, 1999). The supply chain is linked and supported by an efficiently implemented environmental management system, supported by environmental certification and the recognition of environmental protection elements as one of the objectives of the activity (Tundys, 2018).

Introducing aspects of greening forces the redefinition of business processes, thus changing not so much the elements that make up the chain as the rules that govern it.

Conceptual Framework allows to identify individual elements constituting the components of the chain, but also to identify and identify components characteristic for the green supply chain. It included environmental protection and management of all processes in the supply chain. In the case of the organic product it could be added: greening of the processes and reverse of product. It must be included ecolabeling and the collaboration with the customers and each of the organisation their are part of the supply chain.

The proposed conceptual frameworks indicate the need to pay attention to environmental aspects in construction, implementation and evaluation. In addition, in the green supply chain for organic products, there are requirements for both the product itself and its packaging. These chains can be evaluated using qualitative and quantitative tools, descriptive and mathematical statistical analysis.

3. ANALYSIS OF EMPIRICAL RESEARCH

3.1 Data collection and research process

The selected research sample (the research covered more entities with its scope and scope, only one group of the surveyed organisations was taken into consideration) was made up of 112 enterprises, of which 42 were large organisations and 70 medium-sized ones. The selected entities were producers or processors of organic food products operating in Poland.

3.2 Descriptive analysis

Overall research results on aspects of the green supply chain for organic food producers and processors show that only 21% of them assess the supply chain in which they operate from the point of view of environmental performance. Very important information is that more than 53% of the respondents in this research group have environmental certificates (e.g. ISO 14001). Using the Likert scale, respondents were asked about the use of environmental aspects within the activity (e.g. environmental aspects of supplier selection, ecological packaging, transport). Organisations were also asked how they study and analyse the environmental impact of their activities.

When interpreting selected methods and the element of environmental assessment of the supply chain it should be pointed out that organizations do not have internal regulations or do not use them in this respect.

3.3 Statistical analysis - Anova

The research is based on the Research and is accompanied by detailed hypotheses. Significant differences exist in most cases for medium-sized enterprises. In this respect, they relate to use: KPIs for cost effectiveness, innovation, and cost aspect, for large enterprises, differences only exist in terms of time aspect. Among other factors, there are no significant differences between enterprises, which means that other elements are used in a similar way.

The results of the tests clearly indicate that significant differences are present in the range: KPIs (Key Performance Indicators), packaging (environmental) assessment tools, product and packaging assessment from the point of view of environmental responsibility, environmental Quality House (EQFD), social Life Cycle Assessment (SLCA), control of emissions of pollutants occurring in logistic processes, EU environmental directives and regulations, eco-efficiency measures and indicators, eco-audit, environmental methods of selecting business partners, innovation diffusion models and demand for organic products. These differences occur in the medium size of enterprises. In the surveys of large companies, significant differences exist only in scope: green taxes.

4. LIMITATION AND DISCUSSION

The presented considerations have limitations. The first limitation is the territorial scope. The tools, methods and research results indicated may be an indicator and a guideline of what should be used to assess the green supply chain, what may be its components and what factors should be taken into account. Another limitation is related to the size of the organization, there have been no studies of small enterprises,

The value of the presented considerations refers to the presentation of the conceptual framework for the green supply chain of organic food products and the identification, on the basis of empirical studies, of differences in the implementation of tools and management concepts into the supply chain that occur between the producers of organic products.

5. CONCLUSION

Aspects of the environment and the need to protect it require new actions within supply chains. This includes, for example, the need to pay more attention in logistics processes to reducing negative impacts on the environment and adding cost, quality and time to the aspects of environmental protection as priorities. As a matter of principle, ecological products should be accompanied by a green supply chain. Unfortunately, as research and literature show, this is not always the case.

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