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GREEN SUPPLY CHAIN MANAGEMENT TOWARDS SUSTAINABILITY: THE CASE OF AJINOMOTO IN VIETNAM

Abstract. Environmental condition is deteriorating day by day and the main reason comes from the irresponsibility of the enterprises, which selfishly strive for business profits and totally ignore their bad impacts on the environment. In order to deal with this, governments and international organizations all over the world are urging those enterprises to adopt new green business strategies to protect the environment. One of those green business strategies can be the green supply chain management (GSCM). By using the framework of GSCM, we will analyze the case of Ajinomoto GSCM in Vietnam. The findings of this paper will reveal the benefits of GSCM as well as the factors, which enterprises must pay attention to be more and more successful.

Keyword: Green Supply Chain Management; Vietnam GSCM; Vietnam Environment; Ajinomoto GSCM.

JEL Classification: L21, M11, M14

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**«ЗЕЛЕНЕ» УПРАВЛІННЯ ЛАНЦЮГАМИ ПОСТАВОК ДЛЯ СТІЙКОГО РОЗВИТКУ:
ПРИКЛАД КОРПОРАЦІЇ АЖІНОМОТО У В'ЄТНАМІ**

Анотація. Стан навколишнього середовища погіршується з кожним днем, і основною причиною цього є безвідповідальність підприємств, які егоїстично прагнуть до максимізації прибутку й цілковито ігнорують негативний вплив їх діяльності на екологію. Для вирішення цього питання уряди та міжнародні організації в усьому світі закликають підприємства запровадити нові «зелені» стратегії бізнесу, щоб захистити довкілля. Однією із таких стратегій є «зелене» управління ланцюгами поставок (Green Supply Chain Management – GSCM). На основі вивчення попередніх досліджень автори проаналізували особливості реалізації стратегії GSCM корпорацією Ajinomoto Group у В'єтнамі. Визначено переваги GSCM, а також фактори, на які повинні звернути увагу підприємства для досягнення успіху в цій сфері.

Ключові слова: «зелене» управління ланцюгами поставок; «зелені» стратегії бізнесу; захист навколишнього середовища; Ajinomoto GSCM; В'єтнам.

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**«ЗЕЛЕНЕ» УПРАВЛЕНИЕ ЦЕПЯМИ ПОСТАВОК ДЛЯ УСТОЙЧИВОГО РАЗВИТИЯ:
ПРИМЕР КОРПОРАЦИИ АЖИНОМОТО ВО ВЬЕТНАМЕ**

Аннотация. Состояние окружающей среды постоянно ухудшается, и основной причиной этого является безответственность предприятий, которые эгоистично стремятся к максимизации прибыли и полностью игнорируют негативное влияние своей деятельности на экологию. Для решения данной проблемы правительства и международные организации во всем мире призывают предприятия принять новые «зеленые» стратегии бизнеса, чтобы защитить окружающую среду. Одной из таких стратегий является «зеленое» управление цепями поставок (Green Supply Chain Management – GSCM). На основе изучения предыдущих исследований авторы проанализировали особенности реализации стратегии GSCM корпорацией Ajinomoto Group во Вьетнаме. Определены преимущества GSCM, а также факторы, на которые должны обратить внимание предприятия для достижения успеха в этой области.

Ключевые слова: «зеленое» управление цепями поставок; «зеленые» стратегии бизнеса; защита окружающей среды; Ajinomoto GSCM; Вьетнам.

Introduction. In the last few decades, environment has always been the most discussed topic. Environmental problems, such as global warming, air pollution or ecosystem deteriorating appear on the front-page of the newspapers everyday. Environmental protection now is not the responsibility of only an individual, a country or an organization. It is the job that can

only be done if the world unites. From the corporation's viewpoint, applying green supply chain management (GSCM) is one of the best ways to contribute to the environmental sustainability of the world.

