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Role of non-governmental organizations in the area of effective environmental safety management in Poland on the example of Polish Smog Alert (PSA)

Introduction

Stable ecosystems are fundamental to human well-being, providing essential services that sustain our livelihoods and ensure the long-term health and prosperity of our societies. These intricate webs of life, encompassing diverse species and their habitats, play a vital role in supporting human existence. From clean air and water to food production and climate regulation, stable ecosystems are indispensable to our survival and quality of life. One of the key reasons why stable ecosystems are crucial for humans is their ability to maintain biodiversity. Biodiversity refers to the variety of life forms, from microscopic organisms to plants, animals, and ecosystems themselves, so it is a measure of the health and resilience of an ecosystem. It is commonly known that ecosystems with high biodiversity tend to be more stable, more productive and

adaptable to environmental changes, on the other hand, the loss of biodiversity can contribute to a drastic change of the entire ecosystem.¹

Environmental safety management is a critical aspect of ensuring that ecosystems are protected from harmful practices that may impact the health and safety of living organisms, including humans. It is a complex process that involves identifying potential environmental risks and hazards, assessing their impact, and developing strategies to mitigate and manage them. Relationship between human beings and nature makes it evident that the challenges generated by biodiversity loss and climate change are deeply interconnected and need to be addressed in an integrative manner.² For this reason, not only authorities at the local, national or supranational level play a key role here, but also non-governmental organizations, because they are by their nature focused on the well-being of humans and their environment.

The article focuses on the conditions of air in the cities which directly affects human health. As a case study, the activities of the non-governmental organization – Polish Smog Alert were focused on. Efficiently operating non-governmental organizations in a democratic state allow for optimal realization of the interests of all citizens.

The main objective was to examine the effectiveness of the Polish Smog Alert (PSA, Pol. Polski Alarm Smogowy) as an organization working for the environment – mainly clean air. Theoretical background for such an aim is discussion on environmental safety management, its key components, and the benefits it offers to society. In the research part conducted analysis concerned the fulfillment by PSA of the four basic functions that a non-governmental organization should perform: education, integration, mobilization, programing. The main research method was the analysis of content posted on the organization's website.

The importance of environmental safety management

Environmental safety management (ESM) is essential for maintaining the health and safety of the environment, including the air, the water, and the land we inhabit. Undoubtedly human activities, such as industrial processes, transportation, and agriculture, have a negative impact on the environment and cause significant harm to wildlife and human wellbeing. The direct consequences of these activities can include pollution, climate change, habitat destruction, and biodiversity loss.³ ESM seeks to

¹ B.J. Cardinale *et al.*, *Biodiversity loss and its impact on humanity*, "Nature" 2012, vol. 486, no. 7401, pp. 59–67.

² S. Díaz *et al.*, *Pervasive human-driven decline of life on Earth points to the need for transformative change*, "Science" 2019, vol. 366, no. 6471, p. 8, <https://doi.org/10.1126/science.aax3100>.

³ I. Manisalidis, E. Stavropoulou, A. Stavropoulos, E. Bezirtzoglou, *Environmental and Health Impacts of Air Pollution: A Review*, "Frontiers in Public Health" 2020, vol. 8, <https://doi.org/10.3389/fpubh.2020.00014>.

minimize these negative impacts and promote sustainable practices that protect the environment for current and future generations.⁴

Environmental safety means the security of vital interests and rights of an individual, society and the state against threats arising out of man's and nature's impacts on the environment.⁵ Environmental safety is not an easy task to implement, moreover managing environmental safety issues is highly challenging, time consuming and expensive activity.⁶ ESM is the process of identifying, evaluating, and controlling environmental hazards in order to minimize the impact of human activities on the environment. The management activities also include monitoring of the outcome of the undertaken control actions and finally lead to decisions regarding reassessment of the risk after the control actions have been implemented.⁷ ESM is an essential component of sustainable development as it ensures that economic growth is achieved without compromising the integrity of the environment. It is worth noting that environmental management systems have been successfully implemented for years by companies and NGOs that are sensitive to environmental issues and treat problems related to its protection seriously.⁸

