**SERBIA ACCELERATING INNOVATION AND GROWTH ENTREPRENEURSHIP (SAIGE) PROJECT**

**Program PRISMA**

# ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

**Reclaiming Public Open Space in Residential Areas: Shifting Planning Paradigms and Design Perspectives for a Resilient Urban Future (RePOS)**

Associated project:

Pilot Project for Redesign of Public Open Space
in a Multi-family Residential Neighbourhood
in Niš
(RePOS Pilot Project)

DRAFT DOCUMENT

Niš, Belgrade

22/7/2026

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## ABBREVIATIONS AND ACRONYMS

ESMF - Environmental and Social Management Framework

ESMP - Environmental and Social Management Plan

ESS - World Bank's Environmental and Social Standard

SAIGE - Serbia Accelerating Innovation and Growth Entrepreneurship

SF - Science Fund

SRO - Scientific and Research Organization

PI - Principal Investigator

PIU - Project Implementation Unit

TM - Team Member

GAFUN - Faculty of Civil Engineering and Architecture, University of Niš

UBFA - Faculty of Architecture, University of Belgrade

WP - Work Package

RePOS Pilot Project - Pilot Project for Redesign of Public Open Space in a Multi-family Residential Neighbourhood in Niš

# 1 - EXECUTIVE SUMMARY

This draft Environmental and Social Management Plan (ESMP) has been prepared for the PRISMA Program, funded by the Science Fund of the Republic of Serbia. The draft ESMP document is prepared for the *"Pilot Project for Redesign of Public Open Space in a Multi-family Residential Neighbourhood in Niš" (RePOS Pilot Project)* as the *associated project* of the PRISMA project "Reclaiming Public Open Space in Residential Areas: Shifting Planning Paradigms and Design Perspectives for a Resilient Urban Future" (RePOS). The environmental and social checklist screening carried out during the evaluation of the project is consistent with the ESMF classification and ranked the project RePOS as of moderate risk. The screening result showed that the project has low risk considering ethics and moderate considering the environment, due to planned Associated Facilities/ Activities which must meet ESSs requirements. The document is prepared in accordance with Environmental and Social Management Framework (ESMF) for SERBIA ACCELERATING INNOVATION AND GROWTH ENTREPRENEURSHIP (SAIGE) PROJECT.

RePOS project addresses the problem of urban decay of public open spaces (POS) in inherited housing estates, and almost complete POS disappearance in new multi-family residential areas in former socialist cities, which urban planning policy and practice still fails to address. Therefore, RePOS project aims to reintroduce public open spaces into residential areas of Serbian cities through a novel integrated planning and design approach. It aims to develop systemic guidance directives for urban planning and design with an all-inclusive toolset to support innovative solutions in POS (re)creation, as well as specific guidelines for participation and implementation. The devised theoretical framework will be tested at a pilot project scale in the City of Niš with multiple stakeholders through the *RePOS Pilot Project* as the associated project. The RePOS Pilot Project is developed through participatory process and is expected to improve the environmental quality, functionality, safety, visual appearance and long-term usability of the selected public open space through small-scale innovative solutions. In addition to its direct local benefits, the project has broader demonstration value, as it can serve as a practical and transferable example of small-scale regeneration of public open spaces in inherited multi-family housing estates.

Besides expected benefits of the implementation of the RePOS Pilot Project, potential negative social and environmental impacts may occur. The purpose of the Environmental and Social Management Plan is to highlight them and to set out specific mitigation, monitoring, and institutional measures to be taken to eliminate adverse environmental and social impacts, offset them or reduce them to acceptable levels. Taking into account the nature and scale of the RePOS pilot project, it can be concluded that the implementation of the project activities on site will not adversely affect the quality of surface/ground water or soil, while the impact on greenery, microclimate and land use is expected to be positive. Special attention should be given to the waste management and community and workers health and safety as the areas of the moderate risk during construction phase. Although no hazardous wastes will be generated, temporary and localised waste, noise and air pollution may occur due to construction works and transport activities. Besides that, unauthorized and accidental use of the construction site may endanger the safety of residents, which should be prevented. Social risks should be avoided or mitigated through the early commitment to pilot project from all stakeholders, and through participatory activities and events that enable education and mediation of various interests to ensure project's long-term sustainability. The key components of The Environmental and Social Management Plan are: Plan for the mitigation of adverse impacts on the

environment and social surrounding and Plan for monitoring the impact on the environment and social surrounding, including documents provided in ANNEX 1-11. All the activities related to preparation, design, construction and operation phase of the Project will be carried out in accordance with the relevant laws and/or management strategies of the Republic of Serbia.

# 2 - POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

## 2.1 Relevant Institutions

The Ministry of Environmental Protection of the Republic of Serbia is responsible for producing and implementing the environmental policy. Other relevant institutions for environmental and social management for the associated RePOS Pilot Project are:

- Ministry of Environmental Protection of the Republic of Serbia;
- Ministry of Construction, Transport and Infrastructure of the Republic of Serbia;
- Serbian Environmental Protection Agency;
- Ministry of Labour, Employment, Veteran and Social Affairs of the Republic of Serbia;
- Labour Inspectorate;
- Occupational Safety and Health Administration;
- City of Niš Local Government;
- City of Niš – City Administration for Property, Economy and Environmental Protection;
- City of Niš – City Administration for Planning and Construction;
- City Municipality of Medijana;
- Public Utility Company "Medijana" Niš;
- Institute of Public Health Niš, where applicable;

## 2.2 Existing Serbian Legislation

All planning, design, procurement, implementation and maintenance activities related to the RePOS Pilot Project will be carried out in accordance with the relevant laws, by-laws, strategies and local decisions of the Republic of Serbia and the City of Niš. The legal framework relevant for the project includes, but is not limited to, the following:

- The Constitution of Serbia ("Official Gazette of RS" No. 98/06, 16/22)
- The Constitution of Serbia ("Official Herald of the Republic of Serbia", Nos. 98/2006 and 115/2021)
- The National Strategy for Sustainable Development ("Official Gazette of RS" No. 72/09, 81/09)
- Law on Science and Research ("Official Gazette of RS" No. 49/19, 108/25)
- Law on environmental protection ("Official Gazette of RS" No. 135/04, 36/09, 72/09, 43/11, 14/16, 76/18, 95/18 and 94/2024)
- Law on Planning and Construction ("Official Gazette of RS" No. 72/09, 81/09, 64/2010, 24/2011, 121/2012, 42/2013, 50/2013, 98/2013, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019, 9/2020, 52/2021, 62/2023 and 91/2025);
- Law on Housing and Building Maintenance (,,Official Gazette of the Republic of Serbia'', no. 104/16 and 9/20, 9/22 (Decision of the Constitutional Court)
- Law on Communal Activities (Official Gazette of the Republic of Serbia, no. 88/2011, 104/2016, 95/2018, 94/2024)
- Law on Local Self-Government ("Official Gazette of RS" No. br. 129/2007, 83/2014 - - other laws, 101/2016 - - other laws, 47/2018 i 111/2021 - - other laws)
- Law on Local Self-Government Financing (Official Gazette of the Republic of Serbia no. 62/2006, 47/2011, 93/2012, 99/2013 - harmonized, 125/2014 - harmonized din. izn., 95/2015 - harmonized din. izn., 83/2016, 91/2016 - harmonized, 104/2016 - other law, 96/2017 - harmonized, 89/2018 - harmonized din. associate degree, 95/2018 - other law, 86/2019 - harmonized, 126/2020 - harmonized, 99/2021 -

harmonized, 111/2021 - other law, 124/2022 - harmonized din. izn., 97/2023 - harmonized and 85/2024 - harmonized)

- Law on Occupational Safety and Health ("Official Gazette of RS", no. 35/23)
- Law on Waste Management (“Official Gazette of RS”, No. 109/25)
- Law on Noise Protection in the Environment (“Official Gazette of RS”, No. 96/21)
- Rulebook on the special type of facilities and the special type of work for which it is not necessary to obtain an Act from the competent authority, as well as the types of facilities that are built, regarding the types of work that are performed, based on the decision on approval for the performance of work, as well as the scope and content and control of the technical documentation to be attached to the request and the procedure carried out by the competent authority ("Official Gazette of RS", no. 102/2020, 16/2021 and 87/2021)
- Rulebook on General Rules for Parcelling, Regulation and Construction. Official Gazette of the Republic of Serbia, no. 22/2015.
- Rulebook on personal protective equipment ("Official Gazette of RS", No. 23/2020),
- Rulebook on preventive measures for safe and healthy work at the workplace ("Official Gazette of RS", Nos. 21/20109 and 1/2019),
- Rulebook on the provision of signs for safety or health at work ("Official Gazette of RS", Nos. 95/2010 and 108/2017)
- Rulebook on preventive measures for safe and healthy work when using work equipment ("Official Gazette of RS", Nos. 23/2009, 123/2012, 102/2015, 101/2018 and 130/2021),
- Rulebook on the procedure for inspecting and checking work equipment and testing working environment conditions ("Official Gazette of RS", No. 15/2023)
- Rulebook on records in the field of safety and health at work ("Official Gazette of RS", Nos. 62/2007 and 102/2015)
- Law on protection of personal data ("Official Gazette of RS", No. 87/2018
- Law on Free Access to Information of Public Importance ("Official Gazette of RS", Nos. 120/2004, 54/2007, 104/2009, 36/2010 and 105/2021).

