Managing Environmental Knowledge in Enterprises: The Perspective of Young Employees

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Abstract: Ever-increasing industrial production and consumption are putting an increasing strain on the environment. Currently, the most unfavourable rates of greenhouse gas emissions and waste generation are recorded. Analysing these data, it is apparent that the political and regulatory measures taken are having insufficient effect. In building public awareness of this issue, it is important to create responsibility among the employees of enterprises, who have a direct impact on environmental protection with their everyday decisions. Very important in this process are the internal systems of companies, which should allow the creation of good environmental practices and solutions. But also the sharing of this knowledge and its implementation in the daily activities of employees. Based on the above premises, the aim of this study was to assess the status of environmental knowledge management processes in enterprises. A questionnaire survey was used to achieve the objective. The questionnaire contained open and closed questions and was distributed via the Internet. The target group of the survey was young employees of enterprises. The results obtained determined that those surveyed are characterised by a high awareness of environmental protection. However, most of them believe that they are not well informed about environmental protection principles when doing their job. Respondents also gave a low rating to the availability of knowledge in this area and the possibility of acquiring and improving it. In only about 2% of cases did the respondents receive training dedicated to environmental protection at their workplace. In contrast, as many as ca. 84% declared that there was no environmental training at their workplace. Respondents indicated knowledge gained individually on the Internet, TV, books and other resources as the main source of their knowledge. The identified state prompts actions to raise the profile and role of employee education and the implementation of knowledge management systems, which will be able to contribute to improving environmental performance on the part of enterprises. It is important to keep in mind that very often line operational staff have a very strong influence on environmental issues. They are the ones who separate waste, package products, use consumables, operate equipment, etc.

Keywords: Knowledge management, Environmental knowledge, Young employees, Employee training, Environment

1. Introduction

In recent decades, we as the earth's population have been experiencing more and more pronounced climate change. This is happening largely due to human activities (Steffen et al, 2018). First and foremost, the burning and exploitation of fossil fuels, which generate emissions of the greenhouse gases carbon dioxide and methane (Rockström et al, 2009). Other significant sources of these gases are landfills, energy production and industry. These activities are causing greenhouse gas concentrations to reach their highest level in 2 million years and continue to rise (World Meteorological..., 2024). Climate change and the current environmental situation are exacerbating the demands that are placed on today's businesses. Putting pressure on the way they do business. The expansion of business and the increasing reliance on natural resources is deteriorating ecosystems which will disrupt human well-being in the long term, albeit observable (Tomalka et al, 2024). This is reflected in, among other things: threats to human health and social problems such as migration and conflict (Talukder et al, 2021).

The gradual implementation of transformational actions in companies involves a number of specific practices and the strengthening of management processes. More environmentally friendly actions by companies will require investments, including in human capital, while taking into account fairness and equity. The transformation of companies towards a green economy requires an integrated approach where the institutional, financial and political levels are aligned with these goals. An urgent need has arisen among companies to create and develop knowledge that reduces the negative impact of the organisation on the environment and its resources. Undoubtedly, this direction of development will result in achieving sustainable competitive advantages over industry rivals (Al-Qudah et al, 2022). Therefore, it is essential to take systemic measures to achieve positive environmental impacts. Their real effect will be to improve human wellbeing as well as the environment as a whole (Tomalka et al, 2024). In view of the risks presented, it is extremely important to utilise environmental knowledge by company employees, who, through the way they perform

their work, can have a significant impact on the level of negative impact on the environment. The impact on the creation, storage, sharing and implementation of knowledge are key elements in a properly organised knowledge management system.

A very important and key factor in the implementation of an environmental knowledge management system in companies is employee awareness in this area. This enables a positive overall effect to be achieved and the prospect of a beneficial impact on the activities of the entire company (Nair and Munusami, 2019). Effective and efficient solving of environmental problems and simultaneous work in line with the company's policies requires awareness and competence in the field of environmental protection among employees. A fundamental factor in the effective implementation of knowledge management systems is determining employee awareness and reviewing their resources and knowledge. This is an input resource for building knowledge management and defining barriers to progress. Therefore, the first research question was posed RQ1: What is the level of environmental awareness among young employees?