The importance of ESM can be seen in a number of ways. Protection of the environment can be indicated in the first place. ESM measures ensure that environmental resources such as air, water, and soil are not contaminated or depleted. This protects biodiversity and ecological balance. Then we have protection of human health, ESM is used to ensure that people are not exposed to harmful environmental pollutants that can cause serious health problems. For example, the control of air pollution can reduce the incidence of respiratory diseases such as asthma and lung cancer. Moreover adopting environmental regulations help ensuring that businesses and individuals act responsibly towards the environment and influencing the creation of various corporate environmental practices.⁹ Compliance with these

⁴ *Designing safe and sustainable products requires a new approach for chemicals*, European Environment Agency, 4.02.2021, <https://www.eea.europa.eu/publications/designing-safe-and-sustainable-products-1/delivering-products-that-are-safe> [accessed: 14.04.2023].

⁵ See *environmental safety* definition in Law Insider Dictionary, <https://www.lawinsider.com/dictionary/environmental-safety> [accessed: 15.04.2023].

⁶ R. Yazdanifard, I.E. Mercy, *The impact of green marketing on customer satisfaction and environmental safety*, 2011 International Conference on Computer Communication and Management, "Proceedings of CSIT" 2011, vol. 5, no. 1, p. 639.

⁷ *Control of Environmental Hazards: Assessment and Management of Environmental Health Hazards*, World Health Organisation, Geneva 1989, p. 2, <https://apps.who.int/iris/bitstream/handle/10665/58908/WHO-PEP-89.6-eng.pdf?sequence=1&isAllowed=y> [accessed: 18.04.2023].

⁸ R. Florida, D. Davison, *Gaining from green management: environmental management systems inside and outside the factory*, "California Management Review" 2001, vol. 43, no. 3, pp. 65–66.

⁹ K. Babiak, S. Trendafilova, *CSR and environmental responsibility: Motives and pressures to adopt green management practices*, "Corporate Social Responsibility and Environmental Management" 2011, vol. 18, no. 1, p. 14.

regulations is necessary to avoid legal penalties and damage to the reputation of businesses. Implementing environmental safety management systems can lead to cost savings through the reduction of waste,¹⁰ energy consumption, and environmental remediation costs. Businesses that implement strong ESM policies can gain a competitive advantage by demonstrating their commitment to sustainability to customers, investors, and regulators.

Main components of environmental safety management

Environmental safety management comprises several key components, and is a comprehensive approach to managing environmental risks and protecting human health and the environment from potential harm. ESM includes a range of elements that work together to create an effective management system. These components include:

1. Environmental policy: This is a statement of an organization's commitment to protecting the environment, and sets the framework for the development and implementation of ESM programs. This also involves complying with applicable environmental laws, regulations, and standards, and ensuring that environmental risks are managed in accordance with these requirements. A number of studies have been conducted on the motivations behind companies adapting to rules and regulations. It turned out that voluntary environmental management has been touted as a powerful remedy or alternative to direct command-and-control regulations or market-based approaches.¹¹

2. Environmental risk assessment: United States Environmental Protection Agency (USEPA) considers environmental risk to be

the chance of harmful effects to human health or to ecological systems resulting from exposure to an environmental stressor. Stressors may adversely affect specific natural resources or entire ecosystems, including plants and animals, as well as the environment with which they interact. A stressor is any physical, chemical, or biological entity that can induce an adverse effect in humans or ecosystems. Stressors may adversely affect specific natural resources or entire ecosystems, including plants and animals, as well as the environment with which they interact.¹²

Environmental risk assessments typically fall into one of two areas: human health and ecology and is understood as a process of identifying, analyzing, and evaluating the risks associated with an organization's activities, products, and services,

¹⁰ See *Guidance Manual for the Implementation of the OECD Recommendation C(2004)100 on Environmentally Sound Management (ESM) of Waste*, OECD, Paris 2007, <https://www.oecd.org/env/waste/39559085.pdf> [accessed: 18.04.2023].

¹¹ J. Wu, *Environmental compliance: The good, the bad, and the super green*, "Journal of Environmental Management" 2009, vol. 90, no. 11, pp. 3363–3365.

¹² *Risk assessment*, United States Environmental Protection Agency, <https://www.epa.gov/risk/about-risk-assessment> [accessed: 9.05.2023].

and their potential impact on the environment and human health. Risk assessment involves identifying potential environmental risks and hazards and evaluating their likelihood and severity.

