

Employee Environmental Responsibility: Empirical Analysis and Typology



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Abstract. Environmental responsibility of employees is a key prerequisite for achieving environmental goals of an organization and improving its environmental performance at the managerial and executive levels. Forming environmental responsibility in employees requires an understanding of the mechanisms and drivers of individual environmental behavior that may differ considerably, depending on the environmentally significant professional and personal qualities that encourage their conscious manifestation at work. The purpose of our study is to provide theoretical and empirical substantiation of the types of employee environmental responsibility. Methodological basis for our work includes the concept of individual environmental responsibility and environmental behavior of employees. The empirical base of the study is formed by the data from a survey of employees at Russian pro-environmental enterprises of the oil and gas industry. According to the results of the cluster analysis of the data obtained, we reveal

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characteristics for the role models of environmental behavior and identify four types of employees: eco-conservatives, eco-pragmatists, eco-activists, eco-pro-activists, differing in the awareness and acceptance of the company's environmental values, compliance with environmental requirements in work activities, interest in participating in additional environmental activities and initiative in addressing environmental issues. The results obtained can be used to study the nature of individual environmental behavior and environmental responsibility; they can be also useful for companies in developing and improving human resource management policies and practices aimed at employees' environmental development. The main limitation is the fact that we have chosen major oil and gas industry enterprises as the object of research, and they have a highly developed environmental policy, environmental management and the practice of environmental development of personnel; this narrows the significance of the results obtained within one industry, not allowing us to draw generalized conclusions and give practical recommendations.

Key words: employee environmental behavior, required environmental behavior, voluntary environmental behavior, employee environmental responsibility, environmental competence, environmental engagement.

Introduction

The priority of environmental protection and conservation of natural resources has been a global trend in recent decades encouraging companies to include environmental safety and responsibility issues in development strategies as significant factors promoting competitiveness, investment attractiveness and trust of stakeholders (Dummett, 2008; Wang, 2016). Companies' experience proves that sustainable long-term environmental results are achieved through the consolidation of environmental activities and the human resource management system (HRM), which ensures increased competence, awareness and involvement of personnel in solving environmental problems in every business process and workplace (Bunge et al., 1996; Del Brío et al., 2007; Jabbour et al., 2010; Potrich et al., 2019).

In recent years, the understanding of the critical role of personnel in the implementation of the environmental strategy of an organization brings to the fore the concept of employee environmental responsibility (EER), which is determined by personal internal motives and attitudes in relation to environmental problems and is reflected in various models of employee environmental

behavior. Understanding the role models of employee behavior and their manifestation in real actions is an important condition for achieving the company's environmental goals (Ramus, Killmer, 2007; Benn et al., 2015; Boiral et al., 2015). Currently, various typologies of employees are presented in the literature depending on the presence or absence of individual qualities necessary for performing environmentally oriented activities, but not taking into account the relationship of these qualities or behaviors with employee environmental responsibility, which limits the understanding of organizational and personal mechanisms of its formation in a real organization. In this regard, the purpose of the research is to empirically substantiate and identify the types of employee environmental responsibility.

Literature review

In modern science and practice, environmental responsibility is a widespread concept associated with conscious and careful activity of organizations and people in relation to the environment. On a personality level, environmental responsibility is considered from the standpoint of individual attitudes and obligations (moral responsibility),

which are based on ideological attitudes, environmental values, human knowledge and experience (Ponomarenko, 2012; Kraynik, Sergazina, 2018; Babu et al., 2019). At the same time, individual qualities of an environmentally responsible person manifest themselves in the form of behavior aimed at obtaining environmentally favorable results (Eden, 1993; Hemphill, Laurence, 2018; Norton et al., 2015). When it comes to an employee, environmental responsibility means an understanding of environmental problems, the ability to solve them, and behavior aimed at reducing and preventing negative environmental impacts when performing professional duties.

