

HUMAN PRESSURE ON AIR QUALITY IN BUCHAREST

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Abstract

The environment is the natural space that has been transformed by humans over time. It is mostly made up of water, air, vegetation and soil. They are the elements of the natural environment in which man was born. It is already realized that each element plays an extremely important role in the formation of the natural environment. Moreover, all these elements, which make up the natural environment, are intercorrelated: the climate is influenced by relief; climate and relief determine the spread of vegetation and fauna to preserve the natural environment etc.

The purpose of our research is to highlight the destructive effects of pollution under the action of the anthropic factor and to present some directions of action for a sustainable development, with an emphasis on the air quality in Bucharest.

The paper mainly highlights the effects of human pressure on the air quality in Bucharest. This locality was chosen because it has the highest population density in Romania. Sustainable development involves the relation of the human being with the environment and the responsibilities of the present generation to the next generation. For the Earth to remain a living planet, human interests must be correlated with the laws of nature.

Keywords: *air quality, anthropogenic factor, human pressure*

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Introduction

The paper mainly highlights the effects of human pressure on the air quality in Bucharest. This locality was chosen because it has the highest population density in Romania. In fact, Bucharest is the European capital, with over 8000 inhabitants / kmp, on the third place in Europe, after Paris and Athens or even on the second European place in some studies. Demographic growth is considered to be a first factor that has put pressure on the natural environment. After the Second World War, the plight grew considerably. Thus, from 2 billion inhabitants in the year 1925, the population reached over 3 billion in 1950, over 4 billion in 1985 and over 6 billion in 2000. Researchers estimate that the population of our planet will reach 10 billion in 2030. Over time, man transforms the natural environment by creating settlements, landforms, roads and factories. (Bran, et al., 2019). We also agree with the idea that the natural environment can help humanity, provided that the environment is not destroyed by humanity. Today, however, there are numerous examples of plants and animals being destroyed by humans, including pollution of water, soil and / or air. When discussing the pollution of the natural environment, it is considered the pollution to which man contributes the most. The development of the production of materials, of the population, the increase of energy needs raw materials for industry and food in recent years, have accentuated the conflict between man and nature which had increasingly serious consequences on the ecological balance of the planet. (Rădulescu et al., 2018).

1. Literature review

Industrialization, urbanization and the development of production and mass consumption products are considered factors that contributed most to destroy the planet by wasting natural resources through environmental degradation by water, air and soil. As a result, teams were formed dedicated surveillance laws are designed to protect the environment and measures to punish violators cases the natural environment. (Negescu Oancea et al., 2019). Pollution is one of the ways to damage the natural environment. Pollution is the penetration of natural and artificial pollutants into the natural environment result from human activity: industry, agriculture, transportation, which is wasteful of human activity.

Examples of pollution:

- The administration of chemical fertilizers that can have negative effects on the environment by penetrating substances into the groundwater can reach wells or springs that threaten the health of humans and animals;
- Oil affects the seas and oceans following accidents, being resistant to the action of bacteria and persists for a long time on the surface of the water, which prevents the diffusion of oxygen into the water.
- Energy transport can also be polluted by electricity networks:
 - Noise pollution;
 - Visual pollution;
 - Electromagnetic pollution;
 - Psychological pollution.

Pollution is one of the ways to damage the environment, but there are other sources of degradation that come from human activity.

Overexploitation of the riches of the subsoil, forests, pastures, soil, plants and animals have negative effects. Therefore, the richness of the soil, the areas covered by forests, the destruction of the soil and the disappearance of numerous species of animals and plants, landslides and landslides were achieved.

2. Norms for air quality

Air pollution is perhaps the worst form of health pollution. Air pollution is more difficult to prevent and control than water pollution. This is damaging to human health, buildings and the natural environment. The issue of environmental pollution must be a priority for environmental protection policy.

Air pollution leads to acid rain, due to SO₂ and NO₂ emissions that cause damage to forests and lakes. The impact of acid rain is not direct, it depends on the climatic, biological, geological conditions that determine the precipitation regime and the soil's ability to reduce acidity. It may have important implications in prioritizing the reduction of cross-border pollution.

To understand what local air quality means to population health, it is divided into six AQI categories:

Does each category correspond to a different level of health problems that could be influenced?