3. Environmental planning that can be understood “as the initiation and operation of activities to direct and control the acquisition, transformation, distribution and disposal of resources in a manner capable of sustaining human activities with a minimum disruption of physical, ecological and social processes”.¹³ It involves developing strategies and action plans to manage environmental risks and achieve environmental objectives. Planning may include waste management, energy conservation, pollution prevention, and environmental restoration. According to the *Encyclopedia of Ecology and Environmental Management*, it is worth noting that “environmental management is more complicated than traditional resource management, requiring more sophisticated planning, use of spatial data and implementation techniques”.¹⁴ This type of planning is fundamentally a multidimensional concept, so must be considered from different perspectives, as it helps to create effective green areas, reduces ecological risks and improves air and water quality. Furthermore it significantly reduces health risks and in general improves the quality of residents’ life.¹⁵

4. Environmental performance evaluation: This involves monitoring and measuring an environmental performance against established goals and objectives, and evaluating the effectiveness of ESM programs and initiatives. Monitoring includes conducting environmental impact assessments, measuring air and water quality, as well as monitoring of hazardous waste disposal and emissions.¹⁶ Effective monitoring and assessing the effectiveness of risk management strategies are crucial for identifying emerging risks and adapting risk management strategies to address them. This is directly related to conducting regular environmental audits of an organization’s environmental management system to ensure that it is effective, and to identify opportunities for improvement. Nowadays auditors are involved in reporting on corporate environmental issues, determining the incentive effects of the environmental movement on environmental management, and providing decision-makers with complex, quantitative information on environmental performance.¹⁷ There are new factors that must be taken into consideration in investment appraisal, and in

¹³ J.H. Baldwin, *Environmental Planning and Management*, Routledge, New York 2019, p. 4.

¹⁴ *Encyclopedia of Ecology and Environmental Management*, ed. P. Calow, Blackwell Science Ltd, Oxford 1999, p. 224.

¹⁵ A. Mersal, *Sustainable urban futures: Environmental planning for sustainable urban development*, “Procedia Environmental Sciences” 2016, vol. 34, p. 57.

¹⁶ S. Stojanovic, *Environmental performance evaluation*, Advisera, ISO 14001 Academy, 6.07.2015, <https://advisera.com/14001academy/blog/2015/07/06/environmental-performance-evaluation> [accessed: 9.05.2023].

¹⁷ R. Dixon, G.A. Mousa, A.D. Woodhead, *The necessary characteristics of environmental auditors: a review of the contribution of the financial auditing profession*, “Accounting Forum” 2004, vol. 28, no. 2, p. 120.

helping cost out new pollution control methods. Audits examining the feasibility of replacing materials used with sustainable resources and exploring recycling opportunities, as well as helping estimate the impact of green consumer preference in existing new markets.¹⁸

5. Environmental communication and training: This involves communicating environmental policies, risks, and performance to stakeholders, and providing training to employees and other stakeholders on ESM programs and initiatives. However, the very concept of environmental communication is definitely more complicated and includes a number of elements that are worth mentioning here. Namely, environmental communication has the following features: everyday practices, values, words, actions that are individually interpreted, negotiated and historically rooted; environmental communication is ideologically derived and embedded in a paradigm that assigns instrumental value to the environment and believes it exists to serve humans. Interestingly, it is also tied to pop culture, particularly advertising and entertainment, framed by the media, nowadays with the priority of social media and influenced by social institutions like government, business and NGOs.¹⁹ Wanting to define environmental communication in the simplest way, we can use a definition of Richard R. Jurin, Donny Roush, and K. Jeffrey Danter that closes this issue in one sentence, namely environmental communication is “the systematic generation and exchange of humans’ messages in, from, for, and about the world around us and our interactions with it”.²⁰

In summary, the components of ESM work together to create a systematic approach to managing environmental risks and protecting human health and the environment. Effective implementation of ESM programs can help organizations to achieve their environmental goals and objectives, while also reducing costs and enhancing their reputation. Environmental Safety Management is crucial to ensuring a sustainable future for all. It protects human health, the environment, and supports economic growth. Businesses and individuals must take responsibility for implementing ESM measures to ensure a better future for generations to come.

