

2022

ACTIVITY NO. 1:  
INTERACTIVE REPORT

# Environmental

## CHALLENGES AND CLIMATE ACTION

PART 1  
DESK RESEARCH (POLAND)



Free publication

**Within the project:**  
VEforCA

**Prepared by:**  
Fundacja "Fundusz  
Inicjatyw"  
("Initiative Fund"  
Foundation)



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Erasmus+, Action Type KA210-VET - Small-scale partnerships in vocational  
education and training

Project: 2021-2-PL01-KA210-VET-000047985

**What Vocational Education can do for Climate Action (VEforCA)**

## **Activity No. 1: Interactive report: environmental challenges and climate action**

### **Research, Part 1**

#### **Desk research - Poland**

**Language version: English**

**Prepared by: Fundacja “Fundusz Inicjatyw”  
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**Within the project**

## **What Vocational Education can do for Climate Action (VEforCA)**

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## Overview of approaches to citizen science in the education system and vocational training sector in Poland and Europe

Citizen science as a way of developing civil society and an element of open science has been known in the world since at least the 90s of the twentieth century. However, it was the 21st century that brought a dynamic development of the participation of "non-professional" researchers in scientific activities being conducted, especially in the field of natural and exact sciences, which account for approx. 80% of all implemented projects and actions within the framework of citizen science. As part of social sciences and humanities, the number of research projects carried out as part of citizen science is estimated at approx. 11%.<sup>1</sup>

The popularity and, at the same time, the value of citizen science is based on the belief that every person, regardless of their education, profession, origin, place of residence, material status, can participate in the research process at each of its stages. Thus, they can help in collecting data, participate in the analysis of the collected data, and help in choosing appropriate methods for data processing and drawing conclusions.<sup>2</sup>

In line with the guidelines of the European Citizen Science Association, led by the Natural History Museum in London, citizen science should follow ten key principles-good practices. For example, citizen science should involve citizens in research efforts leading to new knowledge and better understanding. Projects implemented as part of citizen science bring actual scientific results and answers to research questions needed to implement activities for the protection of nature or make decisions in the field of environmental policy. Scientists and citizens alike benefit from citizen science projects and ventures. Research results should be widely available under open licenses.<sup>3</sup>

Citizen science as a type of activity that cannot function without the social activity of citizens, can be supported in individual EU countries through civic education. Civic education is still seen in the EU as the most important tool for promoting active citizenship and society. Through civic education, the formation of critical thinking, as well as the development of people's analytical skills and civic attitudes conducive to the active participation of individuals in social life take place.<sup>4</sup>

In Europe, civic education as a separate compulsory school subject in the 2010/11 school year was present in 20 countries, sometimes already at primary level, but most often in lower and / or upper secondary education. Since 2005 (previous Eurydice report), three countries (Spain, the Netherlands and Finland) have decided to introduce civic education as a stand-alone subject. Civic education is a separate compulsory subject in primary and secondary education

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<sup>1</sup> Citizen science in the social sciences and humanities: the power of *interdisciplinary*, translated from: Tauginienė L., Butkevičienė E., Vohland K., and others, *Citizen science in the social sciences and humanities: the power of interdisciplinary*, Palgrave Communications 2020, 6, 89. <https://doi.org/10.1057/s41599-020-0471-y> (accessed on 07/09/2022), p. 2; K. Materska, *Civic science - an innovative ecosystem in science*, Jagiellonian Library, Kraków 2021, p. 42.

<sup>2</sup> M. Czajkowska, *Civic science - an integral part of Open Science*, Library of the University of Zielona Góra, p. 26.

<sup>3</sup> *Ten rules science citizen*, European Citizen Science Association, Krakow 2016, p. 1, after: *Ten Principles of Citizen Science*, <http://doi.org/10.17605/OSF.IO/XPR2N>.