Knowledge sharing is crucial to the success of an organisation. It drives innovation, enables effective problem solving and facilitates the flow of information between decision-making levels and structures within the company (Zhao, 2024). Knowledge sharing is an activity in which each employee disseminates and exchanges information, ideas, improvements and previous experiences, as well as mutually transforms and improves it. This process provides an opportunity to create synergistic value within the organisation, thereby improving the innovation potential and adaptability of the entire organisation (Qing and Xumei, 2005). Organisational behaviours involving knowledge sharing are voluntary activities aimed at transferring and exchanging information, expertise, including environmental protection principles, between employees or groups (Hoegl et al, 2003). The correctness and effectiveness of this process can have a significant impact on the success of an organisation (Ga´al et al, 2015). However, the ultimate willingness and motives for sharing knowledge depend on the individual characteristics of employees (Sun et al, 2021). Nevertheless, organisations certainly have a great opportunity to support and motivate this process. The results of Jilani et al (2019) research indicate that knowledge sharing in an organisation has a positive and significant impact on its development. Furthermore, knowledge sharing has a positive impact on business performance. These results confirm the benefits that can be gained from implementing and promoting a knowledge sharing policy. In view of the above, the following research question was adopted RQ2: Are employees informed about environmental protection principles at their workplace?

Continuous education and improvement of skills in the field of pro-environmental activities are essential in achieving the goals of sustainable business. The availability of environmental knowledge and the provision of training, coaching and continuing education in this area drive environmentally friendly activities. This approach allows for the engagement of employee innovation and creativity to achieve sustainable work results. The availability and transfer of tacit and explicit knowledge by encouraging employees to share their skills within the company and facilitating the transfer of information to other parts of the organisation, including through training systems and support for knowledge sharing, are important elements of environmental knowledge management.

Sharing environmental knowledge has a positive impact on the green behaviour of employees (Zhang, 2021). The effectiveness of this process may vary depending on the cultural approach to ecology and regulatory forces (Hossain et al, 2025). Knowledge accessibility is defined by Sadeghi and Rad (2018) as the best way to improve the innovative capacity of organisations (Sadeghi and Rad 2018). The availability and sharing of knowledge about environmental protection builds an organisational atmosphere of cooperation. This is achieved by creating facilities and a willingness to share knowledge. It creates consistency in the actions of employees in using such knowledge. It contributes to the generation of greater and better knowledge about the environment (Sawhney and Prandelli, 2000). Therefore, the following research question was adopted in this study RQ3: What is the availability of knowledge about environmental protection?

The role of management is widely recognised in many circles as crucial in the process of any change within a company. Representatives of organisations, owners and managers are essential catalysts in setting the direction for green transformation. Their involvement is indispensable in the comprehensive implementation of environmental protection at every level (Liefländer and Bogner, 2014). It is the organisational and managerial apparatus of the company that should take the lead in building environmental knowledge management systems. Effective and committed managers are able to create a work atmosphere free of fear and based on mutual trust, in which members are willing and ready to share knowledge with each other

(Donate and de Pablo, 2015). Therefore, the following research question RQ4 was posed next: Are the company and its supervisors involved in environmental protection?

2. Green Knowledge Management

The current environmental situation and the context presented make it necessary for industries to continuously work on reducing waste and emissions in the value chains they create. Such initiatives have wide-ranging benefits. They are observable in the field of: financial savings, improved corporate image, increased competitiveness or access to new markets. He et al (2024) refers to the observed need for sustainable practices within companies as cumulative stress. There are many dominant areas of research in the field of knowledge management. The work conducted concerns the role of knowledge management in innovation (Hameed et al, 2021), efficiency (Rashid and Rasheed, 2023), small business activities (Rehman, 2022) and environmental aspects (Shahzad et al, 2020). Many publications present research results and emphasise the importance of knowledge management in reducing the negative impact of business activities on the environment (Rehman, 2022a; Sahoo et al, 2023). Based on this body of work, it is possible to plan further research on the components and sub-processes of knowledge management in companies.