Vietnam is an emerging market, which attracts a big number of multinational corporations all over the world. However,

empirical evidences show that these companies only care about economic profit and totally ignore their bad impacts on the environment. Recently, due to the rising concerns of Vietnamese government about the environment, many MNCs have been trying to find their ways to adapt to the new environmental rules and requirements. Among those, Ajinomoto stands out to be one of a few corporations that successfully apply green supply chain management to protect the environment. The case study of Ajinomoto not only helps us understand where the Ajinomoto's success comes from, but also encourages other corporations to apply GSCM to contribute to environmental sustainability in Vietnam.

With all the reasons above, the topic: «Green supply chain management towards Sustainability: The case study of Ajinomoto in Vietnam» is chosen. In this paper, a closer look into the factors affecting the Ajinomoto implementation of green supply chain management is given to the readers, which helps understand more about the successful story of Ajinomoto in Vietnam.

Brief Literature Review. Green supply chain management. At the time when environmental problem was not a big issue, most researchers in the field of supply chain studied only about supply chain management (SCM). Hervani (2005) defines supply chain management as the coordination and management of a complex network of activities involved in delivering a finished product to end-user or customer. It is an essential business that covers all the stages of the product's life: from resource extraction to disposal. However, with the rising environmental problems and the revolution of supply chain, researchers now have changed their attention to a new concept: «Green supply chain management». It is not surprising that GSCM defines itself as only a little alteration to the definition of «supply chain management». By adding the «green» component, it means that GSCM involves the influence and relationships of supply chain management to the natural environment.

Representative articles on the definition of GSCM are those of Hervani (2005), Ninlawan (2010) and Ghobakhloo (2013). While Hervani (2005) and Ninlawan (2010) state that GSCM is the combination of 4 main activities: Green purchasing/Procurement, Green manufacturing, Green distribution and Re-

verse logistics, Ghobakhloo (2013) uses 5 activities, including Green product design, Green Material Management, Green manufacturing process, Green distribution and marketing and Reverse logistics, to define GSCM.

Figure 1 shows us clearly all the activities of GSCM according to Ghobakhloo (2013).

As we can see from Figure 1, GSCM is the closed loop supply chain with the Reverse Logistics closing the loop. Green Product Design consists of Life-Cycle Assessment (LCA) method and the Environmentally conscious design (ECD). While LCA is used to assess and evaluate the environmental impact of the product, ECD is used to design a product with some environmental consideration. Green Material Management is the activities that replace the environmentally harmful materials with the less problematic one. Green manufacturing mainly concerns about how to reduce the amount of waste and emission during manufacturing process. Green distribution and marketing is the next activity in the chain, which pays attention mainly to green advertising and green transportation. The final activity is the Reverse Logistic (RL). This is the unique one that makes GSCM different from normal supply chain. In this stage, the materials will be reused, remanufactured and recycled, which perfectly close the loop of the supply chain.

Factors affecting Implementation of GSCM. While many researchers concentrate on the definition and the range of activities of GSCM, Hervani (2005) finds its own way to introduce the green supply chain performance measurement system (GSCM/PMS), which analyses all the factors affecting the implementation of GSCM. According to Hervani, those factors include the major boundaries, associated with managing this system, which are external and internal pressure, the inputs of this system and the expected results of the system.

Figure 2 shows us clearly the green supply chain performance measurement system.

The Green Development Model. In «The green supply chain DNA: How to retool your supply chain for the sustainability driven, data rich future» by Deloitte, a model to evaluate the maturity of an organization in applying the green supply chain was presented. A framework, which interconnects with each other, will help to create a transparent and sustainable supply chain. The model depicts 4 levels of maturity an organization can achieve: Follower, Mature, Leading and Innovator. This model, in our opinion, is useful for any organization in applying the green supply chain.

Other researches. Studying about the GSCM, many researchers pay attention to other aspects beside its definition and affecting factors. On the current and potential suppliers' environmental practices are focused Bowen et al. (2001), Handfield et al. (1997), Johansson (1994). Besides, the researchers who studied the environmental risks, economic benefits and drawbacks of establishing a green supply chain are Allenby (1993), Min and Galle (1997), Narasimhan and Carter (1998), Wu and Dunn (1994).

