(Projects funded under the Call 2014 onwards must use this format)

LIFE Project Number

LIFE14 CCA/PL/000101

Final Report

Covering the project activities from 16/07/2015[1] to 31/12/2022

Reporting Date[2]

29/03/2023

LIFE PROJECT NAME or Acronym

Adaptation to climate change through sustainable management of water of the urban area in Radom City LIFERADOMKLIMA-PL

Data Project

Project location:	Radom
Project start date:	16/07/2015
Project end date:	31/12/2020 **Extension date:** 31/12/2022
Total budget:	5,838 099 €
EU contribution:	2,933,976 €
(%) of eligible costs:	56,84 %

Data Beneficiary

Name Beneficiary:	Gmina Miasta Radomia

[1] Project start date

[2] Include the reporting date as foreseen in part C2 of Annex II of the Grant Agreement

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This table comprises an essential part of the report and should be filled in before submission
Please note that the evaluation of your report may only commence if the package complies with all the elements in this receivability check. The evaluation will be stopped if any obligatory elements are missing.

Package completeness and correctness check	
Obligatory elements	**✓ or N/A**
Technical report	
The correct latest template for the type of project (e.g. traditional) has been followed and all sections have been filled in, in English *In electronic version only*	✓
Index of deliverables with short description annexed, in English *In electronic version only*	✓
Mid-term report: Deliverables due in the reporting period (from project start) annexed Final report: Deliverables not already submitted with the MTR annexed including the Layman's report and after-LIFE plan Deliverables in language(s) other than English include a summary in English *In electronic version only*	✓
Financial report	
The reporting period in the financial report (consolidated financial statement **and** financial statement of each Individual Beneficiary) is the same as in the technical report with the exception of any terminated beneficiary for which the end period should be the date of the termination.	✓
Consolidated Financial Statement with all 5 forms duly filled in and signed and dated *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets + full Excel file)*	✓
Financial Statement(s) of the Coordinating Beneficiary, of each Associated Beneficiary and of each affiliate (if involved), with all forms duly filled in (signed and dated). The Financial Statement(s) of Beneficiaries with affiliate(s) include the total cost of each affiliate in 1 line per cost category. *In electronic version (pdfs of signed sheets + full Excel files) + in the case of the Final report the overall summary forms of each beneficiary electronically Q-signed or if paper submission, signed and dated originals**	✓
Amounts, names and other data (e.g. bank account) are correct and consistent with the Grant Agreement / across the different forms (e.g. figures from the individual statements are the same as those reported in the consolidated statement)	✓
Mid-term report (for all projects except IPs): the threshold for the second pre-financing payment has been reached	**N/A**
Beneficiary's certificate for Durable Goods included (if required, i.e. beneficiaries claiming 100% cost for durable goods) *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets)*	**N/A**
Certificate on financial statements (if required, i.e. for beneficiaries with EU contribution ≥750,000 € in the budget) *Electronically Q-signed or if paper submission signed original and in electronic version (pdf)*	✓
Other checks	
Additional information / clarifications and supporting documents requested in previous letters from the Agency (unless already submitted or not yet due) *In electronic version only*	**N/A**
This table, page 2 of the Mid-term / Final report, is completed - each tick box is filled in *In electronic version only*	✓

**signature by a legal or statutory representative of the beneficiary / affiliate concerned*

Instructions:

Please refer to the General Conditions annexed to your grant agreement for the contractual requirements concerning a Mid-term/Final Report.

Both Mid-term and Final Technical Reports shall report on progress from the project start-date. The Final Report must be submitted to the Agency no later than 3 months after the project end date.

Please follow the reporting instructions concerning your technical report, deliverables and financial report that are described in the document Guidance on how to report on your LIFE 2014-2020 project, available on the LIFE website. Please check if you have the latest version of the guidance as it is regularly updated. Additional guidance concerning deliverables, including the layman's report and after-LIFE plan, are given at the end of this reporting template.

Regarding the length of your report, try to adhere to the suggested number of pages while providing all the required information as described in the guidance per section within this template.

1. Table of contents

2. List of key-words and abbreviations

Table No. 1 List of key-words and abbreviations

AB	Associated Beneficiary
BD	Biodiversity
BGI	Blue-Green Infrastructure
The project actions:	
A1	Establishment and operationalization of two working groups on: 1) integrating climate adaptation in local decision making and strategies; and 2) blue-green infrastructure and biodiversity
A2	Biological inventory in the project area
A3	Spatial analysis and climate change vulnerability assessment of the Radom urban space
A4	Hydro-dynamic modelling to optimize water purification in sedimentation ponds
A5	Concepts and projects for the urban climate adaptation measures implementation
B1	Purchase of land for action C3
B2	Purchase of land for action C5
B3	Purchase of land for action C6
C1	Adaptation of sedimentation ponds and weir at Borki reservoir
C2	Management of extreme flows in Borki reservoir
C3	Improvement of water quality, mitigation of flows and biodiversity in Potok Północny
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C6	Construction of innovative green-blue infrastructure for storm water management in the inner-city
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E3	Layman's report
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E4.1	*Conferences at the commencement and closure of the project*
E4.2	*Collaboration with other LIFE projects on climate change*
E4.3	*Study tours to Denmark, Germany and Great Britain*

E5	Other awareness-raising and dissemination activities
E5.1	*Informational and promotional materials*
E5.2	*Building partnership with local society*
E5.3	*Good practice guidelines*
E5.4	*Increasing climate resilience in cities (Workshops)*
E5.5	*Competitions for schools*
E5.6	*Professional TV documentation - Cities and climate change; accepting the challenge*
F1	Project management
F2	External financial audit
F3	After Life Plan
F4	Compilation of information for LIFE RadomKlima indicator tables
Other than the project actions abbreviations	
CB	Coordinating Beneficiary / Beneficjent Koordynujący
CINEA	European Climate, Infrastructure and Environment Executive Agency
CP	Construction Permit based on the Construction Law (pozwolenie na budowę)
EASME	Executive Agency for SMEs
EIA	Environmental Impact Assessment (Ocena oddziaływania przedsięwzięcia na środowisko)
EPA	Environmental Protection Agency (Agancja Ochrony Środowiska)
EPI	Environmental Protection Inspectorate (Inspektorat Ochrony Środowiska)
EU	European Union (Unia Europejska)
FPP	FPP Enviro Sp. z o.o., Associated Beneficiary, ul. Krucza 16/22, 00-526 Warszawa
GDEP	General Directorate of the Environmental Protection (Generalna Dyrekcja Ochrony Środowiska)
IPIP	Investment Project Implementation Permit based on Special Flood Act of 8 July 2010 on special rules for the preparation of investments in the scope of flood protection structures / decyzja o pozwoleniu na realizację inwestycji przeciwpowodziowej
IMWM	Institute of Meteorology and Water Management (Instytut Meteorologii i Gospodarki Wodnej)
MCC AMFITEATR	Municipal Culture Centre AMFITEATR (Miejski Ośrodek Kultury AMFITEATR)
MSRC	Municipal Sports and Recreation Centre (MOSIR Sp. z o.o. w Radomiu)
MPA	Urban Adaptation Plans project (http://44mpa.pl/?lang=en) (Miejski Plan Adaptacji)
MR	Gmina Miasta Radomia, Coordinating Beneficiary; ul. Jana Kilińskiego 30, 26-600 Radom
MRTA	Municipal Road and Transport Authority (Miejski Zarząd Dróg I Komunikacji w Radomiu)
NBS	Nature Based Solutions
NFEPWM	National Fund for Environmental Protection and Water Management, co-financer (Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej)

PBCI	Provincial Building Control Inspectorate (Wojewódzki Inspektorat Nadzoru Budowlanego w Warszawie)
PMG	Project Management Group (Grupa Zarządzająca Projektem)
RDEP	Regional Directorate of the Environmental Protection (Regionalna Dyrekcja Oćhrony Środowiska)
RHS	River Habitat Survey
SC	Steering Committee (Komitet Sterujący)
SME	Small and Medium Enterprise (Małe i Średnie Przedsiębiorstwo)
SSBS	Sequential Sedimentation Biofiltration System (SSSB – Sekwencyjny System Sedymentacyjno – Biofiltracyjny)
UL	Uniwersytet Łódzki, Associated Beneficiary, ul. Banacha 12/16, 90-237 Łódź
UMR	Urząd Miejski w Radomiu / Radom City Hall
VA	Vulnerability Assessment / Analiza Wrażliwości
VEPI	Voivodship Environmental Protection Inspector (Wojewódzki Inspektorat Ochrony Środowiska)
WFD	Water Framework Directive (Dyrektywa Wodna)
WG1/ WG2	Working Group1, Working Group 2 (Grupa Robocza 1, Grupa Robocza 2)
WMR	Waterworks Company in Radom, Wodociągi Miejskie w Radomiu Sp. z o.o., Associated Beneficiary, ul. Filtrowa 4, 26-600 Radom
WLP	Water Law Permit based on Act of 20 July 2017 Water law (Pozwolenie wodno – prawne)

3. Executive Summary (maximum 2 pages)

Project LIFE-RADOMKLIMA-PL **aimed in increasing climate resilience of the city of Radom** by:

1) building **demonstrative blue-green infrastructure** (BGI) for managing extreme rainwater flows and control flood risks (outside and within the city);
2) **enhancing biodiversity** by restoration and creation terrestrial and water microhabitats;
3) mainstreaming climate adaptation into **city planning** and supporting informed decision-making;
4) **rising of awarenes**s and building capacity on climate adaptation;
5) support **exchange of knowledge and know-how**.

The Project was implemented between 16/07/2015 and 31/12/2022 in the partnership of Gmina Miasta Radomia (**MR**), as the project leader with 3 co-beneficiaries: Wodociagi Miejskie w Radomiu Sp. z o. o. (**WMR**), Uniwersytet Łódzki (**UL**) and a SME - FPP Enviro Sp. z o. o. (**FPP**).

The overall planned goals of the project have been achieved.

The key outputs of the project included: 1) activating local stakeholders to work together in integrated climate actions; 2) climate change vulnerability assessment for Radom; 3) demonstrative large-scale BGI: • increased retention and purification capacity of 2 existing water ecosystems (Borki reservoir and sedimentation ponds); • 3 new large-scale areas to

mitigate the hydrometeorological risks (SSBS above the Borki reservoir, the Potok Północny and the Cerekwianka polders); • rehabilitation of urban river section (the Mleczna River); • 34 small-scale BGIs in the densely-developed city area (climaponds, climaboxes, green roofs on bus stops and bike shelters, swales, tree-trenches, permeable surface); 4) education and information materials and improved awareness and dissemination of the climate change effects around the local communities; 5) improved biodiversity;

The project had intended to increase climate resilience of the City of Radom by implementing adaptation actions aiming at managing water resources at the source, thus decreasing local floods and mitigating microclimate. Below the planned results are reported vs their status at the end of the project. *When the planned indicator is equal to that achieved one, there is no added comment in the line.*

- Increased purification capacity of sedimentation ponds by **20%** (C1)
- Increased retention capacity of sedimentation ponds roughly by 10 % (C1) - planned **10 %**, achieved **60%**
- Borki reservoir retention capacity increased by **10%** (C2)
- Mitigating extreme flows in the Mleczna River (C2)
- Creating a water retention capacity in a multi-use retention area at the Potok Północny (C3)
- Restoration of 400-600 m of the Mleczna River (C4) – **630 m**
- Storm water channel A0 sealed on a distance of ca. 800 m, iron pollution in water reduced and water redirected upstream of Borki reservoir (C5) - **679 m**
- Improvement of inflowing water quality by **60%** by sequential sedimentation-bio filtration system (C5)
- Green-blue infrastructure developed and installed (C6) including, (Clima-ponds (ca. 12 items), swales (ca. 8-10 items), tree-trench systems (5 items), green roof (5 items), around 200 square metres of permeable surface – **(**Climaponds **(5 items),** Climabox **(8 items),** swales, raingardens and tree trench systems **(14 items),** green roof **(5 items), permeable surface (65 m2)**
- Integration of biodiversity in rainwater management system in Radom and creation of habitats for biological diversity within the city (5 locations in ponds, green roofs, swales) (C6) – **12 locations** (**11** concerning "small-scale" BGI, where biodiversity was monitored and **1** on the Cerekwianka polders),
- A comprehensive best practice guide on adaptation through rainwater management in cities elaborated (**800** items)
- Information materials and education actions (Actions E) providing numerous opportunities for demonstrating project achievements and proposed solutions for rain water management – **12 913** items of information materials used and/or distributed, **3 880** promotional gadgets distributed, **12** packets of main education actions involving local society (see ***Annex E5.2.1 Tools for building partnership with local society***)
- 4-5 other cities in Poland expected to take up project know-how and transfer it to their plans and projects (E actions) - **4 cities**: Wrocław, Opoczno, Białystok, Zgierz
- RadomKlima Portal has been operating as an internet tool on climate adaptation in cities (E1)
- Specific, worth highlighting achievement of the project was a following distinction. At the end of the project, Scientific Advisory Committee of the Ecohydrology Programme of the UNESCO's IHP (International Hydrological Programme), composed of internationally well-known scientists from all over the world invited LIFE-RADOMKLIMA-PL project and the City of Radom to become **a member of the Global Network of Ecohydrology Demonstration Sites of UNESCO's Intergovernmental Hydrological Programme**

(UNESCO-IHP) initiated in 2010. See https://www.ehaeunescochair.org/unesco-radom-city-demosite

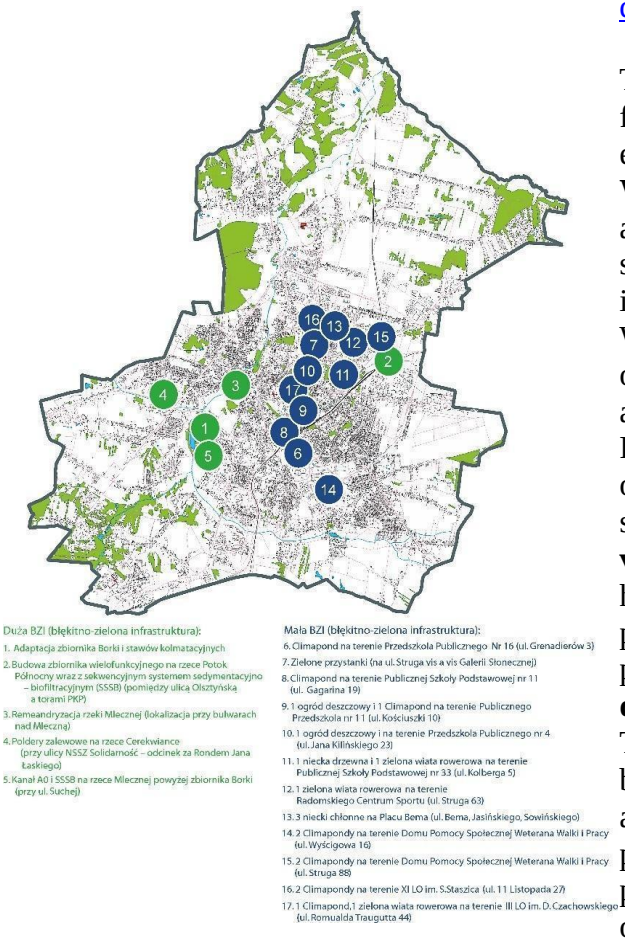

Figure 1: Map of Radom with indicates of locations of small and large BGI adaptation measures implemented by the LIFERADOMKLIMA-PL project

The project foresaw the implementation of five **preparatory actions**. These included establishment and operationalization of two **Working Groups** - 1) integrating climate adaptation in local decision making and strategies operating in MR; and 2) blue-green infrastructure and biodiversity established in WMR, which was crucial in implementation of After Life Plan, future dissemination activities and replication of the project results. Preparatory actions included also elaboration of biological inventories in the project area, spatial analysis and climate change **vulnerability assessment** of the city and hydro-dynamic modelling to optimise water purification in developed BGI. It also covered preparation of all **concepts and technical documentation** for BGI implementation.
The BGI implementation phase was preceded by **land acquisition** procedures within B actions. Identifying the best administrative procedure of land purchase, which postponed project implementation, became, actually, one of the key lessons learnt from the project.

We learned, that using the Special Flooding Act may enable quicker implementation of adaptation actions in Poland in the future.

BGI implemented in the project were classified into two groups (Figure 1):

1) **Small -scale BG**I – (action C6) adaptation actions which support onsite stormwater retention in those parts of the city, where the risk of overloading the stormwater drainage system and flooding resulting from urban run-off and flash floods is the greatest. Thanks to their construction, not only stormwater is collected, but also attractive places are created for residents as well as biodiversity enclaves.
2) **Large – scale BGI** – (actions C1 – C6) adaptation measures which increase the retention capacity of rivers and their valleys, strengthen flood safety, improve biodiversity in river ecosystems and their valleys, and create new, natural recreational space for city residents.

Finally, the project was very successful in promoting their results by communication and dissemination actions (E) running along the whole project duration. These included managing the project website and RadomKlima platform which displays interactive maps of the climate related risks for the Radom inhabitants. All implementations have been marked with the project and educational noticeboards. During networking, awareness rising and dissemination activities we distributed leaflets and displayed project roll-ups and 16 films about the project

activities. The best project “gadget” was planting 513 trees and 191 shrubs in the urban space of Radom.

The project impact has been monitored including surface runoff (D1), hydrological effects (D2), socio-economic impact (D3), microbiological analysis and pollutants of runoff water (D4) and biodiversity (incl. by using e-DNA) (D5).

During the project implementation period, we defined and recognized some problems and we took relevant measures to overcome and alleviate them. The encountered problems resulted in the project duration extension to 31/12/2022 instead of the preliminary closing date 31/12/2020 dealt with:

- ✓ Land acquisition (actions B1, B3) – due to the fragmentation of land ownership, ongoing inheritance proceedings and possible claims, the Civil Law procedure might have caused risks of significant delays. This made us decide to apply special flooding procedure - Act of July 8th, 2010 on special rules for preparation to realization of investments in the field of flood protection structures to acquire the land. The application of the Act was possible because adaptation measures protect areas of the city against uncontrolled river overflows, which was a public interest issue consistent with the Act. One deliverable in B actions, i.e. B2 was cancelled. Originally planned land acquisition for C5 - SSBS at Sucha Street – appeared to be groundless as the range of the task was limited to the land of municipal ownership. The financial means assigned for the action B2 were incurred on B1 action, on which contracted financial means were underestimated.
- ✓ Exceptionally prolonging administrative procedures in the province and state-level institutions, concerning necessary permits for implementation of the C actions (action A5 – *technical documentation and permits*), which caused that the duration of the project was prolonged with 2 years after the acceptance of CINEA by The Letter of Amendment No 3 dated on 26/08/2020.

4. Introduction (maximum 2 pages)

4.1.1 Climate related challenges addressed by this project:

Anthropogenic climate change has already impacted Radom, as well as many other European cities, with increased frequency of heatwaves and heavy precipitation events. River floods, local stormwater runoff and sewer system flooding, droughts and intensification of urban heat island by heat waves, have become the city's inhabitants' and self-government reality. Main problems which the project addresses are:

- increased occurrence of extreme and heavy rainfalls making the rainwater system unable to absorb such large quantity of water in a short time,
- urban sealed areas creating an increased runoff of urban-polluted water,
- fast runoff from roofs, parking lots, streets and asphalted sealed areas endangering further degradation of the Mleczna river natural habitats, sedimentation ponds and the Cerekwianka stream,
- local floods causing severe damages and therefore increasing costs of maintenance and insurance,
- extreme rainfalls increase water pollution in the Mleczna river by sewage overload.

As global warming and associated climate anomalies are projected to increase throughout the 21st century and to intensify the problems listed above, Radom undertook actions to adapt its space to the related risks and to address occurring harmful events resulting from climate change. Radom has densely developed hydrographical network, with a number of small urban rivers, like the Mleczna river, the Cerekwianka stream, the Strumień Godowski and the Potok Północny, flowing into the city centre from rural suburbs. Considering hydrological extremes of the last few years, this causes risk of flooding and pollution coming with the water entering the city from the outskirts.

