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THE IMPORTANCE OF GREEN AREAS FOR REDUCING NOISE POLLUTION IN THE URBAN ECOSYSTEMS – OPINION SURVEY

Alexandru PETRUȘ, Patric BUTNARIU, Paul BOCU

Scientific Coordinators: Assoc. Prof. Biotech. PhD Irina GREBENIȘAN, Lect. PhD Roxana SĂLCIANU

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, 011464, Bucharest, Romania, Phone: +4021.318.25.64, Fax: + 4021.318.25.67, Email: patric.butnariu@gmail.com

Corresponding author email: patric.butnariu@gmail.com

Abstract

Important sources for environmental noise exposure are road, railway and air traffic, or building sites. Noise exposure can also occur through other sources such as wind turbines, and leisure activities such as listening to loud music or other audio content including participation in e-sports (video and computer game competitions). Excessive noise can cause annoyance; in addition, research shows it increases the risk for hypertension, sleep disturbance, hearing impairment, tinnitus and cognitive impairment, with increasing evidence for other health impacts such as adverse birth outcomes and mental health problems.

Today, noise pollution is a major environmental problem, cited as a top environmental risk to health across all age and social groups and an addition to the public health burden. Prolonged exposure to high levels of noise impairs human health and well-being, which is a growing concern. Traffic and other urban noises affect not only human well-being, but also disturb and endanger the survival of species crucial to the urban environment. The mental health benefits from natural sounds and general quietness are considered psychological ecosystem services provided by nature. Urban green space and vegetation produce positive psychological effects. Public parks, gardens and other small green areas provide pleasant sounds from nature, such as rustling leaves, swaying tree branches and chirping birds. Quiet urban areas offer acoustic relief to city inhabitants from noisy surroundings, a prerequisite for mental restoration and well-being.

In this paper, we present the results of the questionnaire for the survey of public opinion regarding the perception of the level of noise in the urban ecosystems. The questionnaire contains ten questions and was addressed to various social categories, of age and with different levels of education. The questionnaire, the statistical interpretation and the graphics were made with the help of Google forms.

Key words*: ecosystem services provided by nature, green area, noise pollution, urban environment.*

INTRODUCTION

Today, noise pollution is a major environmental problem, cited as a top environmental risk to health across all age and social groups and an addition to the public health burden. Prolonged exposure to high levels of noise impairs human health and well-being, which is a growing concern (Aletta et al, 2022).

Noise pollution comes from conventional sources, such as roads, railways, airports, and industry; however, high noise levels may also come from domestic or leisure activities. Traffic and other urban noises affect not only human well-being, but also disturb and endanger the survival of species crucial to the urban environment.

The mental health benefits from natural sounds and general quietness are considered psychological ecosystem services provided by nature. Urban green space and vegetation produce positive psychological effects. Public parks, gardens and other small green areas provide pleasant sounds from nature, such as rustling leaves, swaying tree branches and chirping birds. Quiet urban areas offer acoustic relief to city inhabitants from noisy surroundings, a prerequisite for mental restoration and well-being (WHO, 2018).

In this paper, we present the results of the questionnaire for the survey of public opinion

regarding the perception of the level of noise in the urban ecosystems. The questionnaire contains ten questions and was addressed to various social categories, of age and with different levels of education. The questionnaire, the statistical interpretation and the graphics were made with the help of Google forms.

MATERIALS AND METHODS

Create the Google Drive form and questionnaire

Step 1

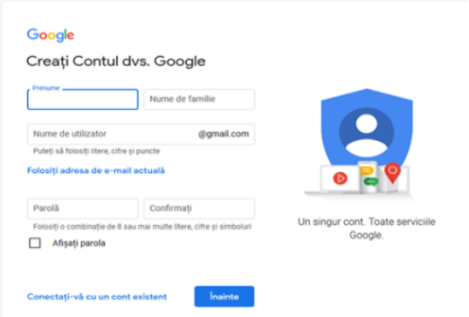
With the browser we created a Google user account, then we went to the G-mail page to create a new account using the "Create an account" option and entered all the necessary data to register and benefit from all Google services offered (Figure 1).