The employee's ability to solve environmental problems is ensured by their environmental competence, which represents a set of environmental values, knowledge, skills and abilities of eco-oriented activities (Subramanian et al., 2016; Cabral, LochanDhar, 2020). The measure of environmental responsibility is employee environmental behavior (EEB), based on a sense of personal interest, determined by the degree of employee involvement in solving environmental problems and achieving significant results in the field of environmental protection (Eden, 1993). Employee environmental behavior combines behavior providing for the fulfillment of mandatory environmental requirements related to the environmental goals and indicators of an organization (mandatory or regulatory EEB), and behavior through which employees show willingness to cooperate with their company and its members demonstrating behavior in the workplace that benefits the natural environment (voluntary EEB) (Daily et al., 2009; Boiral, Paillé, 2012; Norton et al., 2015; Arzamasova, Esaulova 2021).

Thus, employee environmental responsibility can be defined as a form of environmentally significant behavior, manifested in the conscious voluntary involvement of employees in solving company's environmental problems, based on

their internal attitudes and values, and expressed in the desire to implement effective environmentally oriented professional activities through the practical application of environmental-oriented knowledge and skills¹.

Employee environmental responsibility is formed by two interrelated components (*Fig. 1*):

- *environmental competence* is a set of employee's environmental values, knowledge, skills and experience in an environmentally-oriented professional activity;

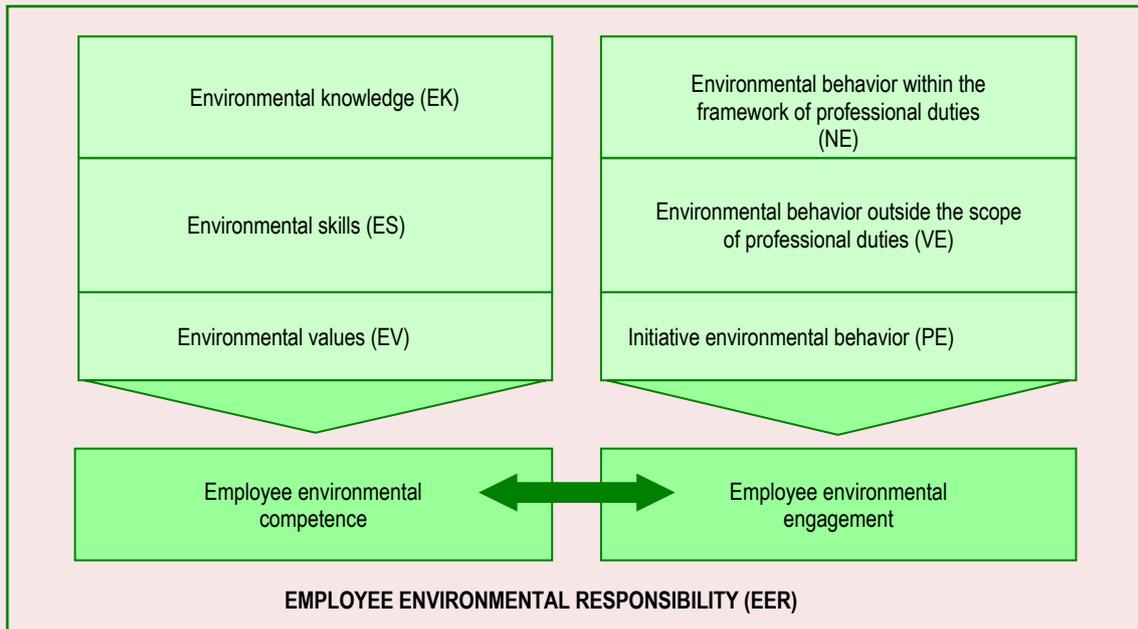
- *environmental engagement* is the active participation of employees in the implementation of environmental policy and goals of the organization, manifested in the voluntary contribution to the achievement of these goals and the desire to make a positive contribution to environmental initiatives and innovations.

The multicomponent nature of this scheme suggests that employee environmental responsibility can manifest itself in various forms of employee environmental behavior. Defining these forms becomes an important research task, since it will allow substantiating the relationship between employee environmental behavior and employee environmental responsibility, which, in turn, will be useful to select and implement appropriate personnel management practices in environmentally oriented companies.

