STUDIU

Irina Zamfirescu, Sorin Cheval, and Alexandru Dumitrescu
Bucharest, July 2025

Bucharest Under Heatwave

The Impact of the Climate Crisis on the Urban Population, Especially on Vulnerable People

Friedrich Ebert Stiftung

Office Romania

IMPRINT

Publisher
Friedrich-Ebert-Stiftung Romania
21 Emanoil Porumbaru Street, Apartment 3
RO-011421 Bucharest, Sector 1
Romania

Responsible:
Anna-Lena Koschig Hölzl

Friedrich-Ebert-Stiftung Romania
Tel.: +40 21 211 09 82
romania.fes.de

Project coordinator:
Tudorina Mihai, FES Romania

Translation from Romanian:
Adina Pop-Coman

Graphic design:
Florin Vedeanu

Cover photo:
Grigore Popescu / AGERPRES FOTO

Orders and contact:
office.romania@ fes.de

Friedrich Ebert Stiftung

Irina Zamfirescu, Sorin Cheval, and Alexandru Dumitrescu
Bucharest, July 2025

Bucharest Under Heatwave

The Impact of the Climate Crisis
on the Urban Population, Especially on Vulnerable People

Table of Contents

Executive summary

The study examines the manifestations of the climate crisis in Bucharest, the forecasts regarding how temperatures will evolve over the coming decades, and the way in which the built environment and the city's green and blue infrastructure influence the effects of the climate crisis. It also provides an analysis of the administrative and political response of Bucharest's local public administration to the impact of the climate crisis, by reviewing some of the existing strategic documents at the local level. The study also describes the everyday experience of heatwave days for several vulnerable groups (people who experience homelessness, people engaged in precarious work).

In drawing up the report, we relied on research tools such as document analysis, interviews, and ethnographic observation. The report shows that despite tremendous potential in Bucharest for public policies centred around mitigating the effects of the climate crisis (due to the lake infrastructure of the city, non-governmental organisations and citizen groups, bigger financial resources than in other local communities), the municipality has not made optimal use of the existing resources and has postponed taking measures that would improve thermal comfort in public spaces. Administrative and political debates completely overlook public policies focused on a just transition, and vulnerable people living in the city need to resort to individual solutions for vital things such as access to water.

Introduction

Climate change has had a significant impact on quality of life in urban areas. Summer heatwaves disproportionately affect urban areas, in part also due to a poorly managed urbanisation process. A loosely regulated urban planning that allowed for exceptions to rules after 1990, combined with individual motorised traffic (caused largely by construction practices and the decades' long lack of interest from local public authorities in public transport policies) are among the factors contributing to the intensification of extreme summer heatwaves in Bucharest. Studies reveal that heatwaves cause the highest number of weather-related deaths in many cities around the world (Luber et. al., 2008).

Cities and metropolitan areas concentrate the majority of a country's population and material assets, and the local and national administrative functions are carried out from offices located in urban areas. Bucharest is the most dynamically developed area in Romania, with over 2 million permanent residents and several hundred thousand more people present daily within its urban perimeter. Such population density, combined with the expansion and complexity of the infrastructure, a dynamic and complex urban metabolism, and the duration of habitation, have affected the environment deeply and irreversibly. The urban climate is a clear example of the changes induced by cities. The temperatures are higher than in the surrounding rural areas, the air is drier, and the wind can intensify locally along canyon-like streets and public squares. What is more, cities are the most heterogeneous environments, with a wide variety of land uses, colours, structures, and materials that change swiftly and generate specific microclimates. Within a small area, one can encounter fully built-up surfaces with one or more storeys, with more or less vegetation, lakes, and parks of various sizes, each with its own, distinct microclimate.

In July, the hottest month of the year, the average air temperature in Bucharest reaches 22.5^{0}C, which places Romania's capital in 9th position behind Athens, Madrid, Rome, Tirana, Skopje, Lisbon, Belgrade, and Istanbul.

Nonetheless, a recent study by the World Bank shows that mortality associated with extreme heat is high in many capitals in Central and South-Eastern Europe (for instance, Prague, Budapest, Bratislava, Zagreb, Sofia, Athens) (World Bank 2025). On the other hand, Bucharest has the highest heat-associated mortality rate overall among all cities in Central and Eastern Europe, surpassed only by Istanbul. This is why the issue of the effects of the climate crisis should be a fundamental public health concern (besides the social costs associated with treating people affected by heat, managing chronic illnesses caused or/and worsened by heatwaves, the medical leaves engendered by these conditions, etc.).

The city of Bucharest was ranked fourth globally in terms of traffic congestion for the year 2024 by TomTom[1]. As regards urban planning, former mayor general Nicușor Dan stated that prior to his term urban regulations were largely ignored, therefore, many of the issues related to traffic congestion and the lack of green spaces are connected to a form of urbanism that did not take these aspects into account[2].

Besides global climate change, the city of Bucharest has had, over the years, public policies that rather contributed to the effects of the phenomenon (widening boulevards at the expense of green areas, proposals for underground pedestrian passages meant to ease car traffic). Environmental concern has been rather limited to the development of parks and has included little to no attention paid to reducing emissions. The mere fact that over the past 15 years, several citizen initiative groups have been set up in order to save various green areas or stop real estate projects from going ahead demonstrates that local communities understand the need to preserve green spaces. Only in recent years have local public authorities in Bucharest taken action to draft strategic documents aimed at managing pollution and only very recently have the public documents included a response to the climate crisis. In parallel, non-governmental organisations have come together and either advocated for or implemented small-scale solutions by funding pilot projects for responsible environmental policies at local level. Bucharest, alongside other major cities in Romania, holds the advantage of

1 https://www.tomtom.com/traffic-index/ranking/?country=UK%2CIE%2CES%2CRO%2CFR%2CBE%2CIT%2CGR%2CAT%2CPL%2CFI%2CDE%2CBG%2CHU%2CCH%2CDK%2CTR%2CCZ%2CLT%2CPT%2CLV%2CNL%2CEE%2CMT%2CSE%2CIS%2CNO%2CSI%2CSK%2CLU

2 Previously, before Nicușor Dan took office, the Bucharest City Hall extensively used the option to build through Zonal Urban Plans, which are urban planning documents that allow for exceptions to the provisions of the General Urban Plan

having civil society resources that local public authorities can use. The resources include expertise, internationally sourced funding, and middle-class individuals who can afford the time to engage in civic activities.

It was only over the past decade, therefore, that Bucharest has seen a large-scale administrative handling of topics pertaining to climate change. The administrative specificity of Bucharest, namely its division into sectors, aggravates the institutional and strategic undertakings at the city level. Cooperation both between the sectors and between the sectors and the Bucharest City Hall was tedious even when all the city's administrations were led by the same political party (2016-2020). The environmental component is critically dependent on collaboration among all these institutions, given the non-localised nature of climate crisis effects or, for example, the water streams that cross the city. Over the past few years, several sectoral administrations have drafted various strategic documents aimed at increasing the quality of air and green spaces in Bucharest, as shown in this report. Despite a noticeable increase in institutional attention from Bucharest local administrations towards this issue, the city has a long-standing history of strategic documents that have only been implemented partially.

All forecasts concerning the evolution of the situation point to a further increase in temperatures in the coming decades. Some scenarios are more optimistic, some are more pessimistic, according to the public policies that the public authorities implement in cities. The fact that currently there are commitments in the form of strategic papers engaged at local, national, and EU level does not constitute a guarantee that the public authorities will implement the said documents. According to the experts included in this research, there is still a lack of expertise in the technical departments and of human resources on the ground for the development of public spaces. The public and political debate lacks the environmental justice component almost entirely. Globally, there is talk about the unequal impact the effects of global warming have on citizens. Resilience and adaptation to the new climate conditions are, as in any other field, much more costly and harder to achieve for vulnerable individuals.

The middle class has at its disposal many more possibilities to mitigate the effects of global warming on the quality of their lives, such as affording to pay for larger electricity bills for using air conditioning, working mostly in spaces with controlled ventilation, affording to buy clothes that are suitable for extreme environmental conditions, etc. However, vulnerable individuals are deeply affected, since they often perform unskilled work in poorly ventilated spaces or outdoors, and their financial resources are limited. Therefore, they cannot afford to reduce the discomfort caused by heatwaves or repair damage caused by severe weather. That is the reason why the analysis of the strategic documents will rather focus on how public environmental policies integrate social justice. In order to get a complete picture of how heatwaves affect the daily lives of vulnerable people during the summer, this study will also provide a section describing how extreme heat affects the various vulnerable groups. The main aspects of their daily lives during heatwaves covered in this report are housing, leisure, and work. For each of these, we will use observations and interviews to capture how vulnerable people are currently affected, and what they risk being affected by in the future.

Chapter 1.
Heatwave Resilience in the City of Bucharest

Urban Heat Island, the Cause of Rising Temperatures

Surfaces covered with concrete, bitumen, asphalt, or other materials, alter the temperature by a few degrees, proportionally to the size of the surface. Cities the same size as Bucharest (a few hundred hectares) may increase the ambient temperature by 5-6ºC as compared to the surrounding region, thus generating a so-called "urban heat island".

Built surfaces in cities retain a greater amount of heat, while a lack of vegetation reduces evapotranspiration and the natural shading effect. Moreover, rainwater drains quickly and does not maintain soil humidity, while human activities release additional heat. The buildings and the urban infrastructure enhance surface roughness, hindering air circulation, and air pollution intensifies the greenhouse effect. All these factors contribute to an increase in temperatures inside the city, proportionally to their respective level of influence. The size of the city, the number of inhabitants, and economic development are other factors that contribute to amplifying the urban heat island effect. Over 50% of Bucharest's surface is anthropogenically modified through buildings, roads, industrial areas, and other forms of landscaping.

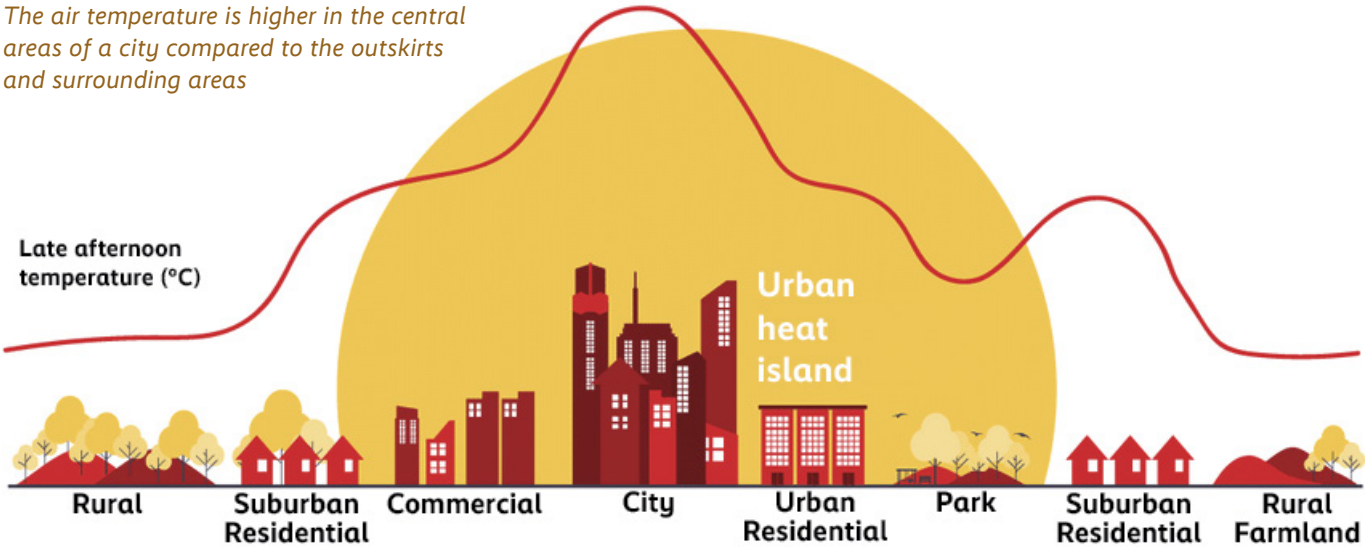
Monitoring Air and Surface Temperature in Bucharest

The national network managed by the National Meteorological Administration uses three weather stations to monitor air temperature. The stations are installed under standard conditions recommended by the World Meteorological Administration (WMO): București-Băneasa (located in the northern part of the capital), Afumați (northeast), and Filaret (located centrally, around Carol Park). In addition, 6 sensors monitor the air temperature in urban environments (Masca Theatre, Sf. Nicolae Special School, Grigore Ghica Voievod Gymnasium School no.30, Cervantes High School, Paradisul verde Kindergarten, and Mihai Bravu High School), all managed by the National Meteorological Administration. An important source of information, currently insufficiently tapped into, are

Figure 1

Theoretical model of an urban heat island

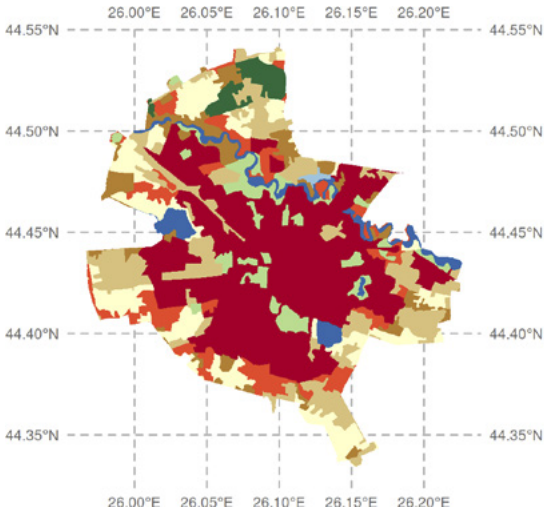
The air temperature is higher in the central areas of a city compared to the outskirts and surrounding areas



Source: https://community.wmo.int/en/activity-areas/urban/urban-heat-island

Land use in Bucharest

Figure 2



Agricultural land ■ Continuous urban fabric
Discountinuous urban fabric ■ Dump and construction sites
Forest ■ Green urban areas, sport and leisure facilities
Indutrial, commercial and transport units
Water ■ Wetlands

Source: Corine Land Cover 2018

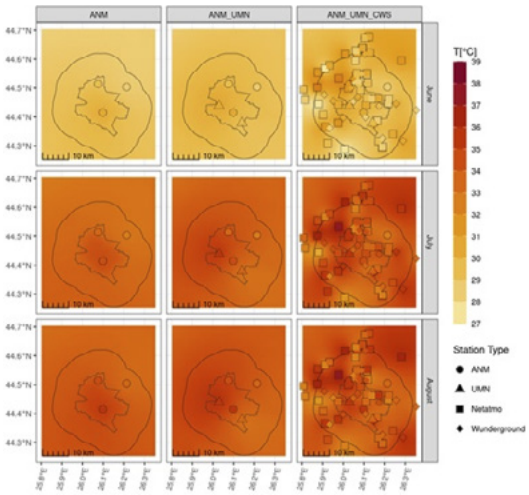
the private weather stations in the Netatmo[3] and Wunderground[4] networks. Including private weather stations in drawing up the climate analysis ensures a better detailing of air temperatures, as it helps identify the warmer areas within the urban heat island.