Step 2

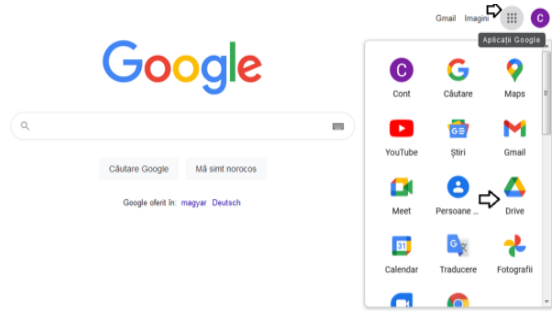
To enter Google Drive, we clicked the button called "Google Apps". After displaying its window, we clicked on the "New" button that offers the submenus: "File"; "Upload a file"; "Upload a file"; "Google Docs"; "Google Spreadsheets"; "Google Presentations"; "Google Forms"; "More". We accessed the "Google Forms" window and added the necessary information (Figures 2, 3, 4).

Step 3

In this stage, we filled in the title of the topic in the column where it says “Untitled form”, then we wrote the question and how many answer options we have. In the "Multiple answers" box we have several options on how we want to make the answers. To add more questions we have to press the button with the circled plus sign (Figures 5, 6).



Figures 1.



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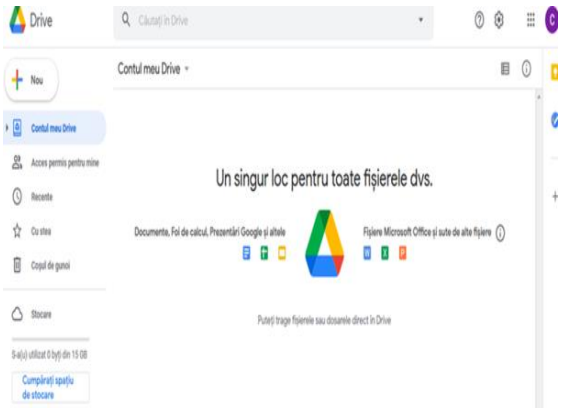
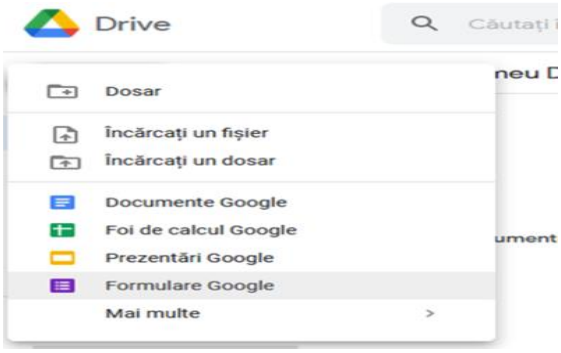


Figures 3.



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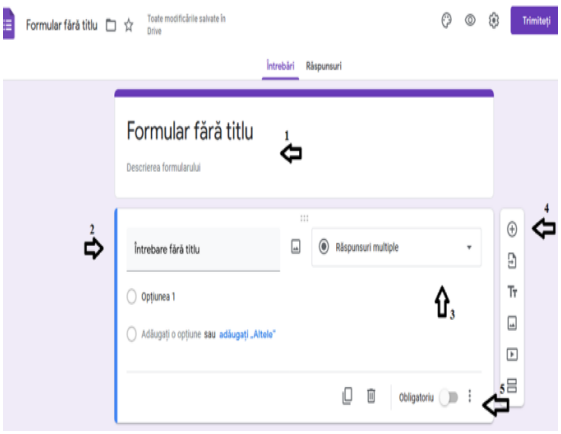

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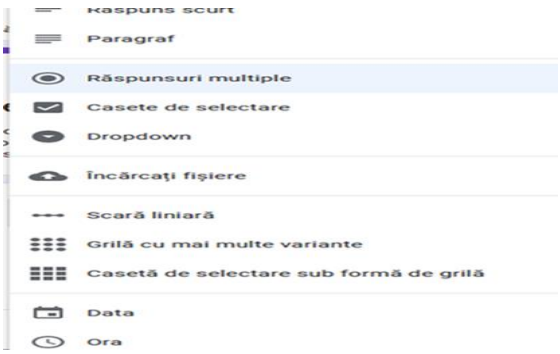


Figure 6.