Research design and methodology

The main research method was the qualitative analysis of content posted on the Polish Smog Alert’s website carried out in May 2023, which was preceded by an

¹⁸ *Ibidem.*

¹⁹ J.B. Corbett, *Communicating Nature: How We Create and Understand Environmental Messages*, Island Press, Washington 2006, pp. 313–339.

²⁰ R.R. Jurin, D. Roush, K.J. Danter, *Environmental Communication: Skills and Principles for Natural Resource Managers, Scientists, and Engineers*, 2nd edition, Springer Science & Business Media, Heidelberg – Dordrecht – London – New York 2010, p. 15.

initial review of the website. In the actual study, content analysis, a categorization key was used, which, appropriately for the study material, was information related to the fulfillment of key functions by an organization working for clean air in Poland. It is worth noting "that in qualitative research, the categorization key is in itself a specific result of the research. The successive categories of the key are successive topics described in the analyzed texts or minor aspects of the main themes. Thus, it is a kind of list of issues raised in the research material"²¹

The starting point for the analysis of the content was the adoption of categories in the form of groups of information which testify to the effectiveness of NGO activities. As indicated above, the aim of conducted analysis concerned on the fulfillment by Polish Smog Alert of the four basic functions that a non-governmental organization should perform,²² and they became the key of the categories:

- education – influencing the shape of civic awareness and attitudes regarding environmental issues;
- integration – impact on partnership relations between entities that can jointly implement the goal of improving air quality in cities;
- mobilization – a set of substantive content and instruments inspiring citizens, public authorities and other groups and organizations to be active in the field of ensuring clean air;
- programing – direct impact on the process of shaping state policy.

The additional categories concern the scope of PSA's influence on environmental safety management in Poland. They are to a large extent related to the above-mentioned categories:

- environmental policy – a statement of an organization's commitment to protecting the environment, and sets the framework for the development and implementation of ESM programs;
- environmental planning – involves developing strategies and action plans engaging stakeholders to manage environmental risks and achieve environmental objectives;
- environmental performance evaluation – involves monitoring and measuring an environmental performance against established goals, and evaluating the effectiveness of ESM programs and initiatives;
- environmental communication and training – involves communicating environmental policies, risks, and performance, and providing learning materials and training to all interested stakeholders.

²¹ K. Szczepaniak, *Zastosowanie analizy treści w badaniach artykułów prasowych – refleksje metodologiczne*, "Acta Universitatis Lodziensis. Folia Sociologica" 2012, vol. 42, p. 98.

²² M. du Vall, *Efektywność działań polskich organizacji pozarządowych w dobie nowych mediów*, Oficyna Wydawnicza AFM, Kraków 2017, p. 33.

Initial overview of the Polish Smog Alert website

Nowadays, the website of a non-governmental organization is its business card. It should contain all key information about the organization. Transforming a website visitor into an engaged user is extremely difficult. In this process, the first contact of the potential beneficiary or donor with the organization (contemporary it happens by its website) plays an important role. Website is a place of shaping the image of the organization in the environment. This means informing about what the organization does, its mission, with whom it cooperates and whether its activities bring the intended effects.

The website of the Polish Smog Alert can be found at <https://polskialarmsmogowy.pl> and its English-language version at <https://www.polishsmogalert.org>. It should be noted, however, that the website in Polish is definitely richer.²³ The organization also has its own profiles on Facebook and Twitter/X and in addition, selected local branches have their own Facebook profiles.

The main tabs on the top bar of the home page include: *News, About us, Local smog alerts, Knowledge, Solutions, Contact, Who supports us*. Tab *About us* includes information about the mission of the organization, its history, methods of operation, and annual activity reports. We can find out that the program declaration of Polish Smog Alert was adopted in 2015.