Theoretical Framework. In this paper, because of some data limitation, the framework, which is derived from the literature discussed earlier, is used to analyze the green supply chain of Ajinomoto Corporation (Figure 3)

In this framework, external issues are pressures, associated

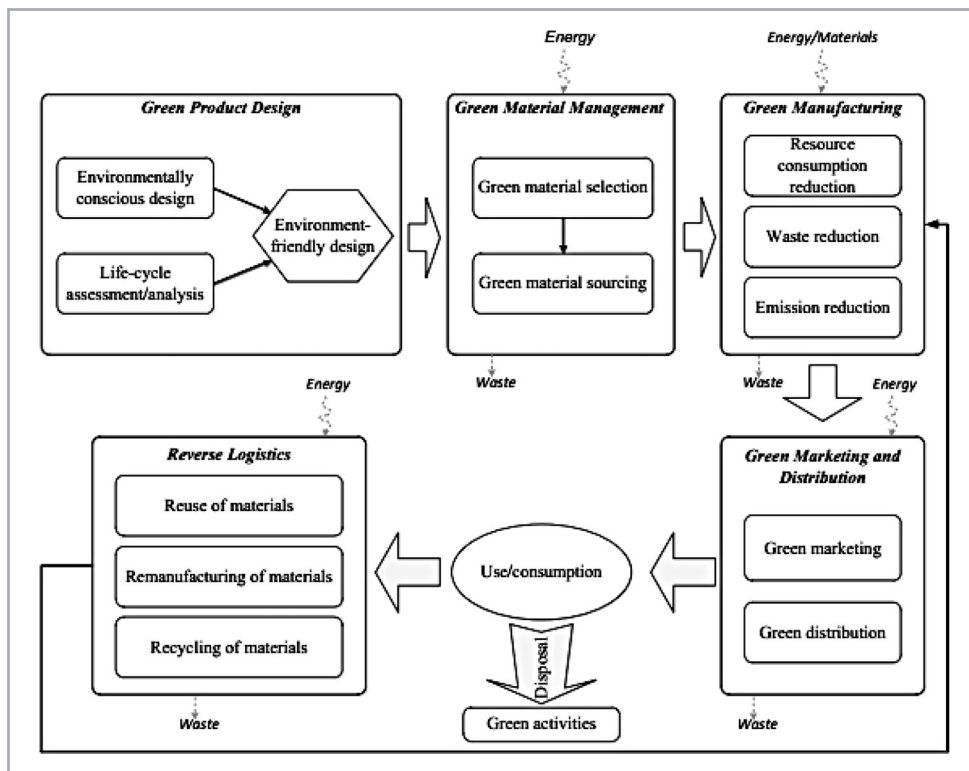


Fig. 1: GSCM activities
Source: Ghobakhloo (2013)

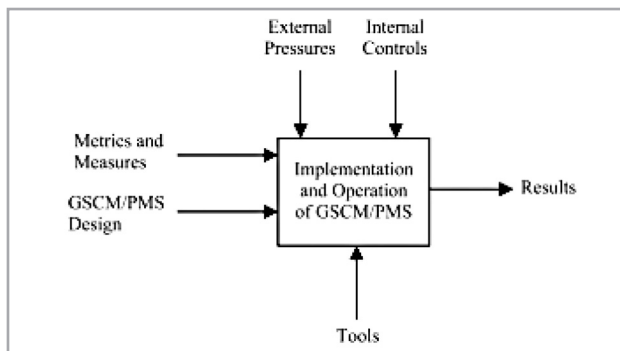


Fig. 2: The GSCM/PMS
Source: Hervani (2005)