Step 4

After completing the questionnaire, we can see what it looks like by clicking on the eye icon and if we see that everything is well written we can send it for completion by the general public. We have the option to send it by e-mail, on social networks or by creating a link. Finally, to see the number of people who completed the questionnaire, we must click on the Answers option (Figure 7).

Step 5

By accessing the Answers option, we see how many people answered the questionnaire and we have the option to see an overall summary drawn in a diagram or we can see how each person answered these questions (Figure 8).

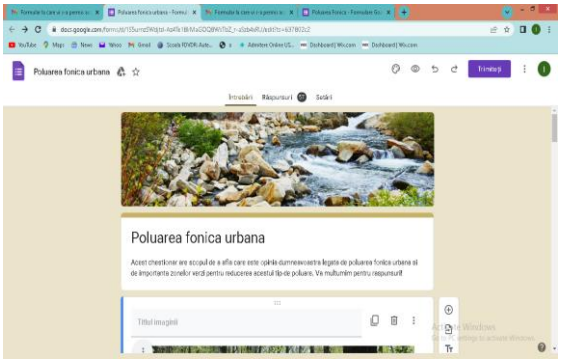


Figure 7.

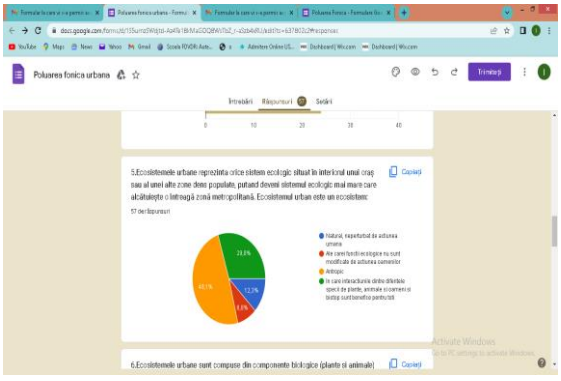
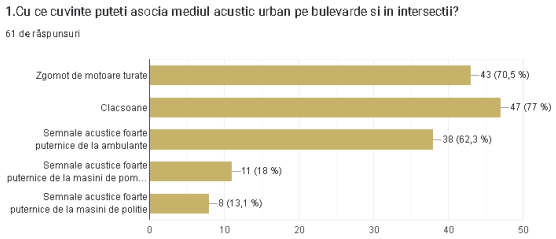


Figure 8.

RESULTS AND DISCUSSIONS

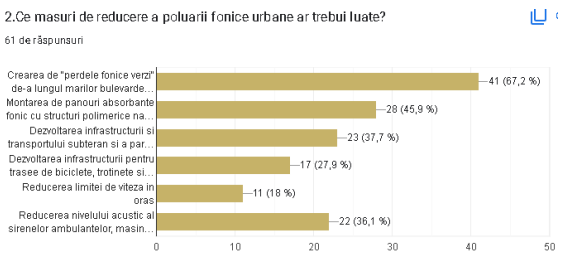
1. With what words can you associate the urban acoustic environment on boulevards and intersections?

