The Wroclaw School of Banking
Research Journal
ISSN 1643-7772 I Vol. 15 I No. 1

Zeszyty Naukowe Wyższej Szkoły
Bankowej we Wrocławiu
ISSN 1643-7772 I R. 15 I Nr 1

Wyższa Szkoła Bankowa
we Wrocławiu

The Wroclaw School of Banking
RESEARCH
JOURNAL

Sustainable development as a basis for the formation of supply chains

Author : Sabina Kauf

Abstract

Emerging market changes and increasing environmental awareness of consumers caused the pursuit to implement the principles of sustainable development along the entire supply chain. However, creating such chains is not easy. The purpose of this article is to seek answers to the question: how to manage the supply chain for it to be sustainable?

Keywords: supply chain, sustainable supply chain, ecology
JEL: Q01, M21

History: received 20 July 2014, revised 10 October 2014, accepted 20 October 2014

Introduction

Sustainable development has now become one of the major megatrends. More and more companies seek to implement its principles throughout the supply chain. In sustainable orientation of the chain many see opportunity for future development, and managing it is treated as a motor of development, creating values and generating success for both themselves and companies are aware that today's brands are seen not only through the prism of their direct manufacturer, but also its suppliers (see Jabłoński 2013).

The implementation of sustainable development principles throughout the supply chain is a complex process and requires a commitment of adequate resources. For many companies building sustainable supply chains, taking into account all areas of the Global Compact (Supply Chain Sustainability 2010): human rights, labor standards, environmental protection and fighting corruption, is a huge challenge. However, the global spread of good practices creates opportunities for brands to develop competitive position both unique and difficult to imitate. But how to manage the supply chain for it to be sustainable and socially responsible? In this article we will attempt to deal with this question.

Sustainable development in the supply chain

Globalization makes modern companies use international resources of raw materials and labor. Supply chains are becoming more complex and less transparent. Their functioning has an increasing impact on the environment and society. Consequently discussions on sustainable development and the need to create a socially responsible supply chains intensify (Straube et al. 2009: 234ff.).

Like sustainable development, *Sustainable Supply Chain Management* has a social, environmental and economic dimension. The aims of sustainable development can be found in, for example, the Treaty on European Union of the Kyoto on greenhouse gas emission reduction. The formulated aims as well as public discussion on climate change and environ-

Contact author:
skauf@uni.opole.pl

mental degradation increase the importance of the environmental aspect of sustainable development for enterprises (Straube et al. 2009: 234ff.). As a consequence, enterprises need to comply to environmental standards, and pay for damage caused, such as the multinational BP which had to pay billions of USD for the oil spilling disaster in the Gulf of Mexico some years ago.

Besides environmental issues, stakeholder expectations also increase in the social sphere. [39] A breach of rules or norms can lead to loss of image. An example is the supermarket chain LIDL, which some years ago joined the Business Social Compliance Initiative. While social responsibility is one of the elements of marketing of LIDL, their breach of human rights and principles of social compliance in Bangladesh was extensively discussed in the press and had as a consequence the prohibition to use social responsibility in their marketing campaigns (see Szokalska 2012).

The strength of stakeholders and their power to influence parts of the supply chain provide incentives for the participants in the logistics chain to satisfy their demands, in order to maintain access to their resources (Müller et al. 2009: 61). Neglect of labour rights or a bad atmosphere at the work place can lead to reduced labour productivity or even strikes (Kosel, Weißenrieder 2010: 12ff.). When being dissatisfied, partners in the supply chain can refuse the supply of their services or know-how. Consumers may boycott producers failing to comply with environmental rules or violating human rights. This, in turn, can lead to financial problems and loss of reputation.[40] The loss of image or reputation can also be the result of a decline in indices embracing companies' environmental and social aims (e.g., Dow Jones Sustainability Index) (Czymmek et al 2009: 252).[41]

Increasing stakeholder demands with respect to corporate social responsibility throughout the supply chain is also a consequence of the changes the field of logistics. The view on logistics has changes - from seeing it as a function of the company to the perspective of the global value chain. These trends have led to the emergence of global supply chains, in which individual cells are interdependent. Their existence is a justification for the implementation of the principles of sustainable development along the entire value chain, not just within individual companies.