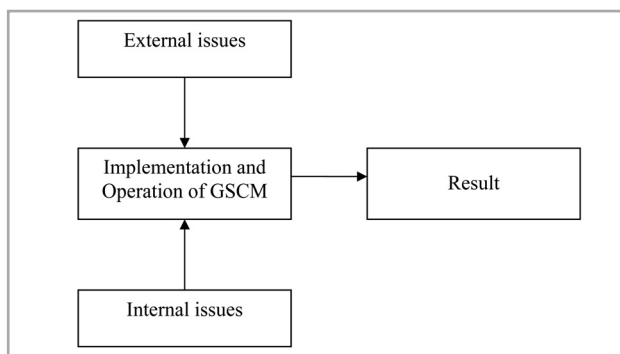


Fig. 3: Theoretical framework
Source: Compiled by the authors

with the stakeholders, such as the host government, the law and community. The internal issues are the organization capability based on the performance in 5 activities of GSCM and the internal pressure. This framework implies that, the implementation of GSCM will be affected both by issues, coming from outside and inside the system and the outcome of the GSCM implementation will depend on how the corporation reacts to those issues.

Methodology and Data. The above framework is applied to analyze the case study of Ajinomoto Corporation in Vietnam. The data used in this paper is primary data collected through in-depth interview with approximately 20 stakeholders such as Ajinomoto's insiders, authorities and experts. The secondary data derived from the website of Ajinomoto Vietnam and Vietnam Environment Inspection Agency with updated data from 2013 to September 2014.

Findings and Discussion. In 1991, when Vietnam introduced its open-door policy to attract more foreign investment, the Ajinomoto Group decided to enter this market. However, the group's products had already approached Vietnamese customers before that decision through distributors from Japan or other neighbouring countries of Vietnam like China or Indonesia. After more than 20 years of adaptation and development, the group now has over 100 representative offices and warehouses spreading throughout Vietnam with more than 2400 officers and staffs. Not only did the company set up two large factories in Vietnam, one in Bien Hoa City and one in Dong Nai province, but it also associated with a dense network of distributors. In 2013, Ajinomoto became one of the top 1000 biggest enterprises in Vietnam and ranked 59th according to the amount of tax paid for the Vietnamese state. Understanding Vietnamese taste, Ajinomoto is widely known by the Vietnamese consumers with familiar products like Umami Spices, Aji-ngo, Aji-quick or Birdy Coffee cans. Ajinomoto is worldwide known for food and chemical products. In Vietnam, the company mainly produces seasoning, cooking oils, monosodium glutamate (MSG) and export them all over the world.

The GSCM of Ajinomoto in Vietnam

External issues. The external issues affecting the implementation of GSCM of Ajinomoto in Vietnam involve the cur-

rently bad situation of the world natural environment and ecosystems, the consumers' awareness, pressure & support and Vietnamese rules & legislation.

The world is witnessing the deterioration of the natural condition and ecosystem. In order to solve these problems, international organizations all over the world have been trying to urge the members to cut down their amount of emission and toxic waste. These actions trigger a universal tendency among enterprises to establish the «green» policy and apply this policy to their business strategies. Vietnam and Ajinomoto are not the exception. Since the Doi Moi in 1986, many MNCs have invested into Vietnam and taken advantage of Vietnamese rich and abundant resources like minerals, oil or timber. On one hand, these MNCs act like a motivation for the development of Vietnamese economy. On the other hand, they badly pollute the environment and damage the ecosystem of this country. This environmental condition of the world in general and of Vietnam in particular put a great pressure on these enterprises including Ajinomoto and force them to reconsider their business strategy if they want to reserve this planet.

With the development of technology and information, Vietnamese people clearly understand the importance of reserving and protecting the environment. With the GDP per capita and income rising, Vietnamese people now have more options and chances to protect the environment. They are gradually changing from buying a product considering only its functions to purchasing greener and more environment-friendly items or products from enterprises that care about the environment. It means that the awareness of Vietnamese consumers has changed, followed by a new trend of shopping: green purchasing. This «green» trend forces the enterprises to pay more attention to their environmental protecting policy.