These conditions have led to an interest in Green Knowledge Management within companies. This term should be understood as: knowledge management's focus on the environmental aspect of sustainability (Gauthier and Zhang, 2020). Green knowledge management promotes progressive growth and environmental awareness within an organisation by changing the way companies deal with innovation and environmental knowledge (Shah, Hussain, and Irshad, 2024). Raising awareness among company management about green knowledge management is the first step towards reducing environmental impact. It provides an opportunity to acquire, understand and effectively use knowledge for environmental purposes (Fong and Chang, 2012). As a rule, board members and senior managers are more knowledgeable and motivated to implement green aspects and work organisation techniques. A well-designed and implemented knowledge management system should equally effectively communicate environmental assumptions and benefits. However, this still requires achieving a higher corporate culture (Song, 2020). Abbas and Khan's (2023) research confirms that green knowledge management is very important to ensure green innovation and corporate green performance. The results of this work confirmed that an organisation's commitment to promoting environmental knowledge and behaviours among employees yields positive results. By extending knowledge management to environmental aspects, the corporate image becomes more responsible in the eyes of business partners and other stakeholders (Abbas and Khan, 2022). In turn, the work of Zhang (2024) confirms that a commitment to green knowledge management positively influences green creativity and green competitive advantage. By the same token, it is a further confirmation of the importance and relevance of effective use of environmental knowledge in companies (Zhang, 2024). The research of He et al, (2024) explains that a culture of environmental knowledge sharing within a company reinforces the benefits of such behaviour, while also contributing to organisational innovation and resilience. The results of Rehman's et al, (2024b) work in SMEs confirmed that an environmental learning mindset plays an important role in improving a company's environmental performance. Acquiring and managing green knowledge in a formalised way translates into better environmental performance for the organisation. This concept places great emphasis on the creation and implementation of environmental knowledge within the organisation's activities. Research by Wang (2022) has shown that companies that adopt an environmental knowledge orientation can expect to reap the benefits of green innovation. As a result, these companies transform into learning organisations, improving the acquisition and implementation of environmental knowledge. This has a broad impact in the form of improved environmental performance.

Gauthier and Zhang (2020) point out that although the issue of knowledge management is sufficiently well researched and makes important contributions to science and practice, the concept of green knowledge management is still insufficiently explored. According to the authors of this work, environmental sustainability is a megatrend that will shape the competitiveness of companies in the near future (Gauthier and Zhang, 2020).

Similarly, Aykol and Leonidou (2015) argued that the implementation of sustainable development concepts in companies has not been sufficiently researched. Most studies on this topic focus mainly on large organisations and developed countries. In view of this opinion, all attempts to conduct empirical research in this area are worthwhile. This is supported both by the underdeveloped base of scientific articles, but also by the social importance of this topic. In view of the above, the aim of this study was to assess the state of environmental knowledge management processes in companies. Due to easier access to young people, the study was

conducted on just such a population. The research gaps presented above provide a solid foundation for the research questions and the aim of the study as presented above.

3. Methodology

A quantitative survey method was chosen to achieve the stated objective. A questionnaire survey was conducted among 104 people. The sampling was characterised by features of purposive and convenience sampling (Novielli, Kane and Ashbaugh, 2023). The survey questionnaire was an original design tool consisting of seven stages. These included respondents' environmental awareness, knowledge of environmental principles in the workplace, the availability and accessibility of this knowledge, supervisors' involvement in this topic and suggestions for improvement regarding the management of environmental knowledge. The questionnaire developed was self-completed by the respondents. It was structured to collect data to assess the status of environmental knowledge management processes in companies. The questionnaire used nominal and ordinal scales, and open-ended questions. After the initial development of the questionnaire, it was subjected to validation and a pilot study. After this stage, minor corrections were made and the final form of the questionnaire was achieved. This process ensured that the questionnaire was comprehensible to the target group of the study. The questionnaire was delivered electronically for completion. It outlined the purpose of the survey and emphasised the voluntary nature of the survey. This was intended to foster confidence and thus encourage respondents to answer honestly and factually. The process of sending out and collecting the questionnaires lasted from January to March 2025. Geographically, the survey was limited to the Małopolska Voivodeship in Poland. The collected results illustrate the knowledge, opinions and assessment of the situation regarding environmental knowledge management in the surveyed sample of respondents. The structure of the sample is presented in Table 1. In accordance with the assumptions of the study, the survey was limited to young age.