Satellite images are another particularly valuable source for temperature monitoring, as they provide data covering the entire surface of the city.

Figure 3

Map of maximum air temperature in Bucharest during the summer months of 2023

Created using data from national network weather stations (National Meteorological Administration – left), supplemented by urban stations (NMA and Urban Meteorological Network - centre) and the Netatmo and Wunderground private stations (NMA, UMN, and Citizen Weather Stations – right)



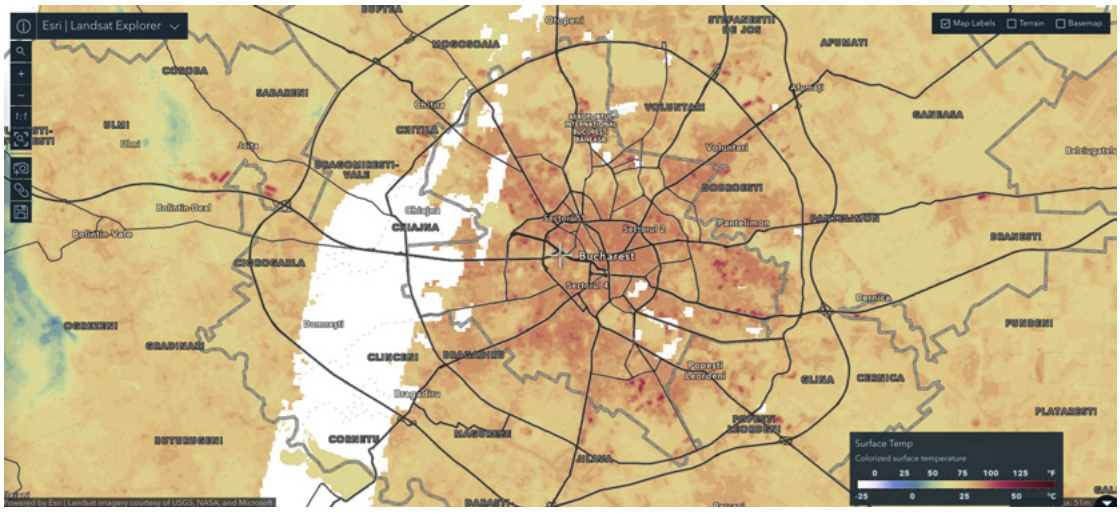
3 https://weathermap.netatmo.com/

4 https://www.wunderground.com/wundermap

Figure 4

Surface temperature of the underlying area,

18th May 2025, extracted from Landsat satellite images



Source: https://livingatlas.arcgis.com/landsatexplorer/

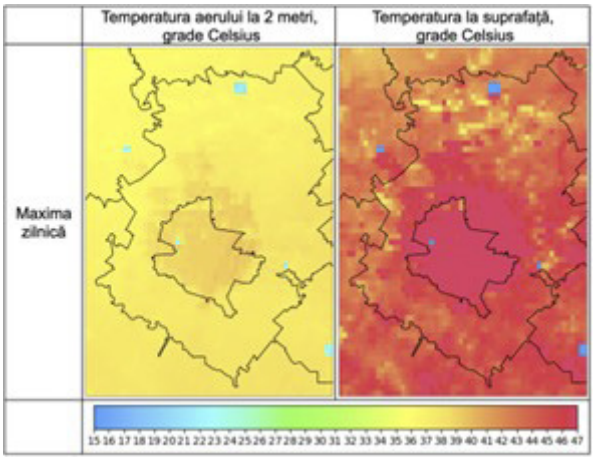
The temperature can also be determined through urban-scale climate modelling.

Concerning air quality monitoring, according to the Integrated Air Quality Plan (developed by the Bucharest City Hall), as of 2018 (the year the document was approved), there have been only 8 fixed air monitoring stations in the city, installed in 2004. Of these, "six are located within the city limits" (IAQP, p.54). In 2023, the network expanded with the addition of 44 more sensors, placed near schools and hospitals (as part of a partnership with the ECOPOLIS Centre for Sustainable Policies[5]). The Bucharest City Hall also owns a mobile air quality monitoring lab, but data collected by this unit is only available up to September 2024[6]. In addition to these, there are also monitoring stations operated by the Ministry of the Environment. According to an Ecopolis representative, air quality measurement is no longer an issue, as the infrastructure is now sufficiently developed (although they did mention that installing more advanced stations would be useful to better identify pollution sources).

Figure 5

Air temperature and surface temperature on 26th July 2023,

Obtained through modelling using the WRF numerical model (Weather Research & Forecasting Model)



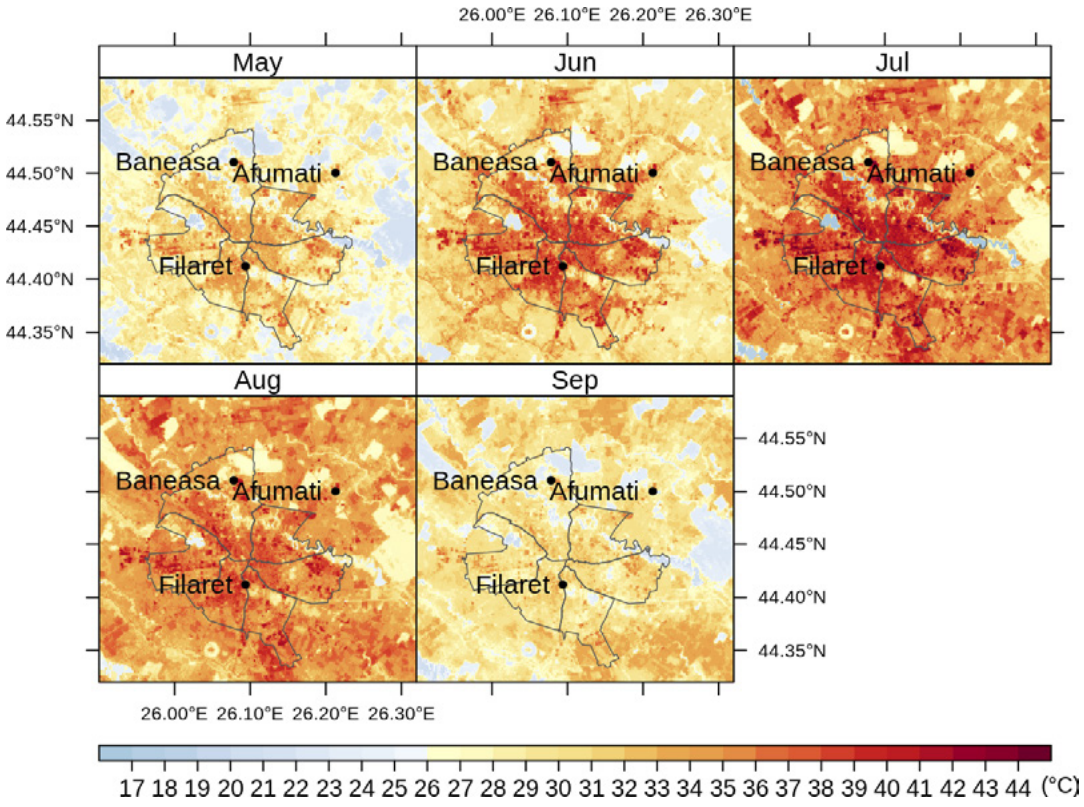
Source: Gabrian et al 2025

5 https://infoaer.pmb.ro/infoaerv

6 https://www.pmb.ro/programe/4/menu-page/14

Figure 6

Urban surface temperature (°C) extracted from Landsat 8 satellite images (2013-2018)



Bucharest's Hottest Areas

Air and surface temperatures tend to be higher in the central areas of Bucharest, but there are also intra-urban variations, influenced by the various types of land use. During the summer months (June, July, August), the average surface temperature rises above 35°C, and in July, the hottest month, the average surface temperatures exceed 40°C across the entire city. Green areas (parks) and aquatic areas (lakes, the Dâmbovița and Colentina riverbeds) maintain lower temperatures of 25-28°C, which highlights their role in mitigating the urban heat island effect and increasing resilience to extreme temperatures.

During the summer, the population inhabiting more than 50% of the capital's surface area is exposed to high and very high risks of extreme temperatures and heatwaves; that surface area coincides with the anthropogenically modified areas of the city. In practice, only areas near parks and lakes, as well as neighbourhoods with 1-2 storey houses and gardens are less affected by thermal risk.

What the Climate of Bucharest Will Look Like Over the Coming Decades

Since the beginning of the last century, the maximum temperature in Bucharest has shown an upward trend, culminating in the very hot years after 2000. Heatwaves have become increasingly frequent, their duration has lengthened, and this trend is expected to continue until the end of the century throughout southern Romania (Antonescu et al 2023).

The evolution of air temperatures over the coming decades can be estimated based on climate scenarios that take into account the warming caused by global demographic evolutions and economic development, as well as the measures taken to reduce greenhouse gas emissions.

Representative Concentration Pathways (RCP) are scenarios used to estimate future concentrations of greenhouse gases, which help model potential climate developments up to the year 2100. The four main scenarios developed by the United Nations-coordinated Intergovernmental Panel on Climate Change are RCP 2.6, RCP 4.5, RCP 6.0, and RCP 8.5, named according to the estimated increase in solar radiation reaching the Earth's surface, expressed in watts per square meter (W/m^2).

Higher values point to high emissions and stronger effects of climate changes, while scenarios with smaller values imply strict measures to reduce emissions. Overall, air temperature will increase more rapidly in the RCP 8.5 scenario (a more pessimistic scenario, where no measures to reduce emissions are taken or the measures taken are ineffective), as compared to the RCP 4.5 scenario (a more moderate one, where measures are taken, with a global effect).

The average annual temperature has increased considerably over the last century and the first decades of the 21st century. At the beginning of the 20th century, the average annual temperatures revolved around 10-12°C, while after the year 2000, they exceeded 12°C every year, and sometimes rose above 14°C. The influence of the city is obvious, with temperatures being higher at Bucharest-Filaret (in the city centre) than at Bucharest-Băneasa (on the outskirts).

Figure 7

The evolution of the annual average temperature in Bucharest over the period 1901-2023 (measured values)

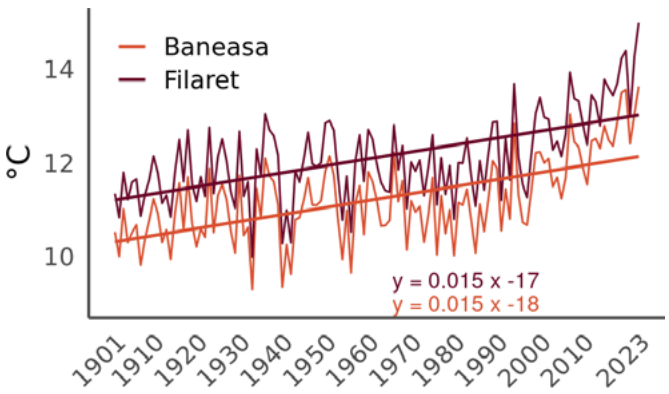
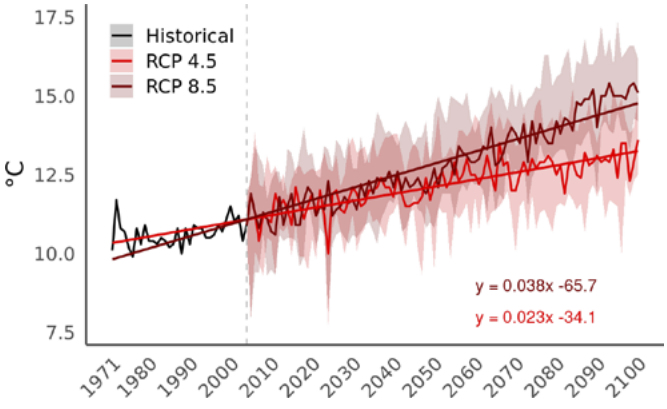


Figure 8

Annual average temperature in Bucharest over the period 1971-2100, scenarios RCP 4.5 and RCP 8.5 (modelled values)



The annual average temperature continues to rise up until the end of the century in both the moderate scenario (RCP 4.5), and the pessimistic scenario (RCP 8.5). In the moderate scenario, as opposed to the 1971-2000 reference period, the annual average temperature will increase by around 1.6°C by 2050 and by around 2.3°C by 2100.