## 2.3 Urban Planning Framework for the City of Niš

- City of Niš. Development Plan of the City of Niš 2021-2027. Official Gazette of the City of Niš, No. 36/2021
- City of Niš. Decision on the Communal Order of the City of Niš. Official Gazette of the City of Niš, no. 13/23
- City of Niš. Decision on Maintenance of Public Green Areas. Official Gazette of the City of Niš, no. 89/05, 38/10, 18/17 and 115/22
- Plan of general regulation of the City Municipality of Medijana (Official Gazette of the City of Niš, no. 72/12)
- First amendments and supplements to the Plan of general regulation of the City Municipality of Medijana (Official Gazette of the City of Niš, no. 105/2015)
- Third amendments and supplements to the Plan of general regulation of the City Municipality of Medijana (Official Gazette of the City of Niš, no. 129/2021)

**For the planned project activities at the RePOS pilot project site, it is not necessary to obtain an Act from the competent authority, according to the:**

- Article 144 of the *Law on Planning and Construction (“Official Gazette of RS” No. 72/09, 81/09, 64/2010, 24/2011, 121/2012, 42/2013, 50/2013, 98/2013, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019, 9/2020, 52/2021, 62/2023 and 91/2025)*, and

- Article 2 of the *Rulebook on the special type of facilities and the special type of work for which it is not necessary to obtain an Act from the competent authority, as well as the types of facilities that are built, regarding the types of work that are performed, based on the decision on approval for the performance of work, as well as the scope and content and control of the technical documentation to be attached to the request and the procedure carried out by the competent authority ("Official Gazette of RS", no. 87/2023, 16/2024 i 16/2026)* (7. - footpaths, furniture (benches, etc.) and landscaping)

Permits are not required, but the **Consent for arrangement of public open space from the City of Niš** as the land owner is needed. Therefore, the Letter of support from the City of Niš is also provided, to demonstrate the commitment of the City to RePOS project.

ANNEX 1 _Letter of support City of Nis; ANNEX 2_Consent of the land owner and extract from the real-estate cadastre

## 3 - PROJECT DESCRIPTION

| **INSTITUTIONAL & ADMINISTRATIVE** | |
|---|---|
| Country | Republic of Serbia |
| Project | **SERBIA ACCELERATING INNOVATION AND GROWTH ENTREPRENEURSHIP (SAIGE) PROJECT** |
| Subcomponent title | Science Fund of the Republic of Serbia |
| Program | Program PRISMA |
| Sub-program: | Engineering and technological sciences |
| Project Title: | **Reclaiming Public Open Space in Residential Areas: Shifting Planning Paradigms and Design Perspectives for a Resilient Urban Future** |
| Acronym: | **RePOS** |
| Participating Scientific and Research Organization (SRO) and address | 1) Faculty of Civil Engineering and Architecture, University of Niš (GAFUN)<br>14 Aleksandra Medvedeva, Niš, Serbia<br>2) Faculty of Architecture, University of Belgrade (UBFA)<br>73 Bulevar kralja Aleksandra, Belgrade, Serbia |
| Principal Investigator (PI)<br>(Name and contacts details): | Dr Milena Dinić Branković, Associate Professor at the Faculty of Civil Engineering and Architecture, University of Niš (GAFUN)<br>milena.dinic@gaf.ni.ac.rs |
| The duration of the project | 36 months |
| Number of researchers | 9/nine (PI+ 8 researchers) |

The environmental and social checklist screening carried out during the evaluation of the RePOS project is consistent with the ESMF classification and ranked the project RePOS as of moderate risk. The screening result showed that the project has low risk considering ethics and moderate considering the environment, which is related to Associated Facilities/Activities. The Associated project must meet ESSs requirements, including conducting environmental and social assessment of the proposed associated RePOS Pilot Project*.

*** Note 1:** Construction works involving the development of a rain garden and instalment of urban equipment at the pilot project site are not funded by the Project within the PRISMA program. However, the purchase of a smart bench with solar panel and three outdoor solar lamps for parterre is funded from the Project within the PRISMA program.

## 1 - RePOS Project Components

RePOS project aims to reintroduce public open spaces (POS) into residential areas of Serbian cities through a novel integrated planning and design approach. RePOS will develop systemic guidance directives for urban planning and design with an all-inclusive toolset to support innovative solutions in POS (re)creation, as well as specific guidelines for participation and implementation. The devised theoretical framework will be tested at a pilot project scale in the City of Niš with multiple stakeholders as the associated RePOS project ("Pilot project for redesign of public open space in a multi-family residential neighbourhood in Niš"- RePOS Pilot Project)

The RePOS project involves conducting semi-structured interviews with the local community and survey with city officials in **WP1** (work package), in order to identify existing issues in residential public open spaces exploitation and determine the key barriers to a more tenant-friendly approach to their design. The project also involves classifying existing public open spaces in residential areas, to guide future (re)development. It also includes the development of systemic guidelines for legislation framework, urban planning and design, leading the way towards sustainable residential public open spaces and towards the establishment of measures for the implementation of urban plans and projects, and for the improvement of the overall participatory process (in **WP2** and **WP3**).

Given the complexity of the investigated issue, RePOS research will apply a holistic approach to generate solutions to the listed challenges that residential POS are facing, and to enhance the scientific and practical echo of research findings. This involves the use of integrated urban planning as the "umbrella" concept. Aside from the contribution to solving the wicked problem of climate change through (re)creating sustainable public open spaces, RePOS research also aim to incorporate the following elements of trans-disciplinarity: (1) including multidisciplinary academic research, (2) engaging stakeholders as societal actors outside of the academy in the process, (3) focusing on a specific, complex and societally relevant, real-world problem of residential environment, (4) working in a transformative manner to propose practical guidance for envisioning, creating and implementing POS, (5) orientation toward the common good in POS, involving public health and resilient environment, and (6) reflexivity throughout the Project.

The developed RePOS guidelines and toolset for urban planning and design will be tested at a demonstration site in the City of Niš (**WP4**). At a pilot scale, RePOS will (re)create, develop and implement an urban design RePOS pilot project***** with innovative solutions for residential POS. The project will be created in line with the established urban planning and design framework, with various stakeholders involved in the participatory process. Thus, the envisioned urban design solution for POS will be compatible with a broad range of stakeholders' needs and expectations. This should ease the pathway of implementation, which will rely on established partnerships between residential community, public sector, project financing and NGO funders. This urban design project will serve as a showcase for planning professionals and local communities in Serbian cities on how to integrate innovative solutions into urban planning practice and development.

Research outputs will inspire updating of legislation and planning regulations, help local governments with decision-making, assist planners in guiding POS (re)development process and benefit local communities by enhancing the quality of housing.

## 2 - RePOS Pilot Project

At a demonstration site in the City of Niš, RePOS aims to (re)create, develop and implement an urban design project with innovative solutions for residential POS in WP4 as associated project: "Pilot project for redesign of public open space in a multi-family residential neighbourhood in Niš"- RePOS Pilot Project. Project activities have so far involved preparing and designing one public open space, and will be followed by arranging and landscaping this POS during the realization segment of activities. The site of the pilot project was selected through analysis of natural and development characteristics of the site, in cooperation with the city officials, and based on residents' interest and motivation. Pilot project redevelopment area is a small-scale public space that is common open and recreational space of a group of residential units. Local community was informed of planning and design practices that promote sustainability and resilience through lectures and discussion meetings, in order to foster their social and ecological awareness. Education of citizens on current trends was necessary for raising their social and ecological awareness, and was performed through lectures and discussion meetings. The needs and preferences of citizens were established by conducting a survey** in WP4. Then, an urban design project was created for the selected site that incorporates innovative solutions and is aligned with the newly established urban planning and design framework. By using ENVI-met software, outdoor microclimate at the pilot project site was simulated in two scenarios: (1) existing urban setting and (2) urban setting of the proposed urban design project. Next, the urban design project was published on the digital platform to inform all stakeholders and encourage them to take part in co-creating their residential POS by providing their input. The envisioned urban design solution for POS is going to be implemented with the support from residential community, public sector, project financing and NGO funders. All works at the pilot project site will be carried out in compliance with the relevant standing regulations.

Realisation of the WP4 of the RePOS pilot project includes the following tasks, which have all been completed so far:

Task 4.1. POS pilot project context was set up through the following activities:

> 4.1.1. Land for POS was provided in cooperation with the public sector and private owners, in line with the systemic improved approach
>
> 4.1.2. Sitting tenants were educated on the principles of sustainable planning and design of POS and their input was obtained, in order to raise ecological and social awareness and to foster tenant motivation to participate in POS (re)development

Task 4.2. Urban design project with innovative solutions for residential POS in Niš was created, grounded in the established urban planning and design framework and with the application of the proposed toolset

Task 4.3. Outdoor microclimate at the pilot project site was simulated in "before" and "after" scenarios, by using ENVI-met software

Task 4.4. The process of POS co-creation was administered by involving all stakeholders, focusing on community involvement and fostering tenant input

Task 4.5. Partnerships between residential community, public sector and civil society were established in order to implement the co-created urban design project for POS

** **Note 2:** All surveys/interviews were anonymous with no personal data collection, and they did not involve children or potentially vulnerable individuals or groups. The participants in the interviews were random volunteers and they were informed about the aims, methods and implications of the project activity.

## 4 - REPOS PILOT PROJECT SITE INFORMATION AND BASELINE DATA

The selected pilot project site is the part of the large housing estate Krive livade, built in 1980s. It includes the eastern part of the cadastral plot No 175/1, cadastral municipality Niš – Ćele Kula (see figure 1), and represents a common space for buildings in Branka Krsmanovića street (no. 19, 21, 23, 25, 27, 29, 31), and Pariske komune street (no. 19, 21, 23, 25), where approximately 1,300 people live. This location was chosen as typological representative of public open space in large housing estates that suffer from degraded green surfaces, lack of functional urban equipment, and vulnerability to storm water retention. The site offers an optimal testing ground for the integration of innovative and sustainable solutions aligned with the RePOS theoretical framework.

Figure 1 - PILOT PROJECT SITE (marked by red dotted line) and micro-location. Source: https://a3.geosrbija.rs/

**A) BASELINE DATA for the RePOS pilot project site are further presented:**

**Population**

The pilot project is located within the residential neighborhood of Krive Livade, situated in the City Municipality of Medijana. According to the *Early Public Inquiry for the General Urban Plan of Niš 2025-2040* and the *Study of Public Open Spaces*, this area represents a dense urban core characterized by socialist-era multi-family housing, with an extremely high population density exceeding 1,000 residents per hectare. Despite recent spatial transformations, it remains a highly attractive residential location due to excellent pedestrian and vehicular connectivity with the city center. The immediate zone of influence directly encompasses approximately 1,300 residents who

utilize the central public open space, maintaining a complex public-private delineation in their daily spatial practices and interactions.

**Health and Safety**

The current state of the public open space poses minor public health and safety risks. As noted in the *Study of Public Open Spaces*, while general maintenance by the public utility company is satisfactory, the urban equipment and furniture largely date back to the original construction period and suffer from physical degradation. Furthermore, the high percentage of impervious concrete surfaces exacerbates local heat stress, while inadequate structured stormwater drainage leads to localized ponding near entrance areas, creating potential biological hazards that highlight the necessity for integrated regeneration.