Table 1: Characteristics of the study sample

Independent variables	Categories	Structure indicator (%)
Gender	female	55
	male	42
	refusal	3
Age	18-22	64
	23-26	34
	27-35	2
Total length of employment	up 2 years	65
	2-4 years	30
	5-8 years	5
Company size	less than 10 persons	20
	10-49	36
	50-249	15
	over 250	29
Industry	transport and logistics	19
	trade	19
	catering and hotels	17
	manufacturing	16
	other	29

4. Results

The study of environmental knowledge management in companies began by determining the level of environmental awareness of the surveyed respondents. Respondents rated individual statements on a Likert scale. The results of this assessment are presented in Figure 1. The data presented confirms that the surveyed sample of young employees has a high level of awareness. High indications for pro-environmental behaviour were achieved in both surveyed cases. The data shows that between 42% and 44% strongly agreed with these

statements and about 33% tended to agree. Taken together, these two attitudes make up the vast majority of responses (around 75%). Which confirms, the high level of environmental awareness of the surveyed sample of respondents.

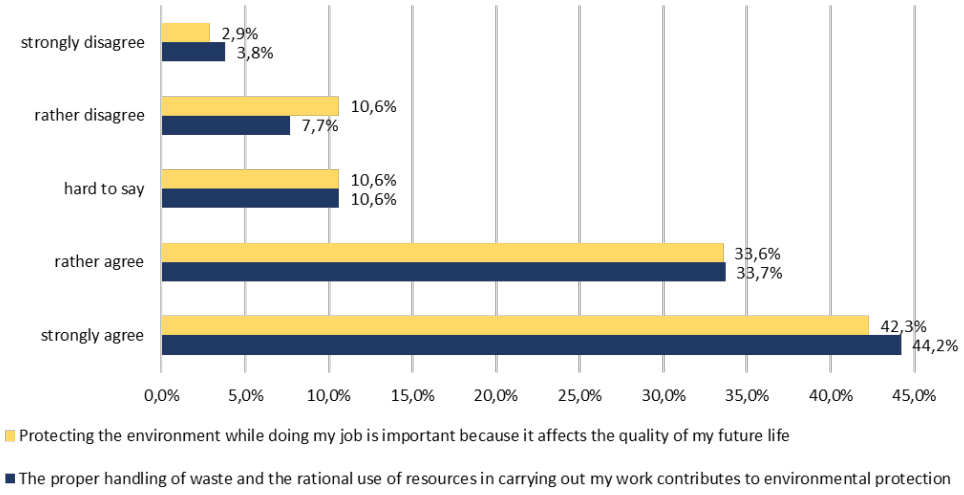

Figure 1: Environmental awareness of the surveyed respondents

For the data that formed the latent variable used to assess their environmental awareness, an internal consistency analysis was performed using Cronbach's alpha coefficient (Revelle, 2023). As can be seen in Table 2, its value was 0,802, which confirms the high consistency of this scale. Removing any of the questions does not increase reliability.

Table 2: Cronbach's alpha coefficient in measuring employees' environmental awareness

	Value
α Cronbach	0,802

The respondents' opinions on the level of their being informed by their employer about the environmental principles at their workplace were further investigated. The data obtained are presented in Figure 2. It can be seen that the majority of the respondents expressed a negative opinion about their information on the principles of environmental protection at work (37,5%). Considering the importance of environmental issues and its widespread publicity, these values are very worrying. For a more detailed examination of differences and opinions broken down by independent variables, a non-parametric Kruskal-Wallis test was performed. Its results are presented in Table 3.

