
THE DECISIVE FACTORS ON ENVIRONMENTAL SECURITY

Sitnikov Cătălina¹, Băndoi Anca², Olari Perju Camelia-Maria³ and Riza Ionuț⁴

^{1) 2) 3) 4)} Faculty of Economics and Business Administration, University of Craiova

E-mail: inasitnikov@yahoo.com; E-mail: anca.bandoi01@yahoo.com;

E-mail: camelia.olari@gmail.com; E-mail: rizaionut@gmail.com

Abstract

Environmental security remains, at the impact with the Third Millennium, a basic objective of research as industrial civilization, urbanization, tourism, agriculture, transport, exert a permanent pressure that sometimes leads to distortions in the balance between environmental factors and even to the degradation of the environment. Thus, modern society destroys the ecological balances all over the planet at a speed that does not nearly equal the restoration efforts. Environmental factors as water, air, soil are permanently subject to aggression resulted from the work of economic organizations. A special role in creating this serious situation lies in the energy intensive industries in the metallurgical, chemical and malini fields, which issue in the atmosphere particularly large quantities of gases loaded with toxic substances. Restructuring the entire economy by stopping the activity of unprofitable organizations and maintaining only the cost-effective ones will have a positive role to play in reducing environmental pollution and creating the necessary conditions for environmental protection measures to be included in the processes of upgrading, modernization and development. A particular issue related to environmental security problems is represented by the way human resources manage waste within organizations. The extent of the danger represented by waste for environmental security requires the adequate training of human resources in what concerns the knowledge, tracking and improvement of the production-collection-transport circuit, until its total elimination. At the same time, we our aim is to identify the influence of major factors on environmental security.

Keywords: security, environment, legislation, technology, human resource.

JEL Classification: O13

Introduction

A human society can not exist without consuming natural resources, but having in mind that natural resources mostly non-renewable or heavily renewable are almost exhausted and the planet's population continues to grow, we need to be more aware that climate change in recent decades are signs of nature showing us that some limits of growth, of exaggerated consumption compared to the restoration power of nature have been reached, and that social and economic systems of the 20th century (socialist, capitalist, etc.) have been true consumer and waste societies that pose a real threat to environmental security.

The development of activity fields of the organizations, within a social-economic system, started the struggle against the Mother Nature, against our own support of life, especially

through massive deforestation for agriculture, which had supplied and must supply a supernumerary population for this planet limited as resources, and continuing with the general and exaggerated pollution of these natural resources. Activities towards environmental security require additional production costs which, added to existing costs under difficult conditions for many organizations, can negatively impact economic and financial results. Under the conditions of financial austerity, the short-term strategy of industrial enterprises may also include measures tailored to each case. At the same time, alternatives for obtaining an economic benefit from environmental security must also be sought to, fact that would make it attractive for investments.

The objective of this article is to identify the factors that influence environmental security.

1.Literature review

The „environment” notion refers to everything that surrounds man, namely to the artificial environment and the natural environment. The notion of environment comes from the noun environment, which means a set of natural or artificial elements that condition the life of man (Sadgrove, 1998). For the European Union, the notion of the environment is defined as a "set of elements" which, in the complexity of relationships, represents the framework, mean and living conditions of man (Mac, 2003). The environment is the natural and social framework in which existence, life in general is taking place. Throughout the development of human society, it has undergone a number of imbalances, followed by degradations that have been grown in recent times (Hein, 1996).

Environmental security can be defined as a conscious human activity, which aims at protecting and improving the quantitative and qualitative conditions of human life (Hein, 1996). Environmental security is achieved through the rational use of natural resources, according to the principle of sustainable development by preventing and controlling all kinds of pollution and harmful effects of natural phenomena (Larry, 1996). Nowadays, due to the fact that negative consequences of human activities are felt in all fields, the protection of different elements of the environment is not automatically achieved by spontaneous functioning of the different natural factors, thus the intervention of man, the consciousness of society is absolutely necessary. Environment security involves special, complex, rationally based projects and, in many situations, major financial efforts.