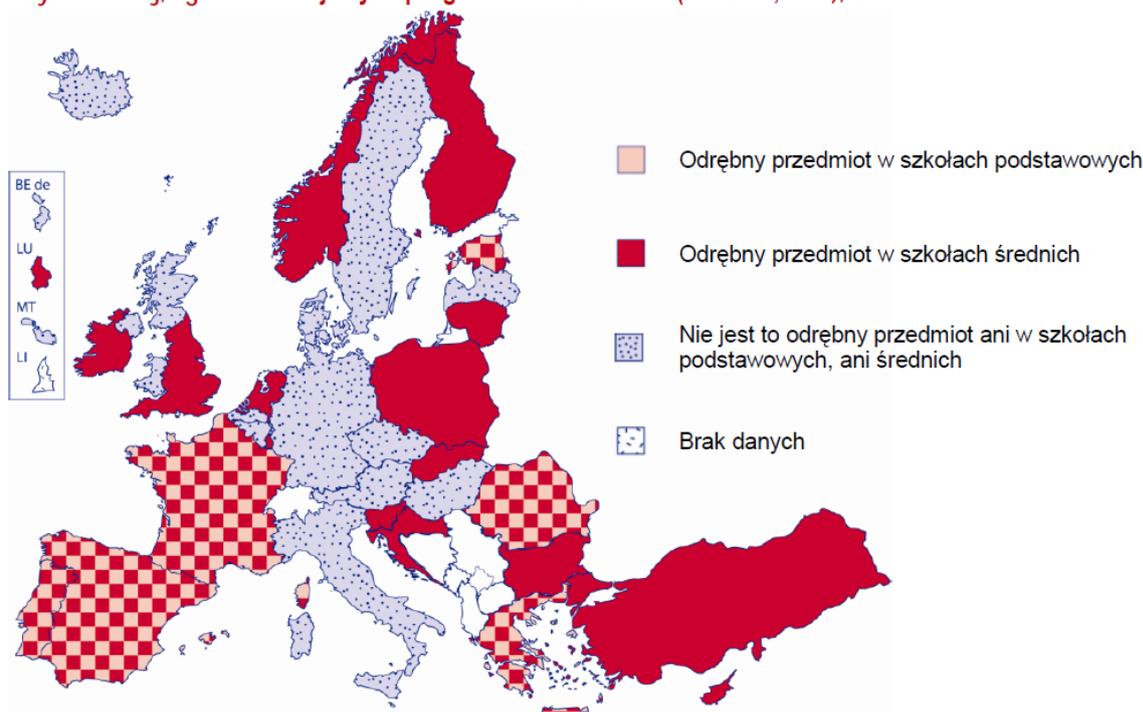
<sup>4</sup> <https://eurydice.org.pl/publikacja/edukacja-obywatelska-w-europie/> (accessed on 12/09/2022).



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in Estonia, Greece, Spain, France, Portugal and Romania. Civic training in France and Portugal begins the earliest (age six). In other countries, it is compulsory in lower or upper secondary education, except in Cyprus, Poland, Slovakia, Finland and the United Kingdom (England), where it is taught in lower secondary education and for at least one year in upper secondary education.<sup>5</sup>

**Rysunek 1.1. Prowadzenie odrębnych, obowiązkowych przedmiotów dotyczących elementów edukacji obywatelskiej, zgodnie z krajowymi programami kształcenia (ISCED 1, 2 i 3), 2010/11**



Source: *Civic Education in Europe*, Foundation for the Development of the Education System, Warsaw 2012, p. 19.

In terms of examples of the use of citizen science in the field of ecology and environmental protection, it is worth mentioning the "ÖKOLOG" programme, which was implemented in Austria and coordinated by the Ministry of Education. Its aim was to support the ecological character of schools by integrating sustainable development into the everyday life of schools. As part of the programme, school principals participated in seminars where they analysed and assessed the performance of their schools and indicators for education on sustainable development. The school staff also checked the projects of other schools, considering the activities that could be included in the programmes implemented in all schools in the country, including in terms of reducing pollution and cooperation with the local community. Taking part in the seminars, school principals also paid attention to democracy and student involvement, as well as gathering ideas related to the implementation of civic education in schools.<sup>6</sup>

<sup>5</sup> *Civic education in Europe*, Foundation for the Development of the Education System, Warsaw 2012, pp. 18-19.

<sup>6</sup> *Civic education in Europe*, Foundation for the Development of the Education System, Warsaw 2012, p. 96, p. 131.



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Citizen science in the field of environment and ecology is a dimension of open, positive education within society and for the benefit of individuals. It aims at the coexistence of man with nature. It spreads beliefs about the need for people to respect all forms of life and nature. It helps citizens to see and understand the diversity and thus the beauty of the natural world around us. It encourages people to act as citizens to preserve this state of affairs. Citizenship methods in education and vocational training for the environment and ecology are essential for the physical, emotional and intellectual development of every human being. Education and training understood in this way is more than classical didactics about ecology and the environment, it is primarily an element of the continuous education of man and citizen to be aware of their rights and obligations as an inhabitant of the Earth.<sup>7</sup>