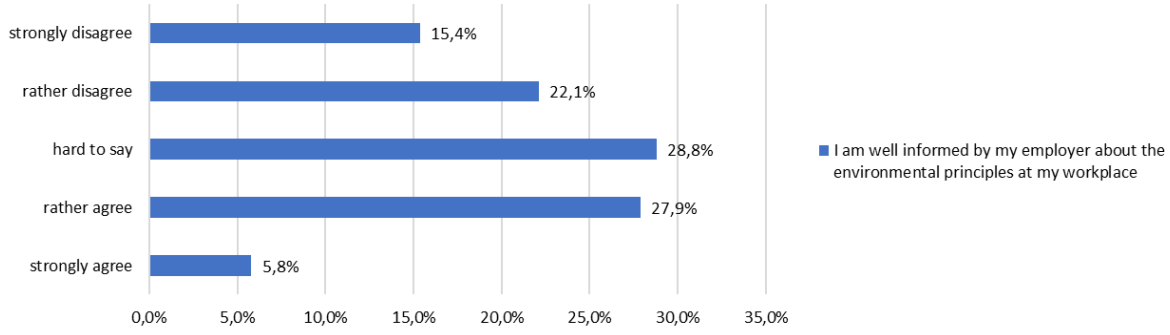

Figure 2: Evaluation of the employer's communication of environmental principles at the workplace

The assessment of employee awareness of environmental protection rules in the workplace was examined in relation to age, company size, scope of company operations and length of service of respondents in order to identify statistically significant differences between these groups. Statistical analysis using the Kruskal-Wallis test (Table 3) did not provide grounds for concluding that there is a statistically significant difference in the assessment of informing respondents about environmental protection principles in the workplace in the groups studied. Significance level α=0,05 adopted.

Table 3: Results of the analysis of differences between groups - Kruskal-Wallis test

Independent variable	χ^2	df	p
Age	0,619	1	0,432
Company size	3,55	3	0,314
Scope of the company's operations	4,13	2	0,127
Length of service	1,42	2	0,491

As a further element of the knowledge management system, employees' opinions on the availability of environmental knowledge were assessed. For this purpose, two statements were used on which respondents declared their approval or disapproval on a Likert scale. The data obtained as a result of the survey are presented in Figure 3. This data shows that the vast majority of respondents believe that environmental information and knowledge is not readily available to them (about 46%), and an equally large proportion of respondents declare that their employer does not facilitate their environmental knowledge (about 63%). These results paint a negative picture of knowledge management systems that are poorly organised and do not provide opportunities for employees to expand their environmental knowledge and put it into practice. The lack of ease in this area discourages individual employees from taking additional action and initiative in their search, a discouragement.

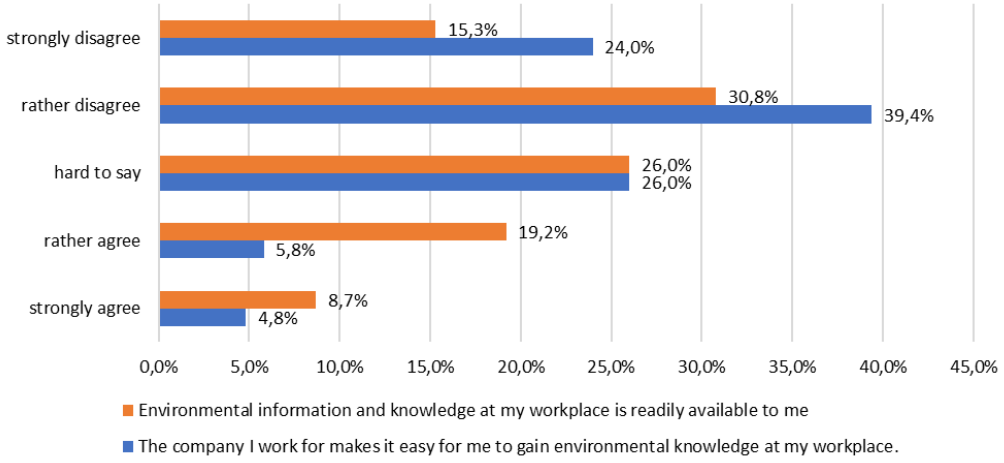

Figure 3: Availability and acquisition of environmental knowledge at the workplace

Cronbach's alpha analysis was used to assess the reliability of this measurement. The results of this analysis indicated that the consistency of responses is at a high and acceptable level (Table 4). This substantiates the conclusions of this study. Removing any of the questions did not improve the reliability of the measurement.