**Geology and Soil**

Based on the geological data from the *General Urban Plan of Niš 2010-2025*, the pilot site is situated on the lower alluvial terrace of the Nišava River basin, characterized by Quaternary alluvial deposits consisting predominantly of gravel, sand, and clayey-silty sediments. The local soil profile within the housing block has been heavily altered by anthropogenic activities during the initial construction, resulting in a technogenic soil layer covered by urban pavements. There are no indicators of deep structural soil contamination resulting from current residential land use.

**Climate**

The macro-location features a moderate continental climate. However, local micro-climatic variations are heavily influenced by the dense urban morphology of the Medijana municipality. The combination of high thermal mass from multi-story concrete buildings and extensive asphalt surfaces triggers a pronounced urban heat island (UHI) effect. The open public space currently lacks optimized vegetative structures to mitigate these micro-climatic extremes, underscoring the need for micro-climate modeling (via ENVI-met) and the implementation of Nature-based Solutions (NbS).

**Seismology**

According to the seismic macro-zoning maps integrated into the *General Urban Plan of Niš 2010-2025*, the wider territory of the city, including the municipality of Medijana, is located in a seismically active zone capable of experiencing earthquakes with a maximum intensity of VII and VIII degrees on the European Macroseismic Scale (EMS-98). While the alluvial substratum slightly amplifies seismic waves, the planned micro-scale landscape interventions and lightweight smart urban equipment pose no risk to the seismic stability of the site.

**Air Quality**

Air quality at the micro-location is continuously influenced by its urban position near major traffic arteries. According to official monitoring data from the Environmental Protection Agency (SEPA) and the Institute of Public Health Niš, the wider urban area consistently faces seasonal air pollution challenges, frequently exceeding the limit values for suspended particles ($PM_{10}$ and $PM_{2.5}$) during the winter heating season. At the micro-location of Krive Livade, the high concentration of buildings and lack of dense vertical greenery limit the natural deposition of these airborne pollutants. The planned nature-based solutions (NbS) within the public open space aim to create local vegetative buffers to mitigate particulate dispersion and improve the immediate microclimate.

**Waste**

Municipal waste management at the pilot site is fully integrated into the communal system. According to the *Plan of General Regulation of Medijana*, this system is operated by the public utility company "Medijana" Niš. While standard waste containers are located along the perimeter streets, the inner public open space suffers from occasional littering due to a lack of well-distributed bins for selective waste disposal. No hazardous waste streams are generated on-site.

**Water Resources**

The pilot area belongs to the hydrographic basin of the Nišava River. There are no open surface water bodies within the Krive Livade housing block. The main water-related issue on the site is the management of atmospheric waters; as identified in the spatial analyses, the existing storm sewage network lacks the capacity to absorb sudden peak runoffs, directly necessitating the introduction of bioretention systems and rain gardens to manage surface water retention.

**Flora and Fauna**

The biological component of the site is strictly defined by its artificial, anthropogenically shaped character. The *Study of Public Open Spaces* notes that while green surfaces were originally planned as mandatory elements of collective housing, they have suffered fragmentation due to recent spatial transformations. However, the study also highlights significant existing individual actions by residents who have initiated urban gardens near the residential buildings. No protected natural habitats or endangered species are present within the boundaries of the pilot project site.

**Noise**

The acoustic environment of the inner residential courtyard is relatively shielded from the high-frequency traffic noise generated by surrounding primary city streets, keeping ambient noise levels within acceptable limits for residential zones. Occasional peaks in acoustic pollution occur along the block's edges due to vehicular movement, further justifying the need for structured landscape interventions that can act as soft acoustic barriers.

**Cultural Heritage**

Based on the protective registers established by the Institute for the Protection of Cultural Monuments and integrated into the *General Urban Plan of Niš 2010-2025*, the specific site contains no protected cultural properties, archaeological sites, or monuments of historical importance.

**B) MICRO-LOCATION of The Repos Pilot Project: Existing Condition and Public Open Space Redesign Project**

Next pages present the RePOS Pilot Project micro-location whithin the neighbourhood, its characteristics and problems as well as Public open space redesign project. Public open space location, photo-documentation of in-situ existing condition and innovative solutions to be implemented (chosen through workshop) are presented in Figure 2. Figure 3 presents the drawing of the existing condition of the micro-location, while the final redesign project for the selected POS is presented in Figure 4 (Conceptual urban design solution) and Figure 5 (Landscape plan). More details on Project and participatory process are given in the next Section 5 (5.1,5.2.,5.3) and in the ANNEXes 4,5,6 and 11.

**PUBLIC OPEN SPACE LOCATION, EXISTING and PLANNED CONDITION (INNOVATIVE SOLUTIONS)**

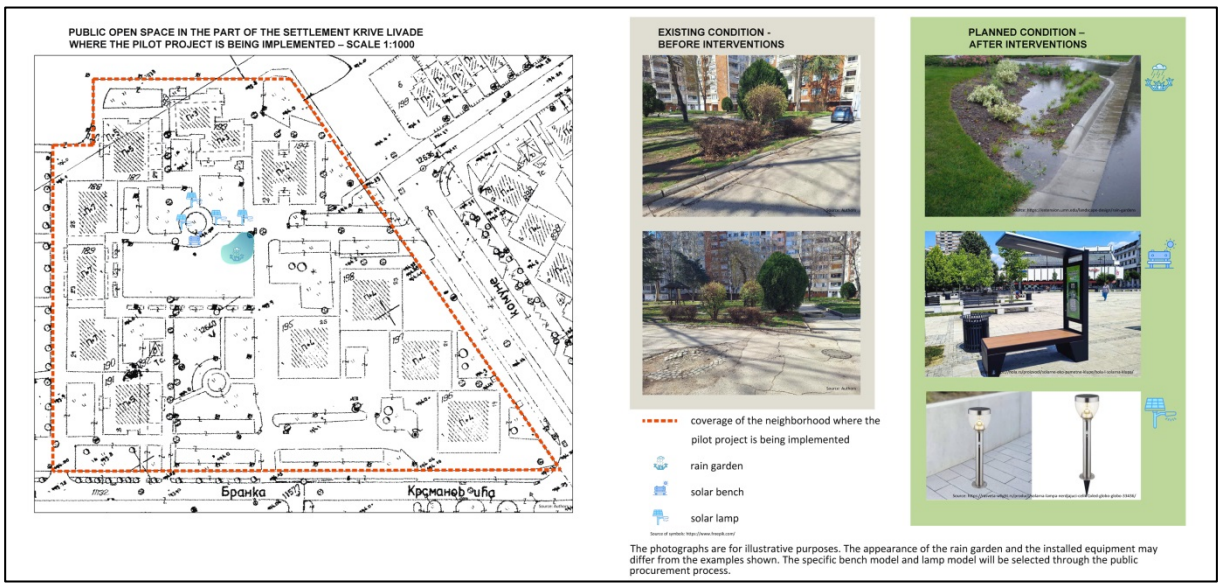


Figure 2 - PUBLIC OPEN SPACE LOCATION AND WORKSHOP RESULTS: Conceptual Urban Design Proposal with Innovative solutions