- ❑ The sound of revving engines
- ❑ The horn
- ❑ Very loud acoustic signals from ambulances
- ❑ Very loud acoustic signals from fire engines
- ❑ Very loud acoustic signals from police cars



2. What measures should be taken to reduce urban noise pollution?

- ❑ Creating "green sound curtains" along major boulevards by planting evergreen trees
- ❑ Installation of sound-absorbing panels with natural or synthetic polymer structures
- ❑ Development of the infrastructure and underground transport and the electric car fleet for the above-ground public transport
- ❑ Development of the infrastructure for bike paths and electric scooters
- ❑ Reducing the speed limit in the city
- ❑ Reducing the acoustic level of ambulance sirens, fire engines, police cars

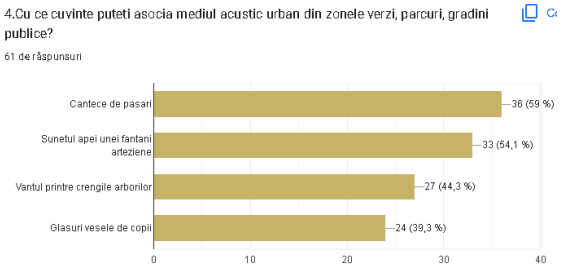


3. Do you consider that green areas are important for attenuation noise pollution in urban ecosystems?

- ○ Yes
- ○ No
- ○ I don't know

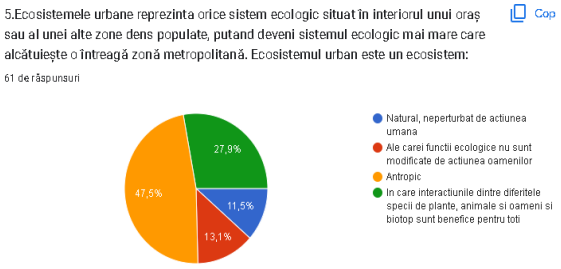
4. With what words can you associate the urban acoustic environment in green areas, parks, public gardens?

- ❑ Bird songs
- ❑ The sound of water from an artesian fountain
- ❑ The wind among the branches of the trees
- ❑ Joyful children's voices



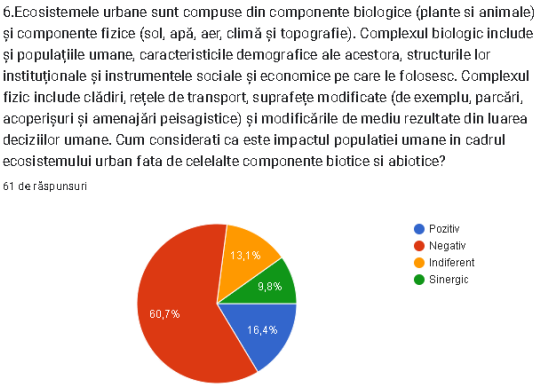
5. Urban ecosystems represent any ecological system located inside a city or another densely populated area, potentially becoming the larger ecological system that makes up an entire metropolitan area. The urban ecosystem is an ecosystem:

- ○ Natural, undisturbed by human action
- ○ Whose ecological functions are not modified by human action
- ○ Anthropic
- ○ In which the interactions between the different species of plants, animals and people and the biotope are beneficial for all



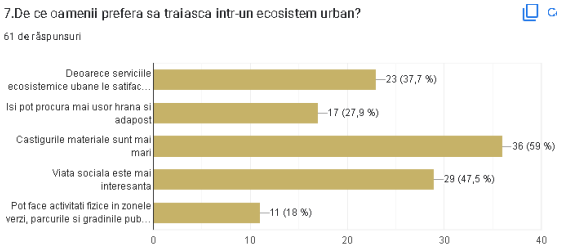
6. Urban ecosystems are composed of biological components (plants and animals) and physical components (soil, water, air, climate and topography). The biological complex also includes human populations, their demographic characteristics, their institutional structures, and the social and economic tools they use. The physical complex includes buildings, transport networks, modified surfaces (e.g. parking lots, roofs and landscaping) and environmental changes resulting from human decision-making. How do you consider the impact of the human population within the urban ecosystem compared to the other biotic and abiotic components?