1. AQI "good" takes values from 0 to 50. The air quality is considered satisfactory and the air pollution presents a low or no risk.
2. The "moderate" AQI is from 51 to 100. The air quality is considered acceptable; however, for some pollutants, there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may have respiratory symptoms.
3. The "unhealthy for sensitive groups" AQI is from 101 to 150. Although it is considered that the general public is not likely to be affected during this AQI interval, people with lung disease, older adults and children are at higher risk of exposure. In ozone, while people with heart and lung disease, older adults and children are at higher risk of airborne particles.
4. The "unhealthy" AQI is from 151 to 200. Each person may begin to experience some adverse health effects, and members of sensitive groups may have more serious effects.
5. The "very unhealthy" AQI is 201 to 300. This would trigger a health alert indicating that everyone can have more serious health effects.
6. AQI "dangerous" greater than 300. This would trigger emergency health warnings. The entire population is more likely to be affected.

3. Findings

Since 2007, the project World Quality Index was born, a project of a non-profit organization with the mission to raise awareness of air pollution and to provide unified and global information on air quality. With the founding team located in Beijing China and several contributors in the field of environmental science, systems engineering, data science and visual design, the project provides air quality information for over 100 countries, thanks to over 12,000 stations in over 1000 large cities. The information is made available to the public through two websites: aqicn.org and waqi.info.

In Bucharest there are 4 large collection stations located on Victoriei Street (Military Circle), Drumul Taberei Street, Lacul Morii Street and Titan Rotunda Street.

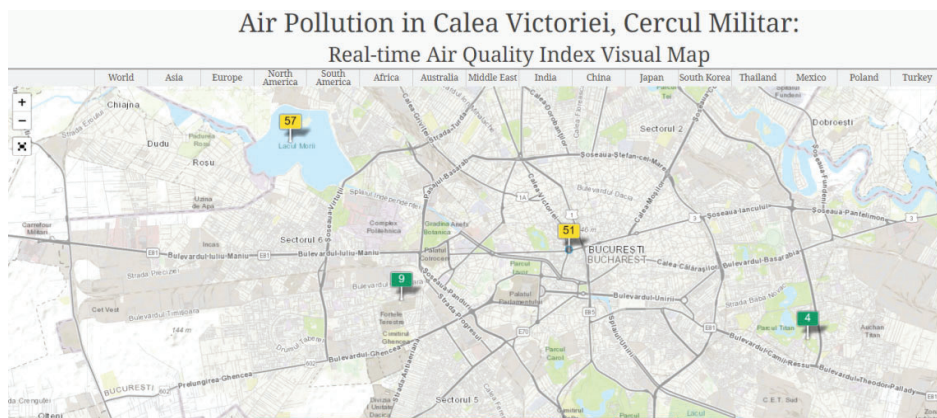
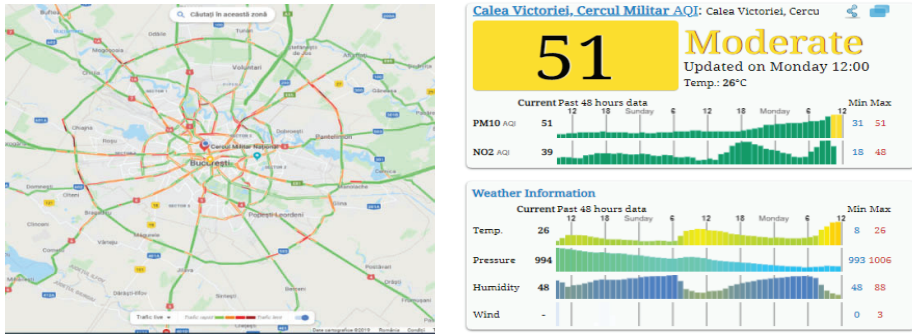


Figure 1. Information collection centers regarding air pollution in Bucharest

Source: <http://aqicn.org/map/romania/municipiul-bucuresti>

The data presented confirm our expectations that a poor air quality can be found in the city center, which is mainly due to car traffic. Worldwide, government agencies use an Air Quality Index (AQI) to tell the public how much air is polluted or how much it is expected to become. Also, Romania has adopted this index, which is used in the reports of the European Union, respectively of the Environment Agency (EEA) and of the European one, through the Center of topics on air pollution and climate change mitigation (ETC / ACM).