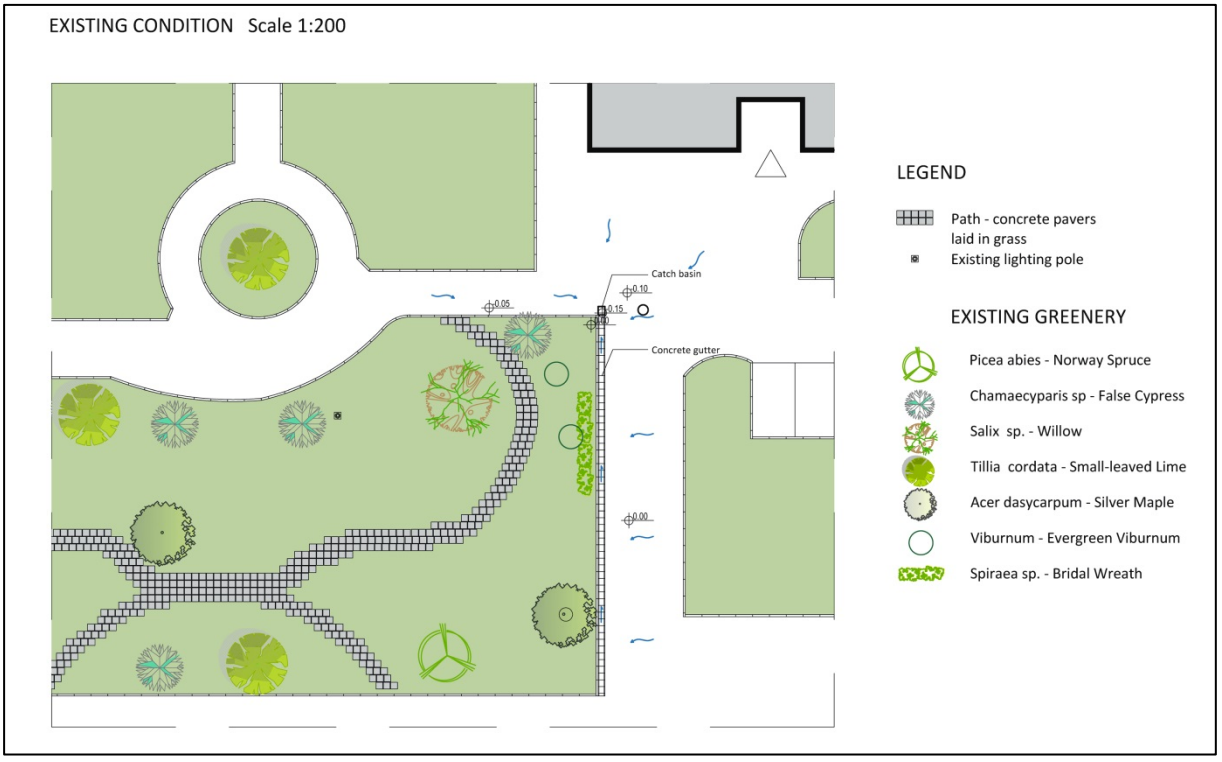


Figure 3 - EXISTING CONDITION

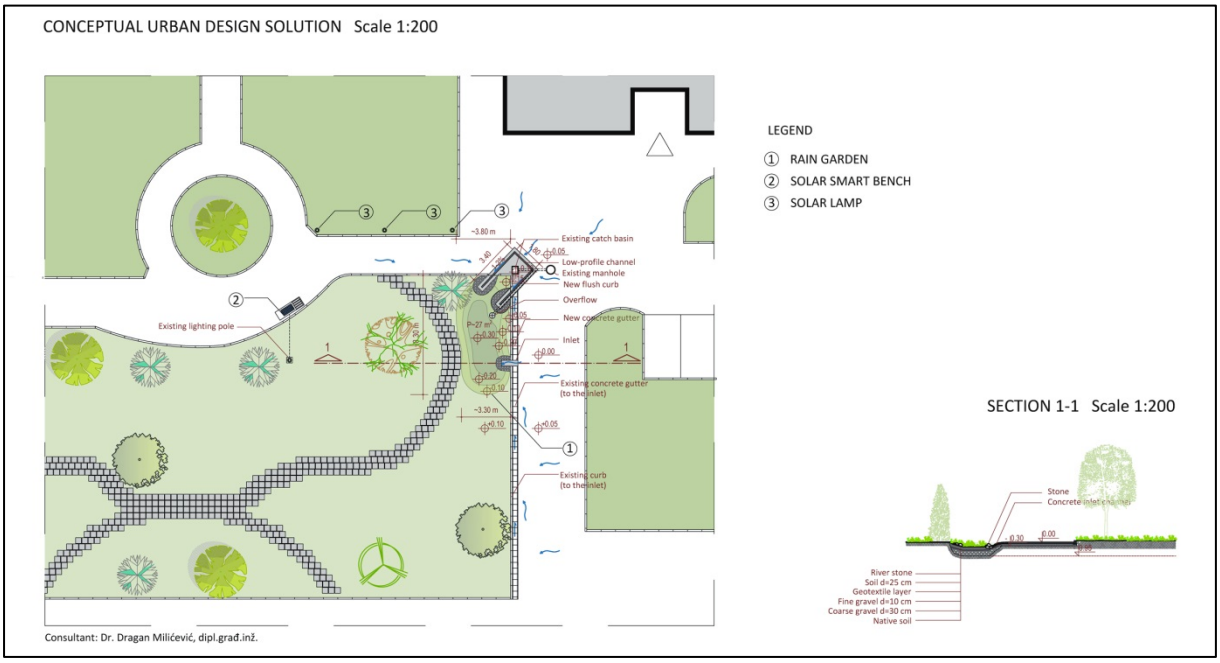


Figure 4 - CONCEPTUAL URBAN DESIGN SOLUTION

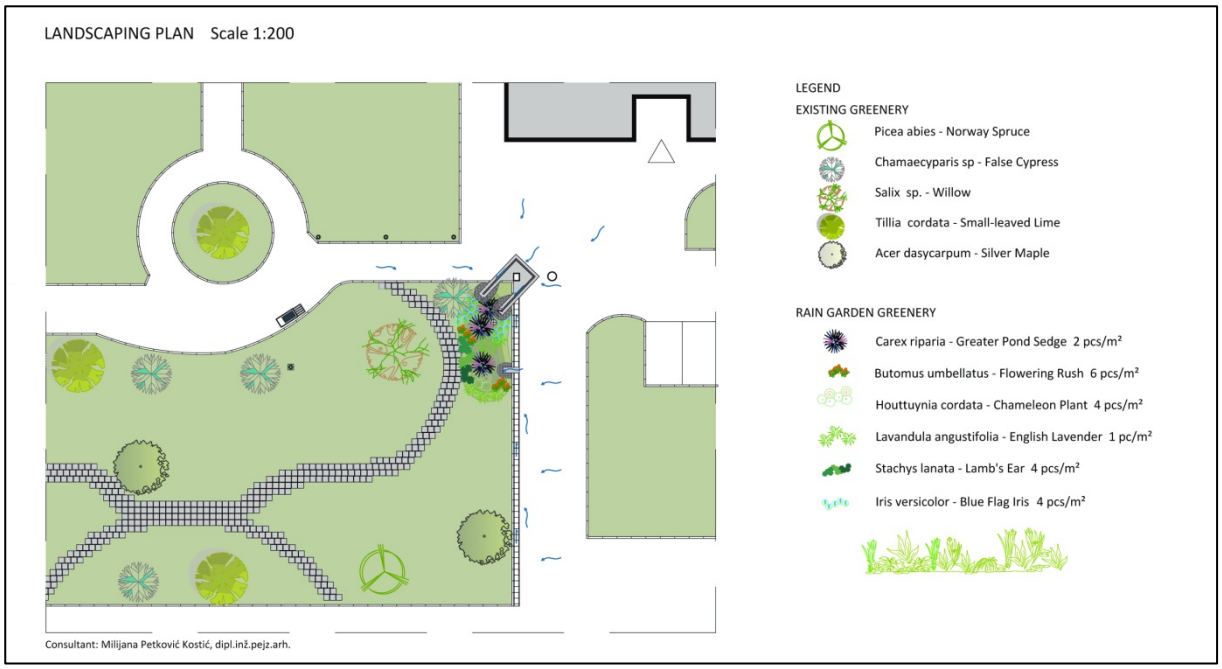


Figure 5 - LANDSCAPING PLAN

# 5 - ASSESSMENT OF THE POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF SPECIFIC ACTIVITIES OF THE REPOS PILOT PROJECT

The Objective 4 of the RePOS research project is *to demonstrate the possibilities and benefits* of the newly proposed planning and design toolset in practice by (re)developing residential POS at a micro urban scale at chosen location in a multi-family residential Neighbourhood in Niš. For that reason "Pilot Project for Redesign of Public Open Space in a Multi-family Residential Neighbourhood in Niš (*further on* RePOS Pilot Project) is planned for realisation as an *associated project* for which the assessment of the potential environmental and social impacts of specific tasks and phases is needed.

The SROs implementing the project will ensure, through abiding by the state laws and rulebooks that none of the project related activities will have a disruptive bearing of any kind on the baseline data in any of its segments, including the soil, air quality and noise, waste, water resources, flora and fauna, neither on workers' nor communities' health and safety. Besides that, potential negative social impacts and risks of the project will be taken into account and mitigation measures will be proposed.

The aim of the environmental and social impact assessment of the RePOS pilot project is to assess the environmental and social risks and impacts of the project throughout the project life cycle. It will assess, in an integrated way, all relevant *direct, indirect, and cumulative environmental and social risks and impacts* throughout the project life cycle, including those specifically identified in ESSs2–10 The environmental and social assessment will include stakeholder engagement as an integral part of the assessment, in accordance with ESS10.

As a general principle, the environmental and social assessment and the resulting Mitigation Plan follow mitigation hierarchy (as suggested by WB ESS1) and incorporate the following steps of mitigation: *Step 1: Anticipation and Avoidance*, refers to identification and evaluation of technically and financially feasible alternatives; *Step 2: Minimization*, applied where avoidance is not possible, refers to identification of specific actions to minimize or reduce adverse environmental and social risks and impacts that are likely to arise throughout the project life cycle; *Step 3: Mitigation***,** refers to identification of mitigation measures to ensure the project will meet the requirements of applicable ESSs 1- 8 and comply with relevant national laws and regulations; *Step 4: Offset or Compensation*, refer to design and implementation of measures that compensate/offset for residual risks and impacts, implemented if avoidance, minimization, or mitigation is not adequate to manage significant adverse risks and impacts *N/A in RePOS pilot project.

## 5.1 NATURE AND SCALE OF THE REPOS PILOT PROJECT:

RePOS Pilot project aims to improve the overall social and environmental public open space quality and address the problems of periodic flooding and storm-water management and to improve the contact with nature and social gathering at the selected micro-location of a multi-family residential estate in the city municipality of Medijana in Niš (Figure 2, 3). Implementation of the pilot project is not financed by PRIZMA Program.

Following the expressed needs and available budget, this small-scale project includes the installation of 1 solar smart bench, 3 solar lamps and rain-garden (27 m2). They should be placed in the residential public open space located in large housing estate (LHE) Krive livade, City of Niš (cadastral

plot No 175/1, Niš – Ćele Kula) that represents a common space for buildings in Branka Krsmanovića street (no. 19, 21, 23, 25, 27, 29, 31), and Pariske komune street, built in 1980s.

## 5.2 PHASES OF THE REPOS PILOT PROJECT IMPLEMENTATION AND REALISATION ACTIVITIES

The implementation and the realisation of this Pilot project consist of four main phases of activities: preparation, design, construction and operation phase. Each of these phases may have potential environmental and social impact which will further be analysed and assessed. In this regard, Mitigation and Monitoring plans will be presented following the same activity phase structure.

1) **PREPARATION PHASE** is related to WP4 Task 4.1. and Task 4.5. and refers to all the activities related to the timely and substantial involvement of the relevant stakeholders in order to secure adequate choice of location and the support for the project implementation and long-term maintenance (ANNEX 4_Report on preparing the pilot project context for POS re-development_D4.1)

   Environmental and social and risk and impacts related to this phase refer to:

   - Legal and adequate **choice of the neighbourhood** for pilot project implementation, coordinated and supported by local self-government and gaining support for project implementation from the civil sector to support long-term maintenance
   - Adequate **choice of micro-location** within the chosen neighbourhood for the RePOS pilot project, coordinated and supported by the local community. This support is essential in order to respond to community needs and to prevent the risk of negligence of the project during time.

   Taking this into account, principles of anticipation and avoidance should be implemented in Preparatory phase through Mitigation and Monitoring Plan.

2) **DESIGN PHASE** is related to WP4 Task 4.2, Task 4.3 and Task 4.4. and refers to conceptualisation, placement and choice of 3 key innovative solutions for POS re-design (Figures 4, 5) (ANNEX 6_Design Project: Co-created Vision for POS _D4.4).