Environmental education as part of the citizen science approach helps explain the essence of both the global nature of the environment and local environmental conditions to individuals and society. Initiatives and undertakings in the field of environmental education and training (at any level: national, regional or local) provide people with ecological and environmental knowledge. They enable the acquisition of attitudes and skills that, in the next step, will allow citizens to take part in a participatory, responsible and effective manner in the effective solving of current and future environmental problems. Environmental education as part of citizen science approach allows to shape the style and quality of people's lives in a way that does not threaten environmental degradation, especially in their local community. Environmental education as part of local initiatives leads to the necessary changes in social attitudes towards the surrounding environment. It creates the right relations in local communities: man - nature - environment, and inspires people to change the system of values and life model into a more pro-environmental and pro-ecological one.<sup>8</sup>

In 2021, during the United Nations Conference on Climate Change (COP26) in Glasgow, the Report „Education International Climate Change Education Ambition Report Card” was presented. It was emphasised that most countries in the world do not pay enough attention to the education and training of citizens in the field of climate change. Only 40 countries out of 133 that signed the Paris Agreement included the development of environmental education in their systemic actions. Moreover, countries are not considering strengthening their education systems as part of international cooperation to support the implementation of national climate action. The countries most responsible for the climate crisis in the world do not plan to supplement their education and training systems with environmental and climate change education.<sup>9</sup>

Moving on to the analysis of citizen science and environmental education in Poland, it should be noted at the outset that the opinions of public authorities as well as researchers and educators differ significantly in this regard.

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<sup>7</sup> W. Kozaczyński, *Ecological education in the civic education system of Polish youth*, Scientific and Didactic Yearbook of the University of Life Sciences in Kraków, issue 200, Kraków 1999, p. 27.

<sup>8</sup>W. Kozaczyński, *Environmental education in the civic education system of Polish youth* , Scientific and Didactic Yearbook of the University of Life Sciences in Kraków, issue 200, Kraków 1999, pp. 31-32; M. Szalewska, *Environmental education in legal terms*, Przegląd Prawa Ochrony Środowiska, no. 1/2021, p. 65.

<sup>9</sup> <https://www.ei-ie.org/en/item/26536:4-alarming-findings-about-education-across-countries-nationally-determined-contributions> (accessed on 09/09/2022).



According to the information provided by the Ministry of National Education, Polish children learn about ecology from kindergarten. Then, at school, students learn about environmental protection, climate change, saving energy, water, raw materials, segregation and recycling of waste. In this way, they develop their pro-ecological competences. Recognising the importance of environmental education, the Ministry of Education introduced a regulation obliging teachers, from September 1, 2020, to discuss the most important climate and environmental issues with students during classes with the educator. During compulsory classes in various subjects (nature, geography, chemistry, physics and biology), Polish students learn about environmental education. They shape the right habits, learning how to save energy, water, raw materials, segregate and reuse waste, as well as ecological handling of technical products. They learn about climate change by getting to know the complexity of the issue. Moreover, the Ministry of Education conducts activities promoting environmental education. It finances the organisation of competitions in geography and ecological knowledge, which is very popular. So far, almost 26,000 students have participated in it. In addition, the Ministry organises training for teachers, thanks to which they improve their competences in the field of ecology. Polish educational law also allows for additional educational classes on environmental issues in schools. The school governing authority – at the request of the school head – may designate hours for each class to carry out additional educational activities.<sup>10</sup>

In the opinion of researchers, environmental issues in the Polish education and vocational training system are not deeply rooted. Despite the positive changes taking place in recent years in the field of disseminating environmental education in the Polish education and training system, it seems that environmental education is still not sufficiently legally-embedded in the Polish education system. In the acts regulating the Polish education system, such as: the Education Law Act (of December 14, 2016), the Education System Act (of September 7, 1991) and the Teacher's Charter Act (of January 26, 1982), the issues of “environmental education” are not specifically or in detail discussed, but briefly mentioned at most.

Elements of environmental education in the Polish legal system can be found in the Act of April 16, 2004 on Nature protection, where it was indicated that “it is the duty of public administration bodies, scientific and educational institutions, as well as public mass media to conduct educational, information and promotion in the field of nature protection.” The aim of the nature protection policy in Poland is also “shaping the right attitudes of people towards nature through education, information and promotion in the field of nature protection” and “conducting educational, information and promotional activities in the field of nature protection.”<sup>11</sup>

Recalling studies involving the analysis of the so-called “Core curriculum” in Polish primary and secondary schools<sup>12</sup>, it can be said that this document does not pay due attention to environmental education. Such terms as “ecological crisis” or “ecological transformation”

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<sup>10</sup> The Department of Information and Promotion of the Ministry of National Education from the Board of Education in Opole, <https://www.kuratorium.opole.pl/tresci-dotyczace-edukacji-ekolog-obecne-w-polskich-szkolach/> (accessed on 08/09/2022).