Polish Smog Alert (PSA) is an initiative that brings together civic movements concerned about poor air quality in Poland. The aim of PSA is to bring the air quality to a state that does not threaten the health and life of people living in Poland. We strive to achieve air quality that meets the standards applicable in our country. The Polish Smog Alert is a non-party organization, cooperating with local governments, non-governmental organizations and scientific communities, as well as with anyone who cares about clean, pollution-free air, as well as the health of Polish citizens.²⁴

PSA started its activity in February 2015 by merging Krakowski, Dolnośląski and Podhalański Smog Alert. Currently, PSA brings together almost 50 local groups and organizations dealing with improving air quality.²⁵

The *Knowledge* tab is extremely important from the point of view of the undertaken analysis. We find here sub-tabs: *Health, Smog*, and the *Repository of knowledge about the city*. From the information provided, we can learn about the impact of air pollution on: respiratory, circulatory and nervous systems. Also about how

²³ The Polish version was chosen for this analysis due to its greater resources. The fragments quoted below are translations of the Polish version of the website.

²⁴ *Nasza misja*, Polski Alarm Smogowy, <https://polskialarmsmogowy.pl/nasza-misja> [accessed: 9.05.2023].

²⁵ *Historia*, Polski Alarm Smogowy, <https://polskialarmsmogowy.pl/historia> [accessed: 9.05.2023].

PM10,²⁶ PM2.5,²⁷ B(a)P,²⁸ PAHs²⁹ affect the elderly, children and pregnant women. The *Repository of knowledge about the city* collects documents prepared by Polish officials or commissioned by them, so as to facilitate the exchange of knowledge and experience.

The *Solutions* tab is also very useful. There we can find information on, among others: subsidies for thermal modernization and boiler replacement, kiln standards, coal quality standards in Poland, limitation of transport in cities or anti-smog resolutions and a set of good practices in the fight for clean air. The *News* tab is updated on an ongoing basis with current events, activities and has the character of a blog posts.

An interesting solution is another bar with tabs placed just below the main photo, which is the background of an important news. The photo separates the upper bar from the next one. There is, among other things, a redirection to the English-language page but also the possibility of subscribing to a newsletter called SMOGletter. There are also a tab leading to current and archival air tests carried out by the organization and heating cost calculator. We can get acquainted with the PSA program, information on the “Clean Air” program or the Academy of Smog Alerts. “The Academy of Smog Alerts is an initiative aimed at supporting and developing social initiatives operating as part of the Polish Smog Alert and new civic groups organizing to take action to improve air quality in Poland”.³⁰

²⁶ PM10 is dust with a diameter of less than 10 micrometers, which is absorbed in the upper respiratory tract and bronchi. When inhaled into the lungs, they can cause various reactions, such as coughing, breathing difficulties and shortness of breath, especially during physical exertion, see WIOŚ Warszawa, http://sojpwios.warszawa.pl/index.php?page=PM10_i_PM25 [accessed: 9.05.2023].

²⁷ PM2.5, fine dust fractions can penetrate the bloodstream, and prolonged exposure to high concentrations of dust can have a significant impact on the course of heart disease (hypertension, heart attack) or even increase the risk of cancer, especially of the lungs, *ibidem*.

²⁸ Benzo(a)pyrene is an organic chemical compound that is a representative of polycyclic aromatic hydrocarbons (PAHs). Benzo(a)pyrene exhibits low acute toxicity and high chronic toxicity, which is related to its ability to accumulate in the body. Like other PAHs, it is a highly carcinogenic compound, see WIOŚ Gdańsk <http://www.gdansk.wios.gov.pl/pl/wios/aktualnosc/295-tajemnicze-definicje-zwiazane-z-ochrona-powietrza.html> [accessed: 9.05.2023].

²⁹ PAHs are formed mainly in the processes of incomplete combustion of coal and wood (generally: biomass) and, to a lesser extent, liquid fuels. The process occurs both in natural conditions (e.g. during a forest fire) and as a result of human activity. Anthropogenic sources (e.g. the so-called low surface emission, i.e. pollution from household stoves and boilers) are responsible for the majority of PAH emissions to the environment, see *Wielopierścieniowe Węglowodory Aromatyczne (WWA) jako szczególna grupa związków – budowa, właściwości, zagrożenia*, <https://wsse.krakow.pl/page/wielopierscieniowe-weglowodory-aromatyczne-wwa-jako-szczegolna-grupa-zwiazkow-budowa-wlasciwosci-zagrozenia> [accessed: 9.05.2023].

³⁰ *Akademia Alarmów Smogowych*, Polski Alarm Smogowy, <https://polskialarmsmogowy.pl/akademia-alarmow> [accessed: 9.05.2023].