The average maximum temperature in July shows an upward trend that is more marked in scenario RCP 8.5 (with high greenhouse gas emissions and no successful mitigation measures). From 2050 onwards, the average maximum temperature in July may frequently exceed 32°C in this scenario. In the more optimistic scenarios (with successful mitigation measures), namely in scenario RCP 4.5, the increase is slower, with a maximum of 32°C particularly towards the end of the century. The trend equation indicates an increase of 0.41°C/10 years for RCP 8.5 and 0.23°C/10 years for RCP 4.5.

The highest daytime temperatures (the daily maximum) have been constantly on the rise and reached their peak during the period following the year 2000, when they exceeded 40°C seven times.

The absolute maximum temperature for the month of July in Bucharest is 42, 4°C and was recorded on 5th June 2000 at the Bucharest-Filaret weather station (NMA 2025). On the same day, absolute maximums were also recorded at the Bucharest-Băneasa station (42.2°C) and Bucharest-Afumați (41.1°C, this value was also reached on 24th July 2007).

Tropical days, when the air temperature exceeds 30°C, are ever more frequent in the Romanian capital, and the trend is expected to intensify further in the decades to come. Both scenarios show a clear increase, but particularly RCP 8.5. In this latter scenario with high emissions, the annual number of tropical days could exceed 100 by the end of the century. Essentially, we could experience an additional three months of air temperatures rising above 30°C. By contrast, the RCP 4.5 scenario, which implies emission-reduction policies, shows a slower but still significant increase. The shaded areas represent uncertainties in climate models. Linear trend equations highlight a very high annual growth rate: 0.495 days/year for RCP 8.5 and 0.298 days/year for RCP 4.5. In essence, every 2 years we gain one extra tropical day in the scenarios lacking mitigation measures (RCP 8.5).

Tropical nights, when air temperatures keep above 20°C, also tend to occur more frequently. While at the beginning of the 20th century such nights were generally rare, after the year 2000, over 20 tropical nights have been recorded annually. The difference

Figure 9

The average daily maximum temperature in July in Bucharest over the period 1901–2023 (measured values)

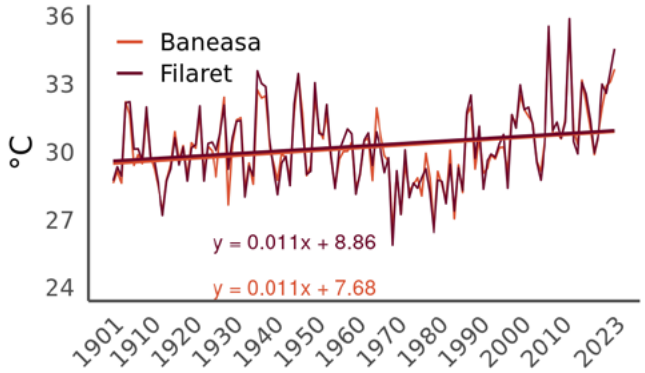


Figure 10

Evolution of the average maximum July temperature in Bucharest over the period 1971-2100, under RCP 4.5 and RCP 8.5 (modelled values)

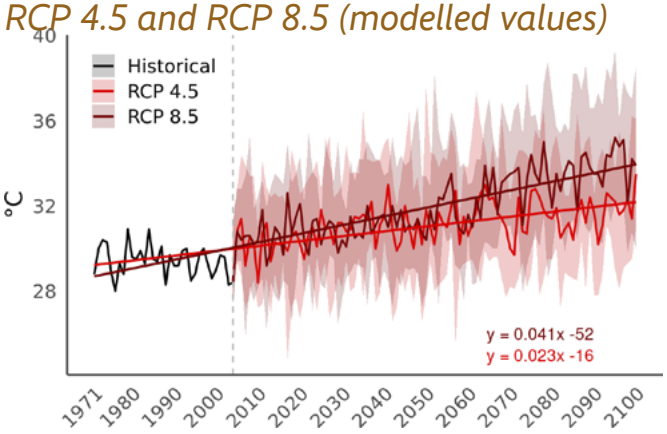


Figure 11

Number of tropical days in Bucharest between 1901 and 2023 (measured values)

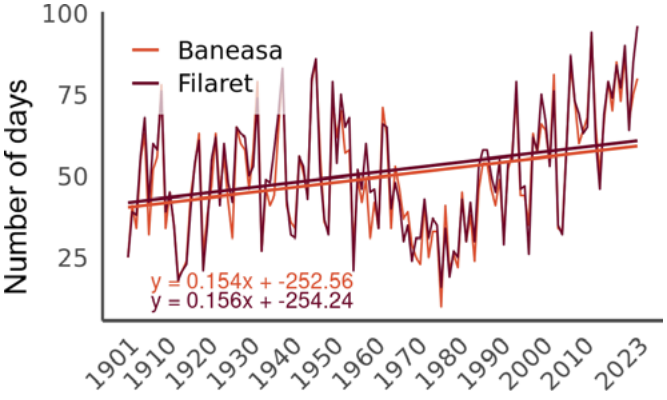


Figure 12

Number of tropical days in Bucharest between 1971 and 2100, under the RCP 4.5 and RCP 8.5 scenarios (modelled values)

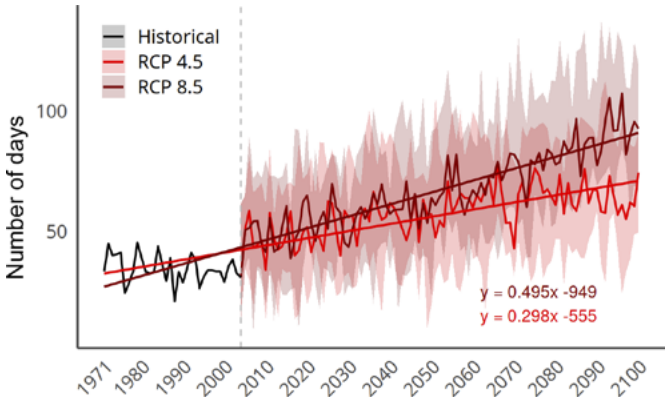
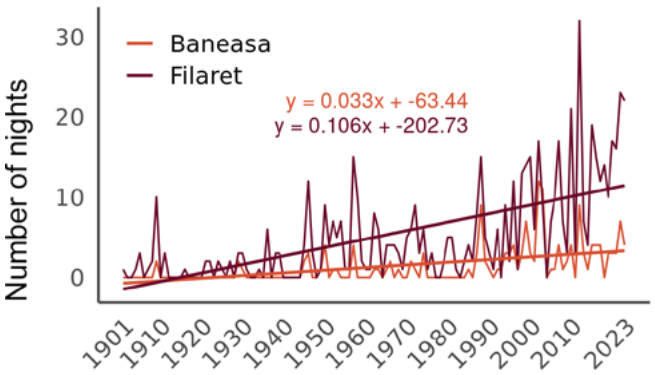


Figure 13

Number of tropical days in Bucharest during the period 1901–2023 (measured values)



in the number of tropical nights between the central weather station and the Bucharest-Filaret station on the northern outskirts highlights the city's impact on air temperature (the urban heat island effect).

Mortality caused by heatwaves and extreme temperatures is estimated to grow significantly by the end of the century, with Bucharest ranking third among European capitals in terms of this rise, behind Istanbul and Athens (World Bank, 2025).

The table below illustrates a progressive increase in the maximum average temperature in July, as well as in the number of tropical nights and tropical days, depending on the timeline and the emissions scenario. Under the RCP 8.5 scenario, the increases are more pronounced, reaching an average rise of 4.3 °C between 2081 and 2100, with 46 tropical nights and 54 tropical days. The differences between RCP 4.5 and RCP 8.5 highlight the significant level of emission levels on the intensification of heatwave-like phenomena.

Figure 14

Number of tropical nights in Bucharest between 1971 and 2100 in the RCP 4.5 and RCP 8.5 scenarios (modeled values)

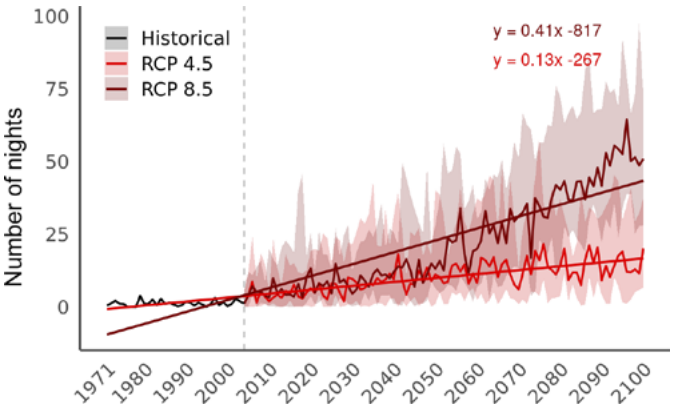


Table 1

Changes across different timelines compared to the reference period (2041–2060 vs. 1971–2000; 2081–2100 vs. 1971–2000) and scenarios (RCP 4.5; RCP 8.5)

Timeline	Scenario	Maximum average temperature in July (°C)	Tropical nights	Tropical days
2041–2060	RCP 4.5	1.6	10	23
2081–2100	RCP 4.5	2.2	13	30
2041–2060	RCP 8.5	1.9	15	29
2081–2100	RCP 8.5	4.3	46	54

Chapter 2.
European Policies Regarding the Climate Crisis. Implications for Vulnerable Groups and the Local Administration

The European Union has long placed climate-related issues on its agenda, taking into account their various dimensions, one of them being how vulnerable individuals are affected. For the purpose of this report, we shall focus on two major projects that directly target local action at the city level.

One of the EU programmes that places vulnerable people at its core is the Social Climate Fund[7]. The programme primarily aims to allocate European funds to member states to ensure a fair green transition, and implicitly to protect vulnerable groups from the costs associated with climate crisis measures. The main funding directions focus on developing programmes that help vulnerable populations cope with housing-related energy costs and manage financial difficulties related to transport ("household in energy or transport poverty").

In Romania, the Ministry of Investments and European Projects (MIPE) is the institution responsible for drawing up plans for the programme and coordinating their implementation. According to the document Social Climate Fund and Plan: Challenges and Opportunities, prepared by the 2024 working group on "Social Climate Fund" under the Presidential Administration – The Department for Climate and Sustainability[8], the funds will become available starting in 2026. Romania is bound to receive around six billion euros out of the total of 54.6 billion euros allocated for all EU member states.

Another important initiative relative to the topic of this study is EU Mission: Climate-Neutral and Smart Cities[9] (EU's mission: 100 smart and climate-neutral cities by 2030). The goal of the mission is for the cities included in the programme to reach climate neutrality by 2030 using a collaborative strategy involving stakeholders. This includes models of cooperation between the public administration, the business environment, non-governmental organisations, the academia, and citizens. Romania has two cities, Cluj-Napoca and Suceava, and Bucharest's Sector 2 included in the project. According to a response to our public information request, Sector 2 City Hall received the City Label in October 2024, meaning that its project was accepted for achieving this goal (the formal document is titled Climate City Contract[10]). What is more, Sector 2 City Hall has set up a climate neutrality department[11] within the Strategy and European Funds Directorate, which includes three positions (the Bucharest City Hall appointed a climate officer in 2025, although it does not have a dedicated department for this area).

In parallel, aiming to support the EU Mission – 100 smart and climate-neutral cities by 2030, Romania's Ministry of Research, Innovation and Digitalization together with the Ministry of European Investments and Projects have created the M100 National Hub[12]. Currently, the M100 is coordinated by an interministerial committee from the Ministry of Development, Public Works and Administration, the Ministry of Education, and the Ministry of Environment, Water and Forests. It also includes four permanent guest members, representatives of the Cluj-Napoca City Hall, Bucharest's Sector 2 City Hall, the Suceava City Hall, and the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI). The national hub went through its own selection process and included ten Romanian cities. This time around, the city of Bucharest applied and was included in the project as a consortium. The Bucharest City Hall coordinates and supports all of Bucharest's six sectors. The chosen cities have reached the stage of establishing/finalising the

7 Details about the project to be found here: https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/social-climate-fund_en

8 Document available here: https://www.presidency.ro/files/userfiles/Raport%20FSC.pdf

9 Information about the programme here: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/climate-neutral-and-smart-cities_en

10 Document available here: https://netzerocities.app/_content/files/knowledge/4438/district_2_ccc_bucharest_.pdf

11 Organisational chart available here: https://docs.google.com/viewer?url=https://www.ps2.ro/index.php/primaria-sectorului-2/rof/organigrama-cu-nume-ps2-la-data-de-18-06-2025/download?p=1

12 Further details here: https://m100.ro/m100-national-hub

Climate City Contract. According to the expert responsible for implementing M100 whom we approached for this research, both the European-level mission and the national programme are an important component of the stakeholders' ecosystem. This involves identifying collaborative and participatory mechanisms among all players, and fostering multilevel dialogue. The coordinator further emphasised the need to ground the work in research and to align relevant strategic documents with the topic, noting that this also presents a valuable opportunity for data collection and for revisiting existing strategies.