The inner city of Radom had a high percentage of impermeable surfaces which, during extreme rains, increase storm water runoff, causing flush urban floods, losses in public and private possessions and contamination of water bodies. Increasing number of extreme precipitation and urban drainage floods was foreseen in the future. The surface runoff from centrally located sealed areas in Radom resulted in temporary inefficiency of the stormwater drainage system, flooding of drainage wells and streets. Even though heavy rains were a local phenomenon, limited in time to several hours, they caused disorders in the functioning of the city. Such situations affected all sectors and the functioning of the city, paralysing transport and mobility, causing flooding and damage to infrastructure, public and private property, threatening the health and even the lives of residents. Almost every summer the city was flooded in sensitive areas. One of them was Maratońska street (the two lane National Road No. 12) which was every year flooded by the Cerekwianka estuary, causing obstacles in traffic. Similar situation occurred at the Borki District and near the Potok Północny.

High percentage of impermeable surface in the central part of the city also causes urban heat island in the inner quarters of Radom. At an air temperature of about 20°C, the city centre is even 13°C hotter than the suburbs (reaching 34 to 35°C in the central parts of the city). At an air temperature of about 30°C, the surface temperatures in the city centre reach 34,8-42,5°C.

In terms of the water management, which is the topic of the project, attention was paid to the quality of water retained in reservoirs (e.g. the Borki Reservoir), which performed many functions, including flood control and recreational functions. In the Borki Reservoir, blue-green algae blooms were observed in the summer period, which often appeared in shallow, overfertilized waters at high air temperatures. More than 90 % of the blooms were toxic and could cause poisoning, temporary stomach, intestinal and liver disorders. In addition, temporarily occurring low water levels (rain-free periods with high temperatures) made it impossible to use the reservoir and exacerbated water quality problems (mainly due to internal recharge from reservoir sediments) once self-purification was reduced. So application of the

tailored solutions purifying waters in the locations in subject was one of the main aims of the project.

4.1.2 The solutions demonstrated / verified by the project

Addressing the problems and challenges described above, the LIFERADOMKLIMA-PL project overall objective was to **increase climate resilience of Radom city by building demonstrative blue-green infrastructure for managing extreme rainwater flows and control flood risks** by applying the following measures:

- **Blue-Green Infrastructure** demonstrated in **various scales** in the project, to mitigate the main problems defined in the previous section. The BGIs were implemented as **large-scale BGI** (those related to rivers and river valleys scales, and demonstrating BGI implementation for reduction of flooding and pollution risks coming with the water entering the city from the outskirts), and as **small-scale BGI** (those related to sealed urban area of Radom, and demonstrating BGI implementation for reduction of urban stormwater generated flush-floods in the inner city).
- **Integration and enhancement of biodiversity** as cross-cutting action of the project, meaning activities to restore habitats in urban water places and to create new micro habitats in the climate adaption sites in the city,
- Several capacity building (Action A1), dissemination and replication actions (Actions E) run based on **participatory approach** (involving large groups of different stakeholders) constitute one of the principles in the implementation of this project from the very beginning. This was the way to achieve building partnership, learn by doing and enlarge the project impact beyond its lifespan.

4.1.3. Description of the technical / methodological solution

- The project applied the following solutions aimed at reaching its goals:

1) **Demonstrating BGI approaches to manage stormwater** on rivers, reservoirs and inner city which is becoming more and more popular lately in Poland and the low-costs, ecosystem-based solutions applied in this project are considered as "trend-setting". Its implementation required developing new technological approaches and institutional methodologies, which created unique know-how available to be replicated both in the future Radom planning practices and in other cities` realms.
2) **Climapond.** This innovative BGI measure had not been tested/installed in Poland before the project implementation and had innovative character. The uniqueness of these modular reservoirs depends on their design and adaptation to harsh rainfall conditions, while preserving habitats for many species.
3) **SSBS - Sequential sedimentation-biofiltration system.** The project used SSBS after LIFE project LIFE08 ENV/PL/000517 in Łódź. In Radom, SSBS was implemented in 3 places (the Cerekwianka polders, colmatation ponds and the Potok Północny reservoir) as a demonstration methodology aimed to increase water retention capacity and quality and prevent flooding of Radom by the rivers flowing into its centre from the suburbs. The SSBS consists of three zones: sedimentation zone with structures added to improve sedimentation, a geochemical barrier made of limestone deposit and biofiltration zone – all aimed to purify urban rivers supplied by stormwater.
4) **Co-operating within Working Groups, BGI co-designing and multi-level territorial approach to managing extreme flows in urban areas.** Two working groups (WG1 on integrating climate adaptation in local decision making and strategies; WG2 on blue-green infrastructure and biodiversity) were established and operationalized. The groups consisted of the representatives of decision-makers, managers, NGOs, practitioners, designers, urban planners and actively took part in the development of the project technical solutions. The aim of the project to increase infrastructure, land development planning and

governance focus on the adaptation measures was achieved by the demonstrative character of the measures and by WGs meetings, hoping that it will make the city adaptation more successful, cost-efficient and institutionalized.

5) **Conducting climate vulnerability assessment.** Radom undertook VA as the first city in Poland. We developed and used our own methodology, based on the best available practices, e.g. from Copenhagen and Aarhus (Denmark) to elaborate the document which was an integrated part of the Radom Adaptation Plan adopted by the City Council in 10/2019. VA alongside demonstration solutions in small BGIs and in protecting and developing biodiversity have been applied in the city's planning document - the City Land Use Study. The document replaces land use plans in decision-making processes, which determine the urban design permits for different stakeholders.
6) **Exchange of knowledge, know-how, dissemination and awareness rising.** The project actions contributed to promote understanding of the impacts of climate change on economic, social, and environmental conditions and to communicate the importance of cost-effective adaptation options. The project representatives were very involved in exchanging knowledge and know-how, as well as in informing on various occasions about climate change, its risks and applied adaptation measures. RadomKlima GIS Platform, an internet based tool, allowed, still does and will allow the public and the professionals to obtain information on climate change, vulnerability and adaptation and to help various stakeholders to take advantage from the Platform in the process of designing infrastructure and city development.

4.1.4. The results and climate action related benefits

1) **activating local stakeholders** to work together in integrated climate actions;
2) **elaboration of climate change vulnerability assessment** for Radom;
3) **co-creating and implementing demonstrative BGI**: • increasing retention and purification capacity of 2 existing water ecosystems (Borki reservoir and sedimentation ponds); • developing 3 new large-scale areas to mitigate the hydrometeorological risks (above the Borki reservoir, the Potok Północny and the Cerekwianka stream); • rehabilitation an urban river section (the Mleczna river); • creating demonstrative small-scale BGIs in the sealed city areas (climaponds, green roof, rigolas: swales, tree-trenches, permeable surface);
4) developing **education and information** materials and actions;
5) **enhancing biodiversity** by including the cross - cutting aim in all project actions, particularly restoration of habitats in urban water bodies and creation of microhabitats in the climate adaptation infrastructure in the city,
6) hydrometeorological and social **monitoring and assessment** of the project effects.

4.1.5 Expected longer term results (as anticipated at the start of the project)

The project has started a new pathway of Radom city to climate change-oriented activity with a long term perspective ahead. It is assumed that the development of adaptation expertise will continue. Like during the project lifetime when the NBSs were implemented and promoted, the AfterLIFE Plan includes activities to disseminate the project's solutions to local people and professional groups who can make use of this potential.

The project contributes to the EU's policies on climate and energy, combating climate change is one of the objectives of the EU's environment policy and the project outcomes are supposed to be a cradle for further actions in the scope thus contributing to the UE environment policy cited above.

The project by achieved results and applied Nature Based Solutions significantly contribute to **European Green Deal** [COM(2019) 640 final]; **EU Biodiversity Strategy for**

2030 [COM (2020) 380 final], **EU Strategy on Adaptation to Climate Change** [COM(2021) 82 final], **Communication on Green Infrastructure (GI) - Enhancing Europe's Natural Capital** [COM(2013) 249 final], **the EU Strategy on adaptation to climate** [COM2021/82 final], **European Climate Law** [COM/2020/80 final] by developing on the ground BGI measures in co-design process, thus building capacity and providing demonstration and know-how for implementation of adaptation actions in local, regional and national scale. The new EU Adaptation Strategy paves the way for a higher ambition on climate resilience: in 2050, the EU will be a climate-resilient society, fully adapted to the unavoidable impacts of climate change. For this reason, climate change adaptation is an integral part of **the European Green Deal** and its external dimension, and firmly anchored in the proposed **European Climate Law**. The **European Green Deal** is a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use.

Our project realizes one of the main aims of The European Green Deal – Green Infrastructure (GI).

GI solutions are particularly important in urban environments. GI features in cities deliver health-related benefits such as clean air and better water quality. Healthy ecosystems also reduce the spread of infectious diseases. Implementing Green Infrastructure features in urban areas creates a greater sense of community, strengthens the link with voluntary actions undertaken by civil society, and helps combat social exclusion and isolation. They benefit the individual and the community physically, psychologically, emotionally and socio-economically.

EU Biodiversity Strategy for 2030 sets out how Europe act to ensure that by 2050 **all of the world's ecosystems are restored, resilient, and adequately protected =** that Europe's biodiversity will be on the path to recovery by 2030 for the benefit of all recipients of the nature benefits in line with the 2030 Agenda for Sustainable Development and with the objectives of the Paris Agreement on Climate Change. LIFERADOMKLIMA-PL project is the first step in Radom to develop the measures to be taken on a wider scale in favour of biodiversity in Poland and Europe.

LIFERADOMKLIMA-PL project significantly contributes to development of Radom resilience to climate change impacts fulfilling the strategic aim for Europe to adapt to the unavoidable impacts of climate change and become climate resilient by 2050 and more biologically diverse by 2030. The project is strongly based on principles of ecosystem approach, eco-hydrology and multi-level territorial approach and make adaptation smarter, swifter and more systemic. Its outcomes are supposed to be a cradle for further actions in the scope thus contributing to the UE environment strategy in the scope of nature based adaptation measures.

5. Administrative part (maximum 1 page)

5.1 Project management:

The project's management process needed daily work to maintain a permanent flow of action with the aim of achieving the objectives foreseen in the proposal. The specific management activities carried out were: preparation of the Partnership Agreements between CB and WMR, FPP and UL; organisation of Monitoring visits; preparation of material for meetings and dissemination events; general actions and activities for the coordination of the project; management of the financial and administrative aspects of the project; preparation of all of 5 reports (1st, 2nd, Mid Term, 4th and 5th progress reports and the following Final Report).

The **project management group** (PMG) members were in contact on a regular basis during face-to-face meetings, by email and telephone. There were **32** official meetings concerning significant or troublesome issues related to the project implementation and current challenges arising within the course of the project, such as land acquisition procedures. Regular management meetings between the project partners took place as needed to coordinate day-to-day implementation, e.g., discussing development of BGI; land purchase progress. Local Radom beneficiaries MR and WMR had regular meetings every Friday to discuss and solve pending issues. Since 2020 there were also many on-line sessions between all beneficiaries upon identified needs, almost every Tuesday.

Steering Committee: There were 6 SC meetings in the project lifetime (24/03/2016; 26/10/2016; 13/02/2017; 24/01/2019; 20/01/2020; 28/01/2022). The role of SC was to manage the project management, monitor and review the progress in implementation, and to allow for re-orientation of project actions, if necessary. SC was in contact on a regular basis, by the face-to-face meetings related to developing the project actions. The Steering Committee regularly reviewed the overall project progress. The SC consisted of: Chairperson (a representative of the coordinating beneficiary), 2 Deputy Chairpersons (representatives of two partners), ordinary members, secretary and invited experts. The latest composition of SC presents as follows:

Table No. 1: Final composition of the LIFE14 CCA/PL/000101 Steering Committee as agreed at the meeting on 28/01/2022

Function in the SC	***Previous composition***	***Newly established composition***
Chairman	prof. Maciej Zalewski	**prof. Maciej Zalewski,**
Deputy Chairman	Jerzy Zawodnik	**Jerzy Zawodnik**
Secretary	Jerzy G. Frączek	**Elżbieta Stanke**
Members:	Katarzyna Jankowska	**Katarzyna Jankowska**
	dr hab. Tomasz Jurczak	**dr hab. Tomasz Jurczak**
	Marta Wronka	**Marta Wronka**
	dr hab. Iwona Wagner	**dr hab. Iwona Wagner**
	-	**Paweł Szałański**
Scientific expert	prof. Maciej Zalewski	**prof. Maciej Zalewski**
Technical expert	Leszek Trzeciak	**Leszek Trzeciak**
Financial expert	Marzenna Rasmussen	**Lars Christian Adrados**
Administrative expert	Katarzyna Jankowska	**Katarzyna Jankowska**

The Project Manager / coordinator in each co-beneficiary was responsible for monitoring the implementations of actions, preparation of the inception report, the progress reports, the mid-term and final reports with payment requests with the assistance of the Finance and Technical Reporting Advisor. Most of the responsibilities have been assigned to the project coordinator in the Coordinating Beneficiary.

Regular management meetings took place to coordinate day-to-day implementation (32 official meetings). Besides UMR and WMR met regularly every week (usually every Friday) to discuss pending issues. SC met six times during the project lifetime. For details on the SC and PMG meetings topics, presentations and attendance see ***Annex F.1.2***

There are 6 reports: 4 progress reports, 1 Mid-term report sent to EASME / CINEA*:* ***29/07/2016; 17/11/2017; 28/09/2018 (MtR); 11/03/2020; 30/09/2021*** *and 1 Final report of* ***31/03/2023****.*

Deliverables: Final progress reports and audit report - achieved
*Indicators of progress: Reports delivered according to the agreed schedule - number of reports delivered on time = **6***

Within the range of management arrangements taken at the beginning of the project, PMG delegated some fields of actions among the beneficiaries. The Scientific Coordinator from UL as well as the Technical and Financial Advisors from FPP were consultants for the Steering Committee and the Project Management Group. They provided expert knowledge in different areas: scientific and technical project running; fulfilling the LIFE provisions and regulations; financial accounting and specific implementation knowledge.

The Scientific Coordinator was responsible for the Ecohydrology content of the design and for advising the PMG in terms of project dissemination and achieving sociological change of view on the matter of sustainable and climate adapted cities.

The Technical and Financial Advisors supported the PMG in solving detailed financial and technical issues that arose during the project implementation. The Technical and Financial advisors helped the PMG with implementing activities and reporting in line with LIFE provisions and regulations.

The responsibility of **collecting financial documentation was assigned,** as was decided at the beginning of the project (first SC meeting on 24/03/2016 **to WMR, and financial monitoring to FPP**.

The financial and technical reports were regularly updated. The progress information was collected monthly from each partner's project coordinators by the UMR Project Coordinator and sent to the Project Monitor.

The progress reports to the co-financer The National Fund of Environmental Protection and Water Management were sent along with 10 requests for payment for MR, WMR and UL. They were both well received and accepted by NFEPWM. The reports included: 1. description of the actions taken, reasons of delays and future plans; 2. Data on financial progress of the project. Copies of the previous progress reports to EASME were also sent to the NFEPWM.

5.2. Communication with the Agency and Monitoring team.

There were 7 monitoring visits: 1 in every year of the project lifetime: 05/02/2016; 22/03/2017; 18/05/2018; 6-7/03/2019; 13/10/2020; 21/05/2021; 24/03/2022.

After every monitoring visit we obtained letters with assessment of the visit and comments to be taken into account in the project implementation process and dealt with in the Final Report.

There are **6** reports: 4 progress reports, 1 Mid-term report sent to EASME / CINEA: ***29/07/2016; 17/11/2017; 28/09/2018 (MtR); 11/03/2020; 30/09/2021 and*** 1 Final report of ***31/03/2023.***

5.3. Amendment to grant agreement:

The Grant agreement between EU and the Coordinating Beneficiary were signed on 26/11/2015 and on 10/12/2015 with the co-financing NFEPWM.

The Grant Agreement with EASME was modified 3 times:

- Letter of Amendment No 1 to Grant Agreement LIFE14 CCA/PL/000101 LIFERadomKlima-PL dated on 6/12/2016 concerned modification of obligation to information, threshold for submission of audit certificate and submission of reports.
- Letter of Amendment No 2 to Grant Agreement LIFE14 CCA/PL/000101 LIFERadomKlima-PL dated on 8/08/2018 concerned the modification of the definition of conditions for natural persons, submission of VAT certificate and threshold for submission of the certificate on the financial statements in order to simplify in favour of the beneficiaries.
- Letter of Amendment No 3 o Grant Agreement LIFE14 CCA/PL/000101 LIFERadomKlima-PL dated on 26/8/2020 modifying: (1) Forms A1, C2 and C3 as set out in

Annex II of the Grant Agreement are modified as set out in the new Forms A1, C2 and C3 attached to this letter. (2) The duration of the project in Art. I.2.2 of the Grant Agreement is extended and shall run from 16/07/2015 to 31/12/2022.

5.4. External financial audit (Action F2)

Radom Municipality was not obliged to perform the project audit. Nevertheless, taking into consideration the LIFE guidelines[3] (which were not conclusive), internal need to perform the audit and because MR had budgeted amount of money for this Action, we decided to do this.

The following auditing company was chosen in a public procurement procedure to carry out audit in the project:

'BETA' Auditing Beata Rękawek , ul. Czapli 43, 02-781 Warsaw,
NIP: 951-150-79-92 REGON: 141174819

"BETA" Auditing was also hired by FPP Enviro to perform the financial audit concerning only this partner because its budgeted EU contribution reached 750 000 EUR (1 209 538 EUR). "BETA" company performed procedures regarding the cost declared in 4 Beneficiaries Financial Statements for the period from 16/07/2015 till 31/12/2022.

The Reports were elaborated based on information and accounting systems provided by the management of all Beneficiaries in response to specific questions. On the basis of the results of these procedures, the Reports say that all documentation and accounting information had been provided to the auditor. They also stipulate that all factual findings and procedures in the project and in FPP Enviro are confirmed without any exceptions. The Certificate for the whole project (all partners) is included in ***Annex F2.;*** for FPP Enviro in ***Annex F2.1***

Responsible Beneficiary: ***MR***

Indicators of progress: ***Audit assignment report - Number of reports =*** *achieved* ***2*** */ planned in a proposal* ***1***

5.5 After Life Plan (Action F3)

The plan was developed in Polish and English. It specifies how to ensure the continuation of the project, both in terms of how to develop the actions initiated in the LIFE project beyond the 5 years and also how to ensure the long-term management of the sites.

The plan was prepared based on the wide consultations with different stakeholders in Radom, including: Municipal Council representatives, NGOs, local community, land designers, urban planners, construction firms.

The Plan is available on the project website https://www.life.radom.pl/pl/wydarzenia/aktualnosci/365-after-life-plan (Polish version) and https://www.life.radom.pl/en/wydarzenia/aktualnosci/366-after-life-plan-2 (English version)

Responsible Beneficiary: ***FPP***

Deliverables: ***The "After Life plan is a part of the project final report and is published on the project's website (Annex F3)***

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[3] *"The certificate is needed only when defined thresholds are passed per beneficiary (affiliate) and only at the FR stage.*
1. LIFE projects 2017 onwards (i.e. Grant agreements signed as of May 2018 and later)
Certificate is requested for each beneficiary and for each affiliated entity, if simultaneously (i.e. both conditions apply):
(i) the cumulative amount of the Commission contribution that the beneficiary requests as reimbursement of actual costs is EUR 325 000 or more; AND
(ii) the maximum amount of the Commission's contribution, indicated for that beneficiary and its affiliated entities in the estimated budget in the grant agreement as reimbursement of actual costs is EUR 750 000 or more".
2. LIFE projects 2014-2016
Certificate is requested for each beneficiary, if:
(i) the total Commission's contribution in the form of reimbursement of actual costs as referred to in Annex III is at least EUR 750 000 (amount increased by the general amendment of 16/08/2018 for all traditional LIFE NAT, LIFE ENV and LIFE GIE, LIFE IPE and LIFE IPC projects)
!Be aware that Condition (ii) as indicated above in Point 1 ***does not apply for 2014-2016 projects!"***

Indicators of progress: After-LIFE-action plan completed at the end of the project - Number of downloads of the plan from the website ***= 500/1 500***

5.6. Compilation of information for LIFE RadomKlima indicator tables (F4)

The KPI online data base (KPI database webtool https://webgate.ec.europa.eu/eproposalWeb/kpi/module) was completed in all requested information regarding the project performance indicators and sent to CINEA for approval.
Information on progress towards achieving the set objectives/KPI values was also provided to EASME/CINEA together with the project Midterm report in 2018.
Collection of information on KPI was performed by project team based on the results from ongoing internal project monitoring.
Estimated KPI values by project end show that for almost all indicators projected end values have equalled to or exceeded initially foreseen values which shows the positive effect of project implementation.
An index of indicators is included in ***Annex F4 Compilation of information for LIFE RadomKlima indicator tables***

Responsible Beneficiary: ***MR***
Indicators of progress:
- Project monitoring reports - Indicator tables submitted – ***3/5***

All details concerning management of the project are included in ***Annex F1 Project management.***

6. Technical part (maximum 25 pages)

6.1. Technical progress, per Action

A1 Establishment and operationalization of two working groups on: 1) integrating climate adaptation in local decision making and strategies 2) blue-green infrastructure and biodiversity.
Foreseen start date: 09/2015 *Actual start date: 01/2016*
Foreseen end date: 11/2022 *Actual end date: 11/2022*

The working groups (WG) were established in 01/2016. The late kick-off of the Groups was due to the late signing of the grant agreement and co-financing agreement. This action was scheduled for the entire project implementation process and prolonged with two years more of the project duration. The whole number of 22 meetings took place according to the needs of the project development.
Two Working Groups operating in the project were **WG1-** Working Group on integrating climate adaptation in local decision making and strategies; **WG2 -** Working Group on blue-green infrastructure and biodiversity.