Below the second bar we find news, which are displayed in the form of tiles, and below news from local PSA branches. Then results from selected air tests. At the very bottom there is a section that presents organizations and institutions cooperating with PSA.

It should be said that the website of the Polish Smog Alert is very clear and intuitive. It is easy to find relevant information, but of course it requires expanding selected tabs to see additional content in the form of subsequent sub-tabs. However, it seems that it shouldn't be a problem for anyone with basic skills, which is particularly important for the fulfillment of the basic tasks and functions of a non-governmental organization.

Qualitative analysis according to the categorizations key

Below, for clarity, the results of the conducted research are presented in tabular form.

Table 1. Results of the conducted research: PSA website content corresponding to the specific categories adopted in the study

Category	Website content
education/ environ- mental communi- cation and training	<p><i>Knowledge</i> tab: information on the health risks of air pollution mentioned above; information on smog, i.e. the basic concepts, where smog comes from and smog in Poland; repository of knowledge about the city (this is where documents prepared by Polish officials are collected to facilitate the exchange of knowledge and experience, often very innovative studies).</p> <p><i>Solutions</i> tab: information on subsidies for thermal modernization and boiler replacement, kiln standards, coal quality standards in Poland, limitation of transport in cities, anti-smog resolutions, a set of good practices in the fight for clean air. There we can also find instructions on how to report waste incineration and non-compliance with the anti-smog resolution.</p> <p><i>Local Smog Alerts</i> tab: here we find a map of local PAS branches (currently 50)¹⁾ and short descriptions of them. Thanks to this, each user of the website can reach the nearest branch.</p> <p><i>PSA program</i> tab: we find here a 23-page brochure from January 8, 2020. It covers the new transport policy, emissions from home heating, and industry.</p> <p><i>Smogopedia</i> tab (combination of the words <i>smog</i> and <i>encyclopedia</i>): it is a project of the Polish Smog Alert, co-financed by the Clean Air Fund²⁾ and is similar to Wikipedia, but includes only information related to smog and air pollution.</p> <p><i>Academy of Smog Alerts</i> tab: activities of the Academy lead to an increase in the importance of the problem of air pollution through, i.e. coordinated and intensified media activities, but also to increase access to information on air pollution. This should strengthen local groups involved in air protection, and make it possible to increase the impact on the national, regional and local anti-smog policy. Of course, we cannot forget about the <i>News</i> tab, where among the information of various nature we will find numerous educational and informative ones.</p>

Category	Website content
integration/ environ- mental planning	<p><i>Local Smog Alerts</i> tab is a place for integrating local initiatives operating under a common banner. It also allows local branches to collaborate with others selected to organize joint actions and events. It makes it easier for site visitors to reach the local organization closest to them.</p> <p>In the tab <i>About us</i>, the organization's integration function is clearly indicated – "Polish Smog Alert is an initiative associating civic movements concerned about poor air quality in Poland".³⁾</p> <p>Good practices that can be found in the <i>Solutions</i> tab help activists develop strategies and action plans engaging stakeholders to achieve environmental objectives. Bearing in mind environmental planning, the sub-tab in <i>Solutions</i> referring to anti-smog resolutions, divided into voivodeships, is inspiring. It allows for the assessment of public administration activities in the field of solutions proposed by PSA, helps to identify areas where it is necessary to intensify activities and motivates all stakeholders to take effective action.</p> <p>In <i>News</i> tab you can find information on current initiatives in which you can join or take advantage of the experience of their creators.</p> <p>The <i>Activist Zone</i> undoubtedly serves to integrate people actively working for clean air in Poland. It allows for direct contact, cooperation and the creation of joint ventures by interested parties.</p> <p>The Academy of Smog Alerts undoubtedly also has an integrating function and influences environmental planning, as it is an initiative aimed at supporting and developing social initiatives and new civic groups organizing to take action to improve air quality in Poland.</p>
mobiliza- tion/ environ- mental communi- cation and training & environ- mental planning	<p>It is worth to begin with, all the information included in the first category (above) undoubtedly also serves to mobilize people to take action in the field of environmental protection and raise awareness in this regard.</p> <p>A particularly important tab in the category discussed here is the <i>Activist Zone</i> tab: intended for those already involved in PSA activities with a wide range of instructions, advice, ideas, initiatives and ongoing activities and needs. The content here is password protected.</p> <p>In the <i>News</i> tab can be found a lot of information about local social campaigns that aim to mobilize local communities to take action for clean air, for example: "Save energy and do not overpay for heating", the social campaign of Warsaw Without Smog organization; "Send a letter to your neighbor and persuade him to replace the furnace" nationwide PSA campaign; a journalistic competition "Heat immediately" organized by Krakow Smog Alert, in which journalists who presented practical advice on the effective use of energy at home during the energy crisis in an interesting and engaging way were awarded.</p> <p>Also in the <i>About us</i> tab, under the <i>How we work</i> tab, can be found information that may encourage website visitors to get involved in activities for clean air. It can be read that PAS brings together people who share one goal – Poland free from smog, and that the movement was born as an expression of rebellion against the passivity of the authorities in the face of the problem of polluted air.</p> <p>The tools offered on the website, such as a "Heating cost calculator" or newsletter (called SMOGletter), which allows to be up to date with the most important information on smog and current measurements of pollution are also mobilizing.</p>

