The Empirical Research of Environmental Protection Significance in the Republic of Serbia

[1, 2] **Filip B. Cvetković,** [3] **Aleksandar Z. Stanković,** [1, 2] **Jasmina Gligorijević**
[1] University „Union Nikola Tesla"
62-64 Cara Dušana, Belgrade, 11158, Serbia
[2] Faculty of Applied Sciences
22a Dusana Popovica, Nis, 18000, Serbia
[3] University „Business Academy ", Faculty of Economics and Engineering Management
2 Cvećarska, Novi Sad, 21102, Serbia
E-mail: cvetkovicfilip0@gmail.com, jasminanesic75@gmail.com, aleksandar.st.srb@gmail.com

Abstract. Protection and promotion of quality of the environment concerns everyone, from the individual to the global level. This process must include all the countries in the world and all the entities within those countries. With a view to having businesses contributing to environmental protection, in recent years, there have been discussions on ecological management within companies. Numerous standards and management systems defined at local, regional, and international levels are adding to the growing impact of ecological management. The environment is one of the key issues within the European Union where the EMAS (Eco-Management and Audit Scheme) system and the group of standards ISO 14000 relating to the environment and companies' relationship to it were defined. Unlike the EMAS system, which is binding to members of the EU, ISO standards are not, but most businesses in the EU implement them in their operations. Companies in RS, resulting from cooperation with EU companies, frequently choose to implement these standards, likewise, to facilitate cooperation with foreign businesses which frequently demand the implementation of these standards. To ascertain how much importance domestic companies place on environmental management and protection this research contains a survey through which the respondents indicate that they do not have much faith in the attitudes of domestic businesses towards the environment. For this reason, it is necessary to make advancements in this area in the future.

Keywords: environmental research, environmental protect, standards, Republic of Serbia

Эмпирическое исследование значения охраны окружающей среды в Республике Сербия

[1, 2] **Цветкович Ф.,** [3] **Станкович А.,** [1, 2] **Глигориевич Я.**
[1] Университет «Союз Никола Тесла»
Сербия, 11158, Белград, Цара Душана, 62-64
[2] Факультет прикладных наук
Сербия, 18000, Ниш, Душана Поповица, 22а
[3] Университет «Бизнес Академия», факультет экономики и инженерного менеджмента
Сербия, 21102, Нови-Сад, Цвечарска, 2
E-mail: cvetkovicfilip0@gmail.com, jasminanesic75@gmail.com, aleksandar.st.srb@gmail.com

Аннотация. Защита и поддержание качества окружающей среды касается каждого, от индивидуального до глобального уровня. Этот процесс должен охватывать все страны мира и все организации в этих странах. С целью привлечения предприятий к охране окружающей среды в последние годы в компаниях ведутся дискуссии об экологическом менеджменте. Многочисленные стандарты и системы управления, определенные на местном, региональном и международном уровнях, усиливают растущее влияние эколо-

гического менеджмента. Окружающая среда является одним из ключевых вопросов в Европейском Союзе, где были определены система EMAS (Схема экологического менеджмента и аудита) и группа стандартов ISO 14000, касающихся охраны окружающей среды и отношения компаний к ней. В отличие от системы EMAS, которая является обязательной для членов ЕС, стандарты ISO не являются обязательными, но большинство компаний в ЕС применяют их в своей деятельности. Компании в Республике Сербия, в результате сотрудничества с компаниями из ЕС, часто принимают решение о внедрении этих стандартов, а также для облегчения сотрудничества с иностранными предприятиями, которые часто требуют внедрения этих стандартов. Чтобы выяснить, какое значение сербские компании придают рациональному природопользованию и охране окружающей среды, данное исследование содержит опрос, в ходе которого респонденты указывают, что они не очень верят в ответственное отношение сербских предприятий к окружающей среде. По этой причине необходимо добиться прогресса в этой области в будущем.