Environmental security is based on discovering the causes that affect the environment and avoiding those causes, reducing the consequences and eliminating them in a significant proportion to the prosperity of man and humanity. Ultimately, the main purpose of environmental security is to protect man, human life. Wallace (2004) considers that the problem of environment security has conscientiously consisted of another stage and a specific goal of teaching the training of specialists in human resources to a number of organizations that respond to the aspirations of such an area. Surely the surrounding environment has become an important part of the development process of human resources competences, being sustained and institutionalized in the European Union; The European Commission finances, for example, training for human resources, as well as other technical courses, all being finalized through a practical activity, usually cleaning a polluted surface (Darie, 2001).

2.Research methodology

Ensuring environmental security at the organization level must be based on the processes of planning, monitoring, and control. A high level of environmental safety requires a proper management of any unforeseen events to limit their adverse effects.

In the next we will specifically refer to waste management. Our first aim is to identify the specific environmental security measures. The security factors were classified in 4 categories:

1. Legislative factors (*level of knowledge and compliance*);
2. Organizational factors (*organization's perspective on environmental security*);
3. Technological factors (*level of implementation of specific technology*);
4. Human factors (*behavior of human resources regarding waste management*).

For each category, 10 environmental safety factors were identified. The table below describes these factors (table no. 1).

Table no 1. Environmental security factors in waste management

LEGISLATIVE FACTORS	ORGANIZATIONAL FACTORS
F1. The knowledge of national and European legislation from waste domain;	F1.Integration of environmental policy into other organization policies;
F2. Conforming with applicable legal requirements in the field of waste management;	F2.Implementation of environmental management and audit systems;
F3. Understanding the importance of legislative requirements and issues arising from their non-application;	F3. Ensure the necessary space for the selective collection of waste, equipping it with containers specific to each type of waste and their functionality;
F4. Understanding how to categorize waste according to legal requirements;	F4. Identify and implement ways to correctly manage waste by category (packaging waste, household waste, metals, plastics, wood, waste oils, tires, batteries, hazardous waste);
F5. Responding to waste management policy in Romania;	F5. Security planning of waste management activities;
F6. Identifying how to implement legal requirements according to the specific activities of the organization;	F6. Determination of correct selection plans and waste disposal flows, including internal capitalization;
F7. Elaboration of a waste management strategy and programs;	F7. Evaluation of the negative impact on the environment produced by the organization in the sense of reducing and even eliminating it, by observing the legal norms;
F8. Secure the process of selective collection, transport, neutralization, recovery and final disposal of waste, including hazardous household waste, in accordance with the legal provisions;	F8. Training human resources with regard to environmental security, as well as stimulating their involvement in the process of development and implementation of environmental decisions;
F9. Classification of wastes produced no matter their quantity according to the legal categories in the waste classification;	F9. Prevention and full control of pollution by using best available techniques for activities with significant impact on the environment;
F10. Establishment of recovery procedures, separate collection of paper, metal, plastic and glass waste.	F10. Identification of pollutants that directly and seriously endanger the health of employees.
TECHNOLOGICAL FACTORS	HUMAN FACTORS
F1. Use as alternative energy sources - solar energy (photovoltaic panels);	F1. Knowledge and compliance with legal requirements in the field of waste management;
F2. Use as alternative energy sources -	F2. Knowledge of tasks and responsibilities

water energy (hydraulic energy, tidal energy, potential osmotic energy);	for efficient waste management within the organization;
F3. Use as alternative energy sources - wind energy;	F3. Implementation of waste management procedures;
F4. Use of decentralized biomass and energy installations;	F4. Applying the training program on optimal waste management;
F5. Reduce the amount of pollutants by using special equipment (filters);	F5. Compliance with waste management policy at the organization level;
F6. Implementation of solid industrial waste treatment methods;	F6. Maintaining a monthly record of waste generated by the company;
F7. Purchase / use of electric or hybrid cars instead of classic cars;	F7. Prompt dissemination of waste management reports, within deadlines set by current legislation;
F8. Digitalization of documents within the organization;	F8. Preventive measures on environmental threats;
F9. Unsure artificial lighting by using economic bulbs - with LED, halogen or fluorescent lamps;	F9. Storage of wastes of any kind only in authorized sites;
F10. Modernization of production processes with efficient work equipment so that the pollution is minimal.	F10. Managing the mode of operation of the installations in the case of exceeding the normed values.