How Do Others Go About It? Best Practice Models

Globally, a number of public authorities have already reached an advanced stage in implementing local projects aimed at increasing city resilience to high temperatures and at lowering, in time, their effects. Thus, besides the support received from non-governmental organisations and the European Union, the Romanian authorities also benefit from such best practice models that have proven to be effective and that can be implemented in cities throughout Romania.

The city of Seville in Spain is implementing the policy of shade in order to cool surfaces. The authorities set out to plant 5,000 trees every year in order to protect the city. In addition, they have decided to use building materials that repel heat[13].

The authorities in Paris are implementing cool islands[14], which are areas where citizens can take shelter during heatwaves. The areas come in the shape of small movable gardens, the courtyards of educational institutions[15] (the municipality funds the removal of concrete and re-greening of spaces), public swimming pools, and historic monumental buildings where temperatures are lower (museums, churches, etc.). Access to these spaces is free of charge during periods of extreme heat.

Rotterdam is implementing the Rotterdam Rooftop Walk policy, which sees building rooftops turned into green rooftops that are interconnected with pedestrian bridges. According to the initiators, this is also a social policy, with priority given to buildings in deprived areas, where households do not have air conditioning and therefore suffer more from the effects of global warming[16].

The city of Medellin in Colombia has been implementing green corridors throughout the city ever since 2017. Pedestrian routes are identified and fully protected from heat through greening measures (trees, widening of grass-covered planting beds). The policy aims at protecting the health of pedestrians, encouraging the use of alternative transportation, and at increasing the city's capacity to absorb carbon dioxide[17].

13 Source: https://www.bloomberg.com/news/articles/2022-08-18/one-of-europe-s-hottest-cities-has-a-climate-change-battle-plan?cmpid=BBD082022_GREENDAILY&utm_medium=email&utm_source=newsletter&utm_term=220820&utm_campaign=greendaily

14 https://www.c40knowledgehub.org/s/article/Cities100-Paris-is-using-blue-and-green-infrastructure-to-tackle-city-heat?language=en_US

15 https://uia-initiative.eu/en/pdf/2549

16 https://www.weforum.org/stories/2022/07/rotterdam-green-roofs/

17 https://news.trust.org/item/20210728130018-qufqy/

Chapter 3.
Bucharest's Administrative Vision Regarding Environmental Challenges

For a long time, the local public authorities in Bucharest have managed green areas strictly as leisure areas, and the issue of the climate crisis has been all but absent from the public agenda. Environmental organisations are the ones that brought the topic of developing public areas in accordance with the goals of climate crisis management into public discourse and then on the administrative agenda.

For this section of the study, we conducted interviews with representatives who have extensive experience in environmental projects in Bucharest and are affiliated with two non-governmental organizations: Ecopolis Center for Sustainable Policies and Văcărești Natural Park Association. Both organisations played a decisive role in shifting the administrative approach to environmental issues, through initiatives such as installing air quality monitoring sensors and establishing Romania's first urban natural park - Văcărești Natural Park -, as well as the country's first urban meadow.

Although there are a number of strategic documents and commitments made by local public authorities in Bucharest, the political and administrative vision remains largely focused on the aesthetics and recreational functions of the city's parks. The main urban challenges revolve around two key dimensions. One of them is pollution, which is driven by individual motorized transport and heating systems (such as private boilers, poor energy efficiency in housing, or the use of polluting fuels during winter, such as wood or even waste, especially among vulnerable families). Therefore, a responsible approach to managing the city in the context of climate warming requires policies that promote alternative or public transport, energy efficiency measures for buildings, and support for vulnerable individuals to replace outdated heating systems. A second key dimension involves designing urban spaces based on the goal of reducing pollution and creating natural areas with enhanced capacity to provide thermal comfort for residents and mitigate the effects of pollution. To address these issues, it is necessary to transform the urban structure and overhaul the current urban planning model, which is based on transit corridors designed to favour car traffic. We are talking about rethinking the spatial structure of cities on a human scale, so that, for example, walking reasonable distances becomes a viable alternative, encouraged through safe and comfortable spaces, protected from the sun during periods of extreme heat (Speck, 2013).

In 2025, Bucharest does not have a climate change strategy. Although there is some concern about the issue of climate change, as we show in this report, the projects actually implemented in the city do not explicitly aim to reduce the effects of the climate crisis.

Two clear manifestations of the climate crisis in the city are torrential rains with large volumes of water over a very short period of time, and temperatures exceeding 37°C in the shade.

Summer storms put flood-prone areas of the city at risk, which can lead to "*damaged infrastructure, material losses amounting to tens of thousands of euros, and hazards. We are talking about financial losses that influence the city's well-being. But there could also be a cost in human lives, especially if critical services, such as emergency medical care, are disrupted.*" [Representative of Văcărești Natural Park Association]

Public discourse around these torrential rains focuses exclusively on the capacity of the city's drainage system to collect rainwater, emphasizing the infrastructure for storm water collection. However, experts advocate for what are known as nature-based solutions. This involves, among other things, systems that allow rainwater to be collected and reused for irrigation during drought periods, for example (in park areas or green pockets, rather than from road surfaces, where filtration systems would be required before the water could be used for irrigation). A complementary solution for managing this water is to increase the permeable surfaces in cities (that is, reducing paved areas and replacing them with soil and vegetation).

Measures based on or inspired by nature-based solutions represent one of the most effective paths for local adaptation, with the major advantage of delivering immediate and often multifaceted benefits. A good example is Liniei Park in Sector 6, where a former industrial site along a disused railway line became a high-quality green space and pleasant recreational area. The project is even more valuable as it is located in Militari neighbourhood, which has a limited amount of green space.

Climate resilience encompasses multiple dimensions, which manifest with varying intensity across Bucharest, as highlighted in the recent Environmental Status Report

Liniei Park
Photo credits: Irina Zamfirescu's personal archive

for Bucharest (Iojă, 2025). Ecological resilience to climate change is insufficient, primarily due to the loss of significant vegetated areas both within and around the city. On the other hand, social resilience is moderate, as Bucharest's population has benefited from a rising standard of living over the past two decades and access to protective amenities (air conditioning being the most notable), though there are substantial disparities between different parts of the city. Economic and technological resilience are also at moderate levels. However, the report points out that institutional resilience is lacking, mainly due to administrative fragmentation and the absence of strategic sectoral tools.

Ecopolis, inspired by the Paris model for managing urban heat islands, proposes greening the courtyards of public institutions in the city of Bucharest (especially schoolyards), which are currently mostly paved and used as parking lots. Expanding green spaces would increase the soil's capacity to absorb rainwater and, therefore, reduce the risk of flooding in certain areas.

Rethinking green spaces must consider biodiversity and primarily serve the needs associated with the climate emergency. Although these areas should also fulfil a recreational function, interventions in such spaces should be as discreet as possible and aligned with environmental priorities. An example of an unnecessary intervention in a park is the initiative by the Sector 3 City Hall to equip I.O.R Park with infrastructure such as fountains, "productivity oases" (i.e., outdoor workspaces), ambient sound systems (including the possibility to make announcements), and artificial lighting. Paradoxically, the

Liniei Park in July 2025.
Photo credits: Sorin Cheval

city hall also envisages "special areas for birds, insects, and small animals" within this green space.[18]

According to experts, the city of Bucharest currently lacks the necessary expertise for nature-based solutions. The lack of human resources on the ground, paired with a lack of expertise at the city hall level, constitutes the number one hindrance. At present, the Bucharest City Hall shows little attention to green spaces, even when it comes to maintaining existing standards. One example is a campaign by the Civic Initiative Group for Izvor Park, which has been striving for two years to secure the replanting of 302 trees in Izvor Park and Floreasca Park.[19]

Those trees were planted as compensation (meaning trees planted following deforestation in the city) and all of them dried out completely within a year. On the other hand, in 2022, through a participatory budgeting project, the Bucharest City Hall replanted the trees in the empty tree pits along Elisabeta Boulevard[20]. Despite the fact that the areas that required replanting were central, the City Hall only took action after an organisation submitted a project for this purpose. These two examples are, to some extent, telling of the Bucharest City Hall's concern for green spaces.

The representative of Văcărești Natural Park Association (APNV) puts forward the solution of turning the currently concreted areas into green spaces/urban forests, with the aim of creating *cool areas* in places where heat islands exist, (one such example is the parking lot in Constitution Square). Another possible solution for increasing green spaces is the creation of urban meadows. APNV piloted such a project near Văcărești Natural Park, on a plot of land abandoned by the authorities.[21] In the organisation's view, this is a good solution for expanding and improving green infrastructure, especially since it does not require irrigation and involves minimal costs (seeding and mowing once a year).

Another possibility for countering heatwave periods is to maximize the benefits offered by the existing bodies of water in Bucharest. According to the APNV representative, Bucharest has significant lake potential, is crossed by a river (the Dâmbovița), and is strewn with a string of lakes. Landscaping these areas could also turn them into bathing spaces during heatwaves, thus providing a free and accessible option for all citizens. This would require interventions and investments to ensure that the water does not pose a health risk to people. Moreover, creating green spaces on the riverbank would help lower temperatures along this corridor in the heart of the city. Another possible cooling solution, in the opinion of the Ecopolis representative, could be to explicitly allow citizens to use existing urban fountains for bathing, or to install splash-type urban fountains where people can cool off (as the Sector 6 City Hall has done in the Favorit area).

Water surfaces play an essential role in moderating the urban climate. Temperatures near large lakes can be 7-8°C lower than 300-350 m away from the shores (Cheval et al 2020).

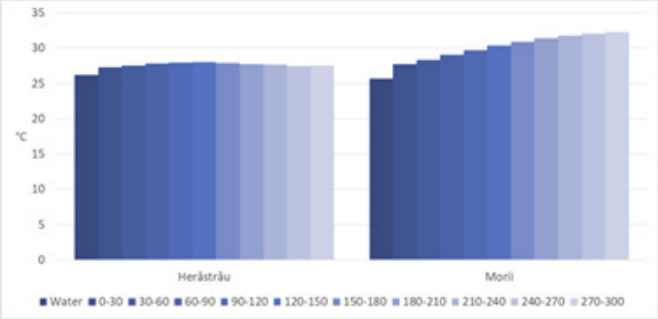
With regard to the pollution engendered by the use of individual motorised transport, the Ecopolis representative says that now Bucharest is the only European capital that has not put in place any measures to deter driving through the city centre.

One final hindrance raised by the experts in this research is the resistance of part of the population to nature-based solutions. Whether it be the anecdotal concern for parking spaces or the worry that *"we may get dirty, nature for some means soil, but soil turns to mud"* (Ecopolis representative), there is still reluctance regarding their proposals for rewilding or creating public parks with minimal intervention. For this reason, at least at the moment, it is important to maintain a balance between the two models for the landscaping of green and/or public areas, according to the representative of Văcărești

Figure 15

Average temperature of the underlying surface around lakes Herăstrău and Morii,

derived from Landsat 8 satellite images (2013–2018). Water = temperature of the lake water; distances of 30 m around the two lakes



18 Source of the information: https://www.primarie3.ro/index.php/presa/comunicat/7683

19 For further information: https://www.facebook.com/permalink.php?story_fbid=pfbid0KuQWF6Fc5NM2tjeVMER5JfvXUN1mPSbaa6LSg112jDNQsrZHDnMKXhq2q32nkHo-Sl&id=100084088747483

20 For further information: https://buletin.de/bucuresti/bugetare-participativa-bucurestenii-au-ales-plantarea-de-arbori-pe-bulevardul-regina-elisabeta-si-sterilizarea-a-3000-de-pisici/

21 https://parcnaturalvacaresti.ro/a-inflorit-prima-pajiste-urbana-a-bucurestiului-2/

Natural Park Association. Nonetheless, things such as tartan around the trees in the streets of Sector 3 or the trees planted in pots in Sector 4 are unnecessary human interventions.

Given the fact that this study also aims to analyse how heatwaves affect individuals with lower or no incomes disproportionately, we would like to warn of the fact that the projects meant to improve the green and blue infrastructure may lead to gentrification. This is why public authorities should make sure that they fulfil their mandate to protect vulnerable groups, to avoid further pushing up the costs of the green transition for vulnerable people. Such projects should be preceded by social impact studies that identify the risks and the groups potentially directly affected by gentrification, as well as the necessary protection measures. Examples from other European states include the construction of social housing in the targeted areas, rent protection, and the allocation of new flats from private investors to social housing.

Strategic Documents for the City of Bucharest

The documents presented below are not an exhaustive list of the strategic documents that exist at the level of the capital's administration in the field of environmental policies. One of the issues of the local public administration is the lack of document centralisation and/or the very different manner in which these materials are published on their respective websites[22].

We highlight the fact that the indexing of these documents does not necessarily constitute a statement of intent by the local public authorities in Bucharest. Some strategies are mandatory by virtue of certain legal provisions. Moreover, if we analyse the implementation of documents that reached their due date and aimed at improving air quality and/or green spaces, we will find that, in fact, these documents have largely gone ignored.

It is important to note that Romania has appeared before the European Court of Justice for failing to implement Directive 2008/50/EC on air quality, regarding the systematic exceedance of PM10 limit values (it was convicted for the period 2007–2016). Another important piece of context is the postponement of the new General Urban Plan. At present, Bucharest operates under a plan adopted by the General Council in the year 2000. This planning document is fundamental to setting the territorial as well as social and economic development directions for Bucharest for at least the next decade. Another relevant contextual detail is that five of the six sectors of the City of Bucharest have signed the Covenant of Mayors, committing to a 40% reduction in emissions by 2030[23]. However, on the official websites of public institutions, we could not identify any analysis regarding the progress made in fulfilling these commitments.