The Logistics Social Response (LSR) reflects the impact of logistics activities on the environment and society was (Carter, Jennings 2002). According to the assumptions of social responsibility, products should be manufactured, delivered, consumed and disposed in the whole supply chain allowing for reductions of CO_2 emissions and energy consumption, as well as the development and use of environmentally friendly packaging and storage (GCI, Capgemini 2008). Social responsibility manifests itself in compliance, by each participant in the supply chain (regardless of its location), with issues such as human rights, safety, prevention of discrimination or child labor. A socially responsible supply chain should be based on the acceptance of various ethical aspects specific to different forms of organization, and to strive to achieve social and environmental benefits for all participants (Kisperska-Moroń 2012: 108).

In the classical supply chain management, major consideration is given to planning, organizing and controlling processes along the value-creation chain. However, in accordance with the report *The Future Supply Chain 2016* (GCI, Capgemini 2008), a basic task of logistics is to create transparent supply chains, managed in accordance with principles of sustainable development. The inclusion of environmental, social and economic aspects in the structure of the supply chain may increase the efficiency of individual companies as well as the whole supply chain (Carter, Rogers; 2008:

[39] Examples of social expectations are compliance with human and labour rights, the development of socially accepted products, equality of opportunity, compliance with social norms and transparency of operations of suppliers (Promberger et al. 2006: 74ff.).

[40] An example is the boycott of BP by specialists of lubricant oil LIQUI MOLY, who after the oil leak in the Mexican Gulf resigned from BP's supply because of their irresponsible and destructive activity for which they do not want to be co-responsible.

[41] See also http://odpowiedzialnybiznes.pl [10.05.2012].

370ff.); Platje, 2014). Sustainable Supply Chain Management differs from the classical supply chain management by a broader view of the processes implemented along the chain. It takes into account not only the origin of the product, but also the manner of its use and disposal.

In this context, sustainable supply chain management is one which refers to the social, environmental and economic developments and to stimulate good corporate governance practices throughout the product life cycle. Sustainable supply chain management is a strategic and transparent integration of socio-environmental activity with the process of supply chain management (supply Chain Sustainability 2010: 5), the aim of which is to create, protect, and long-term value development for stakeholders involved in the manufacture and supply of products on the market (Carter, Rogers 2008: 368). This approach allows all partners in the supply chain for the long-term viability and social acceptance for running a business. Sustainable supply chain management can be defined as the management of the flow of materials and information and coordination between partners along the value-creation chain, while taking into account the objectives of sustainability (economical, social, environmental) requested by stakeholders (Seuring, Müller 2008: 1700).

From analysis of the behavior of today's businesses it can be concluded that most of them responsibly approach the implementation of production processes and services, and maintains positive relationships with suppliers.[42] This applies to direct suppliers. Difficulties arise as the distance between chain/supply network and the leading body increases. This results mainly from the global location of suppliers and procurement procedures of their selection (usually the primary criterion for selection is the cost). Global location of chain partners sometimes makes it difficult to avoid the scandals related to violation of human rights or failure to meet the standards. And the responsibility for the functioning of the supply chain is usually attributed to the dominant enterprise. This enterprise is responsible for the actions of both the preceding cell (e.g., suppliers of raw materials), and the following, which are responsible for the recycling and reprocessing of used products. That was the case with the concern LIDL, which supplier broke human rights in Bangladesh, or APPLE, accused of inadequate control of working conditions at the supplier (it emerged after a series of suicides at the supplier FOXXON).[43]

The growing importance of corporate social responsibility along the entire supply chain is a consequence of the development of outsourcing and relocation of many companies to low-labour-cost developing countries, as cheap labor. Stakeholders are increasingly aware that the pursuit of sustainable development requires the implementation of social and environmental goals not only by the manufacturers of the final product, but all partners in the supply chain (Andersen, Skjoett-Larsen 2009). As a result, stakeholders are increasingly forcing companies to take responsibility for the anti-social and ecological activities of their suppliers and partners in the supply chain. The economic dimension may support this - customers expect high quality products and good service at a low price, where failure to meet stakeholder expectations in the social and environmental field may result in rapid loss of both the brand and the decrease in sales volume.

The primary challenge of creating sustainable supply chains is to analyze all the links of the value-creation chain and to identify potential opportunities and threats resulting from the cooperation between the links of the chain.

[42] Such behaviors have an economic base as they support both quality of services rendered and embedding trust between partners.

[43] http://wiadomosci.gazeta.pl/wiadomosci/1,114873, 9976030,Chiny__Kolejne_samobojstwo_w_fabryce _ fox conn. html [09.05.2013].