Category	Website content
	Finally, it should be noted that on the website can be also found a call to action for people who personally cannot or do not want to engage in PSA activities, but organization's goals are close to theirs – in the <i>Support us</i> tab can be found a simple tool to donate any amount for PSA.
programming/ environmental policy & environmental performance evaluation	<p>It can be said that all content posted on the PSA website proves an organization's commitment to protecting the environment, and sets the framework for the development and implementation of ESM programs.</p> <p>In the tab <i>Our mission</i> we can read directly "The goal of PSA is to bring the air quality to a state that does not threaten the health and life of people living in Poland. We strive to achieve air quality that meets the applicable standards in our country"⁴⁾</p> <p>Important in the context of the discussed category is the sub-tab that can be found in <i>Knowledge</i>. In the <i>Repository of knowledge about the city</i> we find evidence of the impact of PSA activities on public administration, mainly at the local government level. As it has already been indicated earlier, this tab is a collection of documents prepared by Polish officials or prepared on their behalf in the context of environmental policy, especially clean air. This collection is constantly being expanded.</p> <p>A similar proof of the impact on real pro-environmental policy is the sub-tab in <i>Solutions</i>, mentioned above, referring to anti-smog resolutions.</p> <p>On the website under a separate tab we will find detailed information about the "Clean Air" ministerial program. The aim of the program is primarily to combat smog, and additionally it is to minimize greenhouse gas emissions by replacing heat sources and improving the energy efficiency of single-family residential buildings. Additionally, PSA keeps monthly statistics for voivodeships in the field of boiler replacement under the program, popularity of individual heat sources and the ranking of communes in the program (also available in the aforementioned tab).</p> <p>From the point of view of environmental performance evaluation, the <i>We test the air</i> tab is very important. Here can be found information hidden under the tiles, which refer to the relevant materials regarding: periodic and continuous measurements of air purity, transect⁵⁾ measurements and nitrogen oxides measurements.</p>

¹⁾ As of May 22, 2023. ²⁾ This is a philanthropic initiative, based in London, tackling global air pollution. It works with governments, funders, businesses and campaigners to deliver clean air for all as fast as possible.

³⁾ *Jak działamy*, Polski Alarm Smogowy, <https://polskialarmsmogowy.pl/jak-dzialamy> [accessed: 24.05.2023].

⁴⁾ *Nasza misja*, *op. cit.* ⁵⁾ A transect is a straight line that cuts through a natural landscape so that standardized observations and measurements can be made.

Source: Authors' own research.

The results of the qualitative analysis of the content posted on the website of the Polish Smog Alert based on the categorization key indicate that the website of the non-governmental organization is an excellent communication channel, a source of educational and training materials. There can also be found numerous materials inspiring to take action in the field of protecting air quality and encouraging

cooperation by various stakeholders in the fight against environmental pollution. It is also clear that the PSA has an influence on policy making, mainly at the local government level, but also at the central level – an example of this is the “Clean Air” ministerial program. Continuous monitoring of air pollution and the implementation of the furnace replacement program gives a constant impetus to increase efforts to bring the air quality to a state that does not threaten the health and life of people living in Poland.