To date, the scientific literature presents several typologies but, unfortunately, they have not yet been empirically supported. In particular, H. Opatha and A. Arulrajah described three types of employees: "defenders", "non-polluters", "activists" (Opatha, Arulrajah, 2014). There are extended classifications where, in addition to the demonstrated behavior, employee psychological motives are taken into account when solving environmental problems.

¹ Arzamasova G.S. (2021). Formation of eco-integrated human resource management model: Candidate of Sciences (Economics), thesis. Perm.

Figure 1. Employee environmental responsibility elements



Source: Arzamasova G.S. (2021). Formation of eco-integrated human resource management model: Candidate of Sciences (Economics), thesis. Perm.

For example, according to these characteristics, D. Ones and S. Dilchert distinguish “protective”, “executive”, “avoidant”, “motivating” and “initiative” workers (Ones, Dilchert, 2012). Depending on the intensity of the manifestation of employee environmental behavior, high-intensity and low-intensity employees are distinguished (Ciocirlan, 2016).

However, it is obvious that the classifications describe exclusively the employee behavioral differences in relation to ecology, whereas from the point of view of environmental management, it is not so much the formation of environmental behavior models that matters, as individual environmental responsibility, which, as we have justified above, is a complex structure combining professional knowledge, skills, attitudes, personal interest and environmental activities of employees. Within the framework of our research, the key criterion for building a typology of employees is

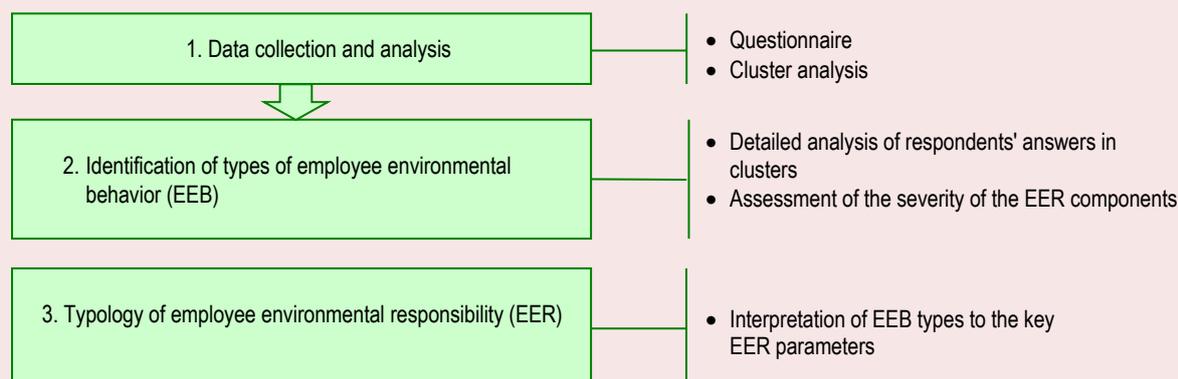
the component expression degree of employee environmental responsibility: environmental competence as a basis for encouraging the manifestation of environmental behavior, and its real manifestation in the form of environmental engagement.

Research methodology

The general model of studying employee environmental responsibility included three stages (Fig. 2).

The study involved 1,522 employees of production and nonproduction units of three Russian oil and gas companies including managers, specialists and workers. The study was conducted in 2021 at enterprises that are among the major nature users and belong to socially responsible companies. The unifying criteria for the selection of research objects were the well-formed environmental management system, “open” environmental policy, recognition of employee significance in

Figure 2. Research general characteristics



Source: own compilation.

Table 1. Research sample characteristics

Option	Meaning
Gender	Men – 75%; women – 25%
Type of division	Employees of production departments – 78% employees of non-production departments – 21%
Work experience in the company	Less than 1 year – 4%; up to 5 years – 18%; 5 to 10 – 23%; more than 10 years – 56%
Age	Less than 25 years old – 4%; up to 35 years old – 33%; 36 to 45 years old – 32%; more than 45 years old – 31%
Education	General (school) – 3.7%; secondary vocational – 29%; higher – 67%; academic degree – 0.3%
Position	Managers – 17%; specialists – 39%; workers – 44%

achieving environmental results and application on an ongoing basis of personnel management practices aimed at increasing the competence and engagement of employees in environmental activities (environmental training, environmental performance assessment, development of corporate environmental culture, implementation of socio-environmental measures, etc.). The research sample volume is 10% of the total number of employees of the enterprises. Table 1 presents the sample characteristics.