   - 1 Solar smart bench with integrated: photovoltaic panel, battery, USB chargers / wireless charging, LED lighting and eco-sensor.
   - 3 Solar lamps - solar LED lighting fixture with pole
   - Rain-garden (27 m2)

   Environmental risks and impacts related to this phase differ between innovative solutions: Solar smart bench and solar lamps related environmental risks and impact refer to: 1 - placement of solar smart bench and solar lamps so that it does not jeopardize existing use of community open space; 2 - Certain solar smart benches and solar lamps may require more energy and raw materials to produce, or may use hazardous and harmful materials in their production, so the selection of the more durable and environmentally friendly option is preferable

   Rain-garden related environmental risks and impact refer to: 1 - placement of the rain garden so that it does not jeopardize existing use of community open space nor microclimate conditions; 2 - risking the choice of plants that do not support local pollinators and maybe invasive, so the selection of the local plants is preferable, 3 - Inadequate replacement of existing greenery with rain-garden may cause negative micro-climatic effects on residential environment

   Taking this into account, principles of anticipation and avoidance, minimisation and mitigation should be implemented in Design phase through Mitigation and Monitoring Plan.

3) **CONSTRUCTION PHASE** refers to activities related to: a) preparation of the construction site, b) earthworks related to rain-garden implementation, c) concrete works and d) solar smart bench and lighting fixture - that are presented in detail in ANNEX 7_Bill of Quantities and Cost Estimate. Each type of these activities is analysed for having the potential risk and impact on the environment.

   a) **Preparatory works** - They include: Cleaning and preparation of the site for the construction of the rain garden. Marking of boundaries according to the design, removal of existing vegetation, topsoil and waste; Removal of the existing concrete gutter and curb, and disposal of debris; Breaking up the concrete around the catch basin at the designated location for constructing the footing for the solar bench, including disposal of debris. Risks and impacts refer to temporary noise, air pollution, disposal and transport of waste, as well as to actions to prevent unauthorized and accidental use of the construction site that may endanger the safety of residents.

   b) **Earthworks** - They include: Mechanical and manual excavation of soil for the formation of the rain garden; Manual excavation of soil for the installation of the concrete gutter and for the installation of PVC pipes; Loading and transport of excavated material to a designated disposal site up to 10 km away, while retaining part of the existing soil suitable for the rain garden; Levelling the bottom of the excavation and forming the designed gradients: Supply, transport and installation of geotextile, coarse and fine gravel layer, crushed stone, PVC pipe; Supply, delivery and placement of soil suitable for the rain garden and overflow drain and decorative river stone; Supply, transport, preparation of planting spots, planting and watering of native plant species suitable for rain gardens; Risks and impacts refer to transport and work related noise and air pollution, as well as to potential risks on residents health and safety, that should be prevented through visibly marked construction site and proper waste management.

   c) **Concrete works** - They include: Construction of an inlet channel for conveying storm-water into the rain garden and a channel at the location of the existing catch basin. Construction of a lean concrete base; Supply, transport and laying of the concrete gutter, curbs, low-profile channel; Concreting of the area between the channel and the manhole with reinforced concrete. Risks and impacts refer to transport and work related noise and air pollution. They also include the possibility of producing hazardous materials waste of construction process, which should be prevented or minimized through proper management.

   d) **Solar Smart Bench and Lighting Fixture** - They include: Supply, transport and installation of a solar smart bench with integrated: photovoltaic panel, battery, USB chargers / wireless charging, LED lighting and eco-sensor; Supply, transport and installation of a solar LED lighting fixture with pole. Risks and impacts refer to potential minimal environmental risks caused by decommissioning, which should be avoided through control of equipment and consumables as well as proper and safe maintenance, monitoring and functioning of equipment.

   Taking this into account, principles of anticipation and avoidance, minimisation and mitigation should be implemented in the Construction phase through Mitigation and Monitoring Plan.

4) **OPERATION** refers to putting RePOS pilot project interventions into use

   The main environmental risks and impacts related to this phase refer to

   - Proper and safe functioning of the equipment
   - Organisational capacities and financial resources for maintenance of the project
   - Use of small amount of chemicals to clean the solar panels and lamps has no significant impact on the environment and people taking into account number of equipment elements.

- Decommissioning: small amounts of hazardous materials contained within the solar bench panel may be released in case of breaks or decommissioning of the panels, and can produce temporary waste localised on concrete surface, which can be easily removed.

Taking this into account, principles of anticipation and avoidance, minimisation and mitigation should be implemented in during Operation through Mitigation and Monitoring Plan.

## 5.3 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

### 5.3.1. Potential environmental impact

In general, The RePOS Pilot Project is expected to generate positive impacts on the selected public open space and its immediate residential surroundings. Although the intervention is limited in physical scope, it addresses several important problems identified at the pilot site, including degraded green surfaces, outdated urban equipment, a high share of impervious surfaces, localized stormwater retention and insufficient functional and aesthetic quality of the common residential open space. The project therefore has the potential to improve the environmental, spatial-functional and visual quality of the site, while also demonstrating an applicable model for similar interventions in multi-family residential neighbourhoods. But since some environmental risks and potential negative impacts may occur both positive and negative impacts will be further analysed.

**Positive environmental impact**

From an environmental perspective, the introduction of a rain garden/bioretention solution will contribute to more sustainable stormwater management. The intervention will enable temporary retention, infiltration and gradual absorption of atmospheric water, thereby helping to reduce localized ponding and improve the permeability of the site. In combination with native and locally adapted plant species, the rain garden can also improve the quality of greenery, support small-scale biodiversity and contribute to the ecological enhancement of the residential courtyard. Bioretention cleanses stormwater by allowing runoff to pass through layers of vegetation, soil, and gravel. Native plants absorb nutrients and pollutants, while the soil and gravel filter sediments and contaminants, improving water quality before it infiltrates into the ground, or is discharged into the sewer system.

The project is also expected to contribute to local microclimatic improvement. The introduction of vegetation and permeable landscape elements may reduce the dominance of heat-absorbing paved surfaces and improve outdoor comfort in the immediate surroundings. Although the intervention cannot eliminate wider urban heat island effects, it can provide localized benefits and demonstrate how small-scale nature-based solutions can be used to improve environmental conditions in dense residential areas.

The installation of solar lamps and a smart solar bench will promote the use of renewable energy and energy-efficient urban equipment in public open space design. These elements will improve the functionality, comfort and visibility of the space, particularly during evening hours. Improved lighting and better spatial organization can also contribute to a safer and more accessible residential environment.

The pilot intervention will also have a positive aesthetic impact on the immediate residential environment. By introducing new greenery, carefully selected plant species, contemporary urban equipment, solar lighting and a more coherent landscape design, the project can improve the visual quality, spatial identity and overall attractiveness of the residential courtyard and its surroundings.

This is particularly important in the context of inherited multi-family housing estates, where common open spaces are often characterized by physical degradation, outdated equipment, fragmented greenery and insufficient visual articulation. The aesthetic improvement of the space can contribute to a more pleasant everyday environment, strengthen residents' positive perception of their neighbourhood and support more responsible use and future maintenance of the public open space.

**Environmental risk and negative impact**

Potential environmental risk and negative impact will be analysed in relation to key areas of impact (SAIGE ESMF - ANNEX 06 - ESMP TEMPLATE):

a) Potential Impacts on the air quality and noise: Temporary, localised moderate air pollution will be related to dust occurrence due to project activities, machinery movement, and transportation, since pilot project construction preparation works involve breaking up the concrete around the catch basin at the designated location and transporting, and dumping small quantities of dry materials. Locally, the air quality may experience some moderate and temporary deterioration due to dust from construction equipment exhaust. The dust may settle on vegetation and pathways.

Temporary, localised moderate noise and vibrations will occur due to project activities, machinery movement, and transportation, since pilot project construction preparation works involve breaking up the concrete around the catch basin at the designated location and loading and transport of waste and excavated materials. In addition transport is needed for bringing to location the native plant species for rain gardens, construction material as well as, solar bench and lamps. Informational and organisational measures should be applied to mitigate the impact.

b) Potential Impacts on water (water protection and drainage) and soil: There is no expected negative impact on ground water, surface water and soil. Project's implementation and operation activities are in general not hazardous, and there are no open surface water bodies within the Krive Livade housing block.

c) Impact of generated waste streams: Preparation activities for the construction of RePOS pilot project include removal of the existing curb and disposal of debris, as well as earthworks and excavation related to construction of rain garden. Excavated soil is not hazardous material and part of it will be transported to the landfill.

Potential health hazards and environmental impacts can happen when installing new materials, if hazardous materials (such as concrete additives, etc.) are used. It may also happen due to improper waste management practices at the pilot project construction site. Negative impact can be avoided by choosing environmental-friendly materials, and if the use of these materials is necessary it can be mitigated through adequate waste management and by strictly following procedures prescribed in Serbian Law on Waste Management.

d) Potential impacts on health and safety workers and community:

During the construction phase, with respect to community health and safety, to avoid accidental injuries, health and safety measures will be applied to prevent the public from entering the pilot project construction area - such as appropriate fencing and signage.

Before the starting of preparation and construction work on the pilot project site, effective measures will be taken to resolve potential emergency situations, for which the Contractor and the works supervision are responsible. The person responsible for safety and health at work will ensure

implementation of safety issues and ensure the workers use proper equipment in line with national legislation (protective equipment, notification, information on environmental and hygienic protection…)

In addition to abovementioned, the environmental risk and potential negative impact was reviewed in relation to:

e) Land use and settlements: Project implementation doesn't require specific permits, but should be supported by landowners. Local placement of the new equipment should follow the existing land use of public space

f) Flora and fauna (protected areas and species) and microclimate: Construction preparatory works for the rain garden include removal of existing vegetation, topsoil and waste. Existing vegetation to be removed are two shrubs, hedge and grass area, and will be replaced with rain-garden local flora that has higher biodiversity value.

Changes in micro-climate are supposed to be positive, but this should be tested in design phase of the pilot project preparation (see: ANNEX 8_Raingarden ENVIMET: Comparison of the Outdoor Microclimate in Two POS scenarios_D4.3)

g) Cultural, heritage and religious issues: The specific site contains no protected cultural properties, archaeological sites, or monuments of historical importance

e) Risk of future neglect of the public open space: There is a potential risk of future neglect of the public open space. Therefore, the long-term organisation of residents to manage and monitor the proper and safe functioning of equipment is necessary, as well as their organisational and financial support by public and civic sector.