Conclusion

Stable ecosystems are not merely a luxury; they are a necessity for human well-being. We depend on these ecosystems for essential services, from food and clean water to climate regulation and cultural enrichment. Recognizing the intrinsic value of biodiversity and the critical role ecosystems play in our lives, it is our responsibility to protect, conserve, and sustainably manage these ecosystems. By doing so, we can ensure a prosperous future for ourselves and future generations, where humans and nature coexist harmoniously. Undoubtedly, the Polish Smog Alert significantly contributes to the consolidation of the aforementioned stability, but also goes a step further in its activities, i.e. it becomes an example of a non-governmental organization that, apart from activities for the stability of ecosystems, contributes to increasing environmental safety.

Conducted qualitative research allowed to obtain answers to the research questions posed by the authors. From the point of view of the four basic functions that a non-governmental organization should perform (education, integration, mobilization and programming), Polish Smog Alert fulfills them with extraordinary efficiency for a non-governmental organization. This proves not only a strong focus on environmental goals, but also great mobilization and integration abilities of various stakeholders, ranging from local activists, through thriving non-governmental organizations, to public administration. Numerous educational and training materials allow to increase awareness of the threats posed by air pollution, but also provide practical solutions that can improve air quality. They are useful both for an ordinary citizen, but also for the public sector, which should take action to ensure appropriate living conditions for citizens of the state.

In turn, taking into account the scope of PAS's influence on environmental safety management in Poland, it should be stated without any doubt that the organization is committed to protecting the environment, and sets the framework for the development and implementation of ESM programs. The NGO develops strategies and action plans engaging stakeholders to manage environmental risks and achieve environmental objectives. Constant monitoring and measuring an environmental performance against established goals, and evaluating the effectiveness of

ESM programs (e.g. “Clean Air”) and initiatives allows to correct and change policies at the local and central level.

The results of the qualitative analysis of the content available on the website of the Polish Smog Alert based on the specific categories indicated that the organization effectively achieves its goals and plays an important role in the area of effective environmental safety management in Poland. Besides, the analysis carried out in the article showed that environmental safety management offers several benefits to society, including protecting human health and safety, preserving natural resources, and promoting sustainable practices. By reducing exposure to harmful environmental risks and hazards, environmental safety management can help prevent a range of health problems, including respiratory diseases, cancer, and birth defects. It can also help protect wildlife and promote biodiversity, ensuring that natural resources are conserved for future generations. In addition, environmental safety management can promote sustainable practices that reduce waste, conserve energy, and minimize the use of harmful chemicals. By promoting sustainable practices, environmental safety management can help create a more resilient and sustainable society that is better able to cope with the challenges of a rapidly changing world.

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Role of non-governmental organizations in the area of effective environmental safety management in Poland on the example of Polish Smog Alert (PSA)

Abstract

The changing state of the environment leads to impacts on human well-being and ecosystem health, which then produces human responses to remedy these impacts, such as social controls, redirecting investments, and/or policies and political interventions to influence human activity. These responses have an impact on the state of the environment, either directly or indirectly, through the driving forces or the pressures.

The article focuses on the conditions of air in the cities which directly affects human health. As a case study, the activities of the non-governmental organization – Polish Smog Alert (PSA, Pol. Polski Alarm Smogowy) were focused on. Efficiently operating non-governmental organizations in a democratic state allow for optimal realization of the interests of all citizens. The main objective was to examine the effectiveness of the Polish Smog Alert as an organization working for the environment – mainly clean air. The conducted analysis concerned the fulfillment by PSA of the four basic functions that a non-governmental organization should perform: educational – influencing the shape of civic awareness and attitudes regarding environmental issues; integration – impact on partnership relations between entities that can jointly implement the goal of improving air quality in cities; mobilization – a set of substantive content and instruments inspiring citizens, public authorities and other groups and organizations to be active in the field of ensuring clean air; programing – direct impact on the process of shaping state policy. The main research method was the analysis of content posted on the organization’s website and in its social media.

Keywords: environmental safety management (ESM), NGO, clean air, smog, Poland, Polish Smog Alert, Polski Alarm Smogowy