In order to deal with the environmental damages, Vietnamese government has introduced new rules and legislations to control the business activities, manufacturing operations and the goods consumptions of enterprises. These laws include the Business Law of 2005 which governs the establishment, operation and management of a company; the Vietnam Commercial Law and the Vietnam Investment Law of 2005 which governs the trade and investment issues; the Environmental Protection Law of 2005, the Consumer Protection Law of 2010 and the Environmental Protection Tax Law of 2011 which governs the management of waste from enterprises. Beside these laws, Vietnamese government also introduced a new green labelling program (Decision no. 154/QĐ-BTNMT with 14 criteria in 2014) to encourage more green production and consumption. Moreover, Vietnamese government has a plan to complete the application of green purchasing policies and the promotion of green consumption trend in all provinces by the end of 2020. These laws and programs strongly affect how the enterprises design their products. With the products being considered green and environment-friendly, Ajinomoto seems to adapt and work well in Vietnamese business environment.

Internal issues. As mentioned above, the internal issues that affect the implementation of GSCM of Ajinomoto are its capabilities based on the performance in 5 activities of GSCM and the internal pressure.

In their development history, Ajinomoto exhibited to the world its strength of maintaining business operations, powerful R&D, large amount of capital investment with the aim of the environment and community protecting. In Vietnam, this group has used all those strength in implementing the GSCM. This will be shown in an analysis of 5 activities of Ajinomoto GSCM:

- *In the Green Product Design activity*, Ajinomoto successfully applies the Life-Cycle Assessment method with the scope of Cradle to Gate in designing a product (Figure 4).

This illustrates the whole manufacturing process of Ajinomoto in Vietnam. The scope: «Cradle to Gate» means that only a part of the products' life cycle, from the preparation of inputs to the time the products get out of the factory, will be assessed. As we can easily see, the inputs (cassava and sugar-cane) are cultivated with the organic fertilizer before being sent to the sugar and starch factory. In these factories, the inputs will undergo a long process using green technology and green

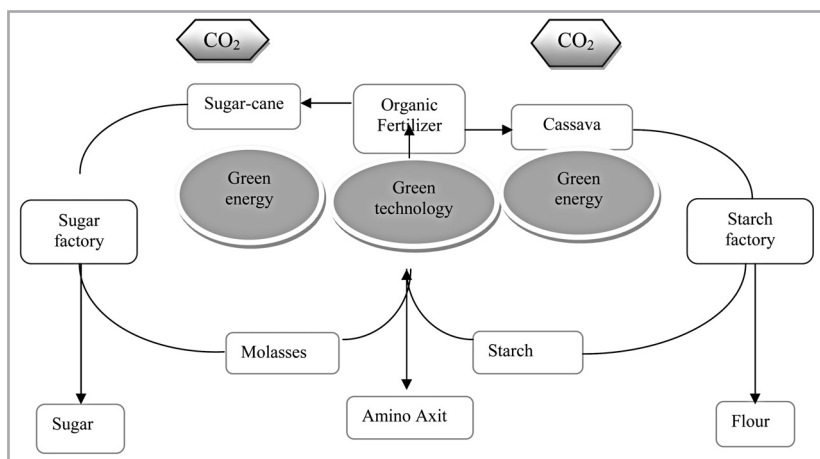


Fig. 4: The enclosed manufacturing process of Ajinomoto's LCA

Source: Authors' analysis

energy, and become sugar and flour. The special point in this process is that the waste from these two factories is reused, not disposed. With this Life-Cycle Assessment model, Ajinomoto can easily design its products towards environmental sustainability.

