

**EVALUATION OF PRO-ECOLOGICAL ACTIVITIES
INFLUENCING THE QUALITY OF NATURAL
ENVIRONMENT ILLUSTRATED WITH AN EXAMPLE OF
A SELECTED COMMUNE**

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ABSTRACT

In this study, the undertaken pro-ecological activities aimed at improving the quality of the natural environment in one of the communes in southern Poland have been discussed. The presented evaluation of pro-ecological activities and their contribution to the improvement of the quality of natural environment in the examined commune from the perspective of the local community, commune authorities and the power company allow concluding that all these groups see the problem in the protection of the natural environment. The residents of the commune have declared their active participation in the improvement of the quality of natural environment in the commune, especially the condition of air. The local power company, through its information policy and activities related to the energy policy of the commune, endeavours to shape pro-ecological attitudes and effectively reduces the negative impact of contamination on the condition of natural environment in the commune. The commune authorities seem to contribute the least to the improvement of natural environment; they definitely need to be more engaged and appoint a leader who would effectively implement sustainable development strategies and work on the improvement of natural environment.

***Keywords:** pro-ecological activities, sustainable development, local community, commune authorities*

INTRODUCTION

The proposed solutions, the purpose of which is to harmonise co-existence not only between people, but also between man and the surrounding natural environment and economic environment, more and more often become the subject of interest of researchers [1], [2], [3], [4]. When developing various types of plans or projects for sustainable development strategies, it is common practice to employ specialists in many fields, who analyse the state of natural environment and indicate the most beneficial actions aimed at improving its condition [9], [10], [11], [12]. The local community as well as industrial enterprises that operate in a given area are increasingly involved in ecological activities [5], [6], [7], [8], [13], [14].

The article presents pro-ecological actions taken to improve the quality of natural environment in one of the communes in Poland. The examined commune in the south of Poland is affected by mining exploration. There is a large amount of pollution, mainly in the air. The most important air pollution in the commune comes

from the process of fuel combustion for technological and heating purposes. The major pollutant is carbon dioxide. Other harmful compounds released to the atmosphere include: sulphur dioxide, nitrogen oxides, carbon oxides and dust. In smaller quantities, various types of aromatic hydrocarbons, elemental carbon compounds in the form of soot, and heavy metals are also emitted. Problems related to the protection of natural environment and measures taken to improve its condition have been presented from three points of view: the local community, commune authorities and the power company operating in the commune subjected to research.

RESEARCH ANALYSIS

In the first stage of the analysis, the natural environment condition was assessed based on surveys conducted among the local community.

The residents of the commune answered the following survey questions related to the assessment of the natural environment condition.

Question 1. In your opinion, which of the following kinds of pollution influencing the natural environment condition in the commune affect you the most: waste, municipal sewage that is not discharged to sewage treatment plants, acid rain, street traffic, emissions from industrial plants, low emissions from individual coal-fired furnaces and boilers?

The residents of the commune believe that the largest amount of pollution - as much as 47% - comes from low emissions from individual coal-fired stoves and boilers (Table 1). In the second place, 16% of the pollution comes from traffic exhaust fumes. Next on the list are: waste - 10%, municipal sewage not discharged to sewage treatment plants - 9%, and emissions from industrial plants - 8% and; in the opinion of the inhabitants, the least pollution of 7% is produced by acid rain; other kinds of pollution account for 3% (Table 1), [15].

Table 1. Factors affecting environmental pollution in the examined commune in the opinion of its residents

Type of pollution	Amount of pollution [%]
Low emissions from individual coal-fired furnaces and boilers	47%
Traffic fumes	16%
Waste	10%
Municipal sewage that is not discharged to sewage treatment plants	9%
Emissions from industrial plants	8%
Acid rain	7%
Other	3%

Question 2. How do you assess the condition of natural environment in the commune (pollution of air, soil)?

47% of the commune residents assessed the natural environment condition as satisfactory; 30% claim that the natural environment in the commune is in poor

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condition; 15% believe that the natural environment condition is good, and in the opinion of 8% of the residents it is very bad (Table 2), [15].

Table 2. Evaluation of natural environment by the residents of the commune

Natural environment condition	[%]
Very good	0%
Good	15%
Satisfactory	47%
Bad	30%
Very bad	8%

The most noticeable factor having a negative impact on the natural environment condition was the emission of harmful compounds from individual coal-fired boilers and stoves (low emission). This state of affairs disturbed half of the respondents. Conversations held with the respondents allow concluding that this is a very serious problem, which often leads to conflicts between neighbours. It turns out that conflicts occur more often between neighbours who do not rely on heat from the heating network than between neighbours in a situation when one of them uses the network and the other does not. Other factors which according to the respondents adversely influence the natural environment condition are related to their place of residence. This results from the fact that people living in the vicinity of the unauthorized dumping ground are the most affected by this nuisance, whereas people living close to the street consider traffic to be the most burdensome factor. Nevertheless, when the respondents were asked about the general condition of natural environment in the commune, over 40% replied that it was satisfactory, while 30% of the respondents were of the opposite opinion – according to them, its condition was poor. It can be observed that in the summer the natural environment condition is relatively satisfactory, which is mainly due to a break in the heating season and the relatively good care of the City Council for the visual image of the commune. However, when the heating season begins, one can clearly see and feel how polluted the air is. Due to low emissions, the quality of life of the residents deteriorates dramatically. The commune inhabitants have declared their will to participate in activities aimed at improving the quality of natural environment in the commune, in particular, the condition of atmospheric air. Currently 20% of the residents use the district heating network, and they very clearly indicate the factors that significantly contribute to the degradation of natural environment in the commune.