Source: the author's own concept

The second purpose of this study is to estimate the level of the implementation of these environmental security measures in the waste management. To this end, a statistical study involving 150 companies from different regions of Romania was performed. These companies generate or produce waste (irrespective of their type) and are responsible for the collection/ sorting/ transportation/ processing/ treatment/ recycling/ disposal of waste. The sample of surveyed companies was randomly selected. The survey took place between November 2018 and February 2019. More specifically, company managers have indicated a level (between 1 and 5) of "implementation" for each listed above environmental safety factor. The level of implementation indicates how to manage/apply a specific environmental security factor at the company. See Table no. 2 for the significance of the levels 1-5.

Table no. 2 The significance of the factor-implementation levels

Level	Type	Description
5	High impact	Achieving environmental security objectives
4	Significant impact	Significant impact on environmental safety objectives
3	Moderate impact	Environmental security objectives partially fulfilled
2	Reduced impact	Minor achieving of environmental security objectives
1	Very low impact	Insignificant achieving of environmental objectives

Source: own processing of the authors after Order No.1993 of 30.05.2014 - on the organization and conducting corruption prevention activities within the National Administration of Penitentiaries and subordinate units

Tables no. 3÷6 below reflect the expected levels of implementation of factors grouped into the 4 categories. The tables are accompanied by figures illustrating the average level of implementation of the factors as well as the weighting of the 1-5 levels of implementation of the environmental measures within each category.

Table no. 3 Statistical data regarding the implementation of legislative factors

LEGISLATIVE FACTORS	Number of companies / levels				
	1	2	3	4	5
F1. The knowledge of national and European legislation from waste domain;	7	12	36	46	49
F2. Conforming with applicable legal requirements in the field of waste management;	7	13	34	46	50
F3. Understanding the importance of legislative requirements and issues arising from their non-application;	7	13	34	46	50
F4. Understanding how to categorize waste according to legal requirements;	7	13	34	46	50
F5. Responding to waste management policy in Romania;	6	10	36	49	49
F6. Identifying how to implement legal requirements according to the specific activities of the organization;	7	13	34	46	50
F7. Elaboration of a waste management strategy and programs;	8	15	48	41	38
F8. Secure the process of selective collection, transport, neutralization, recovery and final disposal of waste, including hazardous household waste, in accordance with the legal provisions;	0	0	8	53	89
F9. Classification of wastes produced irrespective of their quantity according to the legal categories in the waste classification;	0	0	8	53	89
F10. Establishment of recovery procedures, separate collection of paper, metal, plastic and glass waste.	0	0	8	53	89
TOTAL	49	89	280	479	603
Expected level of implementation of legislative factors	$M_1 = 4.00$				

Source: the author's own concept

From the analysis of Table no. 3, the value $M_1=4.00$ represents a significant level of legislative factors implementation on environmental safety.

Table no. 4 Statistical data regarding the implementation of organizational factors

ORGANIZATIONAL FACTORS	Number of companies / levels				
	1	2	3	4	5
F1.Integration of environmental policy into other organization policies;	14	12	47	46	31
F2.Implementation of environmental management and audit systems;	11	17	50	43	29
F3. Ensure the necessary space for the selective	0	0	8	53	89

collection of waste, equipping it with containers specific to each type of waste and their functionality;					
F4. Identify and implement ways to correctly manage waste by category (packaging waste, household waste, metals, plastics, wood, waste oils, tires, batteries, hazardous waste);	0	0	3	49	98
F5. Security planning of waste management activities;	11	17	50	43	29
F6. Determination of correct selection plans and waste disposal flows, including internal capitalization;	11	17	50	43	29
F7. Evaluation of the negative impact on the environment produced by the organization in the sense of reducing and even eliminating it, by observing the legal norms	8	11	48	41	42
F8. Training human resources with regard to environmental security, as well as stimulating their involvement in the process of development and implementation of environmental decisions;	0	0	21	38	91
F9. Prevention and full control of pollution by using best available techniques for activities with significant impact on the environment;	38	39	42	18	13
F10. Identification of pollutants that directly and seriously endanger the health of employees.	6	13	33	47	51
TOTAL	99	126	352	421	502
Expected level of implementation of organizational factors	$M_2 = 3.73$				

Source: the author's own concept

The implementation level of organizational factors, $M_2=3.73$, highlighted in Table no. 4, represents a moderate to significant degree regarding the involvement of the organizations in environmental safety.