A first relevant document is the Green Spaces Register. According to the Green Spaces Law no. 24/2007 (Art. 17), local public authorities are required to compile, publish, and update the technical data of all green spaces based on quantitative and qualitative indicators for these spaces. The Bucharest City Hall is the institution responsible for creating and managing this database. Although this document was drafted in 2011, it never acquired institutional force and produces no legal effects, since the General Council of the Municipality of Bucharest did not approve it. As a result, 18 years following the legal obligation to create one, the city still does not have a Green Spaces Register. According to the institution's announcement, on 31st March 2025, the Bucharest City Hall launched the procurement process for the creation of this Register in the Electronic Public Procurement System (SEAP); however, in the section listing contracts signed by the City Hall for 2025, there is still no contract for this service[24].

According to Law 104/2011 on ambient air quality, local public authorities must develop an Integrated Air Quality Plan (PICA). The Bucharest City Hall had its first PICA approved in a General Council meeting in the autumn of 2018[25]. This first PICA was valid for the period 2018–2022; however, a contract for the preparation of the new PICA was only registered in May 2025[26].

The projects set out in this document mainly aim to improve the quality of public transport, ease traffic flow, create park-and-ride facilities, and implement measures to reduce emissions from heating in the residential sector. Although the document includes a section entitled "Population Exposed to Pollution" (p. 15), this section only provides demographic information without identifying categories that are more vulnerable to pollution than the majority of the population, or populations for whom the cost of transitioning to non-polluting fuels is far too high. The latest report describing the stage of implementation of PICA is included in General Council Decision no. 50 of 2nd March 2023[27].

22 For instance, some city halls have these documents only on the Council Decisions section, in scanned versions, which makes it very difficult to find the documents on the website

23 https://eu-mayors.ec.europa.eu/en/signatories

24 https://www3.pmb.ro/interes-public/contracte?page=2

25 https://doc.pmb.ro/institutii/primaria/directii/directia_mediu/planuri_de_calitate_aer/docs/plan_mentinere_calitate_aer_buc/plan_mentinere_calitate_aer_buc.pdf

26 https://doc.pmb.ro/contracte/www3/2025/149.pdf

27 https://acteinterne.pmb.ro/legis/acteinterne/acte_int/44504

Regarding park-and-ride facilities (parking areas located on the outskirts of the city intended to discourage drivers from metropolitan areas from driving through the city), the Sustainable Urban Mobility Plan (PMUD) had planned five such facilities; by the time this report was drafted, only two had been completed (Străulești and Pantelimon). In recent years, the sector city halls (Sectors 2 and 4) have also built several such facilities. However, there are no public reports on the effectiveness of these public policies[28]. As for encouraging the use of public transport, over the years, the Bucharest City Hall (PMB) has purchased several new public transport vehicles. Nevertheless, the pace of implementing dedicated bus lanes for public transport has been very slow[29].

The Bucharest Local Environmental Action Plan is a strategic document drawn up by the Bucharest Environmental Protection Agency, aiming to "set out the directions and objectives necessary to align economic development with environmental protection aspects [...], a process through which priorities are established for achieving local-level sustainability targets." One of the objectives set out in this plan is the "reduction of the impact of global warming on society and the environment" (p. 17). The first version of this document was produced in 2006, and its most recent revision dates back to 2022 (General Council Decision of the Municipality of Bucharest no. 698 of 22nd December 2022[30]). The document assesses how populations are affected by various environmental factors, with most of the information relating to age. The only instance in which people "living in unsanitary conditions" (p. 146) are explicitly classified as a vulnerable category is in relation to access to drinking water. However, the environmental action plan does not explicitly identify vulnerable categories and therefore does not specify measures to address the problems these people face, nor measures aimed at ensuring social justice in managing the effects of global warming. For example, in the section on urban environment development, soil quality and land use (p. 43), neighbourhoods without access to water, sewerage, waste collection, public transport, or heating are mentioned, yet the proposed actions appear to target only areas where new residential developments are being built, excluding informal settlements or areas inhabited by vulnerable populations. With regard to access to water, although populations living in unsanitary conditions are explicitly mentioned in the problem description, the proposed actions focus solely on the areas of new residential neighbourhoods (p. 48).

The Sustainable Urban Mobility Plan 2016 - 2030 (PMUD) is another key strategy for improving air quality, through public policies aimed at optimising public transport and promoting alternative means of transport. This strategic document does not incorporate a social dimension either and does not set out explicit measures to ensure social justice within the proposed public policy models. Optimising such modes of transport (public transport, walking, or cycling) would be among the most financially accessible means of travel and could have increased the mobility of vulnerable groups, including their access to education, employment, and leisure. From 1st August 2021, the Public Transport Company - STB - more than doubled the price of a single journey, from 1.3 lei to 3 lei. Among the categories of the population eligible for reduced fares on public transport, low-income individuals are not included[31], making public transport a significant expense for those without income or on low incomes (in 2025, a monthly pass costs 80 lei).

In parallel, the measures put forward within the Sustainable Urban Mobility Plan have only been implemented to a small degree, with a current infrastructure for safe cycling remaining relatively underdeveloped, and the length of routes dedicated exclusively to public transport standing at 25 km, reached in 2024, despite the PMUD having scheduled their completion for 2019 (p. 482).

A final document relevant to this report is the Green Cities Action Plan[32], an EBRD initiative under the "Green Cities Programme"[33]. The last stage of public consultation on the document took place at the end of April, meaning that the General Council of the Municipality of Bucharest has not yet approved the Green Cities Action Plan. In its general framework, the document identifies among the vulnerable groups those affected by poverty in Bucharest, noting issues such as energy poverty and poor housing conditions (p. 47). Some of the measures proposed target areas inhabited by disadvantaged groups and explicitly acknowledge the risk of gentrification and, consequently, the deepening of these people's vulnerability.

For example, under Urban Regeneration and Coherent Spatial Planning (p. 187), one action explicitly lists as a benefit "a more equitable city: improving disadvantaged areas" and explicitly notes as a possible risk the gentrification of these areas. Another measure proposed

28 Yet, such interventions lead to behaviour changes over time, so it it not to be expected that drivers will suddenly change their behaviour (namely that they will start using the park-and-ride in order to leave the car in these parking lots and use public transportation in the city

29 Dedicated bus lanes would increase the appeal of public transport, as travel time would decrease enough for it to become a viable alternative to private motorised transport

30 https://doc.pmb.ro/legis/acteinterne/2022/44328/AnexaH698_22.pdf

31 https://www.stb.ro/doclege/Contract_delegare_servicii_transport_Anexa7-Diferențele_tarif.pdf

32 https://paov.pmb.ro

33 https://www.ebrdgreencities.com

in this document is the creation of additional green spaces in highdensity neighbourhoods (p. 190) to reduce the effects of the urban heat island, to improve the management of rainwater, and to enhance quality of life. Here too, gentrification is explicitly mentioned as a potential risk. The document does not include any possible measures that the public administration could take to prevent gentrification.

The Socio-Medical Infrastructure in Place for Heatwave Periods

To complete the picture of how the Municipality of Bucharest is responding to the effects of climate change through mitigation and adaptation policies and measures, we requested, under Law No. 544/2001 on free access to public interest information, details on how periods of redalert heatwaves are managed. We note that the Bucharest City Hall and the Sector 1 City Hall did not respond to these requests.

All the sectors that responded to our request have designated firstaid locations equipped with air conditioning, drinking water, and medical assistance, generally situated within the premises of subordinate institutions such as public relations offices, day centres, or various other social facilities. However, these locations are not suitable for many vulnerable individuals, some of whom tend to avoid contact with structures such as social assistance departments or the local police - particularly people experiencing homelessness or living without legal tenancy - due to fears of possible eviction or the removal of children into the public care system. All the municipal authorities that replied to the request for information have included in their plans the monitoring of the operation of public drinking fountains/ ornamental fountains.

Sector 2 has explicitly included the measure of distributing drinking water by tanker to areas where households are not connected to the public water supply. Regarding its own staff, the Sector 2 Local Police has stated that it makes efforts to identify employees vulnerable to high temperatures in order to protect them during heatwave periods, and that mineral water is distributed to staff "within the limits of available funds." The institution has also specified that it provides water and protective equipment to employees working outdoors.

The Sector 6 City Hall has stated that the Directorate of Social Assistance specifically monitors the health of people experiencing homelessness, distributes water, and directs those affected by the heat towards shelters. The Public Domain and Urban Development Administration of Sector 2 provides water to employees working outdoors (2–4 litres of water per day), as well as protective equipment during heatwave periods.

The data provided by the Sector 3 City Hall and the Sector 4 City Hall are insufficient to be included in this analysis. Sector 4 has stated that the redalert heatwave plan is an internal document, while the Sector 3 City Hall mentioned only that there is a project to improve the energy efficiency of educational institutions and that schools participating in summer school programmes are equipped with air conditioning.

Based on the information provided by the local authorities that replied to us, we are unable to estimate the costs associated with managing redalert heatwave periods.

The Perils of Gentrification

The local public authorities in Bucharest have started wide public policy processes aimed at improving quality of life in the city. There are talks about developing the areas around the chain of lakes, creating parks, making use of the Dâmbovița River (this project was presented by the former mayor general during the 2020 electoral campaign and was known as "Axa Creativă" [The Creative Axis]), and landscaping Lake Morii. All of the above are necessary measures in a city that has been on the brink of environment infringement for a long time. Nevertheless, without an encompassing vision of the effects that these public policies have on the vulnerable populations living in Bucharest, we run the risk of further deepening the housing crisis and pushing it to the point where vulnerable residents are forced to leave the city.

In the absence of public policies, any improvement of quality of life in cities might bring an increase in rental prices or the cost of purchasing housing in areas adjacent to those investments. On the other hand, more often than not, urban regeneration projects target areas that are overlooked by the public authorities for extended periods, with abandoned buildings where the most vulnerable of individuals take shelter. Because of regeneration processes, the buildings are restored and the residents are evicted and forced to move ever farther away from the areas where they lived sometimes for decades. This leads to the breakdown of the community, with children from these families sometimes dropping out of school because their new home is too far away to commute on a daily basis.

One important mention is that the local authorities in Bucharest have all but ignored the social justice element included in the public documents meant to spark adaptation or mitigation measures for the local effects of the climate crisis. This holds true for comprehensive strategies, action plans, or specific measures set out in Local or General Council Decisions.

After reviewing the relevant documents concerning this topic, we found only one document that explicitly addresses issues such as the risk of gentrification in areas where green spaces are enhanced, urban regeneration

takes place, or interventions are made to improve quality of life: The Green City Action Plan. Given the current absence of public policies that explicitly address the threat of gentrification, it is difficult to imagine that in the near future, even assuming there is political and administrative will, public authorities will be able to implement measures to halt the phenomenon of gentrification. Furthermore, considering the public discourse of local elected officials, it appears there is no deep understanding of this phenomenon, and the narrative continues to focus on modernisation and the transformation of the city in the spirit of boosting tourism and beautification. The principles of sustainable development, however, require authorities to incorporate the protection of vulnerable groups as a key dimension in urban projects, particularly those at risk of being severely affected by gentrification, to the point of being unable to afford basic living costs such as rent. Improving the quality of public spaces is a necessary undertaking for authorities, but it must be carried out in a controlled manner to prevent further deterioration of the living conditions of vulnerable groups. It is essential to ensure that all citizens, regardless of income or ethnicity, benefit equally from green infrastructure.

Like many other European or non-European capitals, Bucharest has been rather keen on catering to the real estate market, with the economic factor coming first in what Cole and al. (2017) call a "hierarchy of organised interests". Public projects that aim at improving the green infrastructure are presented as a driving force for real estate projects, creating a dynamic that triggers higher housing prices in areas that were subject to interventions. Thus, individuals on lower incomes tend to be cut from the potential benefits of such public projects. Moreover, they end up paying a hard-to-assess social and economic cost because they are forced to move out of their former neighbourhoods for no longer affording the rent, or because they are evicted from buildings where they were compelled to live without legal tenancy – all this in order to pave the way for urban regeneration projects.

There are several solutions to prevent the gentrification of areas where public authorities intervene. Among the solutions implemented by other states, we cite rent control, public housing in areas with a high risk of gentrification, the obligation for real estate developers to make a certain percentage of social housing units available to the local public authorities out of the total number of flats.

For all the above to be implemented, several measures need to be taken. For instance, there should exist an accurate mapping of the real estate market including the rental costs for each neighbourhood/area. However, Romania retains a grey rental market model, with tenancy agreements that are unregistered for tax purposes, and only partially declared contract values (according to the National housing strategy for 2022-2050[34]). In order to monitor the gentrification effect of public projects, data must be collected regarding long-term incomes. At present, the local authorities do not show consistent interest in monitoring the socio-economic profile of neighbourhoods with a view to fighting the possible effects of gentrification. One of the ways to measure gentrification is through long-term documentation of the socio-economic profile of all the individuals who live in the area potentially affected by gentrification and the monitoring of the dynamics of the displacement of low-income residents by higher-income residents.

The administration of Bucharest shows no interest in the preventive management of gentrification. Presently, the only housing policies dedicated to vulnerable groups focus on social housing (there is a negligible stock of social housing compared to the real needs) and rent support (an ineffective solution for Roma people, who are the victims of racism, or for those families who cannot cover the costs of a deposit or rent in advance). One of the categories most affected by the gentrification driven by improvements in the green infrastructure are informal settlements, namely areas where people live without legal tenancy either in makeshift houses or in abandoned factories/ buildings. Generally, these are located in what used to be the outskirts of the city, away from the built-up area. As the local public authorities became more interested in developing available wastelands and water surfaces, these communities have been under the threat of evictions or fall victim to the vigilance of new nearby property owners, who have moved into the area precisely because of the newfound appeal of these areas.