Figures 2 and 3. Air quality and traffic in Bucharest at the same time interval
Source: <http://aqicn.org> and <https://www.google.com/maps>

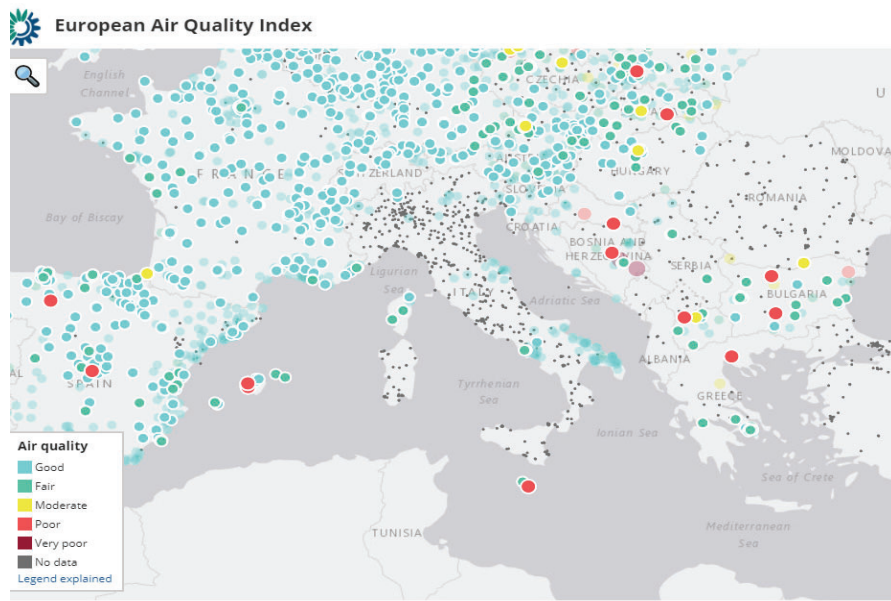


Figure 4. Air quality in Europe
Source: <https://www.eea.europa.eu/themes/air/air-quality-index>

Although in Bucharest, the European Agency uses 6 data recording stations, until the date of writing the article, the data were not available on the official map (see fig. no. 4).

In fact, the Common Air Quality Index (CAQI) has been used in Europe since 2006. In November 2017, the European Environment Agency announced the European Air Quality Index (EAQI) and started encouraging its use on websites or other means of informing the public about air quality.

4. Discussion: destructive effects of air pollution

The use of poor-quality coal in households and small businesses involves significant air pollution. Smoke and soot from low smoke baskets are harmful to health.

Cities where the population is exploited with coal are exposed to high levels of fine particulate and gas emissions from coal stoves that are used to heat homes for space heating and other processes.

These stoves have no form of protection to reduce pollution. In Poland, 46% of soot and dust emissions come from low quality coal burning stoves. In the former Soviet Union, natural gas has contributed to reducing pollution from household stoves in coal-fired cities.

The smoke that comes from the burning of quality coal (businesses or households) is harmful to health. (Bran et al., 1997)

5. Recommendation: directions for recovery in the context of sustainable development

The concept of sustainability comes from the literature, referring to the model of resource utilization. Resource management is defined as sustainable if it does not exaggerate in operation above a certain threshold.

The final point of the process is sustainable development, because it consists of a set of several components, in which different categories such as sustainability and development give life to complex unions. (Rojanschi et al., 2006)..

Sustainable development is a strategy by which communities seek ways of economic development, benefiting the local environment or benefiting the quality of life.

Sustainable development involves the relationship of the human being with the environment and the responsibilities of the present generation to the next generation.

The strategic components of sustainable development and the actions that must be taken to move efficiently from one stage to another are inscribed in the trigonometric sense, from the management of production and services, through the management of resources to the management of change (fig. no. 5).

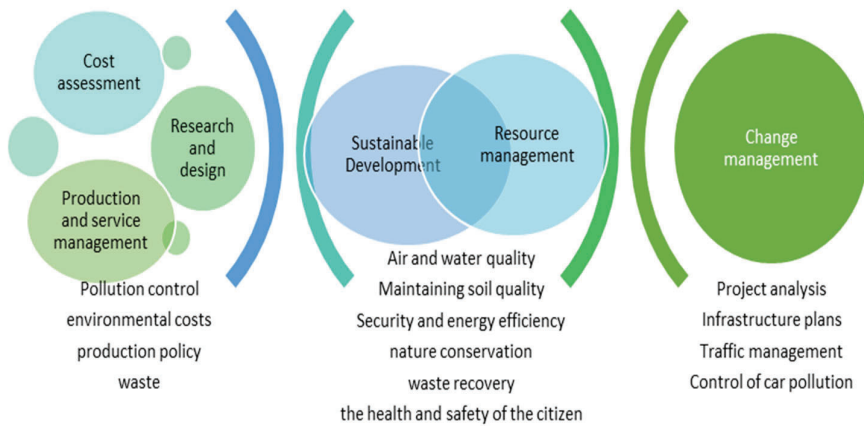


Figure 5. Sustainable development and resource management

Source: Authors

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Conclusions

The deterioration of the environment is caused by: too many cars, jet planes and large tonnage vessels, too many factories operating on old technologies, pollutants, big consumers of raw materials, water and energy, phenomena that are decisive, in the last instance, increasing needs of a population in a state of demographic explosion and especially of the existence of large urban agglomerations.