MR and WMR organized 22 meetings attended by 513 people from about 43 institutions (6 meetings of WG1 – 133 participants; 16 meetings of WG2 - 380 participants). The constant members of the WG2 amounted to above 50 persons. WG 1 operated in Radom City Hall on integrating climate adaptation in local decision making and strategies. An extremely important dimension of the work of WG1 was the substantive input to the Municipal Climate Change Adaptation Plan with the output of The Vulnerability Assessment for Radom elaborated within the project.

WG 2 operating in WMR was focused on biodiversity, blue-green infrastructure implementations in Radom, including conceptual planning and the way the recently collected biodiversity data can provide an input to the concepts implementation; presenting good practices and practical implementations of BGI and adaptation measures in other countries (experiences from Aarhus Municipality in Denmark); discussion of conceptual guidelines and technical concepts prepared for the implementation of the project C actions and getting WG members recommendations to their development; field visits at the implementation sites.
Briefings and reports on the WG meetings are included in ***Annex A1***
Responsible Beneficiary: ***WMR***
Indicators of progress:

- *Number of meetings held = achieved* ***22****/ planned in a proposal* ***20***
- *Number of stakeholders present and involved in the process = achieved* ***43****/ planned* ***10*** *individual institutions*

A2 Biological inventory in the project area

Foreseen start date: 09/2015 *Actual start date: 12/2015*
Foreseen end date: 12/2016 *Actual end date: 12/2016*

The objective of this action was to contribute to the project Objective 2, recognise and map the occurrence and distribution of most valuable species and habitats in the project area, develop baseline biodiversity assessment for assuring means to enhance local biodiversity and minimize negative impact, as well as give recommendations and assisting the best possible planning of the project implementation actions C1-C6, to add value to protecting species and habitats.
The late start of the Action was due to the late signing of the grant agreement and co-financing agreement, however all activities were developed as planned and the Action was finalised on time. The results showed very limited botanical value of the projects sites, moderate value for enthomofauna, fish and amphibians, and relatively and locally high importance for birds. The results were used in the development of concepts for the implementation actions C1-C6– in order to maintain and increase biodiversity value of the project sites.
The outcomes were delivered with the ***[Progress Report No 2 dated on 17/11/2017].***

1. Assessment of the state of fauna in the catchment area of the Mleczna River in the Radom city in the development area related to the implementation of the project LIFERADOMKLIMA-PL (LIFE14 CCA/PL/000101); ***[Annex no 10: 17/11/2017 Progress Report]***
2. Insects: From the estuary of the Kosówka river to the Mleczna river at Piotrówka. Presence of invertebrates in the development area; ***[Annex no 11: 17/11/2017 Progress Report]***
3. Insects: Dolina Cerekwianki. Presence of invertebrates in the development area; ***[Annex no 12: 17/11/2017 Progress Report]***
4. Insects: the Potok Północny. Presence of invertebrates in the development area; ***[Annex no 13: 17/11/2017 Progress Report]***
5. Inventory of actual vegetation and flora with indication of hazards and revitalization action proposals for selected areas of green in Radom; ***[Annex no 14: 17/11/2017 Progress Report]***
6. A report on the results of the natural inventory of 2016 year with recommendations for actions C. 1 to C. 6; ***[Annex no 29: 17/11/2017 Progress Report]***

Responsible Beneficiary: ***FPP***
Milestones:

- ***Environmental inventory conducted. Data collected and analysed. delivered 31/12/2016***

Deliverables:

- Biodiversity baseline report –botany, enthomofauna, fish, amphibians and birds. delivered 31/12/2016

Indicators of progress:

*- Number of reports – **6/2***

A3 Spatial analysis and climate change vulnerability assessment of the Radom urban space

Foreseen start date: 09/2015 Actual start date: 10/2015
Foreseen end date: 12/2016 Actual end date: 08/2017

The objective of this action was to develop Vulnerability Assessment (VA) for the city of Radom, to identify the areas which are most exposed and most vulnerable (not-resilient) to changing climatic conditions, and to climatic extremes, as a basis for further decision making.

The outcome of the action was Vulnerability assessment of the Radom area elaborated in 2017. The experiences and capacity developed in Radom, due to the VA implementation, resulted with close cooperation of the LIFERADOMKLIMA-PL stakeholders with "Urban Adaptation Plans" (MPA) project, launched at the beginning of the 2017 by Ministry of the Environment of the RP (http://44mpa.pl/) and made Radom visible as one of the pioneering cities in implementation of comprehensive climate adaptation activities in Poland.

As additional task, a short version of the VA report was elaborated in 2022 and distributed during the Final Conference and other informative events (see ***Annex E5.1.1***)

The Action included two sub-actions: **A3.1** Spatial analysis of climate, infrastructure, demographic and environmental data and building the data base, and **A3.2** The climate change vulnerability assessment of the Radom urban space.

The following activities were undertaken within the sub-actions:

A3.1 Spatial analysis of climate, infrastructure, demographic and environmental data and building the data base:

- **Data collection:** Climatic, environmental, infrastructure and demographic data were collected and consolidated in the project database. Data were obtained from national and regional monitoring stations, other public and private institutions, NGOs and website resources.
- **Selection of key sectors for detailed analysis:** The key four sectors for detailed analysis and VA in Radom were selected in a participatory process with the WG1. The selected sectors are: public health, water management, Transport and Spatial management.
- **Spatial analysis:** Basic spatial analysis of the Radom area was performed, based on the collected data. The analysis covered distribution of key environmental features, population (including sensitive groups), infrastructure of the key sectors, and others. ***[Annex no 5.9, 5.10, 5.11, 5.12: 29/07/2016 Progress Report].***

A3.2 The climate change vulnerability assessment of the Radom urban space

- **Vulnerability Assessment methodology:** The methodology for VA was developed by FPP, including algorithms for the mathematical analysis of the adaptation potential. The methodology was presented to the WG1 members, and consulted with the project beneficiaries and external experts from research institutes. ***[Annex no 5.13: 29/07/2016 Progress Report]***
- **Vulnerability Assessment analysis** was conducted and included:

  - Exposition analysis, including: **I) climatic scenarios analysis** based on 6 regional climatic models, 10 EURO-CORDEX simulations, for two emission scenarios: RCP4.5 and RCP8.5; **II) thermal exposure analysis and surface urban heat island distribution** based on satellite imaginary from two instruments: MODIS (Moderate Resolution Imaging Spectroradiometer; June 2015 - June 2016; over 2000 images) and ASTER (Advanced

Spaceborne Thermal Emission and Reflection Radiometer; August 2000 - June 2016; 55 images); **III) hydrological exposure analysis** - based on hydrological model developed in the action A4, indicating flood risk areas related to **rivers and sewage system overloads** in the year 2016 and 2050; **IV) Interactive map of historical fire brigade interventions** in Radom in the years 2014-2016, linked to the precipitation data.

- Sensitivity analysis: The WG members were consulted on: consequences of the occurrence of climatic disorders for the functioning of the sectors and their components; assessment of the sensitivity of the sectors and their components to climate change; risks arising from a changing climate for the key sectors and the consequences for the city functioning. The collected data was used to determine the sensitivity of the sectors to climate change, and were the basis for sensitivity analysis.

- Adaptive potential analysis: The evaluation of the adaptive potential of the area of Radom was carried out based on the distribution of BGI and green areas of different typology.

- Vulnerability Assessment maps: illustrating exposition, sensitivity, adaptive potential and vulnerability for population including vulnerable groups and infrastructure components of the key sectors were produced. The maps are available at the interactive platform produced in the action E1 (***http://mapy.life.radom.pl/*** now ***www.gis.umradom.pl/life_radom_mapy.html***). All together 141 final maps were produced.

- **Vulnerability Assessment Report** was developed. The VA results were discussed with the WG1 members on WG meetings and during individual meetings with stakeholders (in particular UM, WMR and Urban Planning Office).

Vulnerability assessment report was provided in the previous report ***[Annex no 3a, 3b, 3c: 17/11/2017 Progress Report]***

Responsible Beneficiary: ***FPP***

Milestones:

- ***Vulnerability assessment of the Radom area conducted. delivered: 17/11/2017***

Deliverables:

- ***Vulnerability assessment report. delivered: 17/11/2017***

Indicators of progress:

- *Maps generated* ***141/20***

A4 Hydro-dynamic modelling to optimize water purification in sedimentation ponds

Foreseen start date: 09/2015 *Actual start date: 12/2015*
Foreseen end date: 12/2016 *Actual end date: 10/2017*

The objectives of this action were to provide a general information about the hydrological risks in Radom area (input to action A3); and to develop science-base for concepts and technical projects related to large-scale BGI adaptation measures on the Borki reservoir and sedimentation ponds, to increase the efficiency of implemented adaptation measures (A5, C1).

There were two models developed in this activity:

Hydraulic model for the Borki reservoir and sedimentation ponds was developed to support design of the system, to increase self-purification and retention of stormwater transported during rainy weather by the Mleczna river, and protect the Borki reservoir) ***[Annex no 17: 17/11/2017 Progress Report]***

Hydrodynamic model of the Mleczna river basin has been developed for the river and stormwater drainage systems of the city of Radom; ***[Annex no 18: 17/11/2017 Progress Report]***

The hydrodynamic model was used in VA report (Action A3), optimization of the large scale adaptation measures planned in the Actions A5 and C1-5. It provided information required to design shape, volume and size, and decide about location for the implementation actions, and in consequence, final concepts and technical documentation.
UL started to implement the project in the first quarter of 2016 (partnership agreement). The work started with verification of documents and data necessary to develop models. Then, UL carried out administrative works related to tender and contract. Monitoring and modelling works were implemented from the 3rd quarter of 2016 to October 2017, which took the same time originally planned in the timetable.
Responsible Beneficiary: ***UL***
Indicators of progress:
- *Number of reports prepared –* ***6/1***

A5 Concepts and projects for the urban climate adaptation measures implementation
Foreseen start date: 09/2015 *Actual start date: 01/2016*
Foreseen end date: 12/2016 *Actual end date: 09/2022*

The objective of this Action was to develop concepts and technical projects for implementation of both **large-** and **small-scale** BGI measures, as demonstration in urban climate adaptation.

Large-scale/rivers BGI adaptation measures design (*Annexes A5.1 , A5.1.1- A5.1.5*):

Large-scale adaptation measures covered design of the interventions to be implemented in the Radom rivers, reservoirs and river valleys, in the locations of: the Borki reservoir with sedimentation ponds (***Annex A5.1.1***), the Mleczna river (***Annex A5.1.2***), the Cerekwianka river (***Annex A5.1.3***), channel A0 with SSBS over the Mleczna river at Sucha Street (***Annex A5.1.4***) and the Potok Północny (***Annex A5.1.5***).
To precise the overall ideas of adaptation and BGI implementation described in the application stage, several field consultations, face-to-face, WG and PMG working meetings had taken place since the beginning of 2016. The elaboration of final versions of the concept which were used to further technical project procedure was finished on 20/09/2017 and delivered to EASME: for action C1 and C2; ***[Annex no 25: 17/11/2017 Progress Report];*** action C3; ***[Annex no 22: 17/11/2017 Progress Report]; a***ction C4; ***[Annex no 23: 17/11/2017 Progress Report];*** action C5; ***[Annex no 24: 17/11/2017 Progress Report];*** action C6; ***[Annex no 21: 17/11/2017 Progress Report]***

Technical projects for large – scale adaptation measures

All technical projects for all large-scale C actions were eventually achieved but accomplishment of the Action A5 in terms of obtaining all necessary permits, including, EIA, WLP, IPIP and CP was very troublesome since significant delay in administrative procedures, beyond the time that was foreseen by law. This was one of the most significant reasons for asking CINEA for the extension of project duration with 2 years.
To justify the prolongation of administrative procedures, one of them was the procedure for obtaining EIA for **Borki reservoir and sedimentation ponds** having been lasting for 1,5 years, instead of 60 days. The final EIA was issued only on 06/09/2019 with a permission for adaptation work to be carried out from September to February (out of the breeding period of amphibians and birds). CP was obtained on 15/05/2020.

In the **Potok Północny** there was a problem with a technical project elaboration. It was delayed due to the modernization of the land registry in the area of the planned reservoir. IPIP was finally achieved on 10/06/2021.
For **restoration of the Mleczna River**, the EIA procedure took 6 months. The IPIP under Special Flood Act was obtained from the Mazovia Province Governor (the investment did not

require land acquisition and Special Flooding Act was applied in this case due to other reason – possibility of return of municipal properties to private owners) was obtained on 28/04/2020. As to **SSBS at Sucha Street,** due to lack of funds for SSBS in the budget, the scope of SSBS was limited and adjusted to the area of the land owned by the Radom Municipality. The process of shaping the final scope of the task so that the project's objectives were achieved was time-consuming and only culminated in the technical design on 11/01/2021. That task was implemented as part of the existing water and legal permit for conservation, held by the WMR. The EIA procedure for **the Cerekwianka polders** took 6 months. IPIP was obtained on 18/05/2020.

The list of dates of obtaining all permits and decisions (EIA, WLP, IPIS, CP) for the tasks of large-scale BGIs is attached as ***Annex A5.1***

Photographic documentation on C actions is included in ***Annex C1_C6***

Detailed information, technical projects, administration permits and some photos concerning large-scale BGIs are included in ***Annexes: A5.1.1, A5.1.2, A5.1.3, A5.1.4 and A5.1.5***

Design of small-scale BGI adaptation measures in Radom urban area (A5.2):

The aim of development of small-scale BGI in the urban landscape was to contribute to slowing the flow of storm water from roofs, parking lots, streets and other sealed areas of urban terrain as crucial to decrease the risk of local flooding in the area of Radom. The action also focused on the enhancement of biodiversity integrated into all implemented solutions. The concept prepared in this action envisaged developing a plan for implementing elements of an innovative system to slow rainwater runoff in the city, through the use of solutions as "Clima-pond", swales, tree trench systems, green roofs, mini polder floodplains and permeable pavements.

The activity started with verification of the locations proposed at the stage of the project application. New locations were selected based on the results of VA report, WG members suggestions, and face-to-face meetings with the project stakeholders, according to the following criteria:

- presence of independent investment plan which could prevent implementation of a new BGI project,
- possible restrictions resulting from the local law (MPZP - local development plan),
- terrain conditions and technical possibilities of the BBI implementation,
- distribution of BGI in the most vulnerable Radom space,
- distribution of BGI in public spaces and near schools and kindergartens, to assure best demonstration effect.

Along the overall period of the project duration, many of the proposed and researched locations had other ongoing investments, which due to their advancement could not be any more adapted for BGI. On other relevant locations there were some constraints concerning mainly underground infrastructure conflicting with planned solutions.

Altogether, 18 stakeholders were investigated, including: WMR, Urban Planning Office, Department of Investment of the RM, The City President Office, Directors of Schools, Kindergartens and Nurseries, administrators of other City institutions

Finally, there are 13 locations (no. 14 from the table below was only designed without implementation within the project) identified for implementation of 34 elements of small-scale BGI in the city landscape and one conceptual design of Education square to be implemented after the end of the project from external financial sources by school (Table 1).

All technical concepts, projects, permits, decisions, maps not delivered in the previous Progress reports and MtR are included in ***Annex: A5.2***

Table No. 2: All small-scale BGI projects developed by FPP Enviro

No	Location	Address	BGI object	Number of BGI						BGI in
				Climapond	Climabox	Swale/Treet rench/Rain garden	Green bike shelter / bus stop	Impermeable surface	Rainwater tank	Total
			Planned in a proposal	12	0	13	1	1	0	27
			Implemented	5	8	14	5	1	1	34
1	Public Kindergarten No. 16	Grenadierów 3	Climapond, Swale	1		1				2
2	Jagielloński Square	Plac Jagielloński	2 Green bus stops, Tree trench, Swale			2	2			4
3	Adam Jerzy Czartoryski Public Primary School No. 11	19 Gagarina Street	Climapond	1						1
4	Public Kindergarten No. 11 in Radom	10 Kościuszki Street	Climapond, Cascade rain garden	1		1				1
5	Public Primary School No. 33	5 Kolberga Street	Tree trench, Green bike shelter			1	1			6
6	Julian Tuwim Public Kindergarten No. 4	23 Kilińskiego Street	Concrete climabox		1					1
7	Bema Square	ul. Bema, Jasińskiego, Sowińskiego	3 Swales with damming elements			3				3
8	Radom Sport Centre	63 Struga Street	Green bike shelter				1			1
9	Social Welfare Home of a Veteran of Struggle and Work	16 Wyścigowa Street	2 Brick cCimaBoxes and 2 Swales		2	2				4
10	Social Welfare Home Over the Creek	88 Struga Street	2 Wooden and steel Climaboxes and 2 Swales		2	2				4
11	Stanisław Staszic High School No. 11	27 11 Listopada Street	Climapond, 2 Wooden and steel Climaboxes and 2 Swales, Permeable surface (pavement 65m2), Rainwater tank (1000 l)	1	2	2		1	1	6
12	Colonel Dionizy Czachowsk High School No. 3	44 Traugutta Street	1 Climapond; 1 Green bike shelter	1			1			3
13	Municipal Center of Culture Amfiteatr	1 Parkowa Street	Composite climabox		1					1
14	Leather, Clothing, Styling and Services School Complex	5 Śniadeckich Street	Educational square project without implementation. Conceptual design only.							0

Responsible Beneficiary: ***UL***
Milestones:

- Preparatory technical concepts elaborated- ***achieved 20/09/2017***

- Environmental Impact Assessment procedure finalised - ***achieved 6/09/2019***

Deliverables:

- Concepts and technical projects for the implementation actions achieved 05/09/2022[4] (***Annex A5.2)***

Indicators of progress:

A.5.1 The concept of the Borki reservoir adaptation to climate change

- Number of projects prepared = ***1/1***

A.5.2 The concept of River Mleczna restoration

- Number of projects prepared = ***1/1***

A.5.3 The concept of development of green-blue infrastructure in the urban landscape

Landowner and land users interviewed

- Number of projects land owners interviewed = ***18/30***

[4] *Last permit for „small-scale" BGI – climapond in III High School at Traugutta Str.*

*- Number of projects prepared = **14[5]/6***

A.5.4 The concept of application of sequential sedimentation biofiltration systems for Stormwater purification

*- Number of projects prepared = **2/2***

B1. Purchase of land for action C3

Foreseen start date: 05/2016 *Actual start date: 11/2017*
Foreseen end date: 12/2020 *Actual end date: 11/2022*

The objective of this action was to purchase land for action C3. The land purchase action started earlier than planned, together with other B actions - on 01/2016. Municipal Real Estate Office and PMG analysis showed that since the allotments were very narrow and perpendicular to the stream, the number of owners with whom the negotiations were supposed to be held had increased to 48.