### 5.3.2. Potential social impact

Potential social impact will be analysed in relation to stakeholders included in project conceptualisation and implementation. The stakeholders of RePOS PILOT PROJECT include: City of Niš, building managers and local residents, civic society organisations. The target population are the residents of the chosen neighbourhood in Medijana city municipality of Niš. City of Niš is the land owner and as such key stakeholder in pilot project implementation. The organisations of the civil society have potential role in providing organisational and financial support for pilot project realisation. RePOS prilot project may be beneficial for both educating stakeholders on environmentally-friendly POS design solutions, aesthetic and ecological improvement of the specific multifamily neighbourhood and for building and strengthening ties between all stakeholders involved in the participation process.

**Positive social impact**

The RePOS pilot project is expected to provide a large positive social influence during and after project realisation. RePOS Pilot Project will possible be beneficial to local communities, vulnerable and marginalized people, or society as whole as it is aiming to introduce community building and environmentally friendly innovative solutions for reclaiming POS in multi-family housing areas to improve the environmental and societal performance of residential public open spaces .

RePOS Project will address a number of challenges related to envisioning, planning, designing, implementing, developing and maintaining POS, thus impacting a broad range of user groups. Having

in mind the main research aim – to create a safe, accessible, inclusive, resilient, green and diverse space - RePOS results will benefit primarily the *local community* gravitating towards POS. The *tenants* as the targeted end-user group will enjoy POS in their immediate residential environment that decreases health risks from air pollution and heat stress, but all urban residents will benefit from POS that mitigates adverse effects of urbanization and natural hazards, thus contributing to the overall quality of urban life. Project will be designed on an *inclusive basis*, so that all project-affected parties benefit in equitable manner from the project.

As part of the communication activities, the project team will raise awareness on environmental and social benefits of implementing innovative solutions for reclaiming POS in multifamily housing areas. All stakeholder communication activities involve only stakeholders who have agreed by signed consent to participate in project realization. The team will provide scientific information as well as project generated results to the stakeholders through presentations, talks and leaflets. All stakeholders and residents will be regularly updated on the progress of the pilot project via email, and every result will be published on a digital platform. This is done to ensure that residents are continuously informed about activities in their immediate residential environment. (ANNEX 4_Report on preparing the pilot project context for POS re-development_D4.1; ANNEX 9_REPOS WEBSITE with FORUM; ANNEX 10_PARTICIPATION PROCESS Time Line: Meetings and Activities)

All of these activities are expected to raise the level of current stakeholder knowledge and promote adoption of prevention measures to reduce the social risks and negative impact.

**Social risk and negative impact**

Social risk and negative impact refers to potential negative stakeholder response on RePOS pilot project implementation and realisation, such as:

- Non - acceptance of the project and project design by local community
- Neglect and lack of the maintenance of the project by local community

In order to avoid it, anticipation and avoidance mitigation step was conducted during Preparation and Design activity phase of RePOS pilot project, which refers to Pilot site selection procedure and educational and participation activities. These will be further presented in detail (for details on participation process see ANNEX 10 _PARTICIPATION PROCESS Time Line: Meetings and Activities).

a) Pilot site selection procedure and City of Niš support

As a part of demonstration activities within the RePOS project, the pilot site for the (re)development of public open space (POS) has been successfully prepared through a structured co-creation process involving various stakeholders. The preparation of the pilot context focused on awareness-raising, knowledge exchange, and comprehensive multi-stakeholder engagement, establishing a solid foundation for the next phases of RePOS pilot project development and implementation of the urban design project. The selected demonstration site is a residential POS in Branka Krsmanovića Street, City of Niš (cadastral plot No 175/1, Niš – Ćele Kula). The site was chosen in cooperation with representatives of the City and the City Municipality, and based on residents' interest and motivation to participate in the improvement of their shared environment. The process was initiated through consultations with the Chief Urban Planner of the City of Niš, ensuring the pilot project aligns with the city's broader urban planning strategies and expressed interests of local communities.

Following this initial agreement, the research team proposed several potential locations. First proposed location was confirmed by the Chief Urban Planner in coordination with the Mayor and the City's Monitoring Department, but rejected by representatives of the City Municipality of Pantelej, due to problem of insufficient cooperation between the City Municipality of Pantelej and local communities.

Then the second, final location for the pilot site was proposed in the City Municipality of Medijana and officially confirmed by the Chief Urban Planner in coordination with the Mayor and the City's Monitoring Department. Subsequently, meetings were held with representatives of the City Municipality of Medijana, where the pilot site is located, to verify interest in project implementation and its local feasibility. This was followed by a joint mobilization meeting with municipality officials and Homeowners' association managers. To ensure implementation viability, a strategic partnership was established with the Community Foundation Niš, which formally confirmed its willingness to contribute to project activities and support the realization of the pilot intervention. The selection was further socially validated through an educational workshop with residents, confirming their willingness to participate in the co-creation process, and was ultimately finalized by obtaining formal written consent from the City of Niš as the legal landowner (see ANNEXes 1, 2, 3, 4, 10).

b) Educational and participatory event: Choice of project's micro location, preliminary concept, and stakeholders' support

A participatory event was organized on February 12, 2026, at the Municipality of Medijana (17:00–18:30). The event was attended by representatives from the City of Niš, the City Municipality of Medijana, the Community Foundation Niš, local residents and the RePOS team. It consisted of two distinct phases: an educational phase and a co-design phase. The educational component aimed to increase residents' awareness of innovative and sustainable solutions in POS design, along with the presentation of smart solutions for urban equipment. The participatory segment enabled residents to actively contribute ideas regarding the positioning and conceptualization of proposed interventions within their common POS. The event was opened by Marko Aleksovski, Deputy President of the City Municipality of Medijana, who emphasized the importance of this initiative. Following him, Miljana Medarov Vujaklija, Head of the Monitoring Unit of the City Administration for Planning and Construction, addressed the attendees as the representative of the City of Niš responsible for the implementation of the pilot project. Prof. dr Ljiljana Vasilevska, a member of the RePOS team, then presented Nature-based Solutions, focusing on bioretention and rain gardens. The goal was to clarify these elements and explain their function in stormwater management and microclimate regulation. Prof. dr Milena Dinić Branković, the project Principal Investigator, introduced concepts of smart solar urban equipment, specifically smart benches and solar lighting, highlighting benefits such as energy efficiency and digital connectivity. Following the educational presentations, Filip Jovanović, Director of the Community Foundation Niš, addressed the participants to discuss the foundation's role and support in realizing the pilot project. After the educational session, the process moved to active co-creation through group work. Participants collaborated in groups to propose specific locations for the placement of bioretention/rain garden and urban equipment. The event concluded with an open discussion and a structured survey administered to the participants. The survey was designed to gather quantitative feedback on the residents' current use of the space, their perception of key spatial issues, their understanding of the proposed solutions, and their willingness to actively participate in the physical realization, future maintenance

of the pilot project, as well as their overall evaluation of the workshop and the participatory process itself. This workshop represented an important step in strengthening collaboration between residents, local authorities, and the research team. The co-creation process resulted in a jointly articulated vision for the transformation of the selected POS in the form of Conceptual Urban Design Proposal with Innovative solutions (ANNEX 5 and ANNEX 11) that was further integrated into DESIGN PROJECT (ANNEX 6_Design Project: Co-created Vision for POS _D4.4).

* Data privacy protection in conducting the survey is based on acknowledging that the protection of natural persons in relation to the processing of personal data is a fundamental right. Data protection will follow Regulation (EU) 2016/679 Of The European Parliament as well as the national Law on protection of personal data ("Official Gazette of RS", No. 87/2018).

# 6 - SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACT

During the preparation and implementation phase of the RePOS pilot project potential environmental impacts are listed below (Table 1)

Table 1 - Review of the impact on the environment for the duration of the project

| IMPACT | RISK | COMMENT |
|---|---|---|
| Impact on land use and settlements | Does not exist | Project implementation doesn't require specific permits, but should be supported by landowners.<br>Local placement of the new equipment will follow the existing land use of public space<br>Positive impact of the improved functionality and everyday usability of the public space is possible. New equipment and better spatial organization can make the space more comfortable, accessible and useful for everyday residential use.<br>Positive impact of the improved aesthetic quality of the residential environment is possible. New greenery, carefully selected plant species, contemporary urban equipment, solar lighting and coherent landscape design can improve the visual character, attractiveness and overall ambience of the residential courtyard and its immediate surroundings. |
| Ground and surface water | Does not exist | Positive impact may be expected through the improved storm-water management through rain garden/ bioretention solution. The intervention will support temporary water retention, infiltration and gradual absorption of atmospheric water, reducing localized ponding at the pilot site. Bioretention cleanses stormwater by allowing runoff to pass through layers of vegetation, soil, and gravel. Native plants absorb nutrients and pollutants, while the soil and gravel filter sediments and contaminants, improving water quality before it infiltrates into the ground, or is discharged into the sewer system.<br>There is no expected negative impact on ground and surface water. |
| Air quality | Low | Temporary, localised moderate air pollution will be related to dust occurrence due to project activities, machinery movement, and transportation, since pilot project construction preparation |