The modern habitat is characterized by the continuous deterioration of the urban sound environment. As one of the most difficult to influence stress agents in the environment, noise appears as a priority for integrated environmental and health policies.

The results of the monitoring action of the urban noise pollution, carried out by the Institute of Public Health of Bucharest, in collaboration with the specialized departments in the territory, showed a continuous upward dynamic of the exposure levels from the average values of 50 dB in the early 80s to about 70 dB in 1999.

Building factories and factories, developing cities and transports, cleaning forests to use wood and growing agricultural areas, carelessly throwing large amounts of toxic waste into water and air, man broke the natural balance existing in the environment, so sometimes he put them endangered his own life. In such a situation, the human being has had to take an attitude to remove the harm he has done and to urgently adopt environmental protection measures, in order to maintain in nature a normal balance between all the factors that make up the environment. For the Earth to remain a living planet, human interests must be correlated with the laws of nature.

References

1. Bran, F., Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2019). THE ANTHROPIC PRESSURE ON THE FOREST SPACE. DYSFUNCTIONS AND RISKS IN ROMANIA. *Quality-Access to Success*, 20.
2. Bran, F., Alpopi, C., & Burlacu, S. (2018a). TERRITORIAL DEVELOPMENT-DISPARITIES BETWEEN THE DEVELOPED AND THE LEAST DEVELOPED AREAS OF ROMANIA. *LUMEN Proceedings*, 6(1), 146-155.
3. Bran, F.; Rojanschi, V.; Diaconu, G. (1997), Politici Ecologice, ASE
4. Bran, Florina; Ioan, Ildiko; Dinu, Marin, Mockesch, Carmen (1999) Mic Lexicon de protecție a mediului, Economic Publishing House, Bucharest
5. Burlacu, S., Bodislav, D. A., & Rădulescu, C. V. (2018a). E-COMMERCE AND GLOBAL FOOD RESOURCES. *Managerial Challenges of the Contemporary Society. Proceedings*, 11(2), 48.
6. Burlacu, S., Gutu, C., & Matei, F. O. (2018). GLOBALIZATION--PROS AND CONS. *Quality-Access to Success*, 19.
7. Căpătîină, Camelia; Racoceanu, Cristinel (2003) Deșeuri, Editura Matrix ROM, București
8. Negescu Oancea, M. D., Burlacu, S., Buzoianu, O. A. C., Mitrita, M., & Diaconu, A. (2019). STRATEGIC OPTIONS FOR THE DEVELOPMENT OF ECOTURISM IN THE DORNELOR COUNTY. *The USV Annals of Economics and Public Administration*, 19(1 (29)), 21-28.
9. Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2018a). DEMOGRAPHIC EXPLOSION AND IT GOVERNANCE IN PUBLIC INSTITUTIONS. *Managerial Challenges of the Contemporary Society. Proceedings*, 11(1), 18.
10. Rădulescu, C. V., Dobrea, R. C., & Burlacu, S. (2018b) THE BUSINESS MANAGEMENT OF DISTRESS SITUATIONS. THE 12th INTERNATIONAL MANAGEMENT CONFERENCE "Management Perspectives in the Digital Era" November 1st-2nd, 2018, BUCHAREST, ROMANIA, 1, 741-747
11. Rojanschi, Vladimir; Bran Florina, Iosif, Gh. N. Filon Toderiou, Economia și Protecția Mediului, Editura Economică, București
12. Rojanschi, Vladimir; Bran, Florina; Diaconu, Gheorghita, (2006) Protecția și Ingineria Mediului, Economic Publishing House, Bucharest
13. Rojanschi, Vladimir; Bran, Florina; Grigore Florian, Ildiko, Ioan (2006) Cuantificarea dezvoltării durabile, Economic Publishing House
14. www.cnaic.ro – Radioactive pollution
www.mmediu.ro, Impact of waste on the environment