Ключевые слова: экологические исследования, защита окружающей среды, стандарты, Республика Сербия

Introduction

In the modern setting sustainable growth is an integral part of any country's development strategy. Sustainable growth does not solely pertain to economic development but also ecological, social, and cultural development of the society. For this reason, the topic of environmental protection has received much attention on macro and micro levels, i.e., on business level. The purpose of this research is to acquaint the reader with ecological management at micro level, which the research targets and whereby it will be determined how much importance domestic companies place on environmental protection.

At state level, aside from the implementation of command and control instruments some commercial instruments have been applied. The primary types of commercial environmental protection instruments are construction permits, ecological taxes, ecological fees, ecological subsidies and incentives and programs for responsibility and compensation [Europian Environmental Agency, 2005]. Out of the listed instruments pollution permits are prominent when USA soil is concerned, while special care is given to ecological taxes on EU soil. Namely, an ecological tax reform based on the principles of income neutrality has been conducted in EU. The increase of existing taxes and the introduction of new ones related to the environment have not led to a boost in public revenue but have rather been the foundation for a reduction of income taxes whereby EU members strive to solve their unemployment problems [Stojanović, 2016]. We have ecological taxes to a certain degree which does not reach the extent in the EU [Stojanović, Đorđević, 2016].

Aside from the legal regulations and commercial instruments defined by the state, corresponding standards are defined at international level and the standard related to environmental protection is ISO 14000. ISO standards are not mandatory for companies, but to establish best reputation, socially responsible behavior and smoother cooperation with international companies' domestic companies frequently choose to standardize, that is, accept and implement these standards in their operation and develop ecological management systems.

With a view to promoting their philanthropic behavior, international and domestic business entities alike quite often define or invest in projects related to environmental protection, which certainly significantly contributes to a qualitative betterment of the environment.

To determine the extent of conscientiousness with which domestic businesses approach the environment this research conducts an opinion poll on whether domestic companies treat the environment conscientiously. The results of this analysis will be useful for hypothesis testing and drawing important conclusions.

Literature Overview

As has been stated earlier environmental protection is of utmost importance for the survival of humanity. For that reason, many authors internationally and within the Republic of Serbia work on environmental pollution problems from ecological and economic aspects. Researchers involved in economic aspects observe this problem at macro and micro levels, i.e., at business entity level, which is the focal point of our research.

This literature overview is split into three parts. With reference to representative literature the first part addresses theoretical viewpoints regarding environmental management by businesses. Then we do the same for EMAS and ISO 14000 standard. In the third part of the overview, we present empirical results from this area which we use as the basis for the creation of our research.

Environmental Management at Company Level

Environmental management at company level is regular company activity the goal of which is to reduce operations' negative influence on the environment. The basic tasks of environmental management primarily encompass company level activity planning for environmental protection and thorough organization of these ecological activities. The company's environmental management system itself is based on managing the impact the company has on the quality of the environment and how it affects use of natural resources the volume of which is being reduced resulting from inadequate and excessive use.

Environmental management is conducted at local, regional, and international levels, which depends on the company's type of operation [Elizabeth Delaney, Barbara Thomson, 2013]. If a particular company's operation is related to electricity production, nuclear energy, gas lines, air transport, railway, or chemical facilities, in those cases, they are considered high-risk in terms of the environment. Such companies must manage their environmental protection systems at regional and interregional levels. The basic tasks these companies have, in terms of environmental management are:

- Suppression of soil, water and air pollution;
- Rational and efficient use of water resources;
- Implementation of ecologically acceptable production technology
- Application of ecologically acceptable materials;
- Preservation of rare species of plants and animals, etc.

Companies whose operations cause less environmental damage should establish a local level environmental management system [Elizabeth Delaney, Barbara Thomson, 2013]. This is primarily secured through strict compliance with defined regulations, ecological quotas, as well as standards, be they state level standards, national or international level standards. Aside from adhering to regulations the basic tasks of a company's environmental management are:

- Analyzing the environmental impact of the production process;
- Awareness and implementation of modern production processes which leave a smaller footprint, as well as
- Rational energy consumption, toxic material uses and waste and harmful gas emission reduction.