<sup>11</sup> Act of April 16, 2004 on nature protection, Journal of Laws of 2022, item 916, 1726.

<sup>12</sup> Regulation of the Minister of National Education of February 14, 2017 on the core curriculum for pre-school education and the core curriculum for general education for primary schools, including students with moderate or severe intellectual disability, general education for the first-degree industry school, Journal Of Laws of 2017, item 356.



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do not appear in the document at all. There are also no words or phrases such as: “smog, recycling, disposable plastic, microplastics, circular economy, ecological footprint, water footprint, carbon footprint.” Unfortunately, the Polish core curriculum for schools does not include terms related to climate change, such as: “climate crisis, climate catastrophe, greenhouse gases, the greenhouse effect, warming of the earth's crust, melting of glaciers, rising water levels in seas and oceans, acidification of the seas and oceans, the disappearance of the coral reef.” The only mentions of climate change in terms of global warming and the disappearance of habitats and ecosystems are in the subject of geography in the 1st degree trade school.<sup>13</sup>

Environmental education (also within citizen science), in the opinion of the authors of the publication “Climate policy and its implementation in the first half of the 21st century,” is not sufficiently popularised in Poland in the education and vocational training system, especially now in the context of increasingly serious climate challenges in Europe. The publication indicates that in the countries of Eastern Europe (including Poland) in the field of building social capital, pro-environmental education, especially of young people, is not included at all. The need to combat climate change, after the conclusion of the Paris Agreement in 2015 and adoption by the EU political bodies, is deliberately ignored in education and training, which leads to the lack of involvement of adult citizens in environmental movements, including climate change and the lack of tendency to take pro-ecological actions and activity in everyday life. And the authors notice that citizens in post-socialist countries, including Poles, are less willing to be interested in environmental and climate issues and actively participate, for example, in local civic initiatives aimed at protecting the climate and the environment.<sup>14</sup>

As indicated by the participants of the Global Education Summit (2021) organised by the Education International (trade unions of education and science workers from 178 countries, including the Polish Teachers' Union), school teachers and educators in the VET sector can be an important link in making people aware of climate change and its effects.<sup>15</sup> Adult education staff (administration, trainers, career counsellors, educators, coaches) as individuals having daily contact with adults in their work may contribute to increasing environmental awareness and promoting pro-ecological behaviour preventing negative transformations of the earth's climate.

The poor level of knowledge, awareness and ecological activity of adult Poles is confirmed by the research of the Ministry of Climate in 2019 and 2021. Only 1/3 of Poles take measures to protect their own health related to air quality. As many as 7 out of 10 Poles do not pay attention to the recycling of packaging when shopping. Half of Poles throw away unnecessary or broken items into the garbage. As many as 3/4 of Poles believe that climate change has negative consequences for humanity in general and for themselves individually. At

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<sup>13</sup> A. Kozłowska, *Environmental education in the Polish core curriculum*, *Rocznik Pedagogiczny*, no. 44/2021, pp. 134-135.

<sup>14</sup> J. Gajewski, W. Paprocki (ed.), *Climate policy and its implementation in the first half of the 21st century*, Sopot 2020, p. 19.

<sup>15</sup> <https://glos.pl/swiatowy-szczyt-edukacyjny-edukacja-klimatyczna-stala-sie-kluczowym-wyzwanie-dla-calego-swiatea-nauczyciele-to-liderzy-zmian> (accessed on 09/09/2022).



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the same time, annually, over 50% of Poles either do not talk or think about climate change, or do it sporadically.<sup>16</sup>

At the same time, the adult education staff have competence gaps in the preparation and implementation of ecological aspects to the training provided. Hence the need to increase environmental knowledge and awareness among the staff and adult Poles.<sup>17</sup>

Moving from the national level to the regional level, it can be seen that the need to develop environmental education in schools is perceived by adult residents of the lubelskie voivodeship. According to the research, more than a half (52.9%) of the respondents strongly believe that environmental education should be conducted at school. 33.6% of the respondents chose the answer “rather yes.” The results show that the inhabitants of the Lublin region are supporters of introducing ecological education to educational and training institutions. It can be assumed that the local community of our voivodeship recognises the need and importance of environmental education from an early age in order to instil in the community the willingness to care for the natural environment throughout human life. At the same time, the inhabitants of the Lublin region participating in the survey assessed their environmental awareness. The vast majority of respondents (53.8%) assessed their environmental awareness as good. 30.3% of the respondents considered their awareness at an average level. Only 13% of the respondents chose the answer “very good.”<sup>18</sup>