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| | | works involve breaking up the concrete around the catch basin at the designated location and transporting, and dumping small quantities of dry materials. Locally, the air quality may experience some moderate and temporary deterioration due to dust from construction equipment exhaust. The dust may settle on vegetation and pathways. |
| Noise and vibrations | Low | Temporary, localised moderate noise and vibrations will occur due to project activities, machinery movement, and transportation, since pilot project construction preparation works involve breaking up the concrete around the catch basin at the designated location and loading and transport of waste and excavated materials.<br><br>In addition, transport is needed for bringing to location the native plant species for rain gardens, construction material as well as, solar bench and lamps. Informational and organisational measures should be applied to mitigate the impact. |
| Flora and fauna (protected areas and species) | Low | Enhancement of greenery quality and local biodiversity may be expected from project realisation. Native and locally adapted plant species can improve the quality of vegetation and support pollinators and small urban fauna.<br><br>Construction preparatory works for the rain garden include removal of existing vegetation, topsoil and waste. Existing vegetation to be removed are two shrubs, hedge and grass area, and will be replaced with rain-garden local flora that has higher biodiversity value.<br><br>Changes in micro-climate may occur and this should be tested in design phase of the pilot project preparation. New vegetation and permeable landscape elements may contribute to reduced heat accumulation and improved outdoor comfort in the immediate surroundings. |
| Soil quality | Does not exist | There is no expected negative impact on soil quality |
| Waste management and management of hazardous materials | Moderate | Preparation activities for the construction of RePOS pilot project include removal of the existing curb and disposal of debris, as well as earthworks and excavation related to construction of rain garden. Excavated soil is not hazardous material and part of it will be transported to the landfill in accordance with the RS legislation.<br><br>Health hazards and environmental impacts can happen when installing new materials if hazardous materials (such as concrete additives, etc.) are used. It may also happen due to improper waste management practices at the pilot project construction site.<br><br>Negative impact can be avoided by choosing environmental-friendly materials, and mitigated through adequate waste management and by strictly following procedures prescribed in Serbian Law on Waste Management. |

| | | |
|---|---|---|
| Health & Safety of the local populations and Workers | Moderate | Improved visibility and perceived safety can be expected as a positive impact of the Project. Solar lighting can improve visibility during evening hours and increase the perceived safety of the residential public open space.<br><br>During the construction phase, with respect to community health and safety, to avoid accidental injuries, health and safety measures will be applied to prevent the public from entering the pilot project construction area - such as appropriate fencing and signage.<br><br>Before the starting of preparation and construction work on the pilot project site, effective measures will be taken to resolve potential emergency situations.<br><br>The person responsible for the Contractor for safety and health at work will ensure implementation of safety issues and ensure the workers use proper equipment in line with national legislation (protective equipment, notification, information on environmental and hygienic protection…) |
| Data privacy | Low | The protection of natural persons in relation to the processing of personal data is a fundamental right. Data protection will follow the national Law on protection of personal data. |
| Risk of future neglect of the public open space | Low | There is a potential risk of future neglect of the public open space. Therefore the long-term organisation of residents to manage and monitor proper and safe functioning of equipment is necessary, as well as their organisational and financial support by public and civic sector.<br><br>Improved spatial quality and participatory preparation may encourage more responsible use and support future maintenance of the space. |
| Cultural, heritage and religious issues | Does not exist | The specific site contains no protected cultural properties, archaeological sites, or monuments of historical importance |
| Demonstration value for similar residential areas and promotion of sustainable water management, renewable energy and energy-efficient urban equipment. | Does not exist | The pilot project can serve as a practical model for similar small-scale regeneration interventions in inherited multi-family housing estates. As a positive environmental impact, solar lamps and the smart solar bench demonstrate the use of renewable energy in small-scale public open space design, while rain-garden demonstrate sustainable rainwater management. |

## 7 MITIGATION PLAN

Mitigation Plan aims to eliminate, offset, or reduce to acceptable levels the potential adverse environmental and social impacts of a project. It translates mitigation measures into actionable steps spanning a project's preparation and design, construction, and operational phases.

| **MITIGATION PLAN** | | | | |
|---|---|---|---|---|
| **Issue** | **Mitigating Measure** | **Institutional responsibility during implementation** | **Cost of Mitigation (If Substantial)** | **Institutional responsibility - Supervision** |
| **REPOS PILOT PROJECT PREPARATION / DESIGN** | | | | |
| Involvement of the relevant stakeholders: Choice of the neighbourhood for pilot project implementation | - Coordinating the choice of the neighbourhood for project implementation with the local self-government, including representatives of the local municipality, and providing support<br>- Gaining support for project implementation from the civil sector<br>- Letter of support from the City of Niš<br>- Consent of the land owner and extract from the real estate cadastre<br>- Letter of support from the "Community Foundation - Niš" | PI/ SROs | / | PI |
| Involvement of the relevant stakeholders: Choice of the pilot project site within the neighbourhood | - Coordinating pilot project site selection with the local community and municipal representatives, and providing support.<br>- Data privacy protection<br>- Educational and Participatory Workshop with local community and municipal representatives. | PI/ SROs | / | SROs |

| | | | | |
|---|---|---|---|---|
| | - Data protection will follow the national Law on protection of personal data. Consent to participate in project realization | | | |
| The choice of location of the rain-garden, solar smart benches and solar lamps in local public spaces may have an aesthetic and functional impact on the residential environment. | - It needs to be carefully designed in accordance with residents' needs and preferences.<br>- Careful siting of the solar smart bench / solar lamps, solar lamps and rain garden.<br>- Coordinate placement with local communities through a participatory workshop<br>- Ensure that there are no special instructions as to the open space use and appearance, and ensure approvals are received by all responsible local authorities- if needed. | PI | / | PI/SROs |
| Selection of solar lamps and smart benches | Certain solar smart benches and solar lamps may require more energy and raw materials to produce, or may use hazardous and harmful materials in their production.<br>- They also differ in lifespan of functional parts (lights, chargers/batteries, wi-fi…), that should be regularly replaced and repaired.<br>- Obtain sufficient information from the producer<br>- Look for certificates or statements on how the solar smart benches/lamps are produced and how they last.<br>- Select the more durable and environmentally friendly option.<br>- Select adequate local native plants to biodiversity.<br>- Variation in costs of solar smart benches and lamps may be incurred | PI | / | PI/SROs |
| Select local native plants | Certain rain gardens use exotic or ornamental plants (instead of local native plants) that do not support local pollinators and maybe | PI | | PI/SROs |

| | | | | |
|---|---|---|---|---|
| | invasive.<br>Select adequate local native plants to support biodiversity. | | / | |
| A simulation of the microclimate before and after | Inadequate replacement of existing greenery with rain-garden may cause negative micro-climatic effects on residential environment<br>Simulate the outdoor microclimate for “before” and “after” scenarios at the pilot project site within the public open space (POS) in the housing estate ( EnviMet) | PI | / | PI/SROs |
| **REPOS PILOT PROJECT EXECUTION /CONSTRUCTION** | | | | |
| Protection of trees and vegetation that are not intended for removal during the construction works | - Defining the "Root Protection Zone – RPZ". Minimum 1.5 m from the trunk for small trees.<br>- Install a fence at least 1.2 m high before the start of any works (including the delivery of machinery).<br>- No construction materials, rubble, or soil may be deposited in the RPZ, nor may equipment or construction machinery.<br>- Drainage control (e.g., water pumping) must ensure that water does not flow into or accumulate in the tree's root zone.<br>- Washing of concrete mixers containing fresh concrete is prohibited on the construction site, including the RPZ.<br>- Maintenance, repair, and servicing of machinery or any oil changes are prohibited within the construction site area, including the RPZ. | Contractor/ SRO_GAFUN | / | SRO_GAFUN |
| Development of Grievance mechanism | - Any individual who feels threatened or harmed by some of the specific activities related to RePOS Pilot Project can submit a complaint. Complaints, objections or comments in written form can be submitted by filling out the complaint form (.docx file) which will be available at the project website. The electronic | SRO_GAFUN | / | SRO_GAFUN |

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|---|---|---|---|---|
| | complaint form should be filled out, saved and sent via email to contact e-mail address provided at the project website;<br>Authorized persons of REPOS project will consider all complaints responsibly and will take timely and appropriate actions in relation to received complaints. The project will only deal with objections directly related to this pilot project.<br>- All personal data any individual provides will be used in accordance with applicable regulations on the protection of personal data and will not be made public. We will use the contact data exclusively for future communication regarding complaint. | | | |
| Unauthorized and accidental use of the construction site may endanger the safety of residents | - Before the start of the activity, construction site will be visibly marked to localise construction activities and temporary waste disposal and ensure the safety of residents.<br>- Notices about the construction activities will be placed in visible places for the local population. | Contractor/ SRO_GAFUN | / | SRO_GAFUN |
| Safety of pedestrians and suitable crossings | - A suitable pedestrian crossing must be provided, equipped with kerb ramps that allow the use of wheelchairs, trolleys, bicycles and prams. | Contractor/ SRO_GAFUN | / | SRO_GAFUN |
| Dust, noise, emissions generated during construction, activities may be a nuisance to nearby human or animal populations | - Ensure regulatory requirements to limit noise are followed, and noise is kept to the allowed working hours and intervals as per the relevant regulation<br>- Do not allow machinery to idle.<br>- Water down working areas to limit dust generation<br>- Inform residents on the timetable of construction works (info-panel)<br>- All trucks need to be covered | Contractor/ SRO_GAFUN | / | SRO_GAFUN |

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| | - Contractor's machinery to be carefully selected<br>- Wet truck load<br>- Haul material at off-peak traffic hours (9-14h)<br>- Use alternative roads to avoid main roads<br>- Proper road signs and markings of the site, to minimise the chances of a wrong turn<br>- Ensure the planned and safe movement of vehicles in the residential area | | | |
| Vibrations | - Limit activities to daylight working hours,<br>- If there is material damage to the local houses, buildings and infrastructure (access roads included) caused by the works, the damage will be compensated for and will have to be rectified,<br>- Locate the equipment for earth works as far away as possible form vibration-sensitive receptors. | Contractor/ SRO_GAFUN | / | SRO_GAFUN |
| Traffic disruption during construction activities | - Traffic Management Plan with appropriate measures for traffic diversions that can be easily noted and followed, including traffic police assistance,<br>- Traffic Management Plan which will define a speed limit for the construction vehicles and organise traffic in such a way that populated areas are avoided as much as possible,<br>- During the works, maximum use of the existing road network. Avoid the construction of new temporary roads,<br>- Inform the local community about the works planned | Contractor/ SRO_GAFUN | / | SRO_GAFUN |
| Waste management | - Improper waste management may pollute the environment and pose a threat to residents and animals in the vicinity of the site. | Contractor/ SRO_GAFUN | / | SRO_GAFUN |