We collected data by anonymous questioning of employees using our own questionnaire containing 19 questions-statements developed on the basis of indicators of the elements of employee environmental responsibility (see Fig. 1) including:

1) environmental competence includes three groups of indicators for assessing the knowledge

(environmental knowledge – EK), activity (environmental actions – EA) and value (environmental values – EV) characteristics of an employee;

2) environmental engagement is represented by questions-statements to assess the level of:

– normative engagement (NE), which reflects the manifestation of employee environmental behavior within the framework of employee's job responsibilities;

– voluntary engagement (VE), which determines the employee's participation in additional environmental activities that go beyond the requirements of job descriptions and work instructions;

– potential engagement (PE), which reflects potential employee's readiness to solve environmentally significant tasks through the support and promotion of environmental proposals and innovations.

Table 2. Component indicators of employee environmental responsibility (fragment)

Variable	Index	Indicators
ECO-COMPETENCE	Environmental knowledge (EK)	An employee knows the measures necessary in their professional activity to prevent a negative impact on the environment and natural resource conservation
	Environmental values (EV)	An employee understands their personal responsibility for the impact of their activities on the environment
	Environmental action (EA)	An employee studies the information and weighs their actions in the workplace if they can lead to negative effects for the environment
ECO-ENGAGEMENT	Normative engagement (NE)	An employee fulfills the established obligations and environmental requirements for the professional activity
	Voluntary engagement (VE)	An employee on their own initiative takes part in environmental actions aimed at improving the environment
	Potential engagement (PE)	An employee shows interest and willingness to participate in working groups to address environmental issues
Source: own compilation.		

Table 2 presents the characteristics of the component indicators of employee environmental responsibility.

We carried out the assessment of the elements of employee environmental responsibility on a five-point Likert scale in values from 4.0 (the answer is “I completely agree”) to 0 points (the answer is “I do not care”). We checked the validity and reliability of the questionnaire using Cronbach’s alpha and the average variance extracted (AVE) indicators, whose values did not exceed the critical 0.7 and 0.5, respectively. Discriminant validity value according to the Fornell – Larcker criterion (AVE square root) exceeded the correlation coefficients of each variable. Thus, we can talk about the consistency and high reliability of the analysis tool.

To identify employee groups, we used cluster analysis with the k-means method with preliminary allocation of the optimal number of clusters using the construction of a hierarchical model by Ward’s method. We carried out cluster analysis using the SPSS Statistics software product. We implemented the characteristics of the role models of employee environmental behavior and employee segmentation by the type of employee environmental responsibility on the basis of a detailed analysis of

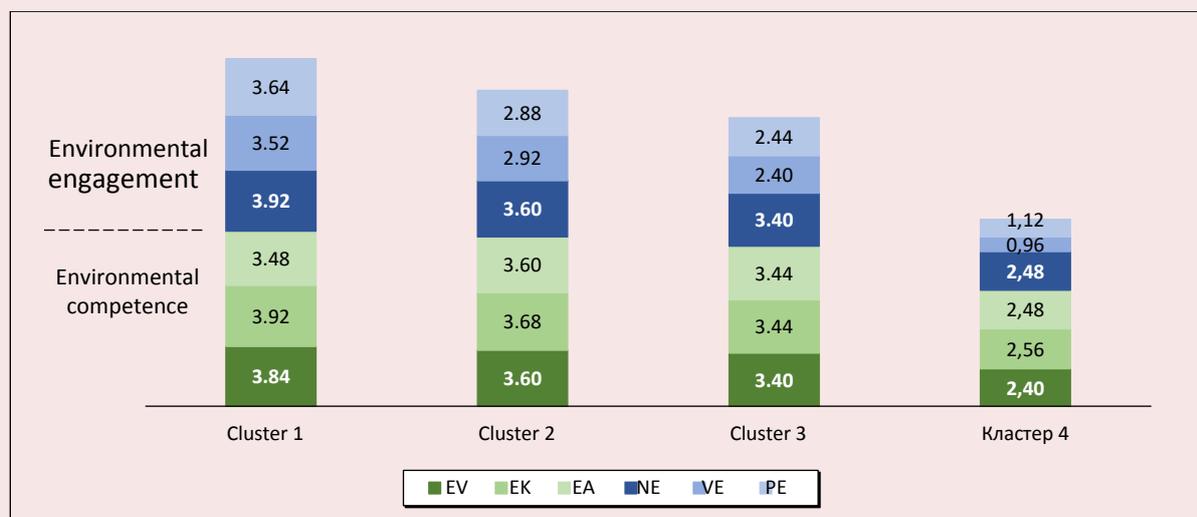
respondents’ answers to questionnaire questions and an assessment of average responses in clusters.