It was only in December 2024 that the Municipality of Bucharest set up a Commission for informal settlements (although the law that envisaged such a commission dates back to 2019), and there are still no measures in place to formalise these settlements aimed at protecting families that live near areas targeted by projects set to improve the quality of green spaces. Currently, only Sector 6 City Hall is trying to build social housing in the same place for an informal community living in the middle of an area that is going through an optimisation process.

One of the largest urban regeneration projects is aimed at revitalising the Dâmbovița River. The former mayor general, Nicușor Dan, put forward the project Dâmbovița – the city's creative axis[35] and presented it as one of his key election campaign projects in 2020. Clearly, the course of a river running through a capital city plagued by traffic congestion and suffering from a severe lack of green

34 https://legislatie.just.ro/Public/DetaliiDocument/256917

35 In 2022, the municipality also applied for Anghel Saligny funds to finance this project

spaces is a major public policy matter for the city. However, the public debate around this project has never taken into account the potential gentrification effects it could have on the areas immediately surrounding it.

Public discussion is increasingly focusing on the participatory dimension of these projects. However, given the experiences of non-governmental organisations in Bucharest in trying to include vulnerable people in debates on issues that directly affect their quality of life, there is relatively little chance that the city's most vulnerable citizens will be included in discussions about projects envisioned for the city.

Improving green infrastructure and the central and semi-central areas must be done with care for vulnerable groups. Otherwise, the most vulnerable among us, who contribute little to nothing to global warming, will end up paying the highest price for climate change.

Public Infrastructures in Bucharest and Their Level of Adaptation to the Climate Crisis

Generally, the city administration of Bucharest does not implement measures that directly aim at improving resilience to rising temperatures during the summer and that fight the heat island effect. It was only earlier this year that the Bucharest City Hall appointed a climate neutrality officer. The institution does not have a department focused on measures to tackle the effects of climate change, either at the macro level through public policies, or at the micro level, by rethinking public green spaces in light of the new reality. The responsible for environmental issues currently has no projects aimed, for example, at nature-based solutions. Moreover, certain infrastructure elements are not adapted to drought and the extreme summer temperatures the city now faces.

The Ecopolis representative interviewed for this study cited the example of playgrounds in Bucharest, which are set up using plastic materials placed on tartan surfaces, unlike in other cities and states, where natural materials such as wood are preferred. The tartan overheats during hot periods, which makes the temperature rise further, as opposed to a scenario where the soil is left in a natural state. Furthermore, it also gives off a rubber smell. Not all playgrounds are shaded by trees, and some are even left fully open into the scorching sun. This kind of arrangement for areas that should be as close to nature as possible – thus adding an environmental education element – runs counter the model of designing green areas that are close to a natural state and, therefore, more effective in relation to the climate crisis.

Another example of infrastructures unadjusted to heatwave periods are bus stops. In some spots, these are fully exposed to the sun, with no natural shade from trees around them (for instance, on Elisabeta Boulevard and in Operei Square).

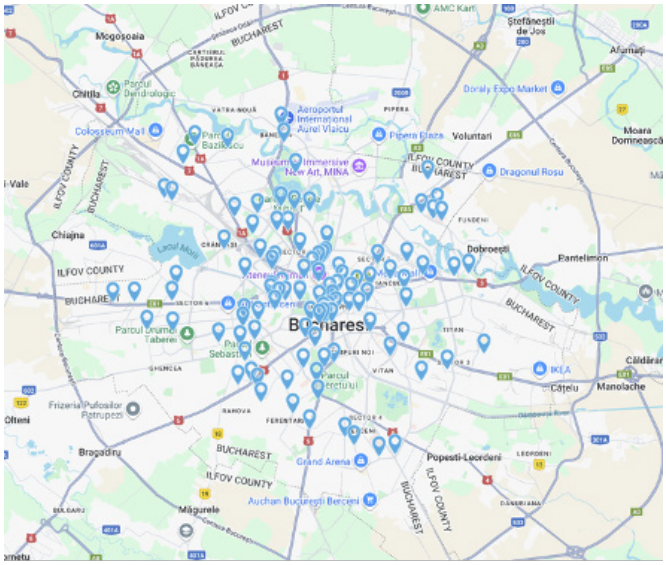
Bucharest also lacks explicit public policies meant to encourage walking. One measure that could be implemented is the planting of trees for shade in the gathering areas near pedestrian crossings. Besides optimising public transport by renewing the fleets or introducing dedicated bus lanes, the local public authorities pay no attention whatsoever to walking in the city. In Bucharest, traffic lights are still coordinated primarily to ease car traffic, with little consideration for pedestrian waiting times. In some areas, the traffic lights are fully exposed to the sun (one example would be Operei Square). Moreover, the walking routes themselves lack shade, which makes walking during heatwaves a deeply unpleasant experience and a potential health hazard. The Ecopolis representative mentioned cooling networks that could follow pedestrian routes and be designed to provide shade along the pavements, offering protection from the glare of the sun.

One important element when it comes to city adaptation to the climate crisis is access to free drinking water in public spaces for all citizens. Although over the past few years the drinking fountains infrastructure has seen improvements, all the people included in our study – experts, workers, people who experience homelessness – consider that it is still insufficient when compared to the real needs. According to a news article,[36] (Buletin de București), in June 2025, Nova Water Company was operating 140 drinking fountains in Bucharest. Sectors 2 (56 drinking fountains[37]) and Sector 66 (128) have their own drinking fountains..

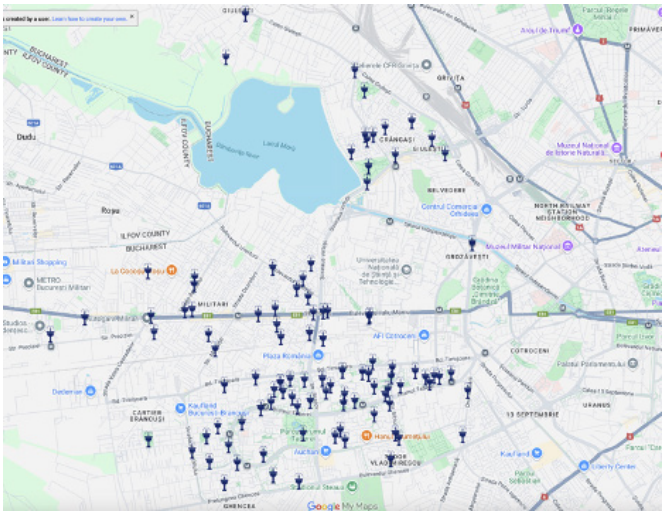
36 *Drinking fountains in Bucharest. A list of their locations,* Andreea Tudor, June 2025: https://buletin.de/bucuresti/cismele-cu-apa-potabila-in-bucuresti-lista-locatiilor/

37 A list of the drinking fountains operated by Sector 2: https://www.ps2.ro/index.php/primaria-sectorului-2/presa/stiri/1026-lista-fantanilor-si-a-cismelelor-publice-cu-apa-potabila-din-sectorul-2

Traffic lights in the sun (personal archives of the authors)
Photo credits: Irina Zamfirescu's personal archive



A map of the drinking fountains operated by Apa Nova
Print screen credits: apanovabucuresti.ro



Map of the drinking fountains operated by Sector 6 City Hall
Print screen credits: primarie6.ro

Chapter 4.
Vulnerable Groups during Heatwaves

Methodology

The studies conducted on populations vulnerable to heatwaves (e.g. Gibb, 2024; Cuomo, 2011), the most vulnerable categories are as follows:

1. People who are homeless or living in precarious conditions (without access to utilities and/or in overcrowded housing);

2. Individuals suffering from cardiovascular and/or respiratory illnesses;

3. Workers who work outdoors and/or in buildings with no ventilation (usually precarious jobs that are generally associated with unskilled work);

4. Elderly people.

While people with average incomes may have the option to seek shelter during periods of extreme heat, for those engaged in low-skilled labour or living in precarious conditions, deflection strategies are mostly not an option. The debate around the effects of extreme temperatures on the human body is important not only from the perspective of universal access to a decent life, but also from a cost perspective. Some studies reveal that productivity declines over periods with high temperatures, hence the need to adapt the working hours in order to avoid the times of day when temperatures peak.

In some situations, a decline in productivity also goes hand in hand with a decline in incomes for those people who even in normal weather conditions earn low wages. This points to a deepening of financial vulnerability (Phuong, 2013). In addition, vulnerable populations with low or no income also face costs associated with emergency medical care and social assistance. Given the fact that low income is usually linked to precarious nutrition and a limited access to prophylactic medical services, it is to be expected that a large part of the low-income population also suffer from medical conditions, which further complicates the situation (Cusack, 2013).

What is more, according to Gibb (2024), because of the extremely high temperatures and the ensuing hyperventilation symptoms during heatwaves, people who work outdoors inhale a greater amount of toxins. Given the high level of air pollution in Bucharest, this could lead to severe health issues for workers in sanitation, construction, delivery, etc.

This section's focal point has been the daily experience of vulnerable people in Bucharest during heatwaves. Generally, as shown above, the public authorities do not concentrate on analysing how extreme weather events affect certain populations disproportionately. (Bicknell et. al, 2009). This is the very reason why we believe that it would be useful to spark a public debate about how these people's lives are affected, and particularly how the public authorities could manage such periods so as not to further deepen the state of vulnerability. As shown hereinafter, these people lead individual lives and have no systems available to help them navigate the increasingly longer periods of extreme heat.

In drafting this report we interviewed individuals who work in delivery, public sanitation (green areas), and the construction sector. The study also includes people who experience homelessness and people who live in informal housing areas. This report draws on nineteen interviews. We mention that for the last two categories (people who experience homelessness and people without legal documentation), the data were collected over a period of three years (2022-2025) during systematic visits to two informal housing areas in Bucharest. Direct contact with the daily lives of the communities over extended periods has allowed for direct observation of the problems these families face during heatwaves. Six interviews were done with people who qualify as rough sleepers and five interviews were done with non-EU workers; eight employees managing green areas were interviewed while on the job, and three people experiencing homelessness who worked as day labourers without legal documentation on construction sites. As for the informal housing communities included in the study, we estimate that there are about 80 people living in three informal housing areas in Bucharest, one in Sector 2 and two others in Sector 6.

As part of the methodology we used, the information in this section takes the form of qualitative research and therefore, it is not statistically relevant data. However, the experiences shared by the persons included in the study constitute a good starting point for a public debate concerning social justice within the policies that aim at managing global warming, and provide relevant information from daily experiences that may inform future decisions. In addition, we

consider that the long time spent with people who experience homelessness and people who live in informal housing provides enough data to help illustrate, at least in part, the systemic effects of precarious housing during heat health alerts.

National Regulations Concerning the Management of Red Heat-Health Alerts

The main pieces of legislation that provide for the measures to be taken in the field of labour during periods of extreme temperatures are Emergency Ordinance no. 99 of 29th June 2000 concerning what measures can be taken during heatwaves for employed persons and Government Decision no. 580 of 6th July 2000 on the methodological rules for the application of GEO 99/2000. To define extreme temperatures, legal texts refer to temperatures over + 37°C.

During periods of extreme temperatures, employers must reduce the intense physical activity workload, must ensure a good ventilation of the workplace, and provide water (2-4 litres/person/shift) and access to showers (Art. 4 of the law). However, as shown hereinafter, these rules are observed only partially and rarely for people working in sanitation, and delivery or for day labourers.

Housing and Heatwaves

Electricity

The biggest problems faced by people who live in precarious conditions, whether they sleep in public spaces without legal documentation or in informal housing, are access to food, ventilation, and water. While during winter they can preserve perishable foods for longer periods by relying on the cold temperatures outside, in summer, without electricity, they are forced to buy food almost daily.

> *I have a car where I keep my stuff. In winter, I can buy a large salami and it lasts longer, but in summer, I can't.*
>
> *(I., a person who experiences homelessness)*

One way they try to save money is by purchasing larger quantities of food on payday, knowing they will quickly run out of funds during the month. Yet, without a refrigerator, this strategy becomes unfeasible during heatwaves.

People who live without tenancy agreements can get gas cylinders relatively easy, so they are able to cook. Cooking is also a way for vulnerable families to save money, enabling them to prepare larger quantities of food. However, without access to electricity, they cannot use a refrigerator and therefore cannot preserve cooked food for several days during heatwaves. One woman living without legal housing status in a home without electricity mentioned that another potential way to save money is to buy food close to its sell-by date, as it is much more affordable. Still, without a refrigerator, she cannot preserve the food (she referred to meat specifically) bought at discounted prices, meaning she cannot optimise her food budget:

> *There were discounted poultry parts at *[store name]*. I had just received my salary; I could have bought a larger quantity, because I run out of money fast. But what can I do if I don't have a fridge? I buy just enough to make one pot of soup and that's it. Summer is hard, there's nowhere to keep things cold.*
>
> *(V., a person living without legal housing status in an abandoned house).*

Without electricity, vulnerable individuals have no way to cool the space they live in during the summer. They often live in overcrowded homes, which worsens thermal discomfort. As a result, they sleep relatively poorly, although they did mention that it was not something that affected the quality of they lives all that much. Most interviewees tended to compare the situation to wintertime, when the cold is harder to endure than the summer heat.

> *Sometimes we sleep outside, ma'am, we do not have a choice. We stretch out here, at least there's a bit of wind. There are a lot of us in that room, especially with the kids... Winter's okay, we keep warm like that. Summer is harder.*
>
> *(D., a person living in a former industrial facility).*

Another issue that affects their quality of life during the summer is insects (mosquitoes and bedbugs), which they say are aggressive and disturb their sleep. People who live in homes without windows or in public spaces say they have no way to protect themselves.