Sustainable supply chain as an element of competitive advantage

Effective supply chain management is multi-faceted, increases the chances of participation in the creation and development of new products and brands. These are being increasingly assessed not only in terms of quality but also the social connotations associated with them. The prestige of the brand can interact positively, while negative associations may be disastrous for the company. This happened, for example, to the Finnish corporation Nokia, which in 2007 seeking to reduce costs moved one of its factories from Bochum, Germany to Romania. As a result, leading German politicians and much of the public has announced a boycott of products of the concern and the company which so far had the image of one which cares for employees lost its reputation. This example highlights that the decline in acceptance and legitimacy to act is a significant weakening of the competitive position and the lack of support from society can lead to difficulties in the survival of the market economy and entrepreneurship.

A panacea for maintaining or increasing social acceptance of manufactured products and long-term development is to create sustainable supply chains. These allow for better use of natural resources and improvement of relationships with suppliers. The need for partnership for the realization of the principles of sustainability along the entire value-creation chain is particularly evident in the case of outsourcing and relocation to developing countries for cheap labor. In these countries the environmental and social requirements are often not respected. This fact causes the opposition of stakeholders who are putting pressure on manufacturers of finished product to take responsibility for the behavior of all partners in the supply chain (Andersen, Skjoett-Larsen [2009: 75ff.)]. Manufacturers aware of the consequences of failure to meet the expectations of stakeholders require partners to implement and comply with standards based on the principles of sustainable development. At the same time they are willing to offer favorable terms of cooperation, such as better wages. Building strong relationships with partners in the chain usually results in an increased willingness of suppliers to implement the standards of sustainable development at a lower cost. In ideal cases, the suppliers may become partners in the creation and development of new products. And improving the image by increasing the quality of the finished product components influences the perception of all the links in the value chain.

Thanks to the involvement of partners in the implementation of sustainable development goals it is possible to generate mutual competitive advantages in the form of cost optimization, minimizing the risk of operations and improvement of the image along the entire value-creation chain (see Kauf, Tłuczak 2014).

The specificity of the various sectors of the economy and individual companies makes the supply chains created within them unique and require a different approach to the issue of sustainable development. Nonetheless, there are some basic instruments that are adequate in every case. A code of conduct, internal and external audit or professional training of employees, among others, may be expected to bring benefits. The use of these instruments by the partners in the chain allows not only to identify areas in which sustainable development principles are not respected, but also to eliminate causes of antisocial behavior.

One of the important elements that allows to generate competitive advantage due to the creation of sustainable chains is transparency and ongoing communication between partners. Specific facts and figures concerning the functioning of individual cells of value-creation chain allow to take corrective actions at the right time and place. Compatible data collection systems can be the basis of comprehensive analysis, e.g., the environmental life cycle of the product. Manufacturers of expensive and reputed brands of products in particular, are expected to minimize the risks and avoid harm (e.g., child labor, human rights violation) along the entire supply chain. Any abuses must be identified and reported. The process of reporting on the issue of sustainable development makes companies realize social, economic and environmental consequences of their actions. Its purpose is to provide well-balanced information about the effectiveness of the company in both positive and negative terms (Wytyczne … 2014).

Publication of information on the social and environmental behavior of enterprises forces changes in strategy and determining new goals and influences the criteria for selecting suppliers. Consequently, a shift of the center of gravity occurs as the elements of price and quality are being replaced with the environmental and social aspects. The desire of enterprises to maintain long-term competitive advantage is a common cause of resignation from the partnership when the suppliers fail to keep the sustainability standards.