Table 4: Cronbach's alpha coefficient in measuring availability of environmental knowledge

	Value
α Cronbach	0,766

The next stage of the study analysed the availability of training, which can be understood as part of the process of knowledge sharing and implementation in the company. The data collected are presented in Table 5. They show that as many as 83,7% of the surveyed employees do not receive training in which environmental knowledge is imparted at the workplace. In 14,4% of cases, environmental protection was part of the subject matter of more general training. Only 1,9% of the employees declared the existence of training entirely dedicated to environmental protection. Those who declared this were employed in companies with more than 250 employees in the following sectors: automotive and trade. These figures may indicate that companies neither seek to build nor develop the environmental competences of their employees and do not support environmental goals in real and practical terms. This is a manifestation of the lack of systematic and formal implementation of knowledge in this area. This confirms that environmental education of employees is not part of the strategy of these companies.

Table 5: Presence of training in companies dedicated to environmental protection

Answers given by respondents	Percentage of indications (%)
No	83,7
Yes, in my work there is training entirely dedicated to environmental protection	1,9
Yes, there is training in my work that is partly dedicated to the environment protection	14,4

A chi-square test was performed to better examine the relationship. The relationship between environmental training and company size, scope of operations, and employee seniority was verified. The test results are presented in Table 6. In cases where there were grounds for rejecting the null hypothesis and a relationship existed, the V-Cramer coefficient was calculated. The data presented in the table prove that there is a statistically significant relationship between environmental training in companies and company size and employee seniority. The values of the V-Cramer coefficient indicate that this relationship is moderate.

Table 6: Results of the chi-square independence test

Independent variable	χ^2	df	p	V-Cramera
Company size	15,7	6	0,015*	0,275
Scope of the company's operations	8,38	4	0,079	-
Length of service	9,70	4	0,046*	0,216

*- there is a statistically significant relationship $p<\alpha=0.05$

In view of this low level of training in companies, the next step investigated what the main sources of employees' environmental knowledge are. The results are presented in Table 7. As can be seen, the vast majority of employees surveyed (approx. 67%) base their activities on knowledge gained from the Internet, TV, books or other resources. This is followed by declarations of relying at work on knowledge gained from secondary school (approx. 17%) and university (approx. 12%). Only 3% of respondents declared that their main source of environmental knowledge on the job is knowledge gained at work. These data are cause for concern and confirm that environmental knowledge management in companies is hardly functioning in practice. Employees are on their own when it comes to further training. They have to rely on external sources of information. Also noteworthy is the low percentage of indications of formal education, which apparently provides very little environmental knowledge for future employees of companies.

Table 7: The main and greatest source of knowledge on environmental protection at work

Answers given by respondents	Percentage of indications (%)
Knowledge I have gained myself from the internet, TV, books and other resources	67,2
Knowledge gained during my studies	12,5
Knowledge gained at work	3,0
Knowledge gained in secondary school	17,3

In order to examine the relationship between sources of environmental knowledge in greater depth, a chi-square test was used to analyse the relationship. The data obtained during the analysis are presented in Table 8. The study showed that age, gender, company size and scope of activity do not influence the sources of environmental knowledge acquired by employees. However, there is a statistically significant relationship between the sources of environmental protection knowledge and length of service. The strength of this relationship is moderate, as indicated by the V-Cramer coefficient (0,372).

Table 8: Results of the chi-square independence test

Independent variable	χ^2	df	p	V-Cramera
Age	8,34	6	0,214	-
Gender	3,92	3	0,271	
Company size	9,09	9	0,429	-
Scope of the company's operations	6,56	6	0,364	-
Length of service	28,8	6	<0,001*	0,372

*- there is a statistically significant relationship p<α=0.05

In the next stage of this study, the level of commitment of the company and supervisors to environmental protection related to their activities was determined. The data obtained are presented in Figure 4.