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| | - Introduce separate containers for inert waste (concrete, rubble), green waste (vegetation) and municipal waste in accordance with local law.<br>- Waste should be transported exclusively by covered trucks (tarpaulins) in order to prevent spillage on roads.<br>- All wastes generated will be disposed of at an authorised site<br>- There will be no open burning of wastes | | | |
| Soil and water pollution from improper material storage, management and use | - Organise and cover material storage areas<br>- Isolate the areas for washing the concrete and other equipment on the construction site<br>- Organise the site to minimise the risk of generating sediments and accumulating wastewater, which could cause pollution of the surrounding soil<br>- Any deposits of excess soil, stone, etc. may only be temporary until the works have been completed. After that, excess soil, stone and other waste material must be removed, and complete rehabilitation of all areas degraded by the works must be done. | Contractor/ SRO_GAFUN | / | SRO_GAFUN |
| Safety of local population | - Excavation of soil for the formation of the rain garden results in drops in elevation that can pose tripping hazards for people if it is not clearly marked.<br>- Clearly mark the construction site to prevent unauthorized and accidental use that may endanger the safety of residents | Contractor/ SRO_GAFUN | / | SRO_GAFUN |
| Safety of workers | - Provide workers with safety instructions and PPE<br>- Provide a safe alternative traffic flow<br>- On a daily basis, check whether workers have and use the prescribed PPE. | Contractor | / | Contractor |

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| Control of equipment and consumables | Ensure control of purchased equipment and consumables, and their verification before use according to responsible SRO | PI / SRO_GAFUN | / | SRO_GAFUN |
| Protection of cultural heritage | - The contractor will develop a Procedure for the case of "chance find“ before the start of the works and will describe the process of managing cultural heritage that may be accidentally discovered during the construction process;<br>- In case of accidental discovery, the location will be fenced off (protected), and the competent authorities will be informed within 24 hours after the discovery.<br>- Instructions shall be given to record and register artefacts or other possible "chance finds" discovered during excavation or construction. | Contractor | / | SRO_GAFUN |
| **SOLAR SMART BENCH AND LIGHTING FIXTURE** | | | | |
| Risks when installing the Solar Smart Bench and Lighting Fixture and<br>safety against electric shock | - Incoming Materials Control**:** Before installation, perform a visual and functional inspection of the photovoltaic panel, battery, and inverter. Verify that all equipment bears the required safety certifications (CE mark) and meets the appropriate ingress protection rating (e.g., IP65) against water and dust.<br>- Safe Installation: Installation shall be carried out exclusively by qualified electricians. During installation, ensure that all electrical connections are securely sealed and adequately protected against vandalism and adverse weather conditions.<br>- Battery Management: Establish a strict handling protocol for lithium-ion batteries. Exposure to extreme temperatures and physical damage during transport and assembly is strictly prohibited.<br>- PV Panel Transport: Transport PV panels vertically in dedicated holders with protective film. Stacking them one on top of another | Contractor/ SRO_GAFUN | / | SRO_GAFUN |

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| | is forbidden.<br>- Bench Electrical Connections: All electrical connections on the bench must be performed with the battery disconnected. Follow the proper assembly sequence: install the structure first, then the battery, followed by the panels. Leaving unprotected live cables is strictly forbidden.<br>- Post-Installation Testing: After installation is completed, perform an insulation resistance test (or grounding continuity test) before putting the equipment into operation.<br>- Solar LED Pole Installation (with foundation): Protect the excavation for the pole foundation with adequate fencing during digging. When concreting the foundation, position the anchor bolts precisely according to the template to avoid any need for subsequent drilling. | | | |
| **OPERATION** | | | | |
| Proper and safe functioning of equipment | Ensure long-term organisation of residents to manage and monitor proper and safe functioning of equipment<br>Enable public and civic-sector engagement for enabling/mediating financial support for maintaining the equipment | Maintenance City of Nis/GAFUN | / | Maintenance City of Nis/GAFUN |
| Use of small amount of chemicals to clean solar benches and lamps may have minimal impact on people and the surrounding environment | The potential impact is minimal. Ensure compounds are evaluated for their environmental impact and potential for injury. | Maintenance City of Nis/GAFUN | May impose additional costs for more expensive eco solutions | Maintenance City of Nis/GAFUN |
| Plan for decommissioning (dismantling) | Create special instructions for the end of working life, which includes safe disconnection of voltage, disassembly of panels and batteries, | Maintenance City of Nis/GAFUN | / | Maintenance City of Nis/GAFUN |

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| | and their separation as electronic and hazardous waste (batteries) and delivery to an authorized recycling center. | | | |
| Safety of local population | Small amount of hazardous materials contained within the solar bench panel may be released in case of breaks or decommissioning of the panels, localized on the concrete surface.<br>The potential impact is small and localised. Ensure rapid collection of wastes.<br>Ensure workers are trained in adequate decommissioning procedures with spill control measures in place | Maintenance City of Nis/GAFUN | / | Maintenance City of Nis/GAFUN |

# 8 MONITORING PLAN

Monitoring plan aims to ensure that the project adheres to national environmental laws, labor standards, and international safeguards as well as to track whether proposed safety, pollution, and socio-economic mitigation measures are being effectively executed on-site. Besides that, it provides a transparent framework to record community feedback and enables identifying unforeseen environmental risks and proposal of new mitigation measures.

| **MONITORING PLAN** | | | | | |
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| What parameter is to be monitored? | Where is the parameter to be monitored? | How is the parameter to be monitored (what should be measured and how)? | When is the parameter to be monitored<br>(timing and frequency)? | Who is responsible for reporting? | Monitoring |
| **RESEARCH PROJECT PREPARATORY PHASE** | | | | | |
| Support for project implementation from the local self-government and civil sector | At the SRO office | Letter of support from the City of Niš<br>Consent of the land owner and extract from the real estate cadastre<br>Letter of support from the "Community Foundation - Niš" | Prior to procurement | PI | SROs |
| Support for project implementation from local community.<br>Data privacy - consent to participate | At the SRO office | Educational and Participatory Workshop results report and documentation | Prior to procurement | PI | SROs |

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| Careful siting of the solar smart bench / solar lamps, solar lamps and rain-garden. | At the SRO office | Design project documentation | Prior to construction works | PI | SROs |
| Environmentally friendly production process and durability of smart solar benches and solar lamps | At the SRO office | Through technical Specifications of smart solar benches and solar lamps- receiving and keeping all specifications | Prior to procurement | PI | SROs |
| Adequate local native plants to support biodiversity | At the SRO office | Through receiving and keeping all specifications | Prior to procurement | PI | SROs |
| Microclimate parameters change | At the SRO office | EnviMet results report | Prior to procurement | PI | SROs |
| **PROJECT IMPLEMENTATION PHASE – CONSTRUCTION PHASE** | | | | | |
| Visibly marked construction site for accidents prevention | On Project site | Periodically check placement of mark | Before starting preparatory and construction works and constantly during construction works | Contractor / SRO_GAFUN/PI | Contractor / SRO_GAFUN |
| Dust, noise, emissions and vibrations | On Project site | Periodically check sound levels at the work site to ensure it is within legal limits and as per local permitting. Through complaints (if area is populated) | During construction works constantly | Contractor / SRO_GAFUN/PI | Contractor / SRO_GAFUN |

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| Proper waste collection and management | On Project site | Daily supervision of waste collection<br>Ensure no open burning is taking place Keep receipts from authorized landfill | Daily | Contractor / SRO_GAFUN/PI | Contractor/ SRO_GAFUN |
| Transport activities are regulated | On Project site | Daily supervision of transport activities | Daily | Contractor / SRO_GAFUN/PI | Contractor/ SRO_GAFUN |
| Control of equipment and consumables, and their verification before use | On Project site | Check of equipment and consumables | Before placement during construction works | Contractor / SRO_GAFUN/PI | Contractor/ SRO_GAFUN |
| Proper and safe functioning of the equipment | On Project site | Periodically check of equipment and consumables | Weekly | PI | City of Nis/GAFUN |
| Chemicals to clean solar benches and lamps are evaluated for their health and environmental impact | On Project site | Periodically check | Monthly | PI | City of Nis/GAFUN |
| Ensure workers are trained in adequate decommissioning procedures with spill control measures in place | On Project site | Certificate provided by Contractor In accordance with national regulation | Before preparation and construction works | Contractor / SRO_GAFUN/PI | Contractor/ SRO_GAFUN |

| OPERATION | | | | | |
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| Rain garden maintenance | On Project site | Rain garden is largely self-sustaining once established, but it requires:<br>a) Vegetation and Soil Care monitoring, including periodic inspection of plants, and weed.<br>b) Drainage and Infiltration monitoring , including inspection of inlets, outlets, and downspouts for trash, debris, or sediment blockages;<br>c) Structural Checks, regarding gullying, soil movement, or edge erosion | Regular seasonal check of young plants, especially during the first two years. Special check in dry periods.<br>Regular seasonal weed inspection<br>Check of debris & sediment two times a year. Special check after heavy storms.<br>Structural Checks after major weather events. | PI during RePOS project lifecycle | GAFUN during RePOS project lifecycle<br>City of Niš after RePOS project completion |

## ANNEX 1-12_ LIST OF DOCUMENTS

ANNEX 1_Letter of support City of NiS

ANNEX 2_Consent of the land owner and extract from the real-estate cadastre

ANNEX 3_Letter of support Community Foundation Nis

ANNEX 4_Report on preparing the pilot project context for POS re-development_D4.1

ANNEX 5_WORKSHOP RESULTS:  Conceptual Urban Design Proposal with Innovative solutions_D4.2

ANNEX 6 _Design Project: Co-created Vision for POS _D4.4

ANNEX 7_Bill of Quantities and Cost Estimate

ANNEX 8_Raingarden ENVIMET:Comparison of the Outdoor Microclimate in Two POS scenarios_D4.3

ANNEX 9_REPOS WEBSITE with FORUM

ANNEX 10_PARTICIPATION PROCESS Time Line: Meetings and Activities

ANNEX 11_WORKSHOP documentation

ANNEX 12_Grievance Form

## * PUBLIC CONSULTATION DETAILS AND MINUTES OF MEETING FOR THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

1. Manner in which notification of the consultation was announced: media(s) used, date(s), description or copy of the announcement

2. Date(s) consultation(s) was (were) held

3. Location(s) consultation(s) was (were) held

4. Who was specifically invited (Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office)?

5. List of Attendees (Name, organization or occupation, contact details)

6. Meeting Agenda

7. Summary Meeting Minutes (Comments, Questions and Response by Presenters)

8. List of decisions reached, and any actions agreed upon with schedules and deadlines and responsibilities.