With a view to accomplishing the defined tasks in environmental protection, companies must allocate significant finances. Namely, these funds are invested in the standardization of the operation, rendering it compliant with defined standards regulating the area of environmental protection among which ISO 14000 is widely regarded and accepted. More on this standard in the continuation of the research paper. However, in addition to standardization, businesses must make significant investments in staff education to secure ecological operation, and they must also invest into new equipment and production technology, etc.

Quiet often companies must facilitate numerous activities and projects in environmental protection which are not necessarily related to their operation, however this is done in the spirit of philanthropy or social responsibility.

EMAS and the ISO 14000 standard

An environmental management system is a system that requires full commitment to fulfilling obligations and removing problems and risks. Environmental aspects are organizational activity elements, products or services which may mutually affect the environment. Environmental management depends on the meaningfulness of an organization, an organization's environmental protection system's area of application, organizational obligations, organization context and activities, products and services and organizational activities themselves that influence aspects of the environment. Understanding an organization is important, as well as understanding of the context to secure the activity of important issues which may positively or negatively affect the environment.

Through the application of EMAS (environmental protection management and audit scheme) a company effectively identifies, assesses, and finds suitable solutions for environmental protection problems arising from their own processes [El-Gayar, Omar, Fritz, Brian, 2006]. EMAS has the potential to combine mandatory and non-binding requests which pertain to the environment, and which may, through their own action, positively affect the company's image. EMAS (Eco-Management and Audit Scheme) is an ecological management and independent assessment system with which organizations assess the influence of their activity on the environment, inform the public on then current state assessment and promote operation efficiency in accordance with environmental requirements. EMAS is EU's voluntary scheme the goal of which is to facilitate companies' growth in compliance with environmental protection requirements [Wenk Micheal, 2006]. EMAS is regulated by a decree of the European Parliament and Commission and as such it entails obligatory implementations for all members of the European Union. By applying EMAS, Serbia, which is not a member of the EU, will meet the conditions for active participation in the European commercial network. Aside from the EMAS system, which is compulsory for all EU members, ISO 14000 is also desirable. Business and organization operation according to these standards create advantage on the European market.

An ISO standard that defines the living space as environment was released in 2004. The most significant areas that standards from this series tackle are [Paul de Backer, 1996; Jackson Suzan, 1997]:

1. Environmental protection management
2. Auditing environmental protection systems
3. Assessment of the effects of environmental protection systems
4. Standardized environmental protection for products/services
5. Assessing product life cycle from the aspect of environmental protection
6. Rating products according to environmental impact.

Standards are designed to be applicable worldwide. The goal of this standard is to prevent pollution through organized environmental protection. System compliance is important whereby a positive outcome of the goal is achieved. With the implementation of this standard the company itself reaps numerous benefits and those are presented in Figure.

With environmental protection management systems, the management executes the requirements of an organization's executives in terms of environmental protection. The purpose of the requirements is defined in the management manual with various guidelines and process descriptions which are implemented and monitor an environmental management system.

An Empirical Research of Environmental Protection Significance in the Republic of Serbia

Empirical results regarding responsible attitudes of businesses towards the environment

Zeng et al. conducted an analysis of socially responsible behavior towards the environment in small and medium-sized businesses, that is, they performed a quality analysis of their ecological management in China. Their results indicate that SMEs with various pollution levels have different ecological quality management systems. For SMEs with high pollution levels, it was shown that

social and market driving forces and government incentives have high impact on their ecological performance. Those who had lower pollution levels had lower investments in ecological management and the environment [Zeng et al., 2011].

ISO 14000 implementation benefits [SIQ – Slovenian Institute of Quality and Metrology]

Day et al. conducted an analysis with developed and developing countries to get an insight into corporate responsibility towards the environment. They examined the conduct of small and medium-sized enterprises towards the field of environmental protection and climate change and corporate social responsibility. The results they obtained show that the relation between the areas of environmental protection and climate change on one hand and corporate social responsibility on the other varies greatly depending on the industry type in a country. Namely, companies in developed countries put more emphasis on ecology compared to less developed countries.