## Environmental report for VET: Environmental challenges and case studies of actions taken

### Environmental challenges.

Poland, like all countries in Europe and the world, faces many ecological challenges and climate threats. Based on the Ecological Strategy of the Polish State until 2030, we can state what are the greatest environmental challenges facing our country. Firstly, it is leading to a more efficient use of resources, in such a way that the increasing level of consumption and the wealth of Poles does not cause further burden on the natural environment. Secondly, it is preventing the air quality standards in the country being significantly exceeded (especially in winter – heat season). Third, it is preventing unacceptable levels of contamination of surface waters. Fourth, it is combating biodiversity-declining. Fifthly, it is reducing the high level of noise exposure of the population.<sup>19</sup>

Climate scenarios for Poland show us that in the next decade, the most common adverse weather phenomena will be heat waves with a tendency to extend their occurrence time. The

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<sup>16</sup> <https://www.gov.pl/web/klimat/> (accessed on 08/09/2022).

<sup>17</sup> <https://epale.ec.europa.eu/pl/blog/jak-zarzeniaszyc-wplyw-szkolenia-na-srodowisko> (accessed on 08/09/2022).

<sup>18</sup> M. Jarosz, W. Głowienka, M. Stoma, *Assessment of the ecological awareness of the inhabitants of the Lublin region*, in: M. Babicza, B. Nowakowicz-Dębek (ed.), *Selected issues in the field of environmental protection and threats*, Ed. University of Life Sciences in Lublin, Lublin 2021, p. 37, p. 40.

<sup>19</sup> *State ecological policy 2030*, Ministry of the Environment, Warsaw 2019, pp. 23-24.



severity of short but very intense rainfall is also expected, which may cause local flooding and inundation. 44 Polish cities with over 100,000 inhabitants were diagnosed with 4 sectors most sensitive to the climatic phenomena that threaten cities. Water management is indicated in all of them. In 41 cities, it was found that the health and safety of residents are the most vulnerable to the negative effects of extreme climate phenomena, including due to the increased risk of worsening cardiovascular and respiratory diseases. In 36 cities, it was found that the increase in the intensity of threats – rainfall, extreme temperatures, storms or floods – may disrupt the functioning of transport. In 14 cities, energy was identified as a sector sensitive to climate change.<sup>20</sup>

A significant environmental challenge for our country is also the protection of biodiversity. Over the decades, there has been a general decline in the country's natural values. There are many regions in Poland, particularly highly urbanised or with intensive agriculture, where nature degradation and species composition deterioration is progressing. The unfavourable changes in the number and composition of plant and animal species most often result from defective spatial management, including rapid, uncontrolled urban development, settlement spreading within naturally valuable areas, crossing ecological corridors by transport infrastructure, and the unification and impoverishment of landscapes. The changes taking place in agriculture also have an impact. Both the progressive intensification of cultivation towards large-scale agriculture and the abandonment of traditional agricultural use lead to the disappearance of ecosystems associated with traditional farming and the loss of traditional agricultural landscapes, which are the habitat of many species.<sup>21</sup>

Going to local level, Lublin is the largest city in the lubelskie voivodeship and the seat of regional authorities. The lubelskie voivodeship is an area of natural value with many legally protected areas and objects. The nature protection system consists of: two national parks, 17 landscape parks, 8 nature reserves, 17 protected landscape park areas, 1,396 natural monuments, 23 special bird protection areas, 48 special areas of habitat protection, 7 nature and landscape complexes, 182 ecological areas, 315 animals protection zones or 3 plant protection zones.<sup>22</sup>

Moving on to environmental challenges at the regional and local level, it should be noted that the main environmental threats to the lubelskie voivodeship and the city of Lublin do not differ generically from those for Poland.

One of the most important, current environmental threats to the region are investments in the transport system (mainly road investments, but also railroads), which often conflict with natural systems and may constitute a difficult natural and social barrier to overcome. The expansion of the local and regional transport system leads to an increase in the fragmentation of natural habitats, isolation of local plant and animal populations, and breaking the continuity of ecological links, which may result in a gradual loss of biodiversity. Spatial planning issues are also a particular challenge facing Poland. The decreasing share of green areas and the

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<sup>20</sup> *State ecological policy 2030*, Ministry of the Environment, Warsaw 2019, pp. 25-26.

<sup>21</sup> *State ecological policy 2030*, Ministry of the Environment, Warsaw 2019, p. 231.