The precise range of the area necessary to be purchased for the adaptation measures in the Potok Północny valley had to be also coordinated with two big infrastructural investments in the area: North South (NS) inner city ring-road (the investment was planned for several years, and the decision was made by the Radom Mayor at the beginning of 2017 – when Municipal Urban Planning Bureau proceeded to elaborate NS concept; and construction of the railway road no 8 by the General Director for National Roads and Motorways).

Recognized high number of owners of the allotments in this area, and high number of unsolved heritage procedures and claims towards the land, might have threaten the successful and timely obtaining the land for the project purposes caused that we applied a special flooding procedure - Act of July 8th, 2010 on special rules for preparation to realization of investments in the field of flood protection structures. The allotments were located in the flooding area. By application of this Act, the land was not literally purchased but, on the basis of the decision of the Voivode, by operation of law, it became a municipal property or State Treasure property in disposal of the municipality. The amount of the compensation was determined by status, purpose and value of the expropriated property on the date of the decision on expropriation issued by Voivode, and it was done after obtaining the opinion of property valuer.

The IPIP for the Potok Północny was issued on 10/06/2021 and it was a document proving the dedication of the land for action C3. One of the owners appealed against the IPIP, which resulted in extending the time of land acquisition. Due to the IPIP stipulation the appeal did not prevent the commencement of investment works, which started on 09/09/2021. The process of signing the agreements about the payments of compensation between RM and land owners started in 09/2022 and was completed by the end of 2022.

Communication with the land owners. Two meetings with landowners were organised: in Radom City Hall 08/04//2019 and the field meeting on 27/05/2021 close to the area of PP investment.

*Responsible Beneficiary: **MR***

Milestones:

*- Land purchase contract signed – **achieved 30/11/2022***

Deliverables:

- Documents proving the dedication of land for the implementation actions – 10/06/2021 (IPIP) (Annex B1)

Indicators of progress:

*- Purchase contracts signed - ha = achieved **2,11/** planned in a proposal **1,2***

[5] *Technical projects for „small-scale" BGI*

B2 Purchase of land for action C5

Foreseen start date: 12/2015 *Actual start date: None*
Foreseen end date: 12/2020 *Actual end date: None*

The objective of this action was to purchase land for the adaptation action C5, located above the Borki reservoir, to create a sequentional sedimentation-biofiltration system (SSBS) securing mitigation of the flow of the Mleczna river, and enhancing ecosystem-based treatment of water disposed by the A0 channel.

Ultimately, after the project amendments concerning SSBS over Sucha Street due to lack of funds for SSBS in the budget for this task, the scope of SSBS was adjusted to the area of the land owned by the Radom Municipality. In that case, the adaptation was implemented as part of the existing water and legal permit for conservation, held by the WMR. The sum contracted for task B2 was transferred to other two actions: B1 and B3 concerning land acquisition for actions: C3 and C6.

Responsible Beneficiary: ***MR***
Milestones:

- *Land purchase contract signed –* ***cancelled due to the change of the area of land needed***

Indicators of progress:

- *Purchase contracts signed - ha = achieved* ***0****/planned in a proposal* ***0,8***

B3 Purchase of land for action C6

Foreseen start date: 03/2016 *Actual start date: 09/2021*
Foreseen end date: 09/2020 *Actual end date: 11/2021*

The objective of this action was to purchase land for the adaptation in action C6 - the Cerekwianka Stream adaptation, which as other land acquisition for C3 was proceeded on the basis of the Act of July 8, 2010 on special principles of preparation for the implementation of investments in flood control structures (Journal of Laws of 2010, No. 143 item 963).

The action started in 01/2016 along with actions B1 and B2. Due to inheritance proceedings and the mortgage in the case of one of the owners, land purchase procedures pursuant to Civil Law regulations could not be completed. Therefore, it was decided to apply the same measures that had been applied to accelerate the land acquisition as in the case of B1. The IPIP for Cerekwianka floodplains was issued on 18/05/2020. It allowed us to start implementing action C6. IPIP is the document proving the dedication of the land for action C6. The land acquisition started after the Development Ministry decision (30/07/2021) adjudicating the land owners` appeal against the IPIP stipulating the final land division and property shares of the particular owners. As the IPIP became final, RM was entitled to elaborate the real estate appraisals for the plots in subject and on that basis to release payments to the landowners. For the Cerekwianka land plots the compensations were incurred in favour of the landowners from 10 to 11/2021.

Communication with the land owners. Two meetings with the landowners were organised in Radom City Hall – 1/03/2019 and 08/06/2020 in order to inform them of the further steps of the land acquisition and payment of the compensation. Soon after the application the landowners of the Cerekwianka land plots were informed about the initiation of the IPIP procedure by the letter of 5/12/2019, and the relevant information was published on the project website. Some of the owners contacted the project office to obtain information about further steps.

Responsible Beneficiary: ***MR***
Milestones:

- *Land purchase contract signed –* ***30/11/2021***

Deliverables:

- Documents proving the dedication of land for the implementation actions *–* ***18/05/2020 (the date when the IPIP became finally valid) (Annex B3)***

Indicators of progress:

- Purchase contracts signed - ha = achieved ***2,2****/ planned in a proposal* ***2***

Regarding both land acquisition procedures (B1, B3) the acquisition indirectly contributed to improving, maintaining and restoring the integrity of the Natura 2000 network since the acquired land is situated (as Radom itself) in a vicinity to the defined area of Natura 2000 and the Nature Based Solutions applied within the project have beneficial impact on the environment as a whole and the more on the nearest areas. The land acquisition was the only way of achieving the desired conservation outcomes of the project. The land is by virtue of the special flood act applied reserved in the long term for conservation, i.e., by enhancing biodiversity, bird species protection: marsh harrier and corncrake but we do not submit to the Final Report digital copies of the land register "conservation clauses". The clauses are not required due to Polish legal regulations. The explanation is included in ***Annex B1.B3.2*** *Explanation about "conservation clauses" in Polish land register*. Maps of the acquired land, which also provides the boundaries of the project areas and the Natura2000 site boundaries are included in ***Annex B1.B3.1*** *Map of acquired land and Nature 2000.*

The data and maps (shapefiles) concerning the land plots acquired for the project implementation were introduced and uploaded to the Land Purchase Database application (LPD) required by the Directorate-General for the Environment. The introduced data concerned both descriptive and spatial information on land parcels acquired in the project.

The overcoming of the problems with the land acquisition that we encountered, paved certain paths of conduct for subsequent beneficiaries of the LIFE program and also way of simplifying the procedures in favor of the adaptation activists. Finding the appropriate procedure for land purchase, for quick implementation of adaptation action, became, actually, one of the key lessons learnt from the project, which in the face of the lack of dedicated adaptation legislation. Taking advantage of these experiences by appropriate decision-making bodies on local and national level, may accelerate implementation of adaptation measures in the future.

C1 Adaptation of sedimentation ponds and weir at Borki Reservoir
C2 Management of extreme flows in Borki Reservoir

Foreseen start date:01/2017 *Actual start date: 09/2020*
Foreseen end date: 03/2018 *Actual end date: 06/2021*

Foreseen start date: 02/2017 *Actual start date: 10/2018*
Foreseen end date: 09/2018 *Actual end date:06/2021*

Due to the functional links between the Borki reservoir and the colmatation ponds, and taking into account the fact that all decisions and permits obtained concerned the Borki reservoir and the colmatation ponds, the report on their implementation is presented jointly for tasks C1 and C2 as one facility. The division into tasks C1 and C2 resulted from the fact that they were presented in this way in a proposal, and then in the grant agreements with the European Commission and the National Fund for Environmental Protection and Water Management. The first part, marked as C1, covering the reconstruction of the colmatation ponds of the Borki reservoir, was carried out on the basis of the detailed design entitled: "Adaptation of the colmatation ponds and trestle weir at the Borki reservoir", while the second, marked as C2, included the renovation of the weir and the front dam and the construction of a

fish pass, carried out on the basis of the detailed design entitled: "Adaptation of the Borki reservoir to mitigate extreme flows".

The objective of these actions was to implement measures related to adaptation of the sedimentation ponds and upper weir at the Borki reservoir. The adaptation allowed it to accommodate increasing flows and sediment loads supplying the reservoir from the upper catchment after intensive rains, increase selfpurification, and maintain / increase biodiversity of the system. As to the reservoir itself – the aim was to enhance the Borki reservoir retention capacity to adapt it to the increased through-flows, allow gradual, controlled water release, minimise internal load (sediments removal) and to increase ecosystems spatial connectivity (fish passes).

Specific measurable purposes of the actions were:

- increasing the retention capacity of the Borki reservoir by about 10-20% through the reconstruction of the damming structure,
- enabling the migration of living organisms and thus clearing the ecological corridor by building a fish pass,
- removal of sediments from at least 70% of the bottom surface of the tank,
- ensuring the proper technical condition of the Borki reservoir hydrotechnical structures,
- improvement of the quality of water flowing into the reservoir by increasing the pre-cleaning capacity of colmatation ponds,
- increasing the retention capacity of colmatation ponds by about 30% by removing bottom sediments and rebuilding the trestle weir.

The scope of the actions included the following works:

- reconstruction of the main weir at km 16+870 of the Mleczna River, including:
  - partial demolition of the existing weir structure and its reconstruction;
  - renovation of the remaining part: concrete and steel structures (abutments, pillars, threshold + basin, barriers and handrails);
  - replacing the gate valves with two double gate valves and adapting the weir to the new damming level NPP=155.30 m above sea level.
- construction of a slotted fish pass at km 16+870 of the Mleczna River at the main weir;
- reconstruction of the front dam - sealing the dam body by burying the PVC wall;
- renovation of the trestle weir at km 17+700 of the Mleczna River (replacement of gate valves, renovation of steel and concrete structures);
- desilting of the Mleczna River bed within the reservoir;
- installation of a system of devices for aerating water and levelling blooms (fountains and aerators) on the tank;
- installation of infrastructure supplying water aeration devices from renewable energy (windmills, photovoltaics);
- reconstruction of colmatation ponds, including:
  - construction of structures regulating the flow of water and pre-treating it;
  - construction of rapids at three existing thresholds;
  - raising the dykes;
  - construction of an exit from the district road and a communication route to the ponds;
  - lighting of the area of colmatation ponds.

The implementation of the project brought the following measurable material and ecological effects:

- increased retention capacity of colmatation ponds by 12,735 m3, i.e. by 60%, by removing bottom sediments and rebuilding the trestle weir (a 30% increase was assumed),
- increased capacity of colmatation ponds to purify water from P and N (nitrogen and phosphorus) (20%),
- preserved species living in colmatation ponds,
- increased capacity of the Borki reservoir, i.e., increased flood retention by 24,558 m3, i.e., by 15.9%, through the reconstruction of the damming structure (an increase of 10 - 20% was assumed),
- mitigated extreme flows on the Mleczna River,
- created a fish pass and cleared ecological corridor,
- removed sediments and roots of aquatic plants in a layer of ca. 10 - 20 cm from at least 70% of the bottom surface of the reservoir,
- proper technical condition of the Borki reservoir's hydrotechnical structures is ensured,
- improved quality of water flowing into the reservoir by increasing the pre-cleaning capacity of colmatation ponds.

Responsible Beneficiary: ***WMR***

Deliverables: Report from maintenance of the sedimentation ponds and of the upper weir – – 1 Report (joint for C1 and C2) 31/07/2021 (Annex C1.C2)

Indicators of progress:

- Increased water retention capacity of sedimentation ponds = achieved ***60%*** */ planned in a proposal* ***10%***

- Purification capacity of sedimentation ponds - ***15 % N, 10% P, 10% Fe, 50% TSS*** *(annual)*

C2 Management of extreme flows in Borki Reservoir

Foreseen start date: 02/2017 *Actual start date: 10/2018*
Foreseen end date: 09/2018 *Actual end date:06/2021*

Responsible Beneficiary: ***WMR***

Deliverables: Report on the performed reservoir cleaning and adaptation activities – 1 Report (joint for C1 and C2) 31/07/2021 (Annex C2)

Indicators of progress:

- Borki reservoir retention capacity increased - % = ***10/ 10***

C3 Improvement of water quality, mitigation of flows and biodiversity in Potok Północny

Foreseen start date: 07/2017 *Actual start date: 09/2021*
Foreseen end date: 09/2018 *Actual end date: 09/2022*

The objective of this action was to create additional retention capacity on the Potok Północny stream, to mitigate transfer of the upstream catchment high flows into the city.
The objective of construction of a flood control reservoir on the Potok Północny together with a sequential sedimentation and biofiltration system was to implement innovative solutions for the management of rainwater and snowmelt, promoting the restoration of natural water ecosystems in urbanised areas, taking into account the needs of society for flood protection and counteracting the effects associated with the phenomenon of drought and increase biodiversity of the stream, as well as self-purification of its waters.
The project consisted in damming up inland surface waters by means of damming devices - a dam and an accumulation threshold - and retaining the waters of the Potok Północny

watercourse in a water reservoir for flood control purposes, together with the construction of functionally necessary accompanying infrastructure carried out as part of the investment.
The specific achievements of the reservoir construction were:

- Alleviation of extreme flows of water flowing into the city via the Potok Północny,
- retention of water flowing into the city via the Potok Północny in an area of 2,2 ha,
- creating a habitat and breeding ground for amphibian species,
- improving the quality of life in the neighbouring settlements by creating more favourable microclimatic conditions and building blue-green infrastructure,
- creating a multifunctional area according to the **WBSR+C** principle (water, biodiversity, ecosystem services, resilience + cultural heritage) fulfilling the functions of:

✓ treatment of rainwater and snowmelt (rainwater) flowing in the Potok Północny through the use of a (SSBS) sequential sedimentation-biofiltration system (WATER),
✓ increasing biodiversity, including the creation of habitat sites (BIODIVERSITY),
✓ acting as a retention reservoir reducing the effects of flooding during periods of intense precipitation, and will provide water for environmental and social purposes during dry periods (ECOSYSTEM SERVICES),
✓ adaptation of the area to climate change by reducing its vulnerability (RESILIENCE),
✓ improving the quality of life for current and future generations (CULTURAL HERITAGE).

The construction works started on ***09/09/2021*** and ended on ***15/09/2022.***
Responsible Beneficiary: ***WMR***
Deliverables: Report on the implemented SSBS / extended detention area on the Potok Północny 31/11/2022 (Annex C3)
Indicators of progress:
- Multi-use water retention area at Potok Północny - ha = achieved (acquired for the project) ***2,11/*** *planned in a proposal* ***1,7***

C4 Restoration of Mleczna River Valley
Foreseen start date: 01/2017 *Actual start date: 10/2018*
Foreseen end date: 03/2019 *Actual end date: 06/2021*

The objective of this action was to restore the Mleczna river channel on the length of 630 m and its valley. Adaptation of the river valley reduced water flow speed and erosion, increased local river/valley/landscape/groundwater retention and vegetation watering, increased biodiversity, and strengthened resilience of the river system to climate change-related stress.

As the land under the river and the valley belongs to the MR, implementation of this action did not require land acquisition. However, the analysis of the land allotments was required in order to exclude potential conflicts related to the land claims, which might have caused e.g., the situation when the land had to be returned due to land claims.
In order to denaturalise a section of the Mleczna River bed, it was designed to perform regulatory structures, which were classified as flood control structures. The aim of the regulation of the Mleczna riverbed section, which enabled the restoration of the natural conditions of the riverbed, was to increase the cross-section of the riverbed and to create a right-sided floodplain, which, together with the decreased longitudinal gradient of the river and the increased flow resistance, delayed the flood waters flow to the lower lying areas of the Mleczna river basin. The construction works started on ***05/05/2020*** and were completed on ***18/06/2021***.

The implementation of the project brought the following measurable material and ecological effects in accordance with the project assumptions:

- recreation of meanders of the Mleczna River bed on the section of 315 m (a section of new meanders on a length of 171 m and a natural channel on a length of 144 m):
  - 4 artificial oxbows acting as hide-out for water fauna during high flow,
  - 10 systems acting as riffle-like (shallows) and stream pool-like (deeps) systems in the riverbed,
  - gravel heaps in the riverbed raising the water level and improving landscape and river bed retention,
  - restored floodplain area for flood protection,
  - reconstruction of the outlet of the rainwater collector to the river into a purifying hydrobotanic system;
- increasing the retention capacity of the Mleczna river basin by approx. 5.5 thousand. m3 (3.1 thousand m3 in stagnant bays);
- lowering the water levels in the riverbed during flood flows by constructing a large-water canal;
- improvement of water quality (the assessment of the result in this respect was made after the analysis of systematic tests of water quality in the river);
- slowing down the flow of flood waters (reducing the longitudinal slope of the channel);
- slowing down of flood waters outflow;
- restoration of degraded natural and semi-natural hydrogenic habitats;
- restoring the ecological corridor of the river valley;
- improvement of habitat quality for bird species, amphibians, invertebrates, etc.

At the request of WWF Poland, gravel prisms were used in the Mleczna riverbed during the works carried out, which resulted in a very favourable for the environment rise of the water level and increased channel and ground retention. Construction works on the aforementioned task were performed in the period from 11/05/2020 to 30/06/2021, while the design works and obtaining the necessary arrangements, permits and decisions lasted from the beginning of 2018. The Environmental Impact Assessment issued by the Regional Director of Environmental Protection was obtained on 18/08/2019; the decision of the Director of the Regional Water Management Board in Warsaw - water permit was obtained on 28/10/ 2019; the construction permit of the Mazovian Voivode to implement the investment in the field of flood control structures was obtained on 28/04/2020.

Responsible Beneficiary: ***WMR***
*Deliverables****: Report on the Mleczna restoration 31/12/2021 (Annex C4)***
Indicators of progress:

- *Restoration of Mleczna river - m =* ***630***
- *Mitigating extreme flows in the Mleczna River - % =* ***10***

C5 Adaptation of the A0 rainwater channel for improving of the water quality outflows to the Mleczna River

Foreseen start date: 07/2018 *Actual start date: 03/2018*
Foreseen end date: 11/2022 *Actual end date: 11/2022*

Adaptation of the A0 rainwater channel for improving of the water quality outflows to the Mleczna River was divided into two tasks:

• Sealing of the inner walls of the A0 channel (679 m section of A0 storm water channel, above the outflow to the Borki reservoir) Ø 1800 mm, made of reinforced concrete pipes, which

transports stormwater from the upper Mleczna river catchment to the Borki reservoir in order to prevent iron infiltration from groundwater. The public procurement procedure was announced on 05/01/2018, settled on 27/02/2018 and the contract signed on 26/03/2018. The investment works were conducted from 05/07/2018 to 24/06/2019.

- Constructing a sequentional sedimentation-biofiltration system for obtaining water from the A0 underground collector, pre-treating it and discharging it to the Borki reservoir in the summer for water alimentation. The investment works were conducted from the 20/04/2022 to 25/07/2022.

The objective of this action was to reduce pollution and high water fluxes to the Borki reservoir.
For the A0 channel sealing, market and technology investigation were carried out aiming at the selection of the best sealing technology. The investigation revealed, that the estimated costs of the action were very variable and high, and the costs of carrying out this activity were higher than the costs foreseen in the project. Therefore it was decided, that a shorter section of the channel will be sealed, and with a more economic technology. This also resulted with smaller funds left for the SSBS implementation.
The main aim of solution was applying a system of Permeable Reactive Barriers for pre-treatment of water from the A0 underground channel, which are used to increase the flow in the Mleczna River, thus supplying the Borki reservoir in Radom. The arrangement of these barriers was part of the Sequential Sedimentation and Biofiltration System, which was adapted to local conditions and was divided into three parts. This system was integrated with a hydrotechnical solution in the form of an underground swirl settling tank for pre-treatment of water and elimination of mainly pollutants suspended in the water column. The entire hybrid system was divided into two parts. The first includes a system of water intake from the A0 underground canal with a swirl settling tank and a pumping station, ending with a settling tank located at the point of water outlet to the surface. The second zone was the above-ground system of Permeable Reactive Barriers (PBR), made in the existing concrete channel, where three types of barriers with a total length of 112 m were used, made of dolomite, limestone and BioKer, respectively. The last element was a biofilter built on a sandy substrate with a plant zone of approx. 600 m2. The overflow into the Mleczna River took place over the entire length of the side slope of the biofilter, lined with dolomite stones.