Results and discussion

Based on the survey results, we divided all 1,522 respondents into 4 clusters by the components of employee environmental responsibility. Belonging to clusters was checked in the range from three to five. We verified the reliability using F-test, the values of which show that the features used for clustering make a significant contribution to differentiation with the allocation of four clusters. Figure 3 presents the results of the cluster analysis.

Cluster 1 united 34.8% of respondents who are characterized by a high level of environmental competence (97%) and a slightly less noticeable rate of environmental engagement (91%). These employees are distinguished by an equally high development level of all components of eco-competence (knowledge, values, skills of eco-oriented activities), which indicates the formation of the required individual qualities necessary to perform eco-oriented professional activity. This is also evidenced by the high level of regulatory engagement (98%). Representatives of cluster 2 (24.1% of respondents) are also characterized by a balanced high level of environmental competence

Figure 3. Cluster analysis results (average answers of respondents)



Source: own compilation.

in all three components (91%), but less noticeable eco-engagement (79%) than in cluster 1. These respondents strictly and timely fulfill their official duties (NE – 90%). The level of voluntary (VI) and potential engagement (PE) among employees of this segment was in the range of 73–75%, which confirms their readiness to participate in environmental programs and events, as well as to take initiatives with environmental effect. Respondents in cluster 3 (34.6%) show a lower level of environmental engagement (69%), while it is worth noting that this indicator is formed due to a significant decrease in voluntary and potential involvement (61 and 60%, respectively). This

group of employees is also characterized by the availability of the necessary knowledge and skills to make proposals for improving environmental performance (eco-responsibility level is 83–86%). Cluster 4 united 6.5% of respondents with the lowest level of environmental competence (at the level of 62%) and engagement in environmental activities (38%).

Cluster analysis proved that the employee's role behavior is not related to the position or department specialization, since representatives of the four clusters are among all employee categories, both production and nonproduction services of the enterprise (Tab. 3).

Table 3. Cluster analysis results by employee categories

Classification	Employee category	Share in the sample, %			
		Cluster 1	Cluster 2	Cluster 3	Cluster 4
Position	Managers	45.8	30.5	21.8	1.9
	Specialists	27.8	34.8	30.9	6.5
	Workers	36.5	36.2	34.6	8.2
Type of division	Production	36.3	34.3	22.8	7.6
	Nonproduction	28.8	34.6	29.5	1.2

Source: own compilation.

Summarizing the results of cluster analysis and respondents' assessments of the proposed questions on the components of employee environmental responsibility allowed identifying specific models of employee environmental behavior (EEB): conservative, pragmatic, active and proactive (Tab. 4).

According to the selected types of environmental behavior, we have identified four types of employees: eco-conservatives, eco-pragmatists, eco-activists, eco-proactivists (Tab. 5).

Eco-conservatives do not interested in the company's environmental activities, partly due to the fact that their job responsibilities require minimal eco-competence, and environmental indicators are not included in the performance assessment. Such employees show low commitment to the company's environmental values and goals, which can become an environmental risk factor due to a lack of understanding of the effects of their actions or inaction both in their daily work and in

Table 4. Employee environmental behavior models (EEB)

<i>Conservative</i>	<i>Pragmatic</i>
Passive attitude toward environmental responsibilities, activities and innovations, lack of interest in environmental activities and company's development	Strict compliance with environmental requirements within the framework of official and work duties, without delving into the essence and significance of these requirements, in order to achieve personal environmental results and company results
<i>Active</i>	<i>Proactive</i>
Conscious participation in the environmental life of the company, support for environmental changes and making suggestions for improving environmental protection activities	High initiative in the field of environmental protection, due to deep commitment to the company's environmental values, willingness to take responsibility for environmental results and act as "environmental leaders"
Source: own compilation.	