<sup>22</sup> *Mobility plan for the Lublin functional area for 2017-2025. The state of the natural environment*, Biuro Projektowo-Konsultingowe TRANSEKO sp. j., p. 6.



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development of air-supply corridors in urban centres cut off open spaces from the city interior, and consequently worsen the climatic conditions and the quality of life.<sup>23</sup>

A serious ecological threat to the lubelskie voivodeship and the city of Lublin is atmospheric air pollution. Despite the decline in air pollutant emissions in recent years due to the implemented pro-ecological investments, especially in the energy sector, the level of air pollutants still reaches the average values on a national scale. The greatest amounts of dust pollution come from the largest cities of the voivodeship, i.e. Lublin, Świdnik and Łęczna (where the coal mine is located). The largest amounts of gas pollutants (without CO<sub>2</sub>) also come from Lublin and the Łęczna. The plants with the greatest impact on the environment in the Lublin region include: Elektrociepłownia “Lublin – Wrotków,” “Megatəm EC-Lublin,” Elektrociepłownia “GIGA” in Świdnik, “Łęczyńska Energetyka” in Bogdanka. The level of pollution in cities, suburban and rural areas is also influenced by domestic heating systems and pollution from means of transport. Despite its agricultural character and significant green and natural areas, the lubelskie voivodeship is ranked 10th in Poland in terms of dust emissions and 12th in terms of gas emissions.<sup>24</sup> In terms of annual air quality assessments, the Lublin Agglomeration and the Lublin zone in 2013-2018 were classified as class C due to exceeding the 24-hour concentrations of PM<sub>10</sub> dust. In 2014, both zones obtained class C additionally due to exceeding the level of benzo[a]pyrene. Moreover, in the same year, the Lublin zone obtained class B due to exceeding the PM<sub>2.5</sub> dust threshold.<sup>25</sup>

A significant ecological threat to the lubelskie region is the deterioration of the acoustic climate of the environment, especially in highly urbanised areas such as the city of Lublin. The main cause of this phenomenon is the growing automotive pressure, poor technical condition of roads, insufficiently functioning public transport and the lack of acoustic protection. In Lublin, almost half of the inhabitants are exposed to road noise during the daytime, and about 28% at night. The noise levels were exceeded in short-term measurements, most often by up to 5 dB, while in long-term measurements – up to 1.6 dB.<sup>26</sup>

## Case studies - good practices.

Moving on to the analysis of successfully implemented ecological initiatives in Poland, it is worth starting with a nationwide project, which is the GLOBE programme (the Global Learning and Observations to Benefit the Environment, [www.globe.gov](http://www.globe.gov)). The undertaking is part of the international research and education programme enabling interested citizens (especially students and young people) to learn about global environmental issues. The mission of the programme is to improve the research skills of young people in the field of such sciences as: physics, chemistry, biology, geography, mathematics and to promote a scientific approach

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<sup>23</sup> *Mobility plan for the Lublin functional area for 2017-2025. The state of the natural environment*, Biuro Projektowo-Konsultingowe TRANSEKO sp. j., p. 7.

<sup>24</sup> *Mobility plan for the Lublin functional area for 2017-2025. The state of the natural environment*, Biuro Projektowo-Konsultingowe TRANSEKO sp. j., pp. 8-9.

<sup>25</sup> *The state of the environment in the lubelskie voivodeship. Report 2020*, Chief Inspectorate of Environmental Protection, Lublin 2020, p. 25.

<sup>26</sup> *The state of the environment in the lubelskie voivodeship. Report 2020*, Chief Inspectorate of Environmental Protection, Lublin 2020, p. 107.



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to the study of natural phenomena. The programme also aims to develop environmental awareness and engage citizens in environmental protection.<sup>27</sup>

As part of the GLOBE programme, half a million students from all over the world take part in research on selected elements of the natural environment on a local scale, and then share the obtained information with communities on an international forum. Young people measure climatic, hydrological and soil indicators, as well as observe land cover and its changes, for example using satellite images. The obtained test results are reported to the Programme database and visualized on interactive charts and in a map application. Currently, the database contains over 100 million measurements from the last 20 years and is updated daily. The programme also provides support for teachers. They can take advantage of professional workshops, didactic support and establish cooperation with teachers and scientists from around the world.<sup>28</sup>