Singh et al. conducted empirical research regarding the implementation of the ISO 14001 system in India. The results they got were that there was a connection between the implementation of the standard and company level waste reduction for companies that implemented it [Singh et al., 2015].

De Silva et al. conducted a survey in organizations to get data on ecological management system implementation in companies in Brazil. Based on the analysis they reached the conclusion that many companies consider ecological management systems a cost rather than a chance to grow and develop [Sena da Silva, G.C. and Dumke de Medeiros, D., 2004].

Weerasiri и Zhengang within their research discovered whether there was a connection between company attitude, environmental issue awareness and their environmental management practices. A survey based on a questionnaire was conducted to obtain the required information. Their analysis indicates that there is no significant relation between attitudes and awareness or attitudes and environmental management practices [Sudath Weerasiri, Zhang Zhengang, 2012].

Concerning domestic authors, this type of research is only conducted from the theoretical standpoint. without empirical analysis. This research aims to ameliorate this lack and as the basis of our research we use the work of foreign authors who have been listed above.

Defining the sample and the basic questions

As previously stated, the goal of this research is to acquaint the reader with company level environmental protection management but also to address whether companies really care about environmental protection and the promotion of its quality. To meet the assignment of this research, a survey was conducted on a sample of 800 participants from the Republic of Serbia (RS). The study encompasses participants of diverse age, education levels and genders. Out of the total number of participants 440 are female and 360 are male.

The defined sample is adequate for reaching conclusions and giving corresponding recommendations [Verbeek, 2008; Adams, Lawrence, 2015]. The participants answered the following questions:

1. "Do you think that companies doing business on RS soil use natural resources rationally?"

2. "Do you think that domestic companies adhere to norms and standards which regulate the area of environmental protection?"

3. "Do you think that domestic companies allocate enough assets for the area of environmental protection?"

Within question 2 respondents can, if they answer positively, list the reasons for which they consider that companies do adhere to defined standards and norms in the field of environmental protection.

The software suite SPSS was used for processing the collected data. As far as tests are concerned, the test used was coefficient of contingency test. By summing up the obtained answers we can draw conclusions about the adequacy of domestic companies' policies in terms of the environment. Based upon that we can give recommendations on how to improve the situation.

Research Results and Discussion

The surveyed respondents answered the question "Do you think that companies doing business on RS soil use natural resources rationally?". As it can be seen in table 1 only 14,9 % of the participants answered positively (119 participants), whereas 85,1 % of participants (about 681 of them) stated that they do not believe that companies operating in RS use natural resources rationally. In the female group 16,4 %, and in the male group 13,1 % gave a positive answer.

Table 1

Contingency Table – Question no. 1 [the authors results, based on the conducted survey]

| | | | 1 | | Total |
			YES	NO	
Sex	Female	Sum	72	368	440
		% within sex	16.4 %	83.6 %	100.0 %
		% within YES response	60.5 %	54.0 %	55.0 %
		% of total participants	9.0 %	46.0 %	55.0 %
	Male	Sum	47	313	360
		% within sex	13.1 %	86.9 %	100.0 %
		% within YES response	39.5 %	46.0 %	45.0 %
		% of total participants	5.9 %	39.1 %	45.0 %
Total		Sum	119	681	800
		% within sex	14.9 %	85.1 %	100.0 %
		% within YES response	100.0 %	100.0 %	100.0 %
		% of total participants	14.9 %	85.1 %	100.0 %

Thus, based on the obtained results from table number 1 we may conclude that the domestic public does not think that companies operating on our soil use natural resources rationally. The results of the second research question are shown in table number 2.