Table 5. Typology of employee environmental responsibility

Option	Eco-conservatives	Eco-pragmatists	Eco-activists	Eco-proactivists
Attitude to environmental values and company's activities	Neutral or indifferent	Adoption of environmental values at the level of pragmatic justifications (encouragement, reward, praise)	Share company's environmental values and strive for the best environmental results	Perceive company's environmental values as their own
Compliance with mandatory environmental requirements	Ignoring and violating (intentional and unintentional)	Execution in strict accordance with the requirements	Conscious responsibility, personal and collective initiative on environmental issues	
Environmental competence	Minimum, within the framework of professional activity requirements	Within the framework of professional activity requirements	General and specialized environmental competencies	
		Additional knowledge and skills related to the position or role	Competencies in related fields of professional activity, experience in solving specific environmental issues and problems	
Voluntary environmental activities	Avoid participation in additional eco-activities, do not show initiative	Take part in eco-enterprises and can take the initiative, provided that mandatory requirements are fixed or material incentives are provided.	Active participants of eco-events, initiatives within the framework of direct environmental responsibilities, can be members of working teams to solve environmental problems	Actively participate in eco-events and initiate their implementation, make proposals to improve the environmental performance of their work, work in related fields and companies, attracting colleagues
According to: Arzamasova G.S. Formation of eco-integrated human resource management model: Candidate of Sciences (Economics), thesis. Perm.				

a critical situation. Eco-pragmatists are employees, characterized by a high level of normative engagement. In order to attract employees of the second type to environmental activities that are not part of their professional duties, additional incentive measures are required or the transfer of participation in events to the plane of “mandatory” requirements. As a rule, employees with a pragmatic behavior type do not always see opportunities to improve their activities from an environmental point of view, but taking into account the necessary knowledge and skills, as well as a high degree of diligence, they can take the initiative provided additional incentives, primarily material. Eco-activists and eco-proactivists are the employees most interested in the environmental activities of the enterprise, who are ready to give their energy and strength to improve it. Eco-activists may need formal and informal support from the outside, expressed in financial incentives, support from management, engagement in working groups to solve environmental significant tasks, various forms of recognition of their contribution to achieving environmental performance (honor boards, media publications, etc.). Eco-activists can be considered as managers of environmental projects, working groups, representatives of the company at external eco-events. These employees, as a rule, act as drivers of environmental innovations in their departments and can be considered as environmental leaders.

Conclusion

In the wake of the growing interest in improving the environmental efficiency of business, the task of measuring and evaluating employee environmental responsibility, which ensures the real participation

of employees in achieving the environmental goals of the organization, is rather relevant, but the least studied from a scientific and practical point of view. The presented study offers an empirically based typology of employee environmental responsibility, combining, on the one hand, the personal mechanisms of employee environmental responsibility, and on the other hand, their manifestation in real practical activities with an environmental effect. This approach allows forming new approaches to the study of the mechanisms and factors of formation of employee environmental responsibility, thereby contributing to the development of ideas about its nature and methods of its management.

From the point of view of practice, the results obtained can be applied by specialists in the field of personnel management to analyze employee environmental responsibility in order to develop appropriate HRM practices for the formation of eco-friendly behaviors and maximize the use of the “ecological” potential of employees in the context of the company’s environmental policy and strategy.

Our study has a number of limitations. The survey was conducted at enterprises of one industry with a high level of environmental responsibility, a developed system of environmental management and practices of working with personnel, which, first, narrows the significance of its results within the framework of one industry; second, it is obvious that at enterprises with less developed environmental policy and environmental protection activities, there are other (rather borderline) types of employee environmental behavior.

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