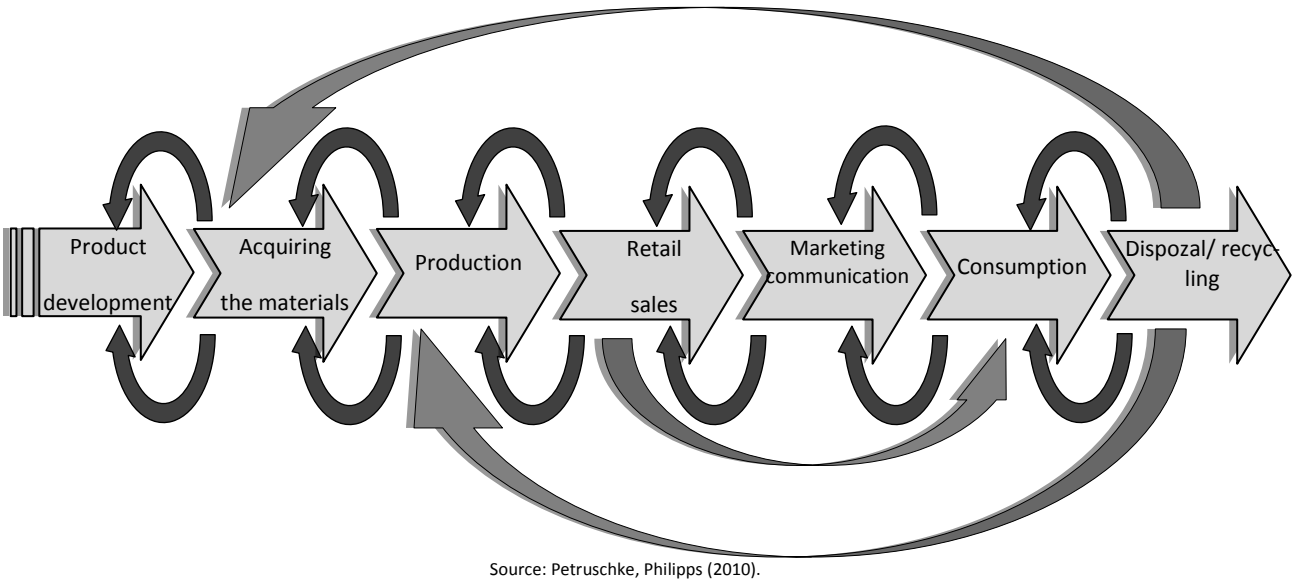
To sum up, taking into account the aspects of sustainability inter alia in purchasing behaviors, research and development, internal and external communication allows for:

- effective and predictive problem solving of issues arising from ecological, economic and social requirements;
- maintaining or improving the availability of resources along the entire value-creation chain;
- generation of long-term competitive advantages through transparency and ongoing communication between all links of the supply chain.

Implementation of sustainability along the entire value-creation chain

From the point of view of modern enterprises is not enough to think in terms of solving problems "at the end of the pipeline." Much better economic and competitive effects can be achieved by preventing the negative effects of environmental and social problems, than to solve them at the moment of occurrence. This orientation leads supply chain partners to establish a partnership with the aim of persuading suppliers to change the composition of the materials or the provision of more sustainable substitutes. Partnerships established in the ideas of sustainable development and offering customers sustainable products lead to a win-win situation for partners and affect the long-term benefits for the suppliers as well. Creating sustainable value creation chains requires the implementation of sustainability principles at every stage, starting with development of new products through production, and finishing with recycling (Figure 1).

Figure 1 Phases and dependencies along the value-creation chain



Source: Petruschke, Philipps (2010).

The first stage, where the principles of sustainability should be implemented is the creation and development of new products. Sustainable product is one that through maintaining its functional characteristics and a price acceptable for the buyers contributes to the improvement of social and environmental issues. Sustainable products should meet not only the economic conditions (for businesses and consumers), but also to be produced at a fair price and abiding environment protection rules. Such products may be created through dialogue, understanding and competence development along the entire value-creation chain. In the product design phase most of the decisions regarding its impact on the environment are being taken. Some argue that the design stage determines up to 70% of the environmental performance of products throughout their life cycle (Ullman 1992). This scale clearly indicates a huge potential to rationalize the use of resources, and invest in innovative concepts.

The basic premise of sustainable product design is to prevent pollution, i.e., to strive for minimal environmental impact of the product. During the design of sustainable product into account shall be taken principles such as (http://www.scirisheyes.com/zarzadzanie-lancuchem-dostaw-green-oraz-proces-jejwdrazania):

- reduction of the raw materials consumption,
- reduction of harmful emissions,
- segregtion, recovery, recycling, reprocessing.

The next stage of sustainable value-creation chain is the acquisition of materials and semi-finished products. In this case, the use of sustainable raw materials is supported by international standards, technology transfer and transparency of supply chains. They allow for the reduction of risks arising not only from the use of outdated technology of acquiring resources, but also social and environmental problems, especially in developing countries. One of the essential elements of acquiring resources is the choice of the supplier. At this stage of sustainable supply chain it is important to identify the forms of influence the suppliers have on the environment, analysis of the organization of transport, and also (and perhaps above all) the possibility of saving natural resources and improving the quality of life in developing countries. In this context, the sustainable management of suppliers means that it meets the requirements regarding the final product and overcoming difficulties in relationships between suppliers.