Table 2

Contingency Table – Question no. 2 [the authors results, based on the conducted survey]

| | | 2 | | Total |
		YES	NO	
Sex	Female			
		Sum — 150	290	440
		% within sex — 34.09%	65.91%	100.0%
		% within the response — 45.45%	61.07%	53.3%
		% of total participants — 18.75%	36.25%	55%
	Male			
		Sum — 180	180	360
		% within sex — 50%	50%	100.0%
		% within the response — 54.55%	38.3%	46.43%
		% of total participants — 22.5%	22.5%	45.0%
Total				
		Sum — 330	470	800
		% within sex — 41.25%	59.75%	100.0%
		% within the response — 100.0%	100.0%	100.0%
		% of total participants — 41.25%	59.75%	100.0%

Results from table no. 2 indicate a better state in terms of participants' opinions on companies and their relationship to the environment. Namely, question no. 2 pertains to whether the respondents consider that domestic companies adhere to the standards regulating the field of environmental protection. Based on table number 2 we see that 41.25 % of participants think that companies strictly adhere to the defined standards whereas 59.75 % of participants do not think the same way. This is important as it shows that domestic companies must adhere to the defined standards but to also indicate their adherence clearly to these regulations to the consumer considering that this may greatly impact reputation and customer loyalty in the future.

Out of the 41.25 % of participants who affirmatively responded to question number 2, 190 answered the additional question about the reasons due to which they believe that domestic companies adhere to defined standards and norms. 160 participants, that is, 84 %, believe that domestic companies adhere to the standards and regulations exclusively out of fear of sanctions while 30 of them think there is philanthropic behavior among domestic companies.

The results to the third research question, related to asset allocation for the field of environmental protection are given in table number 3. Just as with the two previously posed questions this one shows a lack of trust of the domestic public in companies operating within the Republic of Serbia.

Considering these results, we may notice that the participants do not think that companies within the Republic of Serbia allocate enough funds for the field of environmental protection. Namely, only 21.35 % of respondents believe that sufficient means are derived from companies to invest into activities which contribute to environmental protection and promote the quality of the environment, whereas up to 78.75 % of respondents believe that is not the case.

Based on the results of the conducted survey we may infer that domestic companies do not pay enough attention to environmental protection. As some primary recommendations for the future period the following may be given:

1. The state must secure adequate education in the field of ecological management for companies and to provide all the necessary support in this area;

2. Companies themselves must pay more attention to this area;

3. Greater investments from companies are necessary in this area to secure a reduction of negative footprint on the environment.

Table 3

Contingency Table – Question no. 3 [the authors results, based on the conducted survey]

			1		Total
			YES	NO	
Sex	Female	Sum	90	350	440
		% within sex	20.5 %	79.5 %	100.0 %
		% within the response	52.9 %	55.5 %	54.2 %
		% of total participants	11.3 %	43.8 %	55.1 %
	Male	Sum	80	280	360
		% within sex	22.2 %	77.78 %	100.0 %
		% within the response	47.06 %	44.4 %	45.73 %
		% of total participants	10 %	35 %	45.0 %
Total		Sum	170	630	800
		% within sex	21.35 %	78.75 %	100.0 %
		% within the response	100.0 %	100.0 %	100.0 %
		% of total participants	21.35 %	78.75 %	100.0 %

Conclusion

The issue of environmental protection and promotion of the quality of the environment is one of the key issues of modern society. Human and company actions in the past period have caused great damage when it comes to the quality of the environment. Thus, sustainable growth becomes an integral segment of developmental strategies of almost all countries in the world.

At state level numerous steps are taken aiming to protect and promote the quality of the environment. But these activities are undertaken at company level, too, through implementation of ecological management systems and their activities.

Activities within ecological management are directed at preventing negative effects of companies on the environment but there are numerous philanthropic activities aiming to promote the quality of the environment and raise ecological awareness.

Our country is categorized as a developing country. A lot of emphasis is placed on the question of environmental protection, but not as well as in developed countries and the reason for that are various other problems of, primarily, economic, and social character. As at state level the situation is similar when it comes to company level, which the analysis conducted in the research indicates. Namely, it points out that domestic public does not think that companies take environmental protection seriously. For this reason, this is an issue which must be addressed by the state itself, too, but also companies themselves for the benefit of the environment and their reputation at local and international levels.