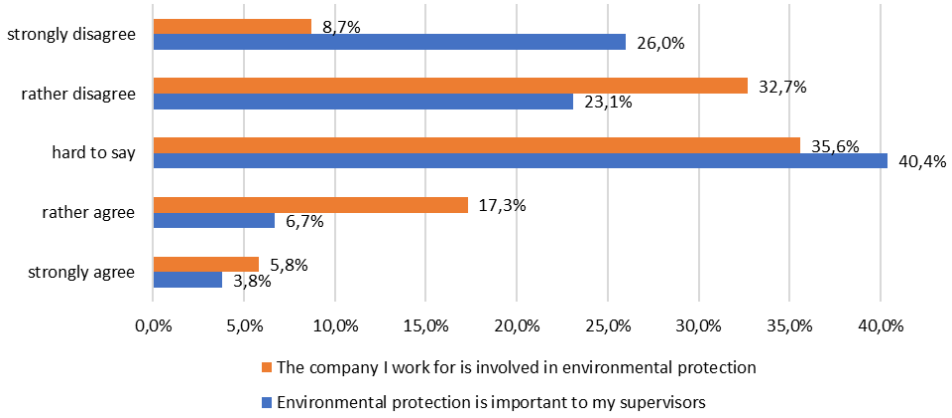

Figure 4: Company and supervisor involvement in environmental protection as perceived by employees

The data shows that there is little commitment from superiors. As many as 49,1% of employees do not agree with the statement that environmental protection is important to their superiors. The commitment of the company as a whole to environmental protection is slightly better perceived. Compared to their superiors' assessment, only 41,4% of employees disagree. This may be due to better promotion and attention to the pro-environmental image of companies, which very often attribute such behaviour to themselves. Nevertheless, it is apparent that employees rate their superiors' and the company's commitment to the environment low. Analysis of these data indicates significant deficits in organisational leadership in the pursuit of ever better environmental performance. Executives do not lead by example and do not foster pro-environmental attitudes in subordinate employees. As in previous cases, the reliability of the scale was analysed. The data obtained are presented in Table 9. Cronbach's alpha was 0,770, which means that the reliability of the scale can be considered acceptable.

Table 9: Cronbach's alpha coefficient in measuring availability of environmental knowledge

	Value
α Cronbach	0,770

In the final stage of the survey, in an open-ended question, surveyed employees were asked to indicate what could be done to ensure that environmental provisions were implemented to a greater extent in their workplaces. The most frequent suggestions and indications included:

- the introduction of training dedicated to environmental protection, preferably in the form of practical workshops, which would increase the knowledge and awareness of employees and employers in this area,
- better segregation of waste, recycling, saving raw materials (water, automatic lighting, avoiding plastics,
- introduction of publicly available materials: posters, brochures, leaflets informing in a pleasant to understand form on how to behave in an environmentally friendly way,
- reducing the use of paper, e.g. through digitalisation and digital documents,
- clearer and more precise guidelines and regular internal audits,
- reduction of excess film and better adaptation of packaging to product size,
- motivating employees through benefits and incentives, encouraging initiative,
- use of sustainable raw materials, e.g. photovoltaic energy, biofuels,
- reporting of environmental data to employees (e.g. resource consumption, energy),
- optimising transport operations management.

As can be seen from the suggestions made by employees, there is a great deal of room for improvement in this area.

5. Conclusion

The research conducted tackles the very important topic of environmental protection in companies. In this case, the research focused on the evaluation of the environmental knowledge management system in companies. Young employees, who do not have much work experience and often occupy line positions, were chosen as the research group. Many times it is their decisions and behaviour that can determine the amount of resources consumed. It is these employees who are responsible for activities such as packaging or waste disposal, and thus their attitude and behaviour have a significant impact on the environmental load. he picture presented by this study of the state of environmental knowledge management is not optimistic. It appears that employees are characterised by a high level of environmental awareness. However, they do not perceive the commitment of their superiors and the company as a whole to environmental problems. Employees mostly rely on knowledge gained from the Internet, TV and other external resources when doing environmental work. In contrast, the companies that employ them provide very little training in this area. Despite the exploratory and non-representative nature of this survey, it highlights a serious problem. This is the insufficient commitment of management and the lack of support for employees to improve their environmental competences at the workplace. It appears that the people surveyed are aware but the company is not interested in their development and in creating an environment of innovation for environmental problems. The potential of these people is untapped in the creation of internal knowledge resources. Through these inefficiencies, the knowledge management system cannot effectively create knowledge, transfer it and apply it to build a competitive advantage in the market.

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AI declaration: AI tools were not used to prepare the manuscript.

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