Responsible Beneficiary: ***WMR***
Milestones:
- Start of the first implementation action – ***achieved 05/07/2018 (****for A0 canal****)***
Deliverables:
- Report on the constructing a sequentional sedimentation-biofiltration system – 31/12/2022 (Annex C5.1, Annex C5.2)
Indicators of progress:
- Channel A0 sealed at a distance of ***693 m*** *and iron pollution in water decreased - Change to baseline:* ***40%*** *Fe*
- Sequenced sedimentation-bio filtration system up the Borki Reservoir applied - ***20%*** *annually (ca. 20% N, 15% P, 10% Fe, 40% TSS)*

C6 Construction of innovative green-blue infrastructure for storm water management in the inner city
Foreseen start date: 01/2017 *Actual start date: 05/2018*
Foreseen end date: 12/2021 *Actual end date:11/2022*

Task 1-14: small-scale BGI in the city landscape (*See Action A5 – index of small-scale BGI)*

Tasks 1-14 were implemented by FPP, and their objective was to implement small-scale BGI in the urban space of Radom. According to the action description in the project application, the following items were implemented: Climaponds, Climaboxes, green roofs, impermeable surface, rigolas (tree-trenches, raingarden, swales). Eventually the following items were implemented:

5 Climaponds – ***biological reservoirs for collecting rainwater from roofs*** (2 Public Kindergartens: No. 11 and No. 16; Public Primary School No.11 (climapond with wooden bench), 2 High Schools: No. III and No. XI)

A total of 5 small reservoirs - ponds - were constructed, collecting rainwater from the roofs of the educational buildings. The water is fed through gutters and then through a system of troughs or so-called dry streams. The reservoirs were designed to accumulate the incoming water during rainfall and the excess gradually infiltrated into the ground during the following days. Once the water was returned, the reservoir was ready to receive the next portion of rainwater. In and around the reservoirs, aquatic and marsh vegetation species were planted, also in additional wooden pots. All locations were equipped with educational boards and Climaponds additionally secured by installing fencing.

8 Climaboxes – biological above-ground reservoirs for collecting rainwater from roofs (Public Kindergarten no. 4 - concrete ClimaBox, High School No. XI - Wooden-metal ClimaBox (2 units), Nad Potokiem Nursing Home - Wooden-metal ClimaBox (2 units), Combat and Labour Veteran Welfare Home - brick ClimaBox (2 pieces), MCC AMFITEATR - composite ClimaBox)

Climaboxes are a kind of rain garden that can be made from a variety of materials. It is an ideal solution where there are no conditions for the construction of a Climapond. They can be placed directly against a building wall. The tanks, like the other small BGIs, have a water retention function, provide the ability to irrigate plants in times of drought and provide a resting place for facility users, both children and adults. Excess rainwater is discharged through a system of dry troughs into absorption basins planted with moisture-loving vegetation.

14 - Rain gardens, Tree trenches and swales - various forms of rainwater harvesting areas:

1 cascade rain garden (Public Kindergarten No. 11) equipped with an emergency overflow was designed to intercept and utilise rainwater from the roof of the kindergarten building with an area of approximately 162 m2 and a paved area (pavement) of approximately 33 m2. The size of the garden was chosen to intercept a torrential rainfall with a probability of occurrence once in 10 years and a duration of 1h, which corresponded to a rainfall total of 35 l/m2. *3 swales* (Bema Square) a set of three depressions in the area that collect rainwater from the surface of the square, acting as absorption basins. Their total surface area is 164.1 m2. The basin zones have been separated by an installation of gabions filled with hydrotechnical stone. 8 swales to manage excess rainwater from Climaboxes (High School No. XI (2 units), Nad Potokiem Nursing Home (2 units), Combat and Labour Veteran Welfare Home (2 units)), Climapond (Public Kindergartens: No. 11) and take place outdoors. Similar solution with one tree was applied at Jagielloński Square to manage rainwater from green roof bus stop.

5 green roofs : 2 bus stops *(Jagielloński Square) and* ***3 bike shelters (*** Public Primary School No. 33, Radom Sport Center RCS, High School No. III) made of a reinforced steel structure allowing for the foundation of a green roof (approx. 10m2) and a green wall (approx. 9m2). The green roof is equipped with a rainwater retention system of a 10m2 area planted with a sedum mix. The roof structure was designed to retain up to 90% of rainwater, which was used to irrigate the roof and the vegetation planted around the shelter structure. Under normal conditions (except during summer droughts), the shelters under the green roofs do not need any additional irrigation of the vegetation.

1 permeable surface (High School No. XI) - ca. 65 m2 of concrete pavement was changed to a permeable surface.

1 rain water tank (High School No. XI) - to store rainwater from school roof that could be used to water social garden runed by local NGO (installation was done by FPP in cooperation with Zielona Akcja NGO that delivered the tank) at nearby parcel.
2 tree trenches (Public Primary School No. 33, Jagielloński Square) a tree row or single tree with an irrigation system. The system at Public Primary School No. 33 was designed to capture and use rainwater from the 290 m^2 of the school's roof. The water from the roof was fed into the basin via gutters and further dry streams. A row of 5 trees of native species has been planted in a basin of approximately 39.6m^2, which is able to absorb nearly 8 m^3 of water at once. Right next to the tree trench, 9 benches have been set up in such a way that educational activities can
Technical documentation/ permits of the items are provided in ***Annex A5.2***
Photographs of the items not delivered in the previous Progress reports and MtR are included in ***Annex C6.2.1***
More information about biodiversity is provided in the description of the action D5, and in the ***Annexes: D5.1 – D5.7***

Task 15: Adaptation of land to create a polder floodplain at the Cerekwianka Stream

Task 15 as other large-scale BGI was executed by WMR.
The aim of the task was to adapt the floodplain as a system of effective and pre-cleaning precipitation and snowmelt floods in the Cerekwianka stream and to help biodiversity in the polder area by using a mosaic of mud and earth habitats with ensuring adequate inflow and outflow, i.e., retention and safe spreading of floods in the polder area. It was important to preserve the native vegetation of the polder area without new species, which ensures the maintenance of morphological continuity and the permeability of ensuring the good condition and ecological potential of the Cerekwianka stream, a separate migration corridor and a place for spawning and growing up of ichthyofauna.
The investment site is located in the western part of Radom close to national road No. 12 with heavy traffic. The polder was formed in the area adjacent to the river, where in the past there were ponds fed by the waters of the Cerekwianka stream.
The polder with an area of approx. 1.7 ha (estimated 1.2 ha) has three separate zones (A, B and C) separated by dikes and connected by flotation - overflow structures. Thanks to this solution, in each of the zones, the waters of the Cerekwianka stream are independently purified, which, with three zones, ensures the effectiveness of the process. In each of the zones there are depressions in which water flowing through the polder accumulates.
The retention capacity of a flood polder with a retention area of approximately 1.7 ha and an average depth of 1.0 m was created to reduce the maximum flows in the Cerekwianka stream
Number of sites inhabited by specific species = 1 (out of 12 were planned for the entire C6 task, covering a number of other small BGI tasks, such as clima-ponds, rain gardens, soaking basins, which are also occupied sites).
Construction works on floodplains on the Cerekwianka stream were carried out in the period from ***18/08/2020*** to ***30/09/2021***.
The task was finally accepted from the Contractor on ***06/10/2021***.
Responsible Beneficiary: ***WMR***
Deliverables: ***Report summarizing the finished implementation process – 2 reports (on small-scale BGI and on the Cerekwianka polders) 31/12/2022 (Annex C6.1, Annex C6.2.1)***
Indicators of progress:

- Number of sites colonized by certain species - number = achieved ***12***[6]*/ planned in a proposal* ***12***

[6] *11 „small-scale" BGI (monitored in terms of biodiversity) and Cerekwianka polder*

D1 Monitoring of climatic conditions and surface runoff
Foreseen start date: 10/2015 *Actual start date: 04/2018*
Foreseen end date: 03/2022 *Actual end date: 10/2022*

The objective of this activity was to collect and analyse existing and new meteorological data in the field, and to generate and analyse climatic scenarios for Radom, to be further used for the purposes of the project.

Until 2018 when new weather stations purchased within the project were installed in 3 locations in Radom, WMR in cooperation with UL and FPP collected climatic data from the external institutions, including IMWM, VEPI, Radom Airport, Radom Military Airport, EPA and from private meteorological stations. The data included: rainfall, snow cover, air temperature, air pressure, potential evapotranspiration and humidity.

Climatic scenarios for Radom: Analysis of the climatic scenarios for the area of Radom was based on two future scenarios of the emissions used in the V IPCC report (IPCC AR5 2013), recommended by SPA 2020 the KIMADA project: RCP 4.5 (average changes scenario) and RCP 8.5 (pessimistic scenario). The results of the newest simulations of the climatic models from the CORDEX initiative, sponsored by the World Climate Research Program (WRCP) were used in the analysis of the thermal and hydrological exposition in the VA assessment. We analysed the changing weather (current, 2050 and 2010 perspectives) for 29 climatic indicators, including thermic, rainfall, snow, wind and drought indicators. The task was completed. ***[Annex no 3a: 17/11/2017 Progress Report]***

Collecting meteorological data in the field: WMR purchased and installed in Radom area three meteorological stations. The stations were purchased with delay, due to insufficient funds and time needed to secure them, through financial shifts, and the need for market analysis, assuring the best possible equipment, enabling on-line measurement and synchronisation of data with the IMWM stations network. Finally, WMR obtained the Agency consent to use the budget planned for the conference room rental, for the purpose of purchasing the equipment (*EASME accepted request by the letter Ref. Ares (2017)2270108 - 03/05/2017***).** The purchase and installation were completed in May 2018. Since July 2018 then the stations have been continuously conducting the real time measurements of wind speed, pressure, rainfall, air temperature and humidity. In the letter on the 12th of July 2018, EASME asked about the higher costs of purchase. Detailed explanations were provided in the financial part of the Mid-term Report ***[Annex no D1_1: 28/09/2018 Mid-term Report].***

Due to delay in the purchase and installation of monitoring stations (D1) and in order to provide data for the VA analysis (A.3) and development of conceptual guidelines, technical concepts and technical documentation for the BGI implementation (A.5), UL implemented additional meteorological monitoring in the framework on the contract concerning Action A.4. As part of the action, a 2016 data report covering both hydrological and meteorological measurements was established. Reports were provided in ***[Annex no 19, Annex no 20: 17/11/2017 Progress Report].***

The result of the monitoring conducted in 2018 – 2022 is the Report entitled "Assessment the impact carried out under the LIFERADOMKLIMA-PL project in Radom on the mitigation of the city`s adaptation to climate change" involves obtaining, organizing and analyzing meteorological data from three weather stations in Radom catchment area (Olsztyńska, Sławno, Such). Precipitation data (height and intensity of precipitation) and air temperature monitoring data were analyzed.

Measurements at the weather stations in the Radom area have been carried out continuously from May – June 2018 (depending on the station) to September 2022. Due to the certain purpose of the analyzes, the precipitation charts were generated for the period from 22/08/2018 to 18/08/2022 and recorded temperature charts from the period from 22/08/2018 to 05/09/2022. The individual charts show:

- Precipitation totals by time interval (e.g., months),
- The intensity of precipitation,
- The course of air temperature changes over time.

The main purpose of obtaining data on precipitation and temperatures in the Radom catchment area and conducting analyzes of the recorded measurement sequences remains:

- Preparation of hietograms for calibration of the numerical model of the analyzed hydrological network,
- Determination of basic hydrological relationships in the analyzed catchment area in relation to the measurement campaign carried out on the watercourses and the Borki Reservoir,
- Determination of the so called "catchment response to precipitation",
- Determination of the catchment`s retention capacity,
- Determination of the influence of temperatures on the scale of transpiration and avapotranspiration on the formation of surface runoff and outflow from the catchment,
- Comparison of precipitation and air temperature monitoring results to multi-year data.

See details in ***Annex D1.1 Weather stations report***

Responsible Beneficiary: ***WMR***
Deliverables:

- ***Reports including the first data from the D1 monitoring – achieved 31/03/2017 (delivered in [Annex no 19, Annex no 20: 17/11/2017 Progress Report])***
- ***Report on the meteorological data collected 2017 (delivered in a previous report)***

Indicators of progress:

- *Number of reports prepared:* ***2 reports: 1 from 2017 and 1 summary report including measurements from 2018 – 2022, analysis and conclusions of the monitoring activities carried out*** *(see the Summary report* ***in Annex D1.1)***

D2 Assessment of hydrological effects of adaptation measures (C1-C6)

Foreseen start date: 10/2015 *Actual start date: 02/2016*
Foreseen end date: 03/2020 *Actual end date: 11/2022*

The objective of this activity was to conduct hydrological measurements and modelling needed for design of and implementation of the adaptation measures, as well as plan and convey monitoring of hydrological parameters before and after implementation of the adaptation measures, in order to assess the ecological effect of the project.
The task was divided into two phases: initial - before and final - after implementation of adaptation actions.
In the initial phase of the project implementation, UL was cooperating with an external partner, which in the years 2016-2017 conducted hydrological monitoring and modelling of the Mleczna river basin. Within the scope of the task, the following reports have been generated:

- Report on consultancy services in the field of mathematical modelling for the project LIFERADOMKLIMA-PL in Radom stage II. Delivered in ***[Annex no 19: 17/11/2017 Progress Report]***

- Report on consultancy services in the field of mathematical modelling for the project LIFERADOMKLIMA-PL in Radom stage III. Delivered in ***[Annex no 20: 17/11/2017 Progress Report]***

Measurement campaign was conducted at selected points of the rainwater sewage system and selected cross-sections of surface watercourses, and covered river flow and filling of the riverbed.

The model was calibrated based on the meteorological data collected in this action and action D1. As a result, high convergence of the parameters simulated by the model (e.g., the filling height of the channel) with the real data was achieved.

The work started two quarters later than planned in the application (in the first quarter of 2016). The work ended one quarter later than planned by the project schedule, and the task was completed in 6 quarters.

After the implementation of adaptation measures (actions C1-C6), hydrological monitoring was carried out in 2022 and the hydrological model was verified and optimized in the last year of the project. The report and various annexes to it are included in ***Annex D2***.

The increase in the amount of water transported by the Mleczna river and its tributaries during rainy periods to the city centre contributed to the occurrence of numerous floods. In order to increase the rainwater retention capacity, the technical infrastructure of the Borki reservoir was reconstructed. It contributed to the additional retention capacity of rainwater in the reservoir amounting to almost 30,000 m3. This meant that for an extreme flow in the river after an intense rainfall (the so-called hundred-year-old water), lasting up to 45 minutes, the water fit entirely in the reservoir. As a result, the works performed improved the flood safety of the areas located in the catchment area of the Mleczna River, below the reservoir (city centre). On the other hand, in order to counteract water shortages during periods of drought, a solution was implemented to take over water from the underground A0 canal, running along the Borki reservoir. Optimization of the functioning of the pumping station was carried out and the sewer drain was rebuilt, thanks to which the reservoir obtains additional amounts of pre-treated water.

The construction of flood polders on the Cerekwianka stream and the Potok Północny contributed to the retention of another 27 thousand m3 of rainwater. After the rainfall wave passes, the water retained in the polder can be drained, preparing the system to take over the next wave, or it can be retained and used for the environment (improvement of the microclimate, increasing landscape retention) in rainless periods. Thus, the implemented solutions directly protect the Mleczna river and indirectly the central part of the city against floods and flooding.

Responsible Beneficiary: ***UL***

Deliverables:

- Reports including the first data from the D2 monitoring – achieved 31/03/2017 (delivered in a previous report)

Indicators of progress:

- Number of reports prepared – ***2/1***

D3 Monitoring of social-economic effects of the project

Foreseen start date: 01/2020 *Actual start date: 06/2016*
Foreseen end date: 09/2022 *Actual end date: 10/2022*

The objective of this activity was to gather opinions of adult inhabitants of Radom on concerns and experiences related to the effects of climate change. The task is divided into two stages: before and after implementation of the adaptation actions.

The first public awareness survey was conducted between August and October 2016 . The main objective of the 2016 edition survey was to gather the opinions of adult residents of Radom regarding their knowledge and attitude to the effects of climate change and it was the basis for further survey at the end of the project in September - October 2022. The first survey was carried out between August and October 2016 y and the elaborated report was a summary and compilation of the most important results obtained in the course of the survey and the analyses carried out. Information on the assumed research scope was obtained through the use of a survey questionnaire. The questionnaire consisted of a total of 14 questions. The questionnaire contained mainly questions related to the topic of the study, as well as metric questions. The study was carried out on a sample of 500 adult residents of Radom selected in a stratified and random way, where: 400 respondents were residents of areas of the city particularly vulnerable to climate change; 100 respondents were residents of areas of the city not exposed to climate change.

Areas particularly vulnerable to climate change were defined as residential buildings located within a 1 km radius of: the Mleczna River (the vicinity of the Boulevard on the Mleczna river), Borki Reservoir, the Cerekwianka stream (Halinowski Stream), Potok Północny and Potok Południowy. The Report was delivered in ***[Annex no 28: 17/11/2017 Progress Report]***

The main objective of 2022 edition survey was to determine whether the city's residents experienced an improvement in the quality of life in their city, whether their knowledge and awareness of progressive climate change and its negative impacts had increased, and whether the LIFE14 CCA/PL/000101 project was meeting their expectations in terms of its impact on increasing the city's resilience to climate change. Responding to the above objectives required comparing the results of this survey to the results of the 2016 edition. The study was carried out on a sample of 522 adult residents of Radom in direct contact with respondents. The basic criterion for dividing the respondents was the place of residence, hence in the general sample 400 inhabitants of the city areas particularly exposed to the effects of climate change and 122 inhabitants from the control group represented by people living in Śródmieście (central part of the city).

The second edition of the survey was carried out in the period from September to October 2022. Information on the assumed research scope was obtained through the use of a survey questionnaire. The questionnaire consisted of a total of 18 questions. In order to maintain the possibility of drawing comparisons with the results of the 2016 survey, the number of changes to the content of the questionnaire was limited. In its main part, the questionnaire changed slightly over both editions of the survey. The questionnaire mainly contained questions relating to the topic of the survey, as well as metric questions. These were approved by the Employer at the design consultation stage.

According to the survey outcomes, the inhabitants of Radom do not question the existence of climate change. The vast majority of them consider it a serious problem that should become the basis of city policy. Nearly 2/3 of the inhabitants are concerned about the condition of the natural environment in the city. Over the past six years, the percentage of inhabitants of Radom, declaring the discussed concerns, has increased significantly. Concerns are most often related to poor air quality, and the effects of long-term heat (e.g., drought, water shortages), temperature changes and the formation of the emergence of the urban heat island or the pollution of rivers and water reservoirs. The hierarchy of basic concerns has not changed significantly in recent years. However, the percentages of residents declaring particular of them have changed. Particularly noticeable is the increase in the percentage of residents of Radom who are afraid of poor air quality and respiratory diseases. It can be considered that this is related to the intensive public education on the effects of low emissions conducted in recent years. Knowledge and awareness of the city's inhabitants, regarding the progressing climate change and its consequences, has increased. In the hierarchy of fears of Radom residents, an

important place is occupied by the shortage of greenery within the city limits, and the cutting down of trees and the degradation of the animals' natural habitats. Almost 80% of residents declare that Radom overheats in hot weather, 61% feel a deterioration of their well-being at this time, and 46% are concerned about their own health. The residents of Radom are looking for relief in places where they can take shelter from high temperatures. However, according to 70% of respondents, there are still too few of them in Radom. Over the last few years, the percentage of residents experiencing discomfort related to the lack of food has significantly increased places of green recreation. It is also symptomatic that 73% of Radom residents expect more trees and shrubs to be planted within the city limits. Based on the analysis of the survey results, there is no doubt that any improvement in the quality of life in the city will be strongly related to effects of heating the city during the heatwave. This is of particular importance for the elderly, whose percentage of the population will increase in the coming years. On the other hand, residents felt an improvement in the quality of life in the city in terms of rainwater management. Currently, the percentage of residents fearing the effects of increased rainfall, storms, flooding and of floods is lower than in 2016. The opinions of people living in the areas deserve particular attention directly affected by the effects of climate change. People from this group are much less likely than other respondents to be afraid that they may experience local flooding in the future (e.g., flooding of basements). Improvement also occurred in the aspects of turning streets and sidewalks into torrents during heavy rainfall, overflowing/overflowing sewers, or polluted/obstructed inlets of these. In recent years, the percentage of residents who do not experience these phenomena has increased. 80% of residents also appreciated the usefulness of increasing the capacity of the municipal Borki reservoir and building a new one reservoir on the Potok Północny.