- *In Green Material Management activity*, Ajinomoto uses inputs, which are derived from nature. These inputs are agricultural products like cassava or sugar cane. These products are purchased from the agricultural product companies or produced by Ajinomoto. With these strategies, Ajinomoto has done well in selecting and sourcing the green material.
- *In Green Manufacturing activity*, Ajinomoto successfully applies the Ami bio-organic fertilizer, which is considered environment-friendly in producing inputs. More than that, the entire infrastructure is built based on the Japanese criteria to make the impact on the environment as small as possible. Ajinomoto also applies the ISO 14001:2004 standard in the environmental managing system. With all of these actions, Ajinomoto is able to reduce the resource consumption, the waste and the emission.
- *In Green Marketing activity*, Ajinomoto tries to build its image in Vietnamese consumers' eyes as a «green» food enterprise coming from Japan. This image is transferred to the customers through the means of advertisement on TV, packaging and social activities. Ajinomoto has successfully carried out the «Clean up the Earth together day» in 2014, which is a part of the group's program called «Smile Earth», has been run since 2007. In this program, Ajinomoto calls up its staff and people to collect clothes, books etc. to reuse and donate to the social center. The aim of this campaign is to enhance awareness about the environmental protection among individuals and society.
- *In Green Distribution activity*, Ajinomoto Vietnam associates with a large number of distributors across the country to bring their products to the consumer's hands. This group also builds a warehouse in Dong Nai province to distribute products nationwide. Furthermore, Ajinomoto builds a good relationship with important partners who consume large quantities of their products such as hotels, restaurants or resorts.
- *In Reverse Logistics*, 100% reusable waste is applied directly during the operation of the Ajinomoto plant.

To perform all the activities above, Ajinomoto must be consistent with its goal of protecting the environment and the community. These activities have together created the Ajinomoto's successful closed-loop green supply chain, which contributes greatly to the sustainability of natural environment in Vietnam.

As mentioned above, the Ajinomoto group always tries to bring its image of green enterprises to the consumers. That is why Ajinomoto Vietnam is always under an internal pressure to maintain that image. This pressure forces Ajinomoto Vietnam to develop its technology, invest more to produce green products in Vietnam. This is also a factor that leads to the implementation

of the GSCM. Another form of internal pressure is the corporate social responsibility. The green CSR policy functions as a self-regulatory mechanism whereby a business monitors and ensures its active compliance with the law of environment. Sometimes, CSR shows the willingness of an enterprise to make good impacts on the society in general and on the natural environment in particular. This factor can be clearly seen in the case of Ajinomoto. This group has a wide range of activities, which associate with the society. Carrying out international campaigns about the environment, changing the business model from B2C to B2S and B2E, producing green products, Ajinomoto has supported a better life and a better environment for the people all over the world.

Results. By applying the GSCM, Ajinomoto has achieved a great success. With the green image, Ajinomoto has now become an important part of people's life in Dong Nai province. Ajinomoto encourages people to produce agricultural products and purchases from them.

More than that, Ajinomoto creates jobs and provides a wide range of green products for people here. Ajinomoto also plays a positive role in social activities and becomes a partner of the media and local government. Ajinomoto Vietnam is awarded Sustainable Green Brand by the Vietnam Union of Science and Technology Association (VUSTA).

Applying GSCM helps Ajinomoto achieve a lot of benefits. Firstly, with the green technology and products, the group is able to meet the requirement of the law. Secondly, by using green energy and organic fertilizer, as well as reusing the waste, the group can save costs, reduce the waste and the emission to the minimum. Thirdly, according to the Environmental Protection Law of 2005, Ajinomoto can receive tax incentives due to producing green products with clean manufacturing process, which means Ajinomoto can save a large amount of money. In addition, with the rising environmental problems, a green enterprise can easily introduce itself to the public and attract more customers.

Obviously, with all the characteristics analyzed above, Ajinomoto can be classified as an Innovator in applying the green supply chain management (GSCM), according to the Green development model proposed by Deloitte, as it meets the entire criteria for the mentioned category of classification (Figure 5).

Conclusion. By analyzing the case of Ajinomoto, we can easily see how important the implementation of GSCM at enterprises is. Both internal and external factors of the organization will affect this process. In order to benefit from GSCM, the enterprise must understand the business environment in which it operates, including law & legislations and the consumers' taste. Moreover, the enterprises must improve their capabilities in every activities of GSCM. They should apply new green technology and introduce new green business strategies. The implementation of GSCM influences their image in the eye of the consumers and their CSR policy. Finally, protecting the environment and living sustainably are the responsibilities of all people in the world, and enterprises are not the exception. Applying GSCM is one of a few business strategies that enterprises can adopt to achieve success and contribute to the sustainability of the world.