Resource efficiency in production means, in turn, achieving higher values (productivity), with use of less raw materials. Resource efficiency can be achieved, inter alia, through the use of modern measurement and management instruments, but mainly through closing the resources circulation loop. The use of elements of sustainability in the sphere of production means at the same time improving the production design, the use of clean energy and resources. Sustainable production can bring benefits in terms of reduction of pollution at source and elimination of hazards to human health and the environment.

Another link in the creation of value is the market. In this area, the sustainability elements can be applied primarily in distribution logistics and supply management, in the sense of the choice of means of transport. In general, recipients expect supply of small batches of goods delivered in flexible schedules. The contribution of logistics to the reduction of environmental pollution and prevention of climate change may manifest itself in the choice of such means of transport, which are characterized by low emissions (so-called ecological means of transport). Innovative logistics concepts allow simultaneous optimization of reliability and reduction of both transportation costs and pollution emissions.

A major contribution to the sustainability of value-creation chain is marketing. Companies that want to reap the benefits of the new trends in consumption are required both to provide purchasers the information about the benefits of sustainable products and to convince them of greater value of such products. Consumers should not only be aware that the product is more balanced than one comparable to it, but first of all should be aware that the product will provide them with more sustainable benefits, such as an energy-efficient computer in the medium term, will save the

buyer some costs. Absence of harmful substances in the product is not only beneficial for the environment, but also for the health of consumers. Finally, decent wages and working conditions along the entire-value creation chain contribute to social stabilization of the global society. However, a challenge is the level of awareness of sustainable lifestyles, as well as the importance of environmental issues in the priority ranking of consumers. The creation of awareness and sustainable lifestyles is a long-term process, supported by education and information. In particular, education of children seems to be important, as in this time of life preferences and habits are developed (Leal Filho 2006).

Conclusion

The reflections presented allow for the conclusion that a sustainable supply chain is one that pursues a policy of sustainable economic development by achieving a balance between efficiency, profitability and social interest. The presented short description of the phases of value-creation reveals that the realization of economic, environmental and social goals along the entire value chain cannot be achieved by a single company. Thanks to the commitment of many cells the problems of sustainability can be solved better and more efficiently. Although cooperation chain still faces a number of problems, manifested, among others, in the limitations of the process of creating new products, these are most frequently adjusted to the needs and requirements of customers, but not necessarily meet the conditions associated with the possibility of recycling or reuse. In addition, individual actions undertaken by companies solve the ecological problems only to a small extent, e.g., by moving environmental responsibility to the next link in the chain of value-creation. Making the supply chain more sustainable requires support from customers, who should be aware of the consequences of anti-environmental and unethical behaviour. A commonly occurring phenomenon is also implementation of innovations only by individual companies rath-er than the whole industry. The idea of sustainable development should guide all links in the chain, because the activities of individual companies only can solve environmental problems marginally.

The most important element of sustainable supply chain management seems to be the stimulation of sustainable consumption. Increased awareness of stakeholders will force the chain (not just their leaders) to respect environmental, social and environmental principles of sustainable management, which will lead to changes in the functioning of the supply chain.

Bibliography

Andersen M., Skjoett-Larsen T. (2009), Corporate social responsibility in global supply chains, "Supply Chain Management: An International Journal", vol. 14 no. 2, pp. 75-86.

Carter, C.R., Jennings, M.M. (2002), Logistics social responsibility: an integrative framework, "Journal of Business Logistics", vol. 23 no. 1, pp. 145-180.

Carter C.R., Rogers D.S. (2008), A framework of sustainable supply chain: Moving toward new theory, "International Journal of Physical Distribution and Logistics Management" vol. 38 no. 5, pp. 360-387.

Czymmek, F., Freier, I., Hesselbarth, C., Kleine, A., *Corporate social responsibility*, in: *Betriebliches Umweltmanagement*, eds. Baumast, A., Pape, J., Stuttgart.

GCI, Capgemini (2008), *The future supply chain 2016. Serving consumers in a sustainable way*, Global Commerce Initiative and Capgemini, http://supplychainmagazine.fr/TOUTE-INFO/ETUDES/GCI_Capgemini-SC2016.pdf [10.04.2014].

http://odpowiedzialnybiznes.pl [10.05.2012];

http://wiadomosci.gazeta.pl/wiadomosci/1,114873,9976030,Chiny__Kolejne_samobojstwo_w_fabryce_ fox conn. html [09.05.2013].

http://www.scirisheyes.com/zarzadzanie-lancuchem-dostaw-green-oraz-proces-jejwdrazania [10.06.2014].