Annex D3 includes the final Report of the second 2022 survey.

Responsible Beneficiary: ***MR***

Indicators of progress:

- *Questionnaires distributed and collected in year 1 of the project*
  number of questionnaires = ***500/500***
- *Questionnaires distributed and collected at the end of the project*
  *number of questionnaires =****522/500***

D4 Assessment of the effectiveness of the adaptation measures for water quality improvement

Foreseen start date: 03/2016 *Actual start date: 03/2016*
Foreseen end date: 06/2020 *Actual end date: 10/2022*

The objective of this Action was to monitor quality of surface waters in Radom at the beginning of the project, before implementation of C1-C6 adaptation measures, and at the end of the project, after the adaptation measures implementation. The data generated at the beginning of the project were also used in the development of the conceptual guidelines for the adaptation measures.

The task was divided into two stages: before and after implementation of the adaptation actions.

At the beginning of the project, the monitoring program covered 12 sampling stations, which were sampled for: • physical parameters (temperature, pH, conductivity, oxygen, COD, suspension) • chemical parameters (TP, TN, P-PO4, N-NO3, N-NH4, Fe, Cl), • heavy metals (cadmium, total chromium, nickel, lead, zinc, copper, mercury).

Biological parameters at different stations included analysis for: • hydromorphological status acc. to the River Habitat Survey method; • benthic macroinvertebrates acc. to Inspection for Environmental Protection methodology; • diatomaceous phytobenthos; • phytoplankton and

zooplankton dynamic; • macrophytes; • microbiological water quality, pathogenic bacteria and safety of bathing; • concentration of cyanobacterial toxins; • chemical composition of bottom sediments for the content of biogenic substances, dioxane and PCB; • ecological status / potential.

Details of the analysis were delivered in the previous report ***[Annex no 5; Annex no 10; Annex no 15: Annex no 16; 17/11/2017 Progress Report]***

The quality of surface water at all research stations in accordance with the standards set out in the Regulation of the Minister of Environment of July 21, 2016 (Journal of Laws of 2016, item 1187), was defined as the poor condition of waters, due to the exceedance of numerous physicochemical parameters. Biological parameters indicated poor water quality mainly in the Mleczna and the Potok Północny rivers.

Analysis of the fish community showed that as a result of the restoration of the Mleczna river, the condition of fish habitats, as well as the conservation status of all fish species in the area covered by the investigation works improved.

The first stage of the project was completed in the second quarter of 2017. The final monitoring report comparing the firs data with the results of studies conducted in the last year of the project after the completion of investment works was elaborated in 10/2022 and is included in ***Annex D4.***

The final monitoring report consists of 4 reports on microbiological and toxicological parameters showing that the implemented in the project ecosystem-based solutions improved the chemical and physical quality of water.

1. Report on physicochemistry concerns the assessment of the impact of investments made under the project on the physical and chemical condition of the waters of the Mleczna river catchment area in the city of Radom in order to assess the effectiveness and optimization of the implemented projects. Monitoring of physicochemical parameters was carried out in the period from June 2021 to October 2022, at 12 basic sites to assess the water level in the post-investment period in the project and compare it with the water level at the same sites in the pre-investment period, and at 14 sites supplementary tests in order to assess the effectiveness of individual solutions. The choice of monitoring points was dictated by the location of the project's investment areas and the need to assess the effectiveness of their functioning.
2. Report of biological elements. Includes assessment of the ecological status/potential of the Mleczna, the Kosówka and the Cerekwianka watercourses and the Borki reservoir and evaluation of the hydromorphological condition of the Mleczna river section after hydrotechnical works carried out according to the River Habitat Survey (RHS) method.
3. Report from microbiological assessment and analysis of occurrence of cyanobacteria. In this report the results of the monitoring indicated that the reconstruction of the colmatation ponds fulfilled the intended function and prevented the entry of potentially pathogenic bacteria to the rest of the waters, including several swimming pools.
4. Report on the functioning of the system of cleaning of waters from the A0 channel. The Report presents the effectiveness of the solution, which is a system of Permeable Reactive Barriers for pre-treatment of water from the A0 channel, which are used to increase the flow in the Mleczna river, thus supplying the Borki reservoir. The arrangement of these barriers is part of the Sequential Sedimentation and Biofiltration System, which was adapted to local conditions.

Responsible Beneficiary: ***UL***

Deliverables:

- ***Reports of the first data from the D4 monitoring - delivered 30/06/2017***

- ***Final monitoring - achieved***
  Indicators of progress:
  *- Number of reports prepared – achieved **4/** planned in a proposal **2***
-

D5 Monitoring of biodiversity
Foreseen start date: 03/2016 *Actual start date: 03/2016*
Foreseen end date: 12/2019 *Actual end date: 12/2022*

The objective of this action is to monitor biodiversity in the C1-C6 sites, before and after implementation of adaptation measures. Biodiversity data generated at the beginning of the project were also used in the development of conceptual guidelines for the adaptation measures, as well as were part of the tenders for development of technical concepts and technical projects for the adaptation measures.

The task was divided into two stages: before and after implementation of the adaptation actions.

Details of the work conducted in the first stage are presented in the following reports:

- Assessment of the state of fauna in the catchment area of the Mleczna River in the Radom city in the development area related to the implementation of the project LIFERADOMKLIMA-PL (LIFE14 CCA/PL/000101). ***[Annex no 10: 17/11/2017 Progress Report]***
- Insects: From the mouth of the Kosówka river to the Mleczna river at Piotrówka. Presence of invertebrates in the development area. ***[Annex no 11: 17/11/2017 Progress Report]***
- Insects: Dolina Cerekwianki. Presence of invertebrates in the development area. ***[Annex no 12: 17/11/2017 Progress Report]***
- Insects: Potok Północny. Presence of invertebrates in the development area. ***[Annex no 13: 17/11/2017 Progress Report]***
- Inventory of actual vegetation and flora with indication of hazards and revitalization action proposals for selected areas of green in Radom. ***[Annex no 14: 17/11/2017 Progress Report]***
- A report on the results of the natural inventory of 2016 year with recommendations for actions C. 1 to C. 6. ***[Annex no 29: 17/11/2017 Progress Report]***

The project, by increasing the quantity and quality of water-related habitats, had a very beneficial impact on the biodiversity of Radom. In most of the analyzed areas, species diversity increased significantly. According to the project assumptions, each of the project locations was colonized by a "certain" new species. However, due to the fact that the natural effects are postponed in time – species need time to fully colonize new areas and increase their numbers, on objects created in the last year of the project (e.g., the Potok Północny) positive effects will be visible in the next season.
After implementation, monitoring showed the occurrence of 124 bird species in the studied area, while compared to the results of the 2016 inventory, the number of recorded bird species increased. The list of breeding species was expanded by the thrush nightingale Luscinia luscinia and probably the Little grebe Tachybaptus ruficollis and European stonechat Saxicola rubicola breeding on the surface of the Borki reservoir. The list of species from Annex I of the Birds Directive was also extended from 11 to 16, with the Black stork Ciconia nigra, Black-throated diver Gavia arctica, Whiskered tern Chlidonias hybrida, Black tern Chlidonias niger and Peregrine falcon Falco peregrinus, but they used this area mainly for rest and feeding.
In total, 7 species of amphibians were found in the last year of the project, including 4 species listed in Annex IV of the Habitats Directive – Marsh frog Rana arvalis, Lake frog Rana lessonae, Green toad Bufotes viridis, Common spadefoot Pelobates fuscus.

There was an increase in the number of fish species from 17 in 2016 to 22 in 2022, including 4 species from Annexes II and/or IV of the Habitats Directive: Misgurnus fossilis (increase in the number of sites in 2022), Cobitis taenia (new species statement) and Anguilla anguilla and Aspius aspius, with the presence of the latter 2 species being entirely dependent on stocking carried out by the fishing user of the basin.

The project area is inhabited by a few valuable species of insects, m.in.: the occurrence of species was confirmed. II and IV of the Habitats Directives: cinnaberinus beetle Cucujus cinnaberinus and large copper (Lycaena dispar), in addition, 23 species associated with aquatic habitats of dragonflies - the most species were observed at the Borki reservoir - 22 and over the Cerekwianka stream- 21 species. For the first time, the scarce blue-tailed damselfly Ischnura pumilio was observed – a dragonfly not yet found on Radom reservoirs.

The increase in flora biodiversity was associated with both the spontaneous emergence of new species and communities, as well as the deliberate introduction of new species or the planting of existing ones to strengthen existing populations or restore vulnerable communities. In the years 2021-2022, unlike in 2016, the presence of two protected species of vascular plants and one species of macroscopic fungus included in the red list were found: white water lily Nymphaea alba, floating fern Salvinia natans, clavarioid fungi Macrotyphula fistulosa, although it cannot be unequivocally stated that their appearance is related to the investment. The implementation of the project installation did not result in a reduction in the number of communities recorded in previous years, but the presence of four more, previously unrecorded, was demonstrated: phytocenoses with Charetum vulgaris (habitat protected by European law 3140, Typhetum angustifoliae, Potametum lucentis and Ranunculetum circinati. In the following years, in the longer term, the natural wealth may be positively affected by a change in habitat conditions (increase in humidity, raising the level of groundwater) resulting from the restoration of river beds and increased retention.

Thanks to EDNA monitoring, it was possible to confirm the presence of crested newt in the study area, which was detected in 2016 and failed to detect by the traditional method in 2021 and 2022, and the presence of chickadee was confirmed.

All monitored small BGI facilities had a positive impact on increasing biodiversity. The richest species biodiversity was distinguished by facilities with ponds in Kindergarten No. 16 and Primary School No. 11.

More detailed reports on the biodiversity in the location are provided in ***Annexes D5***:

- ***Annex D5.1*** *Summary Final Report on the Biodiversity Impact of the Project*
- ***Annex D5.2*** *Report on Ornithological after implementation monitoring 2021-2022*
- ***Annex D5.3*** *Report on Batrachofauna after implementation monitoring 2021-2022*
- ***Annex D5.4*** *Report on Ichtyological after implementation monitoring 2021-2022*
- ***Annex D5.5*** *Report on Entomological after implementation monitoring 2021-2022*
- ***Annex D5.6*** *Report on Flora habitats after implementation monitoring 2021-2022*
- ***Annex D5.7*** *Report on EDNA monitoring 2016 - 2022*

Responsible Beneficiary: ***FPP***
Deliverables: ***Final monitoring report achieved 31/12/2022***
Indicators of progress:

- number of reports prepared – achieved ***13/*** *planned in a proposal* ***2***

E1 Project website

Foreseen start date: 09/2015 *Actual start date: 01/2016*
Foreseen end date: 12/2020 *Actual end date: 12/2022*

The project website **http://life.radom.pl/** was regularly updated with the information about activities taking part in the project. The project key documents were available on the website. It was and still is run in Polish and English language, which reflects the key content of the Polish version. See ***Annex E1.1 The project website statistics.***

Since 6/11/2017 the RadomKlima platform has been operating at the website: **http://mapy.life.radom.pl/**. The platform was developed to increase accessibility to information generated in the project to all interested parties, and facilitate dissemination of the facts about climate change and its impact on the key sectors in the Radom area. The platform includes the results of VA, and enables access to the maps generated in this action using GIS tools, including the results of the assessment of exposure, adaptation potential and vulnerability. The purpose of the web application is the possibility of publication of climate data, data search and visual presentation within the borders of Radom. The web application contains thematic layers (basic maps of the city, exposure maps, sensitivity, adaptability and susceptibility). It allows users to select interesting spatial data from the thematic scope and search for a specific area of the city for detailed information. All data was uploaded to the Geoportal server, which was available at http://fpp.apps.divi.pl till the end of the project. The Platform included information about its content and description of the maps that were available to the public, which made it using more friendly.

GIS maps performed at the RadomKlima platform were used for elaboration of one of the key strategic documents in the City (Study of Conditions and Directions of Land Development of the City), and its unique users exceeded the planned indicator of progress (13 493/10 000).

Due to the requirements regarding the durability of the project within 5 years after the end date of the project duration, in December 2022 the platform was transferred to the www.radom.pl portal under the address: www.gis.umradom.pl/life_radom_mapy.html

We used within the project also another tool of communication and dissemination of the project effects– Facebook profile under the address: https://www.facebook.com/profile.php?id=100057404891112

Responsible Beneficiary: ***MR***

Indicators of progress:

E.1.1 Project website

- Total - no. of individuals = achieved ***40 713/*** *planned in a proposal* ***50 000***

Reach - no. of individuals = achieved ***73 148*** */planned in a proposal* ***40 000***

E.1.2 RadomKlima platform

- Unique users of the RadomKlima platform - Number of individuals = achieved ***13 493/*** *planned in a proposal* ***10 000***

E2 LIFE noticeboards

Foreseen start date: 06/2016 *Actual start date: 03/2016*
Foreseen end date: 12/2020 *Actual end date: 10/2022*

The objective of this action was to contribute to promotion of the project by installation of noticeboards on the implemented C actions, other informative boards in the project implementation areas and on the purchased equipment. 43 information boards were installed at exposed locations on sites of large-scale and small-scale BGI as well as on the locations of the weather stations and in the headquarters of all 4 beneficiaries. They were made out of durable material in order to resist vandalism and weather conditions. The signs featured information about the implemented project, also bearing the LIFE-logo / NPEPWM-logo and mention the EU´s contribution / co-financing entity contribution with national financial means. The contents and layout of the boards were arranged in order to provide a general information

about the project for the wide public. The content always included a title, a short description of the project, the aim of the project and funding source and if it concern a certain adaptation measure a detail information about it with various photographic framing. The first basic informative table was delivered with the ***[Annex no 22: 17/11/2017 Progress Report]***

Table No. 3: List of all noticeboards and their locations

No.	**Year of installation**	**Noticeboards / installation location**	**Total number of boards**
1	2017	4 notice boards with dimensions of 120/80 hanging inside the buildings of headquarters of 4 co-beneficiaries , plexiglass printed . Photos delivered ***[Annex no 27: 17/11/2017 Progress Report].***	4
2	2018	3 informative and educational boards / Climatic Kindergarten - Public Kindergarten No 16 in Radom at Grenadierów, Str. 3 Photos delivered ***[Annex no 27: 28/09/2018 Mid-term Report].***	3
3	2020	3 small informative boards about weather stations / locations of weather stations: ST1 Sławno, ST2 Olsztynska, ST3 Sucha Str	5
4		2 big (120x80) notice boards about weather stations / the headquarters of WMR Filtrowa Str. 4 ; about Borki reservoir / over Borki reservoir	
5	2022	22 informative and educational boards on "small-scale" BGI : Public School at 19 Gagarina Str. (2 pcs.) Public School No. 33 at 5 Kolberga Str. (2 pcs.) Public Kindergarten No.4 at 23 Jana Kilińskiego Str. (4 pcs.) Public Kindergarten No 11 at 10 Kościuszki Str. (4 pcs.) Bema / Jasinskiego Square (3 pcs) Combat and Labour Veteran Nursing Home at Wyścigowa Str. (1 unit) Combat and Labour Veteran Nursing Home at Struga Str. (1 unit) XI High School (3 pcs.) III High School (2 pcs.)	31
6		9 informative boards on "large-scale" BGI: Mleczna restoration (2 pcs.) Over Borki Reservoir (2 pcs.) Over Cerekwianka Polders (2 pcs.) Over Potok Północny (2 pcs.) Canal A0 (1unit)	
TOTAL			**43**

Details and photographic documentation about the noticeboards in the project are included in ***Annex E2.***

Responsible Beneficiary: ***WMR***
Indicators of progress:
- Information boards installed after completion of Actions - Number of boards = achieved ***43****/ planned in a proposal* ***25***

E3 Layman's report
Foreseen start date: 01/2022 *Actual start date: 01/2022*
Foreseen end date: 12/2022 *Actual end date: 12/2022*

The Layman's report was elaborated to summarize the project to be distributed among a wide range of recipients. It was written in non-technical language, in both Polish and English versions. It presents final achievements of the project with a core aim to enable a broader audience to understand the project`s issues. This also serves as a promotional tool for dissemination of the project objectives after its completion. Five hundred copies of the PL version and two hundred of the EN version of professionally printed and designed booklets were distributed among schools, project partners, institutions dealing with water management, landscape architects, RDEP, NGOs, local councils in the neighbourhood of the project area.
It is widely distributed by project partners among all interested parties as well as among the city inhabitants also available on the project website – English version: https://life.radom.pl/en/wydarzenia/aktualnosci/368-the-layman-s-report
See ***Annex E3***
Responsible Beneficiary: ***FPP***
Milestones: Layman`s report published achieved ***31/12/2022***
Deliverables: Layman`s report delivered with Final Report (Annex E3)
Results:
A PDF-version is available on the project's homepage www.life.radom.pl
Indicators of progress:
Layman´s report finished - Number of copies printed = ***700***

E4 Networking activities
Foreseen start date: 09/2015 *Actual start date: 11/2015*
Foreseen end date: 12/2020 *Actual end date: 11/2022*

The objective of this activity was to facilitate knowledge, experience and know-how exchange with other LIFE projects, cities and experts.

E4.1 Conferences at the commencement and closure of the project

The conference at the commencement of the project was held on the 8/04/2016 in the Art and Culture Centre "Resursa Obywatelska" in Radom. Around 100 people were expected to participate at the opening conference, while the actual number of participants was 114, including 10 speakers. During the conference the project background and goals were introduced.

The conference officially inaugurated the implementation of the only and one of two in Europe LIFE project on adapting urban space to climate change through urban water and greenery management. The speakers represented: ICLEI (Local Governments for Sustainability is a global network of more than 2500 local and regional governments committed to sustainable urban development), the Ministry of the Environment, Project AdaptCity, Project "Arturówek" implemented in Lodz with the participation of the LIFE program, Institute for Sustainable Development, University of Lodz, City of Copenhagen, University of Warsaw.

The conference was divided into two sessions: 1. General and 2. on Climate Adaptation, both had presentations prepared by foreign and Polish experts (the program and key presentations are available on the website http://life.radom.pl/aktualnosci/konferencja-otwierajac-projekt-life/).
See ***Annex E4.1.1***

The final conference of the implementation project was held mainly online (45 people from the project partners institutions participated personally) on 24/11/2022 from 10.00 a.m. to 3.00 p.m. and was broadcast on the ZOOM platform (possibility to ask questions and give

comments to the speakers) and the FB page of the project https://www.facebook.com/profile.php?id=100057404891112.
The online broadcast was conducted from the studio of the Municipal Cultural Centre AMFITEATR in Radom, where members of the project team were presenting its results and the speakers, panellists and invited guests discussed on the debate the most important issues concerning the adaptation to climate change challenges that cities have to face.
The goal of the conference was to share knowledge and experience of the blue and green infrastructure solutions for city adaptation to climate change implemented in Radom between 2015 and 2022 hoping that the presented approaches and solutions demonstratively implemented in Radom could be replicated in other cities in Poland and abroad and could be widely disseminated by various entities both private and public.
According to the contracted assumptions around 150 people were expected to participate at the closing conference and the indicator was achieved. The Conference both at the Cultural Centre and on-line was participated by 178 stakeholders (133 on-line and 45 stationary).
English-Polish translators were provided as we had guests from abroad.
A recording of the Conference is available at the following link:
https://www.life.radom.pl/en/recording-of-liferadomklima-pl-project-closing-conference
See details in ***Annex E4.1.2***

E4.2. Collaboration with other LIFE projects on climate change

Contacts with other environmental projects, in particular adaptation to climate change and other LIFE beneficiaries were maintained via different channels: formal cooperation, meetings during conferences, Open Days in NFEPWM, advisory electronic mail contacts, on the social network. Flyers promoting our project were sent out via email, along with an invitation to follow the progress of the project on our website and profile to other LIFE beneficiaries from Poland and abroad who dealt with adaptation to climate change and other environmental issues.
The great opportunity to establish contacts with other LIFE beneficiaries was the participation of the project coordinator from MR as a speaker in the ECCA European Climate Change Adaptation Conference in Lisbon on 28–31/05/2019 in the session "EU LIFE programme: Supporting integration and co-production of climate change adaptation in small and medium-sized municipalities across the EU" where some close contacts with LIFE projects were established. These were:

1. LIFE15 CCA/DE/000133 LIFE LOCAL ADAPT: Challenges for small and medium-sized municipalities to adapt to climate change in four European regions - Technische Universität Dresden,
2. LIFE16 CCA/ES/000049 LifeAdaptate project: Supporting commitment of the European municipalities – Instituto de Fomento de la Región de Murcia,
3. LIFE15 CCA/IT/000061 LIFE MASTER ADAPT project: MAinSTreaming Experiences at Regional and local level for ADAPTation to climate change - Regione Autonoma della Sardegna,
4. LIFE16 CCA/SP/00040 Life-Good Local Adapt: Facilitating good adaptation in urban areas of small and medium-sized municipalities of the Basque Country, Spain

The closest cooperation was launched with 5 LIFE projects:

1. LIFE12ENV/PL/00056 „Air Pollution and biometeorological forecast and Information System (LIFE-APIS/PL)" - declaration of collaboration signed on 13th January 2017.