> *The mosquitoes buzz around us and there are other bugs, too. We can't put up nets, so we just deal with them and that's that.*
>
> *(Ion, a person who experiences homelessness).*

For non-EU workers (all interviewees are from Bangladesh), the main issue is the lack of air conditioning. They said that finding housing in Bucharest is difficult and that they had to move wherever they were accepted (the mentioned being rejected from many flats, with racism in the housing market being a persistent issue in Bucharest). Because of the challenges in accessing the open rental market and the high rental prices, they described situations where some of their colleagues were forced to live in hostels, where living conditions are even tougher, mainly due to overcrowding.

> *It's hard for us, ma'am to find a place to rent. People don't accept us. We don't even look for air conditioning anymore. What matters is that someone takes us in [...], we have colleagues living in hostels and it's hard there, it's too crowded and it's very hot.*
>
> *(S., a delivery worker who has lived in Romania for two years).*

Access to Water

Access to water is generally difficult for people who live in informal housing areas. During the summer, the need for water increases, making the task of obtaining it even more challenging. Often, informal agreements with the neighbours are made, but this brings about unpredictable access, arbitrary payments, and sometimes even hard physical labour (with access to water being conditional on performing various tasks). A young man from an informal settlement in Bucharest shared that the person ensuring the water supply for the entire community there worked an entire day hauling hay bales in the heat, despite suffering from a serious lung condition. He had accepted the task out of fear that otherwise they would be cut off from water and electricity (which actually happened a few months later).

> *[But how do you know how the amount each of you has to pay is calculated?] Well, he comes and tells us how much we owe him. We divide it among all of us living here, and that's that. What bills could we ask him to show us? We just try not to upset him so he doesn't cut off our water and electricity.*
>
> *(L., a person who lives in an informal housing area).*

> *Sometimes he invites us to do some work for him. He tricks us by saying he'll pay us, but even if he told us upfront he wouldn't pay, what choice do we have? We don't want to fight with him because he can cut off our water and electricity.*
>
> *(V., an inhabitant of the same informal housing area).*

> *We gotta wash more often. I haul water in plastic barrels. It's hard, because we use it up fast; we sweat, and we don't want to go to work smelling bad. Sometimes we pay a neighbour and he helps us with his car, we load up those five-litre containers, as many as we can fit.*
>
> *(S., person living without legal status in an abandoned house).*

What is important to note is that for some informal settlements or individuals living without legal status in vacant homes, access to water and electricity through neighbours often comes at high financial costs and lacks transparency regarding how the charges are calculated. For people who do not have an agreement with neighbours regarding water, or during periods when they need large quantities of water, public water sources are the only available option. Some have to travel long distances to reach these sources or pass through areas where transportation is difficult:

> *It takes me about 40 minutes to an hour. I use a cart for carrying. It's not hard, but I have to cross some tram line and that part is difficult. Otherwise, I walk without a problem*
>
> *(person having experienced homelessness for the past 15 years, caring for two children under the age of 5).*

Some people do not trust the quality of water from public sources and choose to buy water to prepare milk for the babies in their families. Another issue raised is that in the absence of a refrigerator, purchased drinks or water obtained at home warms up very quickly, which makes it difficult for these people to cool down during the summer months.

> *We grab a bottle of water, maybe an ice-cream, just to cool down a bit. But when it's hot, since I don't have a fridge, I have to drink it straight away.*
>
> *(A., woman, living without legal housing status).*

Photo credit: Irina Zamfirescu's personal archive

Most of the participants in the interviews say public drinking fountains are much more accessible now than they used to be, and generally, the police harass them less when they try to get water from these sources. Still, the number of drinking fountains on their travel routes is very low and do not meet their needs. Delivery workers mentioned that most fountains are located in parks, but their routes rarely pass through parks, especially since cycling is explicitly banned in most of them. Their suggestion is to place fountains in transit areas too, not just in green spaces.

> *The water from the drinking fountains is good; it quenches our thirst and helps us cool down. But I don't understand why they're only in parks. In some parks we're not allowed with bikes, it's forbidden. So I can't just go in and have a drink.*
>
> *(E., delivery worker, has been living in Romania for 3 years).*

Another issue raised about the drinking fountains is how difficult it is to fill up water containers. The fountain system makes it quite hard to collect larger volumes of water.

> *It doesn't really work for us to take water and keep it here. Even with those small containers, it's a struggle. It's not much help for bringing water home, we still have to find pumps or wells.*
>
> *(D., a person living on a former industrial site).*

Personal hygiene is generally difficult to maintain in overcrowded spaces. During heatwaves, it becomes even more necessary. The people experiencing homelessness we interviewed say that they resort to the social services provided by non-governmental organisations for access to showers and laundry facilities. As for those living in informal housing areas, they take turn washing in the space where they live, while the other members of the household leave the room.

Leisure Time

The people who do not have the opportunity to cool down during hot summer days, whether because they live in public spaces or because they do not have electricity and cannot ventilate the living space, said that sometimes they go to shopping malls to that end. Some of these people mentioned that the security guards in shopping malls sometimes remove them from the premises because they do not have money and therefore cannot buy anything from the shops.

> *Sometimes we go to the shopping mall to cool down. But they see us. They will let us stay for a while, it's true, but then they ask us to leave. We go to Carusel (i.e. a large bookshop) as well, spend some time inside and drink water*
>
> *(F., a person experiencing homelessness).*

Although there are centres belonging to sector city halls, where people can take shelter and enjoy the air conditioning, the interviewees say that they do not know of such places and that they have not accessed them. Generally, due to a long-standing history of rather hostile interactions with representatives of the public authorities (mainly the local police and social work departments), vulnerable people in Bucharest prefer to avoid contact with public institutions. Therefore, the reason why vulnerable people in Bucharest avoid such places is that they are mainly located in the buildings of public institutions.

Lake Ciurel is another cooling place quoted by the interviewees. In the past, the lake in I.O.R. Park was also a go-to place, but some of our interviewees say that now they avoid the area because of the numerous local police over there. For the time being, Lake Morii is still a bathing option for them. However, the development plans for the area surrounding the lake (some of the projects put forward include recreational activities on the water) may very well make this cooling alternative disappear.

> *I also go to Ciurel for cooling. What can you do, it's really hot. We used to go to I.O.R. park, but we're not allowed anymore, the police will kick us out.*
>
> *(M., a person experiencing homelessness).*

Work and Heatwaves

For most people included in this study work is much harder during the freezing winter months than in the heat of the summer. One notable exception, however, are the people who maintain the green spaces.

> *It's really tough in the summer, I tell you. They make us work 12 hours a day, no matter how hot it is outside, sweeping, cutting grass, all sorts, regardless of the heat*
>
> *(M., a woman employed in green space maintenance services).*

The persons included in our study say that the rule for water distribution during heatwaves is sometimes ignored. One person who worked in sanitation in the public domain had this to say about water distribution:

> *They only gave us water when the mayor came to visit, just so it could be posted online*
>
> *(I., a woman employed in green spaces maintenance).*

Even when water was distributed, there was no way to keep it cool for long periods, so it would get warm relatively fast. Moreover, another female worker shared that they received warm water:

> *They give us water, but what can you do with warm water in this hot weather? Sometimes it's already warm when they bring it. While we do some sweeping, it gets boiling hot*
>
> *(F., a woman employed in green spaces maintenance).*

One of the interviewees suggested thermal bags as a solution for keeping the water cool for longer periods throughout the working shifts.

Six of the interviewees who work in sanitation went to work on days with high temperatures (June 2025). They said that, despite the high temperatures on the day before, they were asked to mow the grass, which unsettled the dust and made it difficult for them to breathe:

> *They don't care about the weather. If something needs doing, you have to do it.*
>
> *(C., a woman employed in green spaces maintenance).*

The interviewees working in sanitation said they had not undergone medical tests to identify any conditions that might make them unfit to work during extreme heat. Two of them mentioned they suffered from health issues that made them feel unwell in hot weather (heart problems, diabetes). Although no tests are carried out, they noted that supervisors are attentive and if someone feels unwell, they are allowed to rest in the shade or take a day off work. However, one of the persons said that there was no option to make up for the missed day, meaning each day off results in a pay cut, so they would rather go to work:

> *We don't have the time to make up for it, because we work in 12-hour shifts and then get 24 hours off. If we miss work, we can't simply show up the next day. They understand, but it still comes out of our wages. So you push yourself, just so you don't lose a day's pay.*
>
> *(R., a male employee in green space maintenance services).*

Those working on construction sites (as day labourers, without formal contracts) said that, generally, site supervisors did provide them with water. However, protective equipment was sometimes lacking. During peak heat hours, some supervisors did not allow them to work at height, while others ignored restrictions for these time intervals altogether.

As for the people working in the delivery system, the workers have to manage the periods of extreme heat by themselves. The reason is that, in fact, there is no employer, no person responsible for ensuring compliance with labour legislation (all participants in the study were employed by online platforms, meaning that they did not have employment contracts and

worked independently). As such, it is down to the employees to decide when to go out to work and what protective measures to take against the heat (this means they bear the associated costs themselves):

> *Well, we don't speak to any boss. We're just there, on the platform. It's not our boss. So we decide, and we pay.*
>
> *(G., delivery worker).*

Due to the considerable pressure to meet a minimum monthly budget, the individuals interviewed who had come to Romania on a work contract (some of them also arrived on study contracts, so for them the pressure to maintain employment is less intense) said they worked between 14 and 16 hours a day. According to them, they need at least 4,000 lei per month to cover expenses such as rent, bicycle rent, and taxes, in addition to food and other essential costs. Under these circumstances, they say they simply cannot afford to stay indoors during periods of extreme heat.

> *We cannot afford not to go out and work. Since I moved here, I have only had the Sundays off and I think last winter was the only time when I could not go out because of the cold. Otherwise, we're out working every day*
>
> *(E., a delivery worker who has been in Romania for three years).*

They explained that, given Bangladesh's climate, it was fairly easy for them to adapt to the heatwaves over here (but not to the freezing cold periods, when they couldn't cope and had to stop working on the coldest days). Some of the strategies they use to mitigate the impact of the heat is to cover their faces to avoid sunburn. They use water from public fountains and mention that some of the clients offer them cold water during heatwaves.

Conclusions and Recommendations

Bucharest's climate is getting hotter, regardless of the climate scenario considered. The rise in temperatures seen over the past century is expected to continue until the end of the century under the RCP 8.5 scenario (where no mitigation measures are taken). The increase will be obvious in both average and maximum temperatures, leading to more frequent heatwaves, extreme temperatures, tropical days and nights. The effects of warming will be felt across all sectors of activity. The risk of mortality associated with extreme temperatures will increase, as will energy consumption during the summer months.

Bucharest has taken a few first steps towards climate adaptation, mitigation, and resilience in response to the intensification of extreme weather events. However, these efforts must be sustained, expanded, and tailored to meet the needs of the community and economic stakeholders. Improving institutional resilience is among the most urgent priorities. In addition, Bucharest holds significant potential for sustainable urban development, but the energy transition must be accelerated to mitigate the impact of pessimistic climate forecasts (RCP 8.5), which estimate over 100 tropical days annually by 2100.

The growing pressure caused by extreme heat in Bucharest requires an appropriate reaction through measures taken at individual level, as well as at community level. We can take *adaptation measures* aimed at minimising the local effects of extreme heat, *mitigation measures* to help reduce its underlying causes, and *resilience measures* to enhance our ability to respond, recover, and return to normal activities.

In recent years, some public authorities in Bucharest have started to take concrete steps to manage the effects of climate changes. This is due in part to pressure from the European Union and non-governmental organisations, and in part to the increasingly obvious effects of climate change (storms, high temperatures). The presence of NGOs actively piloting measures to reduce the effects of heatwaves and promoting nature-based solutions to tackle the climate crisis provides a valuable opportunity to inform and engage the local community. This, in turn, can help exert pressure on local authorities. At present, several strategic documents aim to reduce pollution and increase the quality of green and blue areas. Perhaps one of the most conspicuous manifestations of this shift in attitude is the fact that this year the Municipality of Bucharest has appointed a climate neutrality officer (within the Bucharest City Hall). Nonetheless, the fact that some of the key documents concerning the quality of green and blue spaces have yet to be approved by the General Council suggests a limited understanding among political decision-makers of the urgency of the situation.

On the other hand, an increasing number of non-governmental organisations and grassroots initiatives are publicly advocating for the preservation of green spaces and the (re)valorisation of areas with potential for improving the environmental infrastructure. One of the core values championed by both sides is the inclusion of citizens in the planning of these future initiatives. The participatory dimension appears to be a principle that both public authorities and civil society frequently highlight in public discourse when it comes to the city's ecological future.

However, vulnerable individuals are almost entirely absent from the public debates. The threat of gentrification is hardly ever mentioned in the public discourse. Except for a few people from the technical staff who (occasionally) reference the issue in public documents, the fact that market mechanisms lead to rising housing costs in areas adjacent to improved green infrastructure, or that urban regeneration often results in evictions, seems to be missing from any local public authority's action plan.

Another aspect that goes undocumented by the public authorities is the daily lives of vulnerable groups living in the city. During heatwaves, we are relatively used to receiving advice about staying hydrated, remaining indoors, and avoiding work in direct sunlight. In fact, these are not feasible options for people who live in precarious housing conditions or have low wages from day labour or poorly paid jobs. What is more, those working independently, without labour contracts, such as is the case of delivery workers, are deprived of the rights they would otherwise have in relation to the companies they serve during periods of extreme heat.