As part of the GLOBE programme in Poland, students have the opportunity to improve their skills in the following areas: asking problem questions, acquiring new knowledge and explaining phenomena. They can learn and understand the principles of conducting research and drawing conclusions from the collected data. The programme also allows the use of available educational materials and tools during individual work with a student with special educational needs. As part of the programme, students can conduct environmental observations and experiments, formulate scientific questions, take quantitative and qualitative measurements, learn methods of interpreting results. Teachers gain access to Guides / Handbooks and lesson / training scenarios. All these educational activities develop the imagination and creativity of young people. Thanks to the use of modern tools (such as: GPS, internet, measuring equipment), ICT technology and the use of a modern model of teaching science, young Poles gain interest in the educational process and willingly participate in citizen science activities in the field of environment and ecology.<sup>29</sup>

In Poland, as part of the GLOBE programme, Regional Research Programmes are also implemented, which include three modules: (1) Recognition and counteracting the effects of floods; (2) Atmospheric Dust Studies; and (3) Satellite Climate Lessons.<sup>30</sup>

Another ecological initiative worth characterising is the regional project “LIFE Green-Go! Carpathians”. The programme is addressed to local government authorities, local communities and other stakeholders (such as non-governmental organisations, nature protection institutions, etc.) at the local and regional level - as they are the people and entities having the greatest, direct impact on the shaping of space and on the preservation of natural and landscape values in their surroundings. This project is part of the following aspects: sustainable spatial and natural environment management, biodiversity protection and ecological education. The project in question is implemented in 200 municipalities within the scope of application Framework Convention on the Protection and Sustainable Development of the Carpathians

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<sup>27</sup> <http://globe.gridw.pl/globe-w-polsce/program-globe-w-polsce> (accessed on 07/09/2022).

<sup>28</sup> *Folder of the GLOBE Program in Poland*, p. 1, <http://globe.gridw.pl/globe-w-polsce/program-globe-w-polsce> (accessed on 07/09/2022).

<sup>29</sup> <http://globe.gridw.pl/nauka-i-edukacja/kacik-nauczyciela> (accessed on 07/09/2022).

<sup>30</sup> *Folder of the GLOBE Program in Poland*, p. 2, <http://globe.gridw.pl/globe-w-polsce/program-globe-w-polsce> (accessed on 07/09/2022).



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(Carpathian Convention). As part of the project, so far, among others, following actions were taken:

- the conditions for shaping ecological connectivity between the valuable mountain ecosystems of the Carpathians were analysed;
  - consultation seminars and a series of trainings for representatives of Carpathian institutions, local governments and non-governmental organisations were conducted;
  - geo-information tools were used: a geoportal and a related mobile application to disseminate knowledge about green infrastructure;
  - a distance learning course (e-learning) devoted to green infrastructure was carried out;
  - cooperation at the local community level was inspired: a competition for a local project, i.e. a case study – related to the shaping of green infrastructure in Carpathian municipalities – acting as good practices to be disseminated on a national and international scale;
  - knowledge and good practices in shaping green infrastructure were disseminated: local educational campaigns, publication of a guide, information activities on an international scale.
- The implementation of the project contributes to increasing knowledge, awareness and interest in the subject of green infrastructure, understanding and appreciating its role and importance - both nature (elements of green infrastructure are essential refuges of biodiversity, they also act as ecological corridors), as well as socio-economic (they are the “supplier” of the series important ecosystem services). In addition, the project stimulates the uptake of new local initiatives for the protection of natural values and landscape of the Polish part of the Carpathians: an essential element development potential of the region based on tourism and recreation or traditional agriculture (regional products, healthy food, etc.). As part of the project, local decision-makers and the community of residents are shown that investing in green infrastructure simply pays off.<sup>31</sup>

Moving on to the local level of environmental initiatives, let's start our analysis with the information that the City of Lublin has been participating in the “Eco-City” project initiated by the French Embassy from the very beginning, i.e. since 2013. Since 2013, the “Eco-City” project has accompanied the sustainable development of Polish cities, awarding the best initiatives in this field every year. The project uses French experience to support Polish local governments in undertaking innovative ecological projects serving not only the city, but often also the larger community. Private entities and French experts who support Polish cities in the implementation of modern investments are also involved in the implementation of the project on the basis of synergy. During the project, the city of Lublin was the winner of the competition four times (in 2014, 2016, 2017, 2018) and in 2017 it received a distinction award (by the way, it should be noted that each year a greater number of cities could become a laureate of the competition or obtain a distinction). In the field of environmental education, as part of the project in Lublin, regional workshops were organised, which enabled the enrichment of the exchange of knowledge and experiences between French and Polish experts on specific topics, in response to the needs reported by the city. At the same time, in terms of the ecological infrastructure investment, the city of Lublin has made a comprehensive modernisation and

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<sup>31</sup> *Education for sustainable development*, Centrum UNEP / GRID-Warsaw, 2019, pp. 34-35.