2. LIFE12 ENV/MT/000732 "LifeMedGreenRoofProject" – visit of the representatives of the project in Poland on 1/02/2017 and participation of the RadomKlima project (LIFE14CCA/PL/000101) in the Maltese End-of-Project Seminar on 20th July 2017
3. LIFE14 CAP/HU/000010 "LIFE CAP HUN - LIFE Capacity Building in Hungary" -Hungarian LIFE Capacity Building Project visited LIFERADOMKLIMA Project on the 13th November 2017. The aim of the trip was to learn the best practices in order to help developing the quality of the Hungarian LIFE proposals and projects. Our two-person Hungarian delegation dr. Ottó TOLDI and dr. Kata Konstantin carried out interview and overviewed activities carried out in Radom.
4. LIFE14 CCA/NL/000302 LIFE URBAN-ADAPT: demonstrating urban climate adaptation and resilience in inner city Rotterdam.
5. LIFE20 CCA/HU/001604 LIFE LOGOS 4 WATERS „Integrated application of innovative water management methods at river basin by coordination of local governments" LIFE20 CCA/HU/001604, Budapest, Hungary, whose coordinator participated in the closing conference of our project on 24/11/2022 as a speaker.

And others, with which we had less close cooperation:

1. LIFE11 ENV/DK/899 Project on Stream of Usseroed "Usserød Å – Joint flood solution".
2. LIFE15 CCA/SI/000070 LIFE ViVaCCAdapt Adapting to the Impact of Climate Change in the Vipala Valley.

See ***Annex E4.2.2***

E4.3 Study tours to Denmark, Germany and Great Britain

Three study tours were organised within the project:

1. *Study tour to Denmark*, 19 – 22/09//2016. 14 participants: MR - 3 persons, WMR - 4 persons – UL- 3 persons; FPP - 4 persons. The visit covered technical trips to Copenhagen and Aarhus, two major Danish cities experienced in BGI application, as well as elaboration and implementation of climate change adaptation strategies.

2. *Study tour to Germany -* as a part of co-arrangement of the 14th Conference Rainwater - legal, economic and technical aspects in Poznan on 1 – 3/10/2019 with participation of 5 representatives of the project partners.

3. ***Study tour to the Netherlands –***18-21/10/2021. 11 participants : MR - 2 persons, WMR - 3 persons, UL - 2 persons; FPP - 4 persons. The visit was focused on getting knowledge and seeing Dutch Nature Based Solutions applied in Rotterdam by meeting LIFE URBAN-ADAPT representatives who dealt in the project with demonstrating urban climate adaptation and resilience in inner city Rotterdam.

The detailed information about the 3 above study tours is provided in the ***Annex E4.3***

Other Networking Activities:

Networking constituted a substantial part of the activities held by the project staff. PMG, SC and staff members of the project took part in various international and national meetings. The list of all the events in which beneficiaries took part representing the project and building relations with other projects and stakeholders in adaptation to climate change is attached in the ***Annex E.4.2.1***

The project was reaching also beyond the Radom territory:

- MPA - At the beginning of 2017, the Ministry of the Environment of the RP has launched a project aiming to develop Urban Adaptation Plans (MPA) for all cities above 100,000 inhabitants in Poland (http://44mpa.pl/). Radom takes part in this project, together with 43

other cities. The Ministerial Consortium acknowledged capacity developed in Radom, due to the implementation of the LIFERADOMKLIMA-PL Project, and invited the project to cooperate in the MPA development.

- CLIMCITIES – The experiences of LIFERADOMKLIMA were also used in the implementation of project "CLIMate change adaptation in medium and small size CITIES", funded by the EEA Financial Mechanism - Bilateral Cooperation Fund. The project was coordinated by the Institute of Environmental Protection - National Research Institute (IOS-PIB) and aimed at development climate change adaptation medium (<100 thousands inhabitants) for 5 small cities in Poland (Tomaszów Mazowiecki, Nowy Sącz, Siedlce, Bełchatów, Ostrołęka). The results of the LIFERADOMKLIMA project presented to these cities and the links established between the projects.
- UL established cooperation with the commune of Konstantynów Łódzki and Zgierz in order to implement investments in the construction of blue-green infrastructure as an example of actions taken from the LIFERADOMKLIMA-PL project for adaptation of cities to climate changes. In addition, cooperation was initiated with the municipality of Karlino in the field of improving the quality of the Parsęta River for introducing salmon.
- On 2-5/06/2019, 80 stream specialists from environmental departments of Danish municipalities took part in a technical trip "Waterbodies in Poland - Study tour for Danish water stream specialists" to Poland. The trip was organized by Envina (Danish non-profit organization for public planning- environmental, - and nature specialists). The goal of the trip was to exchange knowledge, experiences and know-how on river restoration, maintenance and monitoring, implementation of Water Framework Directive in Poland, climate adaptation measures using water resources, and others.
- On 26 and 27 May 2022, two expert seminars were held in Warsaw, which aim was to gather knowledge on the challenges that accompany sustainable management of river valleys. The two one-day workshops were attended by practitioners and experts representing Radom, Łomianki, Opoczno, Łódź, Krakow and Warsaw, as well as representatives from the world of science and NGOs. The expert seminars were held as part of the project Urban ecosystems of river valleys River Valleys. The potential of ecosystem services in the face of anthropogenic climate change implemented by the Sendzimir Foundation in cooperation with Phronesis SA of Oslo. The seminar resulted in a publication entitled "Managing urban river valleys Report from the Warsaw 2022 Expert Seminars", in which one chapter is devoted to adaptation measures in Radom within the LIFERADOMKLIMA-PL project as an example of good practice.
- Collaboration with UL students involved in the project activities during the lectures, exercises and student internships and on the occasions of study tours to Radom to visit the project sites of the adaptation measures and learn about them. See ***Annex E4.2.3***
- The investments in the city of Radom implemented as part of the LIFERADOMKLIMA-PL project have been reported as model ecohydrological solutions for rainwater management in cities. The Scientific Advisory Committee of UNESCO's Ecohydrology Programme (EH-SAC), composed of internationally well- known scientists from all over the world, had a meeting on 14 and 15 December 2022 at UNESCO Headquarters in Paris, France to evaluate all applications for new Ecohydrology Demonstration Sites submitted to UNESCO-IHP. The LIFERADOMKLIMA-PL proposal was very well received by the EH-SAC because it demonstrates a solid understanding of ecohydrology techniques as well as provides evidence on how the ecohydrology approach will be demonstrated to the public. In this context, the EH-SAC has evaluated the aforementioned proposal and has confirmed that it satisfactorily meets the requirements for approval. The UNESCO informed on 29/12/2022 that "**Radom City**" in Poland is accepted for inclusion in the Global Network of UNESCO Ecohydrology Demonstration Sites. **The same the**

LIFERADOMKLIMA-PL project "Adaptation to climate change through sustainable management of water of the urban area in Radom City (Poland)" and Radom city become a part of the Global Network of Ecohydrology Demonstration Sites of UNESCO's Intergovernmental Hydrological Programme (UNESCO-IHP) initiated since 2010.

Responsible Beneficiary: ***WMR***
Indicators of progress:
E4.1 Conferences at the commencement and closure of the project
- Conferences carried out at the beginning and closure of the project number of individual participants reached = ***292/250***
E4.2 Collaboration with other LIFE projects on climate change
- Successful meetings with other LIFE-project teams - Number of LIFE project teams collaborating together = ***3/3***
- Carried out study tours - Number of tours held = ***3/3***

E5 Other awareness-raising and dissemination activities
Foreseen start date: 09/2015 *Actual start date: 03/2016*
Foreseen end date: 12/2022 *Actual end date: 12/2022*

E5.1. Informational and Promotional materials

The information about design and production of first parts of the informational and promotional materials were delivered in previous reports. ***[Annex no 5.20: 29/07/2016 Progress Report; Annex no 27: 17/11/2017 Progress Report].***
First promotional result in the project was a design of the project logo which consequently was used to mark all promotional materials produced.
Overall number of promotional and informational gadgets amounts to 2 880 items.
At the beginning of the project the following informational and promotional materials were produced: 50 mugs, 3500 A5 leaflets (500 in English), 300 paper bags with project logo, 300 A4 notebooks, 100 USB memory sticks, 200 metal pens, 300 pencils, 200 t-shirts, 100 backpacks, 200 stickers. They were sent to EASME on ***13/10/2017.***

In 2019 / 2021 the following items were produced: 50 ceramic mug 300 ml, 300 eco bags, 300 hardbound A5 spiral-bound carbonless notebooks, 100 USB memory sticks with a capacity of 32 GB, 250 recycling pens - grey cardboard body , 300 printed eraser pencils, 70 bidons equipped with a container in which fruit can be placed, 70 bag-type backpacks with drawstring closure, 70 pcs of cooling towels in blue, measuring 30 cm x 80 cm; with attached cover.

Besides, 7 roll-ups were prepared and used during many promotional and informative events, as well as in the headquarters of all partners they are permanently displayed in the coordinator offices. 9 000 leaflets in Polish and English, Best Practice Guidelines and Vulnerability assessment briefing brochures, posters (2 posters on the green bus-stops, 2 on the green bike shelters, for "Feel the holiday climate" – sport activities over Borki reservoir, Family picnic on 28/07/2019 also over Borki reservoir. Detailed list of all promotional materials is included in ***Annex E5.1***

The project representatives took part in several events and conferences, during which the informational and promotional materials produced within the project were distributed, like the opening and closing conference, open days in NFEPWM, picnics, conferences, Art Competitions (5 editions) In particular, the project films were several times projected on the occasion of different events organised by the project beneficiaries, and were found to be a very

successful mean of communication about the project. The list of the events is presented in the ***Annex E4.2.1***.

Several awareness-raising and dissemination activities were implemented (E5), among which the most spectacular were: i) "Concert with the climate" promoting the LIFE RADOMKLIMA project performed by the Radom Chamber Orchestra, during which elder inhabitants of Radom could hear the greatest classical music hits, and learn about LIFERADOMKLIMA-PL project; ii) promotion of the project at every holiday weekend from 23/06/2019 to 01/09/2019, at the Borki reservoir as part of the "Feel holiday climate" sports activities combined with the promotion and activation of the local community organized by the UMR and WMR; iii) Family Picnic over the Borki reservoir for climate protection (and not only) enthusiasts – 28/07/2019 at 2.00-6.00 p.m. on the area of the Municipal Sports and Recreation Centre in Radom (info on local portal https://www.cozadzien.pl/zdjecia/piknik-rodzinny-na-borkach-zdjecia/57983; iv) recording film for the Discovery Channel on 26/07/2019; v) 5 editions of art competition for primary and secondary schools in Radom 2016 - 2020.

Since 2020 due to Covid pandemic situation, the project beneficiaries participated partly in on-line and stationary events and arranged own initiatives:

i) 4/06/2021 within the scope of collaboration with other LIFE projects: participation of Radom Municipality Coordinator in on-online Vipava Valley Beyond Tomorrow – Closing Event of LIFE ViVaCCAdapt;
ii) 19/05/2021 on-line presentation of the project assumptions and achievements on webinar on LIFE projects organized by the Marshal's Office of the Pomeranian Voivodeship, Department of Regional and Spatial Development;
iii) 28-29/08/2021 participation in The Garden Festival organized by local NGO Green Action.

Besides,the University of Lodz developed a special animation showing the difference between the situation prior to BGI installations versus past-investment state on the example of Radom city as a good practice in management of stormwater in cities based on NBS. It is introduced to the project website http://life.radom.pl/pl/wydarzenia/aktualnosci/282-symulacja-retencji-krajobrazowej and FB. As a promotional and educational tool, an animation was developed showing how the solutions implemented in Radom reduce the problem of flooding and adapt the city to climate change.

Figure 2 Animation showing the difference between the situation prior to BGI installations versus past-investment state. Source: http://life.radom.pl/pl/wydarzenia/aktualnosci/282-symulacja-retencji-krajobrazowej

E5.2. Building partnership with local society

In a proposal we assumed to apply various methods to build partnership with local society. These were: wide dissemination of brochures and folders to local community, simultaneously informing them about the project design and directing stakeholders to the project website.

There were many intentional and ad-hoc activities undertaken by the project partners together or standing alone. To describe only two of them, here beneath they are presented.

Press releases.

Several articles related to the project were published in local and national newspapers. Also national specialist journals for water professionals and engineers were interested in the progress of the project, such as implementation of the first Climapond in Radom. The articles were provided with previous Progress Reports ***[Annex no 5.19: 29/07/2016 Progress Report; Annex no 30: 17/11/2017 Progress Report; Annex E5_2. 28/09/2018 Mid-term Report:]***

The press releases not reported in the previous Progress Reports are included in ***Annex E5.2.2***

Cooperation with local NGOs.

In terms of building partnership with the local society, meetings and media promotion were held. Local NGOs were invited for the Working Group meetings. These are mainly: League of Green Conservation, Naturalists` Club of Radom Region, Environmental Protection Institute - National Research Institute, Institute for Sustainable Development. Also the local NGO expertise was used for consulting the initial concepts prepared in the A5 action, like consultation on the Mleczna river restoration (meeting on 10/07/2020 see Annex A1). NGOs participated in consultation of After LIFE Plan, and put their impact on many other actions in the project. On the other hand d the project representatives eagerly joint the NGOs initiatives (participation in ecological events, e.g. Festival of Gardens on 28-29/08/2021 in Municipal Cultural Centre AMFITEATR in Radom organized by the Green Action Association; in Ecological Sunday – Deko EKO fourth 'Positive party over generation' – from The Advanced Youth cycle (reactivation) organised by Municipal Geriatric Partisan Association (Stowarzyszenie Miejska Partyzantka Geriatryczna) and Creative Environments Club "Łaźnia" (Klub Środowisk Twórczych "Łaźnia") which took place in the area of city fountains, the Żeromskiego Street and the Concert Shell on 15/09/2019, ecologic picnic on 06/2022 with tree seedlings distributed among Radom inhabitants), cooperation with Association of Radomians for Democracy running a website Radomskie Drzewa (https://drzewa.radom.pl/) – Radom Trees, where the project LIFE trees are digitised. More initiatives concerning building partnership with local society and detailed information about each of them are included in ***Annex E5.2.1***

E5.3 Good practice guidelines

The knowledge gained in the project was published in a Best practice guidelines, relating to climate adaptation for rainwater management in Radom. It covers climate aspects of the city, the vulnerability assessments and the entire process of developing adaptation solutions from the design phase to implementations. It also shows the water quality, management and environmental effects of the project. Publication was issued in a book form (format A4; 800 copies) and will be distributed by project partners among interested parties and also available as a PDF-download. See ***Annex E5.3***

E5.4 Increasing climate resilience in cities (Workshops)

KLIMAPOLKA Workshop. On 7th December 2016 there has been held a workshop conducted by the Institute for Sustainable Development within the KLIMAPOLKA Project and organized in cooperation with the Municipal Water Works Sp. z o. o. in Radom in the company's office. The workshop was attended by **38** people including the owners and employees of private companies, university employees, local authorities, employees of the Municipal Water Works in Radom, the Municipal Urban Planning Office, the Polish Federation of Engineering Associations (NOT), the Association of Polish Power Engineers, the Association for the Promotion of Energy Production and the Centre for Environmental

Education. Promotional materials were distributed. Mrs Katarzyna Jankowska, the Coordinator of the LIFERADOMKLIMA-PL project had a presentation entitled: "Adaptation to climate change as an important element of climate policy".

E5.5. Competitions for schools

Five editions of school competition were held on the 'Water day' in March in **2016, 2017, 2018, 2019 and 2020** among the Radom **59** primary to secondary schools. The competitions were open art contests for school children called – the first "Water is LIFE", the second one "Water in my area", the third "Water in a city", the fourth "Climate change effects" and the fifth "Eco-city". The 5 editions of the competition were attended by 59 schools - 396 school pupils. The winning works were chosen by a jury including the City Hall representatives from the Education and Culture Departments and also the MR project coordinator and director and the deputy chairman of the WMR. The winners were awarded prizes. The works of the 2018 year edition were presented on the Ecology Picnic on 8/06/2018 in the Hall of the headquarters of Radom Orchestra and permanently at the Coordinating beneficiary office for 3 months between April and June 2018. There was a significant interest from local people attending the picnic in the presented works and the involvement of young Radom inhabitants in a climate change theme. The presenter of the works – the project Manager in MR estimates the number of viewers amounting to about 200 people. The 2020 edition was restricted due to the COVID-19 epidemic situation thus it was attended only by 12 pupils. See ***Annex E5.5***

E.5.6. Professional TV documentation - Cities and climate change; accepting the challenge

16 items of TV documentation were produced within the project. They are as follows:

- **first film** about the project (about 20 minute long), produced at the beginning of the project describes its premises. It shows the project area prior to implementation of the actions, contains interviews with partners and stakeholders and residents. The film was presented during the End-of Project Seminar at the University of Malta and during Open Day at the National Fund for Environment Protection and Water Management; on LIFE Open Days in NFEPWM in April 2017, and on the "Concert with the climate" held on 3rd March 2018. https://www.youtube.com/watch?v=edbYJkOSqbc
- **30-second spot** about project LIFE. It was presented in local TV DAMI – 10 broadcastings between 2nd and 12th December 2017. https://youtu.be/xcqAu0_nUAI
- **2 films** (1 over 15-minute long and 1 over 3-minute long) produced in 2021 about the most important adaptation measure on Borki reservoir and colmatation ponds
- At the end of the project **12 films were produced**, including 2 long (about 20 minute) films: one on small-scale Blue and Green Infrastructure elements implemented in the project and one summarizing the effects achieved in the whole range of the project. It shows the results, gives expert interviews as well as with partners and residents. Target groups of both films are the public. The films used an adequate style of language and cutting.

All films have English subtitles. A list of all TV documentation of the project with links, where you can watch the films is included in ***Annex E5.6***

Beneficiary: ***MR***
Deliverables: Promotion materials and TV documentation achieved 4/11/2022 (Annex E5.1, Annex E5.6)

Indicators of progress:
E5.1 Informational and promotional materials
*- Number of individuals receiving the materials = ~ achieved **3 880/** planned in a proposal **1 000***
E5.2 Building partnership with local society
*- Awareness raising: active participation in events; participation in games or quizzes; filling in forms; commenting; asking questions/getting answers - no. of individuals covered/survey Volunteer- Number of individuals = **50/50;***
*- Informational picnic attendance - Number of individuals = achieved **530/** planned in a proposal **3 000***
E5.3 Good practice guidelines
*- Guideline finished at the end of the project - Number of copies printed = achieved **800**/planned in a proposal **500***
E5.4 Increasing climate resilience in cities (Workshops)
*- Workshops - Number of individuals from local authorities attended = achieved **38/** planned **50***
E5.5 Competitions for schools
*- School contest attendants - Number of individuals = achieved **396/** planned **3 000***
E5.6 Professional TV documentation - Cities and climate change; accepting the challenge
*- Production of films - Number of films produced = achieved **16**/planned **2,***
*- Numbers of views on YT = achieved **760/** planned in a proposal **2 500***

6.2 Main deviations, problems and corrective actions implemented

During the project implementation period, we defined and recognized some problems and we took relevant measures described below to overcome and alleviate them. The encountered problems resulted in the project duration extension to 31/12/2022 instead of the preliminary closing date 31/12/2020 were:

6.2.1 Delay in the start of the project

Grant agreement between EU and the Coordinating Beneficiary was signed on 26/11/2015, and the co-financing agreement between NFEPWM and project partners on 8/12/2015. The partnership agreements between the CB and AB were signed on 8/01/2016 and the project officially started on 16/07/2015, but actually the project started later. The project partners took all possible actions to minimize the effects of delay, and assure timely implementation of the project which was not successful because of the request for the extension of the project duration.