Sources

Adams K.A., Lawrence E.K. 2015. Research Methods, Statistics and Applications, SAGE Publications, London, United Kingdom, 672 p.

Elizabeth Delaney, Barbara Thomson. 2013. Environmental Management System Development Process. Washington, DC: The National Academies Press. https://doi.org/10.17226/22588.

Europian Environmental Agency. 2005. Market-based instruments for environmental policy in Europe, Tehnical report, Copenhagen, 155 pp.

Jackson Suzan. 1997. The ISO 14001 Implementation Guide: Creating an Integrated Management System, John Wiley and Sons, New York, 304 p.

SIQ – Slovenian Institute of Quality and Metrology. URL:https://www.siq.si/sr/usluge/sertifikacija-sistema-menadzmenta/usluge/zivotna-sredina-i-energija/sistem-menadzmenta-zastitom-zivotne-sredine/ (date of access 10.04.2022).

Verbeek M. 2008. A Guide to Modern Econometrics, John Wiley & Sons, Chichester, 446 p.

Wenk Michael. 2006. The European Union's Eco-Management and Audit Scheme (EMAS), Springer, Berlin, 275p.

References

El-Gayar, Omar and Fritz, Brian D. 2006. Environmental Management Information Systems (EMIS) for Sustainable Development: A Conceptual Overview. Communications of the Association for Information Systems, 17, 34. Available at: http://aisel.aisnet.org/cais/vol17/iss1/34

Paul de Backer. 1996. Umweltmanagement im Unternehmen. Springer, Berlin, 252 p.

Sena da Silva, G.C. and Dumke de Medeiros, D. 2004. Environmental management in Brazilian companies. Management of Environmental Quality, 15(4): 380–388. https://doi.org/10.1108/14777830410540126

Singh Mitrabinda, Brueckner Martin, Prasanta Padhy Martin. 2015. Environmental Management System ISO 14001: Effective waste minimisation in small and medium enterprises in India. Journal of Cleaner Production, 102. DOI: 10.1016/j.jclepro.2015.04.028

Stojanović, M., Đorđrvić, M. 2016. The role of environmental taxes in Serbian tax system. Ekonomika, Niš, 4: 75–85.

Sudath Weerasiri, Zhang Zhengang. 2012. Attitudes and Awareness towards Environmental Management and its Impact on Environmental Management Practices (EMPs) of SMEs in Sri Lanka. Journal of Social and Development Sciences, 3(1): 16–23. DOI: 10.22610/jsds.v3i1.681

Zeng Liang, Proctor Robert W., Salvendy Gavriel. 2011. Can Traditional Divergent Thinking Tests Be Trusted in Measuring and Predicting Real-World Creativity? Creativity Research Journal, 23(1): 24–37. DOI: 10.1080/10400419.2011.545713

Конфликт интересов: о потенциальном конфликте интересов не сообщалось.
Conflict of interest: no potential conflict of interest related to this article was reported.

ИНФОРМАЦИЯ ОБ АВТОРАХ

INFORMATION ABOUT THE AUTHORS

Филип Цветкович, магистр наук, ассистент, Университет «Союз Никола Тесла», г. Белград, Сербия, Факультет прикладных наук, г. Ниш, Сербия

Filip B. Cvetković, M.Sc., Assistant, University „Union Nikola Tesla", Belgrade, Serbia, Faculty of Applied Sciences, Nis, Serbia

Александр Станкович, доктор наук, доцент, Университет «Бизнес-академия», Факультет экономики и инженерного менеджмента, г. Нови-Сад, Сербия

Aleksandar Z. Stanković, Doc.Sc., Docent, University „Business Academy", Faculty of Economics and Engineering Management, Novi Sad, Serbia

Ясмина Глигориевич, доктор философии, профессор, Университет «Союз Никола Тесла», г. Белград, Сербия, Факультет прикладных наук, г. Ниш, Сербия

Jasmina Gligorijević, Ph.D., Professor, University „Union Nikola Tesla", Belgrade, Serbia, Faculty of Applied Sciences, Nis, Serbia