Table no. 5 Statistical data regarding the implementation of technological factors.

TECHNOLOGICAL FACTORS	Number of companies / levels				
	1	2	3	4	5
F1. Use as alternative energy sources - solar energy (photovoltaic panels);	131	11	3	2	3
F2. Use as alternative energy sources - water energy (hydraulic energy, tidal energy, potential osmotic energy);	132	18	0	0	0
F3. Use as alternative energy sources - wind energy;	148	2	0	0	0
F4. Use of decentralized biomass and energy installations;	149	1	0	0	0
F5. Reduce the amount of pollutants by using special equipment (filters);	5	14	35	57	39
F6. Implementation of solid industrial waste treatment methods;	7	12	36	46	49

F7. Purchase / use of electric or hybrid cars instead of classic cars;	17	12	59	46	16
F8. Digitalization of documents within the organization;	17	32	36	44	21
F9. Unsure artificial lighting by using economic bulbs - with LED, halogen or fluorescent lamps;	7	12	36	46	49
F10. Modernization of production processes with efficient work equipment so that the pollution is minimal;	18	46	33	32	21
TOTAL	631	160	238	273	198
Expected level of implementation of technological factors	$M_3 = 2.50$				

Source: the author's own concept

In Table no. 5, the value $M_3=2.50$, resulting from the calculation of the implementation level for the technological factors, highlights a minor to moderate degree regarding the application/involvement of technology in environmental safety.

Table no. 6 Statistical data regarding the implementation of human factors

HUMAN FACTORS	Number of companies / levels				
	1	2	3	4	5
F1. Knowledge and compliance with legal requirements in the field of waste management;	7	12	36	46	49
F2. Knowledge of tasks and responsibilities for efficient waste management within the organization;	7	12	35	51	45
F3. Implementation of waste management procedures;	5	16	35	54	40
F4. Applying the training program on optimal waste management;	5	16	35	54	40
F5. Compliance with waste management policy at the organization level;	5	14	35	57	39
F6. Maintaining a monthly record of waste generated by the company;	7	12	36	46	49
F7. Prompt dissemination of waste management reports, within deadlines set by current legislation ;	7	12	36	46	49
F8. Preventive measures on environmental threats;	17	44	36	32	21
F9. Storage of wastes of any kind only in authorized sites;	7	12	36	46	49
F10. Managing the mode of operation of the installations in the case of exceeding the normed values.	18	46	33	32	21
TOTAL	85	196	353	464	402
Expected level of implementation of human factors	$M_4 = 3.60$				

Source: the author's own concept

The implementation level value $M_4=3.60$ for the human factors, highlights that human resources have a moderate to significant involvement on environmental safety.

Conclusions

The primary objective of environmental security is or tends to express from numerous points of view the provision of maintaining or protecting the environment as close as possible to the natural reality or increasing the growing concern of the surrounding environment. Environmental security components influence the integration of economic and geo-ecological aspects under the sign of protecting or restoring the environment through an environmental policy, starting from the primary or initial geo-ecological realities.

The management of the organization has the task, through management strategies and policies, to contribute to the development of environmental protection actions, to highlight the possible environmental damages that may result from labor process, respectively to implement preventive measures. Human resources have an important role within the organization as they have skills in environmental safety field and are fully devoted to environmental protection issues. An important part of large organizations benefit from specialized training centers, but these are not well-exploited in certain situations, and the interest in preparing and improving human resources in terms of environmental security is relatively low. This low interest is largely due to the low level of funding allocated for training. Under these circumstances, one can use less expensive forms of preparation, such as: individual study or self-training; practical demonstrations in professional units or demonstration centers; teamwork under the guidance of an expert. Both organizations and human resources play a decisive role in the relation with the environment and sustainable development based on traditional experience and relationships. Organizations must recognize their economic interests, support them appropriately and facilitate collaboration to achieve lasting environmental security. That is why environmental measures are a basic objective of mankind, since civilization exerts a permanent pressure of degradation. Of these, an important role is played by the reengineering of industrial processes coupled with strict measures to improve depollution solutions.

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