In the second stage, the analysis was focused on the engagement of the commune authorities in the reduction of pollution emissions and the protection of natural environment, as well as their involvement in pro-ecological measures. Pursuant to the Act of 27 April 2001 "Environmental Protection Law", regarding sustainable development and environmental protection programmes, in 2017 the "Environmental protection program" was developed in the commune subjected to research.

Its main goal is to improve the condition of natural environment through its effective management, development of mechanisms that will protect natural environment from degradation and the impact of mining operations. In order to

determine the most important strategic goals regarding the protection of natural environment in the commune, a SWOT analysis was carried out. This analysis helped to identify weak points in the condition of natural environment. The weakest elements include [15]:

- degradation of natural environment,
- influence of coal mining on natural environment (75% of the commune is affected by mining exploitation),
- vicinity of big industrial plants,
- flood risk,
- low forest cover,
- industrial waste landfill site,
- weak system of individual waste segregation.

The commune authorities, among others, based on the weaknesses identified in the SWOT analysis, prepared tasks to be implemented in order to improve the quality of natural environment. The major tasks included (Table 4), [15]:

- creating conditions for the proper disposal and treatment of sewage throughout the town,
- creation of non-carbon heating systems for residential buildings, especially ecological heating,
- reduction of industrial pollution emissions,
- creating preferences for the development of enterprises with non-disruptive production processes,
- enlargement of green areas.

Table 4. Environment protection tasks implemented in the examined commune

Goals and tasks developed as part of the environment protection program	status of implementation for 2018
Creating conditions for the proper disposal and treatment of sewage throughout the town,	30%
Creation of non-carbon heating systems for residential buildings, especially ecological heating,	20%
Reduction of industrial pollution emissions	17%
Creating preferences for the development of enterprises with non-disruptive production processes,	13%
Enlargement of green areas.	20%

The analysis of the status of implementation of tasks contained in the "Environmental protection program" (the analysis involved interviewing the commune authorities and persons responsible for individual tasks) allows concluding as follows: as the years go by, a growing number of new plans and strategies are emerging (e.g. a plan of supplying the commune with energy utilities, which is one of sustainable development priorities). In principle, they constantly address the same factors threatening the natural environment, which allows concluding that the implementation of this plan leaves much to be desired. In the opinion of the commune residents, each newly developed plan is only a necessary

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evil, resulting from statutory provisions, and as such it is put in mothballs just after being created. The town authorities recall it only when ad-hoc inspections are carried out so as to check the performance of obligations imposed by law and recorded in the plans and strategies of the commune.

The last, third stage of the analysis involved reviewing the measures taken by the local power company to protect the natural environment.

The power company operating in the commune is responsible for providing energy services, as well as producing and distributing heat (coal-fired boilers), drinking water treatment, designing and construction of sanitary installations, central heating systems and steel structures. All of the company's operations are optimized in terms of cost, reliability and environmental protection. This last aspect will be described in more detail because of the topics discussed in the article. The main goals related to the environment condition improvement include:

- building a boiler room monitoring system,
- integration of the heating system in the commune
- obtaining the Clean Production Enterprise Certificate,
- modernization of the water treatment station into one of the most modern stations in the region.

Apart from the above mentioned objectives, the power company has also set long-term goals for a period of 10 years, such as:

- installing equipment with high dedusting efficiency systems,
- utilization of heat contained in water pumped out of the mine,
- promotion of renewable energy sources.

In the power company's documents one can read that all the undertaken measures are pro-ecological and fit in with the sustainable development of the commune.

CONCLUSION

Based on the conducted analysis, the following conclusions can be formulated:

The local community, the power company and the commune authorities clearly identify the factors that pose a threat to natural environment and agree on the need to pursue policies aimed at improving the quality of natural environment.

Implementation of plans and strategies for improving the condition of natural environment in the commune is insufficient; the local community feels that the commune authorities are not taking practical and effective measures.

Although the sustainable development of the commune is considered in a systemic way in combination with social, economic and ecological activities, its implementation is far from satisfactory due to the lack of financial resources, which is constantly emphasized by the commune authorities.

The local power company, through its information policy and activities, significantly contributes to the shaping of pro-ecological attitudes and tries to limit



the negative impact of pollution on the condition of natural environment in the commune. This involves monitoring the coal combustion process in the local boiler room and using the underground water treatment technology.

The commune inhabitants have declared their will to participate in activities aimed at improving the quality of natural environment in the commune, in particular, the condition of atmospheric air. Currently 20% of the residents use the district heating network, and they very clearly indicate the factors which significantly contribute to the degradation of natural environment in the commune.

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