- ○ Positive
- ○ Negative
- ○ Indifferent
- ○ Synergistically



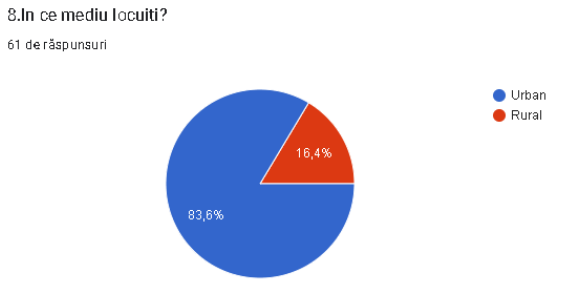
7. Why do people prefer to live in an urban ecosystem?

- ❑ Because urban ecosystem services satisfy their primary needs
- ❑ They can get food and shelter more easily
- ❑ The material gains are greater
- ❑ Social life is more interesting
- ❑ They can do physical activities in green areas, parks and public gardens



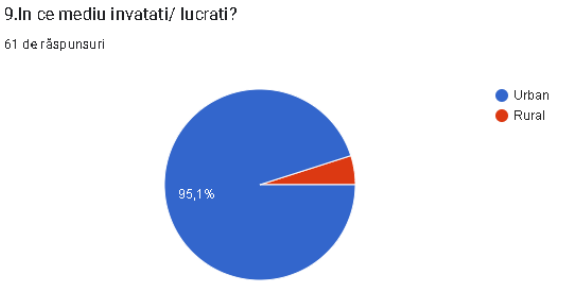
8. In what environment do you live?

- Urban
- Rural



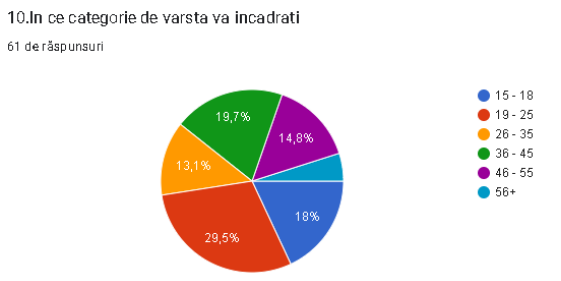
9. In what environment do you study/work?

- Urban
- Rural



10. What age category do you belong to?

- 15-18
- 19-25
- 26-35
- 36-45
- 46-55
- +56



CONCLUSIONS

From the answers provided by the 61 respondents to the questions of our questionnaire, we can draw the following conclusions:

- The vast majority of respondents live and study or work in the urban environment, some of them live in the rural environment, but study or work in the urban environment.
- The urban acoustic environment in congested areas (boulevards, intersections) mainly associates it with the noise of horns, the noise of revving engines and the very loud noise produced by ambulances.
- Among the noise protection measures for citizens proposed by us, they found the most interesting: "green sound curtains" obtained from evergreen trees along the boulevards and sound-absorbing panels with natural or synthetic polymer structures.
- Respondents associate the urban acoustic environment in green areas, parks and public gardens with cheerful, pleasant, soothing sounds.
- Only about 50% of the respondents consider that the urban ecosystem is anthropogenic, which shows us an erroneous perception due to a lack of knowledge of ecology.
- Regarding the impact of the human population on urban ecosystems, 61 of the respondents consider it negative, while 16% consider it positive, 13% indifferent and 10% synergistic.
- In the top of preferences when we asked why people prefer to live in an urban ecosystem, the answer was chosen: “The material gains are greater”.
- Green areas are considered important by the respondents of our questionnaire for reducing the level of noise caused by heavy traffic in urban areas and for the possibility of being able to do sports and relax in nature.

REFERENCES

Aletta, F., Dzhambov, A., Anderson, C., Potvin, D., Rey-Gozalo, G., Ma, H., Jeon, J.Y., Chong, J., Trombetta Zannin, P.H., Rana, S., 2022, Listening to cities, From noisy environments to positive soundscapes, https://wedocs.unep.org/bitstream/handle/20.500.11822/38060/Frontiers_2022CH1.pdf

World Health Organization, 2018, Environmental Noise Guidelines for the European Region https://www.euro.who.int/en/health-topics/environment-and-health/noise/environmental-noise-guidelines-for-the-european-region

SECTION 02
SUSTAINABLE DEVELOPMENT OF RURAL AREA