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References

1. Allenby, B. R., & Graedel, T. E. (1993). *Industrial ecology*. NJ: Prentice-Hall, Englewood Cliffs.
2. Bowen, F. E., Cousins, P. D., Lamming, R. C., & Farukt, A. C. (2001). The role of supply management capabilities in green supply. *Production and operations management*, 10(2), 174-189.
3. Deloitte (2012). *The green supply chain DNA: How to retool your supply chain for the sustainability driven, data rich future*. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/ie/Documents/Strategy/green_supply_chain_DNA_strategy_2012_deloitte_global.pdf
4. Ghobakhloo, M., Tang, S. H., Zulkifli, N., & Ariffin, M. (2013). An Integrated Framework of Green Supply Chain Management Implementation. *International Journal of Innovation, Management and Technology*, 04(01), 86-89.

	Follower	Mature	Leading	Innovator
	<ul style="list-style-type: none"> Legal compliance Trails the competition 	<ul style="list-style-type: none"> Beyond compliance Formal sustainability strategy and goals Not leading competition 	<ul style="list-style-type: none"> Differentiative via comprehensive sustainability strategy Leads competition 	<ul style="list-style-type: none"> Competitive advantage through sustainable value creation Recognized leader that sets the pace
Collect	<ul style="list-style-type: none"> Limited data collection capabilities No formal collection standards 	<ul style="list-style-type: none"> Product detail collected but on a limited set of attributes Limited formal standards 	<ul style="list-style-type: none"> Product data available at multiple supply chain stages Formal standards with vendors 	<ul style="list-style-type: none"> Data is timely, comprehensive and accurate Formal standards with regular audit
Optimize	<ul style="list-style-type: none"> Supply chain managed with limited or no consideration for green opportunities 	<ul style="list-style-type: none"> Environmental impact tracked with focus on waste and reducing footprint 	<ul style="list-style-type: none"> Local (at each link in the supply chain) and global optimization Multiple wastes considered 	<ul style="list-style-type: none"> Out of the box thinking to turn cost centres into possible profit centres
Report	<ul style="list-style-type: none"> Limited to no reporting on green performance of organization 	<ul style="list-style-type: none"> Sustainability report focuses on corporate performance; limited supply chain focus 	<ul style="list-style-type: none"> Reports on supply chain innovations and supplier engagement 	<ul style="list-style-type: none"> Reports comprehensively on green data performance of product or services

Fig. 5: Green development model

Source: The green supply chain DNA: How to retool your supply chain for the sustainability driven, data rich future [3]

supply chain management. Benchmarking: *An International Journal*, 12(4), 330-353.

7. Johansson, L. (1994). How can a TQEM approach add value to your supply chain? *Environmental Quality Management*, 3(4), 521-530.

8. Min, H., & Galle, W. P. (1997). Green purchasing strategies: trends and implications. *International Journal of Purchasing and Materials Management*, 33(2), 10-17.

9. Narasimhan, R., & Carter, J. R. (1998). Linking Business Unit and Material Sourcing Strategies. *Journal of Business Logistics*, 19(2), 155-171.

10. Ninlawan, C., Seksan, P., Tossapol, K., & Pilada, W. (2010). The implementation of green supply chain management practices in electronics industry. *Proceedings of the International Multiconference of Engineers and Computer Scientists* (Vol. 3, pp. 17-19). Hong Kong, China: International Association of Engineering.

11. Wu, H., & Dunn, S. (1994). Environmentally Responsible Logistics Systems. *International Journal of Physical Distribution and Logistics Management*, 25(2), 20-38.

Received 25.10.2014

5. Handfield, R. B., Walton, S. V., Seegers, L. K., & Melnyk, S. A. (1997). «Green» value chain practices in the furniture industry. *Journal of Operations Management*, 15(4), 293-315.

6. Hervani, A. A., Helms, M. M., & Sarkis, J. (2005). Performance measurement for green

Environmentally Responsible Logistics Systems. *International Journal of Physical Distribution and Logistics Management*, 25(2), 20-38.