Jabłoński A. (2013), Modele zrównoważonego biznesu, Diffin, Warszawa.

Kauf S., Tłuczak A. (2014), Społeczna odpowiedzialność łańcucha dostaw jako element zrównoważonego rozwoju (Analiza postaw wobec CSR), „Gospodarka Materiałowa i Logistyka", vol. 3, pp. 6-12.

Kisperska-Moroń D. (2012), *Ewolucja koncepcji społecznych aspektów funkcjonowania łańcuchów dostaw*, in: *Logistyka i inne koncepcje zarządzania w naukach ekonomicznych*, ed. Kauf, S., Uniwersytet Opolski and Wyższa Szkoła Zarządzania i Administracji w Opolu, Opole.

Kosel, M., Weißenrieder, J. (2010), *Das NPM-Konzept - engagierte Mitarbeiter sind kein Zufall*, in: *Nachhaltiges Personalmanagement in der Praxis*, eds. J. Weißenrieder, J., Kosel, M., Wiesbaden.

Leal Filho, W. (ed.) (2006), *Innovation, education and communication for sustainable development*, Series: Environmental Education, Communication and Sustainability, vol. 24, Peter Lang, Frankfurt am Main.

Müller, M., Moutchnik, A., Freier, I. (2009), *Standards und Zertifikate im Umweltmanagement und im Sozialbereich*, in: *Betriebliches Umweltmanagement*, eds. Baumast, A., Pape, J., Stuttgart.

Petruschke, T., Philipps, S. (2010), Strategische Allianzen für nachhaltige Entwicklung. Eine Wertschöpfungskettenanalyse am Beispiel der globalen Aluminiumindustrie, Arbeitspapier im Rahmen des BMBF-Projekts „Strategische Allianzen für nachhaltige Entwicklung – Innovationen in Unternehmen durch Kooperation mit NPOs (StratAll)", Wuppertal.
Platje, J. (2014), Minimizing redundancies and ways to deal with trade-offs in decision making within integrated management systems, "Central and Eastern European Journal of Management and Economics", vol. 2 no. 2, pp. 121-139.

Prawo ochrony środowiska, Dz. U. 2001, art. 3, ust. 50.

Promberger, K., Spiess, H., Kössler, W. (2006), *Unternehmen und Nachhaltigkeit*, Linde Verlag , Wien,

Seuring S., Müller M. (2008), Form a literature review to a conceptual framework for sustainable supply chain management, "Journal of Cleaner Production", vol. 16 no. 15, pp. 1699-1710.

Straube F., Doch S.A., Nagel A. (2009), *Kundenorientierung und Nachhaltigkeit als Treiber der Logistik*, in: *Erfolg kommt von innen*, Deutscher Logistik-Kongress Hrsg., Berlin.

Supply Chain Sustainability. A Practical Guide for Continuous Improvement (2010), UN Global Compact, Businessfor Social Responsibility, www.unglobalcompact.org/docs/ issues_doc/supply_chain/SupplyChainRep_spread.pdf [08.04.2014].

Szokalska A. (2012), Współczesny konsument w świecie wartości, „Methamorphosis Brand Communications", http://www.metamorphosis.com.pl/wiedza/wspolczesny-konsument-w-swiecie-wartosci/ [20.09.2014].

Ullman D. G., *The Mechanical Design Process*, New York 1992.

Wytyczne do raportowania kwestii zrównoważonego rozwoju (2014), www.globalreporting.org/ resourcelibrary/Polish-G3-Reporting-Guidelines.pdf,

Zrównoważony rozwój jako podstawa kształtowania łańcuchów dostaw

Abstrakt

Pojawiające się na rynku zmiany i wzrost ekologicznej świadomości konsumentów spowodował dążenie do wdrażania zasad zrównoważonego rozwoju wzdłuż całego łańcucha dostaw. Jednak tworzenie takich łańcuchów nie jest proste. Celem artykułu jest poszukiwanie odpowiedzi na pytanie: jak zarządzać łańcuchem dostaw, by był on zrównoważony?

Słowa kluczowe : łańcuch dostaw, zrównoważony łańcuch dostaw, ekologia