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expansion of the water and sewage network. As a result, the degree of sewage system in Lublin is currently about 98%, and connections to the water supply system – about 99%. The modernisation covered 151.68 km of the water and sewage system on more than 220 streets of the city. Moreover, Lublin modernised the “Zemborzycka” Water Supply Station, which provides 40% of water supply for the city, as well as the municipal sewage treatment plant facilities. Thanks to the investment, the city increased the efficiency of technical devices and introduced a multifunctional system in the water supply station, enabling the control of the entire water production process. The investment, for which the city obtained funding from the European Union in the amount of over PLN 147 million, also allowed for the connection of over 7.4 thousand people from Lublin to the sanitary sewage system.<sup>32</sup>

One of the most up-to-date and vivid examples of the local initiative of residents to protect the environment is the initiative to oppose a large-scale housing investment in a valuable natural area of the city of Lublin, called “Górki Czechowskie,” which has been carried out for several years. Górki Czechowskie is an undeveloped area of natural hills and ravines in the northern part of Lublin in Czechów, covering approx. 150 ha. Until the early 1980s, Górki Czechowskie functioned as an exercise area for the recruits of the Lublin Garrison (hence the name of the area - training ground). A public debate has been underway since the beginning of the 21st century to determine whether the Górki area should be left undeveloped. In 2019, the Lublin City Council decided to settle the future of Górki Czechowskie through a local referendum. The voting conducted by the residents did not bring a resolution to the matter, as it turned out to be non-binding (only 13% of the eligible voters participated in it). However, the majority (68%) of the voting residents were against the changes in the city spatial development plan and the developer’s implementation of housing investments in this area.<sup>33</sup>

The inhabitants of Lublin involved in this ecological initiative are an example of the implementation of a pro-ecological project as part of citizen science. During the course of the action, the residents on their own and in cooperation with the local scientific community collected scientific data, analysed scientific studies, environmental reports, proving the negative impact of a housing investment in the Górki area on the natural environment of the city and the region, and thus on the quality of life of the residents.

The objection of the inhabitants of Lublin against the development of Górki brought the case to the Administrative Court, which in the first instance found that the opponents of the housing development in this valuable natural area of the city were right. Although the case of Górki Czechowskie is not finished, as it is waiting for a final decision in the Supreme Administrative Court, the example of this local initiative of residents shows that the residents' unity in a matter important for the entire local community allows, contrary to the intentions of local authorities, to stop the investment, which arouses serious reservations of ecologists, scientists and the inhabitants themselves that it will have a negative impact on the natural environment and the quality of life in Lublin.

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<sup>32</sup> *Eco-City. Energy of Change*, Centrum UNEP / GRID-Warsaw, 2020, pp. 5, 25, 27, 28.

<sup>33</sup> [https://pl.wikipedia.org/wiki/G%C3%B3rki\\_Czechowskie](https://pl.wikipedia.org/wiki/G%C3%B3rki_Czechowskie) (accessed on 08/09/2022).



## Summary and recommendations

Citizen science is a dynamically developing method of conducting scientific research in the world, involving representatives of local communities, apart from professional scientists, regardless of their education, profession or age. Citizen methods of conducting scientific research make it possible to engage citizens at every stage of the research process: selection of methods, data collection, and results analysis.

Citizen science is most often used in natural and exact sciences, less often in social sciences and humanities. Citizen science approach is particularly developed within ecological and environmental initiatives, allowing local communities to engage in climate and natural issues of importance to them that directly affect the quality of life in local communities.

Environmental education in Poland still does not seem to occupy an appropriate place in the general education system and in the training and vocational education sector. Many studies and reports show us that Poles still have an insufficient level of environmental knowledge and awareness. Compared to other European countries, Polish citizens are much less involved in local ecological and pro-environmental initiatives.

The education and vocational training staff have great potential to disseminate environmental knowledge and awareness among youth and adult Poles. In the context of the climate challenges ahead of Europe and Poland, it is important that environmental education and citizen science become an inherent element of education and vocational training.

The lubelskie voivodeship is struggling with climate challenges and threats, just like the whole of Europe and the world. The most serious environmental threats include: air pollution, deterioration of the acoustic climate of the environment, low and insufficient quality of water resources, and transport investments colliding with the existing ecosystem of plants and animals.

Grassroots initiatives in the field of environment and climate can be implemented with great success. The involvement of local communities makes it possible to suspend, often against the intentions of local authorities, investments that, in the opinion of scientists, ecologists and residents, will adversely affect the local nature, environment and quality of life in the city.

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