Local public authorities must incorporate into their climate resilience and adaptation policies the guarantee of energy security and access to water for all

individuals, especially those in situations of profound vulnerability. The absence of electricity and water constitutes the expression of social injustice, which manifests severely during periods of extreme heat. It appears that the vulnerable groups examined in this report had to find solutions by themselves, although in many cases we are dealing with intergenerational poverty, and a violent system that perpetuates poverty. Ensuring minimally decent conditions (including access to electricity and water) during extreme heat, and implementing public policies that prevent these individuals from being excluded from the benefits of improved air quality and green spaces, are concrete expressions of social justice in the context of climate crisis management.

Recommendations:

→ **The use of scientific data and the development of local climate services.**
Investments and spatial planning must rely on tailored data and specific applications in order to meet the climate challenges at local level effectively.

→ **An institutional paradigm shift in relation to the climate crisis.**
The local public authorities have to regard the effects of the climate crisis not just in terms of environmental issues, but also as real problems of public health and social justice, and integrate this vision in their urban planning.

→ **Cooperation between the seven city halls of the Municipality of Bucharest**
It is crucial that they develop collaboration mechanisms to identify and implement solutions across the city. The effects of the climate crisis are not localised, which means that developing strategies at the level of each individual sector is relatively ineffective.

→ **Setting up specialised departments for the local management of the climate crisis.**
Following the model of Sector 2 City Hall, each city hall should have a department dedicated to managing the climate crisis, with clear responsibilities in developing, coordinating, and monitoring local strategies, in harmony with relevant national and local strategic documents.

→ **Training individuals who hold political office in the field of climate crisis**.
At present, local and general councils do not adopt some of the fundamental strategies and documents in this field. We believe that there needs to be a deep understanding at this level of the effects of the climate crisis and the measures that can be taken to mitigate them.

→ **Implementing nature-based solutions**
In order to mitigate the effects of heatwaves and summer storms, authorities should pilot and roll out green solutions inspired by successful European models. Local public authorities must begin piloting such measures and then, in a second phase, develop the projects on a large scale.

→ **Rewilding impermeable areas**
It is necessary to identify areas where surfaces made of concrete, bitumen, asphalt or other materials can be reduced and replaced with soil and vegetation that require minimal water for irrigation, similar to the urban meadows piloted by the Văcărești Natural Park Association.

→ **Making use of open water surfaces**
The Dâmbovița River and its chain of lakes can become cooling corridors and recreational areas (including bathing zones), accessible free-of-charge to all citizens.

→ **Rethinking the paradigm for green space design**
Green spaces should be planned primarily around their ecological and climate adaptation roles, not solely for aesthetics or leisure. Any unnecessary reduction or intervention in these areas diminishes their capacity to counteract the effects of the climate crisis.

→ **Social impact studies for urban regeneration projects**
Projects aimed at improving green-blue spaces and urban regeneration must rely on social impact studies. Potential groups at risk of gentrification should be identified, and measures implemented to prevent this phenomenon.

→ **Adapting public infrastructure to extreme climate**
Public infrastructure, such as playgrounds, pedestrian crossings, bus stops, and walkways should be adapted to reduce temperatures and/or provide shade.

→ **Audits of green spaces in relation to extreme heat exposure**
Conducting audits of public spaces to assess risks associated with extreme temperatures and then establishing shaded corridors to protect pedestrian routes, ensuring safety for walkers, cyclists, and scooter users.

→ **Expansion of the public drinking fountain network**
Drinking fountains should be installed not only in parks, but also in high-traffic urban areas, particularly along routes frequented by outdoor workers during the summer months.

→ **Regulations on access to water and the use of public fountains**
Local regulations should allow people to bathe in public fountains and collect water. This should apply particularly to people who do not have access to water in their households, at least during yellow, amber, and red heatwave alerts.

→ **Compliance with legal standards for working in heatwave conditions**
Local public authorities must closely monitor compliance with legal provisions regarding work during extreme heat, both for their own employees and subcontracted staff (particularly sanitation workers). One suggestion we received during our fieldwork was to provide water in containers that preserve temperature, such as cool boxes.

→ **Improving energy efficiency in buildings**
Local authorities should consider more complex plans for improving building energy efficiency, including the use of heat-reflective construction materials and green roofs. Priority should be given to disadvantaged residential areas, where residents cannot afford high-energy costs for heating or cooling.
Simultaneously, efforts should be accelerated to retrofit buildings for thermal efficiency. Adaptations such as ventilated structures, green or perforated roofs can significantly reduce indoor temperatures, helping to mitigate thermal stress.

→ **Expansion of NZEBs (Near Zero Energy Buildings)**
These buildings address both the effects (adaptation) and causes (mitigation) of climate change. NZEBs have extremely high-energy performance, with energy consumption tending towards zero. At least 30% of their energy needs are met through nearby renewable sources. This contributes to reducing greenhouse gas emissions and energy consumption in the building.

BIBLIOGRAPHY

Antonescu B, Ene D, Boldeanu M et al. 2023. Future changes in heatwaves characteristics in Romania. Theor Appl Climatol 153, 525–538 (2023). https://doi.org/10.1007/s00704-023-04412-5

ANM. 2025. Caracterizare climatologică multianuală 1961-2023. https://www.meteoromania.ro/clim/caracterizare-multianuala/cc_1961_2023_07.html

Cheval S, Popa A-M, Șandric I, Iojă I-C. 2020. Exploratory analysis of cooling effect of urban lakes on land surface temperature in Bucharest (Romania) using Landsat imagery. *Urban Climate* 34, 100696. https://doi.org/10.1016/j.uclim.2020.100696

Cheval S, Dumitrescu A, Amihăesei V, Irașoc A, Paraschiv M-G & Ghent D. 2023. A country scale assessment of the heat hazard-risk in urban areas. Building and Environment, 229, 109892. https://doi.org/10.1016/j.buildenv.2022.109892

Cole, H. V., Lamarca, M. G., Connolly, J. J., & Anguelovski, I. (2017). Are green cities healthy and equitable? Unpacking the relationship between health, green space and gentrification. *J Epidemiol Community Health*, *71*(11), 1118-1121.

Cuomo, C. J. (2011). Climate change, vulnerability, and responsibility. *Hypatia*, *26*(4), 690-714

Cusack, L., van Loon, A., Kralik, D., Arbon, P., & Gilbert, S. (2013). Extreme weather-related health needs of people who experience homelessness. *Australian Journal of Primary Health*, *19*(3), 250-255.

Frumkin, H., Hess, J., Luber, G., Malilay, J., & McGeehin, M. (2008). Climate change: the public health response. *American journal of public health*, *98*(3), 435-445.

Gabrian IS, Dinicila S, Dumitrescu A, Velea L, Cheval S. 2025. Simulating the Urban Heat Island during High-Heat Events Using WRF Urban Parameterizations: A Case Study for Bucharest (Romania). *Building and Energy* (articol submis)

Gibb, K., Beckman, S., Vergara, X. P., Heinzerling, A., & Harrison, R. (2024). Extreme heat and occupational health risks. *Annual review of public health*, *45*.

Iojă C. 2025. Starea mediului în București. Platforma de mediu. Raport de cercetare, ediția a II-a, 165 pg.

Platforma Ro-Adapt. https://www.roadapt.ro/geoportal-harta-interactiva.php

PHUONG, V., FEW, R., & WINKELS, A. (2013). Heat stress and adaptive capacity of low-income outdoor workers and their families in the city of Da Nang, Vietnam.

Speck, J., 2013. Walkable city: How downtown can save America, one step at a time. New York, Macmillan.

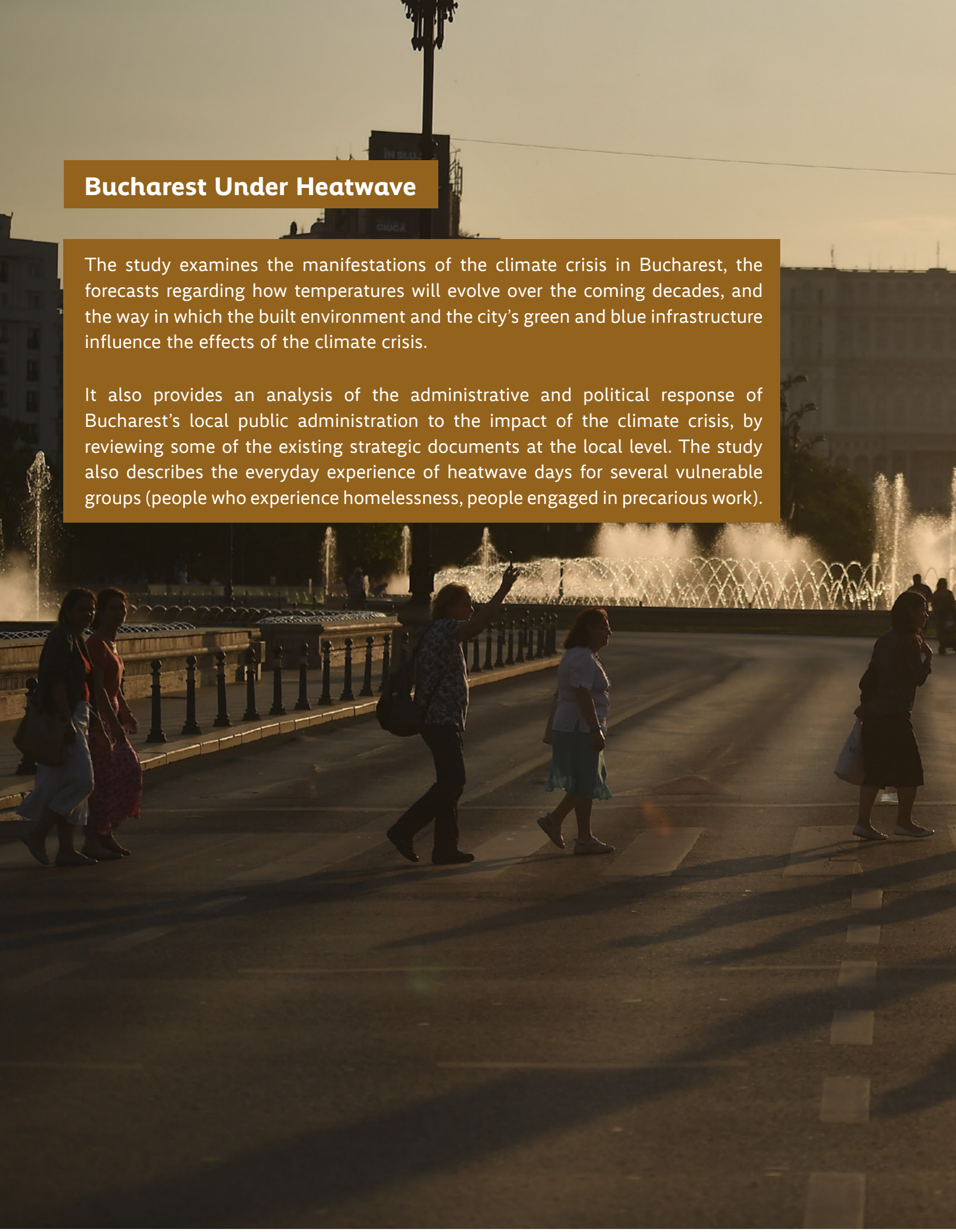
World Bank. 2025. Unlivable. How Cities in Europe and Central Asia Can Survive – and Thrive – in a Hotter Future. © World Bank.

About the Authors

Irina Zamfirescu has been active since 2006 with the Association Active Watch, and since 2022, she has held the position of lecturer in the Department of Sociology at the Faculty of Sociology and Social Work, at the University of Bucharest, where she coordinates the Master's programme *Cross-disciplinary perspectives on socio-ecological transformations*. She conducts most of her research as engaged anthropology, working with vulnerable communities. She is interested in social justice and, together with communities affected by extreme poverty, undertakes advocacy efforts aimed at improving the quality of life for people experiencing homelessness and families living in informal communities. She is also involved in research exploring practices of coexistence within multi-ethnic communities. As of July 2025, she has been a member of the European Commission's Housing Advisory Board.

Sorin Cheval is a climatologist at the National Meteorological Administration, with key scientific interests in urban climate, climate variability, and the study of risk-related phenomena. Sorin Cheval is an associate professor at the University of Bucharest and at the European School of Management and Technology in Berlin, as well as a doctoral supervisor in the field of Geography at Babeș-Bolyai University in Cluj-Napoca. He has authored over 100 scientific papers published both nationally and internationally; he is the lead author of the forthcoming IPCC Special Report on Climate Change and Cities.

Alexandru Dumitrescu is a scientific researcher specialising in climatology, with over two decades of experience at the National Meteorological Administration, within the Climatology Department. His core expertise lies in the analysis of climate changes, using integrated methods that include observational data, remote sensing, and climate modelling. He is also involved in the development of operational climate services, turning complex climate information into practical tools for sectors such as agriculture, urban planning, and the management of climate and natural risks.



Bucharest Under Heatwave

The study examines the manifestations of the climate crisis in Bucharest, the forecasts regarding how temperatures will evolve over the coming decades, and the way in which the built environment and the city's green and blue infrastructure influence the effects of the climate crisis.

It also provides an analysis of the administrative and political response of Bucharest's local public administration to the impact of the climate crisis, by reviewing some of the existing strategic documents at the local level. The study also describes the everyday experience of heatwave days for several vulnerable groups (people who experience homelessness, people engaged in precarious work).

Friedrich Ebert Stiftung