6.2.2 Land purchase

Land purchase was needed to implement actions C3, C5, C6. According to the project schedule, it was to be purchased at the beginning of the project, but it could not be completed at that time due to ownership fragmentation, different expectations of the owners, inheritance proceedings and the mortgage. With regard to construction of floodplain on the Potok Północny (action C3), the Cerekwianka stream (action C6) and SSBS at Sucha street (action C5), we initially planned to purchase the land directly from the owners of the allotments under the Civil Law procedure. However, due to the above ownership problems identified during the project implementation, the Municipal Law Department in Radom Municipality elaborated analysis which showed that, in view of the fragmentation of land ownership, ongoing inheritance proceedings and possible claims, the Civil Law procedure might have caused risks of significant delays. To avoid that risk, the analysis suggested acquisition of the land based on

special flooding procedure - Act of July 8th, 2010 on special rules for preparation to realization of investments in the field of flood protection structures. The change was possible, because adaptation measures planned in the project, protect some areas of the city against uncontrolled river overflows, which is a public interest issue. The special flooding procedure was therefore indicated as more favourable for the project, however it required specific additional documents (such as technical project, environmental decision/EIA, survey of water management conditions), to be elaborated prior to the land acquisition procedure initiation. Preparation of these documents was time consuming and experienced significant disturbances. Delay in the land acquisition caused the implementation of the actions C started a lot later that it was planned. Finally land acquisition in the project referred to two locations: Cerekwianka (C6) and PP (C3). The third planned land purchase for action C5 (B2) was modified so that the action was implemented within the boundaries of municipal land.

Nevertheless the problems and delay in the required land acquisition was successfully overcome. We obtained the validated IPIPs for C3 and C6 actions issued by the Mazovia Province Governor, which passed ownership of the plots onto Radom Municipality, and allowed us to execute all adaptation work in the field. The IPIPs were issued under immediate enforceability, which meant that owners were obliged to release properties within 90 days of the date of the IPIPs issue, which enabled us to conduct construction works prior to the compensation payments to the owners. The IPIPs were issued by the relevant entities with some delays: for the Cerekwianka floodplains (B3) on 18/05/2020 and for the Potok Północny (B1) on 10/06/2021. To actions: B1 and B3 the procedure of the land acquisition started after the Development and Technology Ministry decision (30/07/2021 for the Cerekwianka stream and 07/04/2022 for the Potok Północny) adjudicating the land owners appeals against the IPIPs stipulating the final land division and property shares of the particular owners. The IPIPs stipulations the appeals did not prevent the commencement of investment works, which took place on 18/08/2020 for the Cerekwianka stream and 09/09/2021 for the Potok Północny.

IPIPs were the documents proving the dedication of the land for action C3 and C6 and giving Radom Municipality the ownership of the plots required for the construction phase of the project. Other C actions did not require land acquisition. As was written some chapters earlier, originally planned land acquisition for C5 – SSSB at Sucha street was groundless as the range of the task was limited to the land of municipal ownership.

To accelerate the process of payment the compensation for the owners of the land to be acquired for the project, the Coordinating Beneficiary organised 4 meetings with landowners: 2 for the Potok Północny in Radom City Hall on 08/04//2019 and the field meeting on 27/05/2021 close to the area of PP investment and 2 for the Cerekwianka stream in Radom City Hall on 1/03/2019 and 08/06/2020 in order to inform them of the further steps of the land acquisition and payment of the compensation. Soon after the application the landowners of the Cerekwianka stream were informed about the initiation of the IPIP procedure by the letter of 5/12/2019, and the relevant information was published on the project website. Some of the owners contacted the project office to obtain information about further steps.

6.2.3 Exceptionally prolonging administrative procedures in the state-level institutions, concerning necessary permits for implementation of the C actions (delay in implementation of action A5 action – technical documentation and permits).

The equally bothersome problems during the overall duration of the project concerned significant delays related to the prolonged administrative procedures, which had impacted on land acquisition and implementation of construction works in field. The last technical project for large-scale BGI was SSBS upstream the Mleczna River (C5), which was modified so that it was constructed on the municipal land. The construction works completed on 7/2022.

The delays in the range of action A5 – technical documentation and permits obviously resulted in the delays in further actions concerning implementation and monitoring stage.
Delays in administrative procedures and for other reasons concerned the following C actions which were all essential to obtain environmental effects of the project:

A. actions: C1 , C2 - adaptation of sedimentation ponds and Borki reservoir,
B. action C3 - construction of floodplain on the Potok Północny,
C. action C4 - restoration of the Mleczna river valley,
D. action C5 –SSBS over the Mleczna river,
E. action C6 - construction of floodplain on the Cerekwianka stream,
F. small-scale BGI.

A. The procedure for obtaining EIA for Borki reservoir and sedimentation ponds (actions C1-C2) took 1,5 years (from 13/04/2018 to 12/10/2019), instead of 60 days foreseen by law. During the period, the Regional Directorate of the Environment Protection (RDEP) imposed an obligation to carry out the environmental impact assessment (EIA) procedure, including submitting an environmental report which is not usually applied to this kind of work, which has the character of adaptation of existing structure, not new investment character. This decision prolonged the whole proceedings. The EIA was completed on 06/09/2019 with a permission for the field works to be carried out from September to February (out of the breeding period of amphibians and birds). This meant that in spite we had obtained all the necessary permits to implement the adaptation works at that time, we could not start the works earlier than on 1/09/2019 and had to finalize them in February 2020. In the view of the above, WMR made an official complaint about excessive length of the environmental decision procedure to the General Directorate of the Environmental Protection - GDEP (superior to RDEP). GDEP agreed with the WMR, concluded the excessive length of the procedures, and ordered to draw consequences for the guilty of negligence. We obtained CP on 15/05/2020 and the investment works were conducted from 01/09/2020 to 15/06/2021.

B. The greatest delay referred to the Potok Północny. We have been waiting for IPIP for 13 months - from 04/05/2020 to 10/06/2021 due to two consecutive factors: the modernization of Railway route no 8 in the project area and relevant divisions of the certain common for our and Railway Authority plots and introduction all the changes to the municipal land registry in the area in the area of the planned reservoir (administrative changes in boundaries and numbers of plots in the area), which was independent of the project beneficiaries. After that the finalized technical documentation still needed to be replaced with: new maps for the development site, new excerpts from the land register, re-elaborated geodetic division of real estate in the area of investment, and updated appraisal of the valuation of land properties. Because of that the application with completed new technical documentation to the Mazovia Province Office was submitted on 4/05/2020. This resulted in commencement of construction works only on 9/09/2021. The implementation phase lasted from 09/09/2021 to 14/10/2022.

C. For restoration of the Mleczna River (action C4), the EIA procedure took 6 months (06/02/2019 – 12/08/2019). The Water Permit (WP) was received on 28/10/2019. On 28/04/2020 the IPIP under Special Flood Act was obtained from the Mazovia Province Governor (the investment did not require land acquisition, but in this case the Special Flooding Act was applied due to a possibility of returning the municipal properties to private owners). After public procurement procedures the investment lasted from 11/05/2020 to 30/06/2021.

D. Adaptation of the A0 rainwater channel for improving of the water quality outflows to the Mleczna River was divided into two tasks:

- Sealing of the inner walls of the A0 channel (679 m section of A0 storm water channel, above the outflow to the Borki reservoir) in order to prevent iron infiltration from groundwater. The investment works were conducted from 05/07/2018 to 24/06/2019.

• Constructing a sequentional sedimentation-biofiltration system, securing further flow mitigation and ecosystem-based treatment of water disposed by the channel. The investment works were conducted from 20/04/2022 to 25/07/2022. The task was postponed because of the insufficient funds for the SSBS implementation. Due to that, in the tender for the technical documentation of the Borki reservoir and sedimentation ponds (C1, C2), elaboration of the concept for SSBS was included, to find other economic variant solutions, of using cleaned rainwater from the A0 collector to supply the Borki reservoir. In order to assure funds for the SSBS implementation, we suggested financial transfers between WMR and UL. Eventually UL financed the construction works on the site from the savings in the category *Personnel costs*. That was the reason for the delay – UL waited to achieve the sufficient level of the personnel costs expenditure to indicate the amount of savings finally devoted to the SSBS on Sucha Street.

E. The EIA procedure for the Cerekwianka stream (action C6) took 6 months (5/02/2019 - 12/08/2019). The WP was timely issued on 07/10/2019. On 12/11/2019, an application was submitted to the Mazovia Province Governor for IPIP, which was obtained on 18/05/2020 and the implementation phase lasted from 18/08/2020 to 30/09/2021.

6.2.4 Delay in small- scale BGI

Small-scale BGI (C6). Delay in the project work in this Action and, consequently, implementation was caused by uncertainties regarding the interpretation of the new Water Law in Poland (in force since 1/01/2018). The uncertainties were related to the interpretation of the Act regarding the criteria for the necessity of obtaining WLP for infiltration and retention of stormwater in the small-scale BGI elements. After consulting WMR and MR representatives, the decision has been made, that the project would be implemented based on the received permission from the City Office, which issued the final decision about the implementation based on the completeness of the provided documentation.

Another reason of delay in small-scale BGI was very hard situation in 2021 on the construction market in Poland due to construction boom after Covid crisis period. There were temporary shortages of building materials (especially metal elements), shortage of construction workers and problems with finding external contractors which resulted in extension of the time of some BGI items implementation. Due to unsuccessful efforts in finding a contractor of a permeable surface (parking - Wicherka street) we decided not to implement the action and instead of that to install smaller permeable surface (ca. 65 m2) at XI High School and not planned before additional green bike shed on the land of Dionizy Czachowski III High School.

6.2.5 Hydrometeorological stations and collecting hydrometeorological information

WMR purchased and installed three meteorological stations with delay, due to which, UL implemented additional meteorological monitoring in the framework on the contract with the external company as part of the action D2. Because of that, the 2016 data report covering both hydrological and meteorological measurements was established. Reports were provided in [***Annex no 19, Annex no 20: 17/11/2017 Progress Report***].

6.2.6 Transfer of responsibilities and funds between MR and WMR

WMR had been created to run all investments concerning water management in Radom and thus it had both great experience and well qualified members of staff to conduct part of the project related to implementation actions C. It was decided (accepted by EASME in mail dated on 31.08.2017), that large-scale BGI actions were supposed to be transferred together with allocated funds from MR to WMR, to simplify procedures and accelerate implementation of adaptation actions.

6.2.7 Covid-19 pandemic situation 2020 – 2021.

Unexpectedly many project operations were also significantly slowed by the COVID-19 epidemic situation. They were not implemented at all or partially with extreme difficulty. Some pending administrative procedures important for kicking-off the investment actions (small and large-scale BGI) were delayed due to the staff absence in various offices/ authorities and teleworking. Delays in the construction works were caused mainly by perturbances caused by material and equipment delivery delays (for instance coconut mat on floating islands) and human resources supply as a result of COVID-19. This situation generally affected the project actions concerning administrative procedures, construction works, working groups, participation in conferences, promotional events, study tours, the art competition on the Water Day in March.

Due to the described problems the project duration was prolonged with 2 years. The extension did not result in any increase in the budget and granted co-financing. All types of costs - personnel costs, travel and accommodation expenses, external assistance costs, durable goods and other direct costs - were covered from the project budget and some increased expenditures mainly incurred for C actions from the beneficiaries own contributions.
The project duration extension did not hamper the overall project objectives and, most importantly, ecological effects of its implementation, quite the opposite, the extension helped us to complete all tasks planned in the project and achieve expected results and deliverables.

6.3 Evaluation of Project Implementation

6.3.1 Methodology

A1 Establishment and operationalization of two WGs.

Standard methodology of cooperation with stakeholders platforms was used, based on a combination of various communication and facilitation methods, workshops and meetings. The inspirations were taken from the methods well tested in the implementation of the EU projects: SWICH, LIFE EH-REK and LIFE EKOROB.

A2 Biological inventory in the project area. D5 Monitoring of biodiversity.

BD monitoring was conducted for flora, entomofauna, ichtiofauna, batrachofauna and ornitofauna according to standard traditional methods of biodiversity monitoring. Additionally, e-DNA method was applied for water BD monitoring.

A3 Spatial analysis and climate change vulnerability assessment of the Radom urban space.

Project elaborated own methodology for VA (see description of A3 action in this report).

A4 Hydro-dynamic modelling to optimize water purification in sedimentation ponds

Field measurements (bathymetric measurements, determining the size and spatial distribution of bottom sediments, discharge measurements, granulometric and suspended solids transport measurements) were conducted. The measurements were used for mathematical model and computational simulation of the sediment flow in the projected systems.
Hydrodynamic model of the Mleczna river basin was developed both for rivers and stormwater drainage systems. Firstly, audits of rainwater flow mathematical models, and "rainfall/runoff" hydrological models operating in the city were made. Secondly, extended field measurements were conducted (measuring campaign of the rainwater drainage system and surface waterways - ditches, streams, rivers, and meteorological measurements - temperature and precipitation). The models were calibrated and verified based on the filed measurement data. Hydraulic and hydrological analysis of the catchment area for the current climate scenario and future climate scenarios adopted in the LIFE program were conducted in Bentley software.

D1 Monitoring of climatic conditions and surface runoff

Climatic data were initially collected from the external institutions, including IMWM, VEPI, Radom Airport, Radom Military Airport, EPA and from private meteorological stations. Ultimately, according to the project assumptions, three meteorological stations were purchased and installed in the Radom area, and they collect data continuously with the online access. This gave us and further stakeholders a possibility to obtain the meteorological data from our "own sources" – for different purposes connected with increasing of climate resilience of Radom.

D2 Assessment of hydrological effects of adaptation measures (C1-C6)

Baseline hydrological assessments were built on the results of measurement campaign, conducted at selected points of the rainwater sewage system and selected cross-sections of surface watercourses. The measurements covered river flow and filling of the riverbed. The measurements were used for modelling of the hydrological effects of planned adaptation by application of a HECRAS model. The model was calibrated based on the meteorological data collected in this action and the action D1. As a result, high convergence of the parameters simulated by the model (e.g. the filling height of the channel) with the real data was achieved.

D3 Monitoring of social-economic effects of the project

Monitoring of social-economic effects of the project was conducted based on surveys implemented among adult representative of the population of the city of Radom, living in areas of different exposition to climate change and its effects. It, as a new tool for planning new BGI in the city, gives answers directly from the most interested stakeholders – the city residents.

D4 Assessment of the effectiveness of the adaptation measures for water quality improvement

The concept of monitoring and detailed sampling and analysis plan of the physical, chemical and biological properties of surface waters in Radom for the project was developed based on the historical data obtained from the WMR and VEPI in Radom and included: • Monitoring of physical and chemical parameters according to the standard procedures in WMR. • Determination of the ecological status on the basis of benthic macroinvertebrates, according to the common EU standard methods of sampling macroinvertebrates and methods recommended by the EPI. • Evaluation of the hydromorphological quality of selected river sections by the RHS method recommended by WFD. • Identification of diatomaceous phytobenthos in rivers and monitoring of phytoplankton and zooplankton by classical hydrobiological methods; • Microbiological assessment of water in the Borki reservoir for pathogenic bacteria, analysis of concentration of cyanobacterial toxins and analysis of the chemical composition of sediments in the Borki reservoir and for the content of biogenic substances, dioxin and PCB.

6.3.2 Results

Table No. 4: Results of the project

Action	Foreseen in the revised proposal	Achieved	Evaluation
C1-6 A5 B1-3	*Objective*: Building demonstrative BGI for managing extreme rainwater flows and control flood risks (outside and within the city). *Expected results:* Building 6 large scale BGI and ca. 26 items of small-scale BGI **C1:** Increased P and N removal in sedimentation ponds (20%); Increased water retention capacity of sedimentation ponds (10%);	**6** large – scale BGI **34 items** of small-scale BGI have been constructed. See ***Annex C6.2*** **4 conceptual guidelines** for large-scale BGI were developed (delivered in ***Progress Report 17/11/2017***). **C1:** Increased P and N removal in sedimentation ponds (achieved **20%**); Increased water retention capacity of sedimentation ponds	The objective was fully completed and all expected and even bigger results were timely delivered**.**

	Conservation of species inhabiting the sedimentation ponds; Increase of the through-flow to the Borki reservoir during flush flows (30%). **C6:** Creating a 1.2 ha polder on the Cerekwianka river, accommodating flows after torrential rain.	(10% - **achieved 60%)** **4 technical concepts** for large-scale BGI were developed (delivered in ***Progress Report 17/11/2017***). **5 technical project** for large-scale BGI were developed (for actions: C1-C2; C3; C4, C5; C6). See ***Annex A5.1*** **C6:** Creating a **2,2 ha** polder on the Cerekwianka river.	
C6 A5 A2 D3	*Objective:* Enhancing biodiversity by restoration and creation terrestrial and water microhabitats. *Expected results:* Integration of BD in rainwater management system and creation habitats for BD within the city (5 locations in small-scale BGI) **C6:** Easing extreme water flows; Improving the public perception of green areas in the city and raising awareness of the role of water in towns; Increasing air humidity in the city and decrease effect of heat islands; Creation of microhabitats for biological diversity inside the city; Improved quality of the habitats of species of amphibians, invertebrates and other groups; Improved urban landscape value.	**7 reports** on after-implementation BD status developed at **12** BGI sites showing: - considerable increase in BD after the BGI implementation, - creation microhabitats for biological diversity inside the city, - improved quality of the habitats of species of amphibians, invertebrates and other groups, - improved public perception of green areas in the city and raising awareness of the role of water in towns (public surveys), - improved urban landscape value. Experiences show that even small BGI have large impact on BD increase.	The objective was fully completed and all expected and even bigger results were timely delivered.
A1	*Objective:* Mainstreaming climate adaptation into city planning and supporting informed decision-making. *Expected results*: 20 WG meetings held, 10 individual institutions present and involved in the process **A1**: Recommendations on integrating climate adaptation in local plans and strategies (WG1); Reports from the WG2 meetings with conclusions on implementation of Actions A5 and C1-C6.	**22** WG meetings held, **43** individual institutions present and involved in the process. See ***Annex A1*** **2 recommendation** to Municipal Adaptation Plan (WG1) **4 recommendations** to technical project by WG2	The actions concerning the objective were implemented successfully and the results show that the objective was achieved.
E1-4 A1	*Objective:* Rising of awareness and building capacity on climate adaptation. *Expected results:* **E1:** Fully operational project website, providing all relevant information about the project (**1**); Fully operational Internet portal	**1** project webpage, **1** internet portal, **43** informative boards installed. See ***Annex E2***, **2** conferences at the project commencement and the closure of the project. See ***Annex E4.1,***	Action objective was fully completed and expected results were timely delivered. Project impact was accessed as entirely positive on public

	"RadomKlima", featuring expert information about the project and related fields (**1**). **E2: 25** informative boards installed after. **E3:** Layman´s report finished (**500 copies**). **E4.1.** Conferences at the commencement and closure of the project (**2 conf. / 250 participants**); Conference materials after final conference (**1 item**); Dissemination and raising awareness activities. **E4.2** Collaboration with **3** LIFE projects; **10** meetings, **4** seminars, **3** conferences, **3** symposia on other LIFE projects attended, **E4.3** Study tours to Denmark, Germany and Great Britain (5 people per partner) - 3 study tours.	**292** participants of opening and closing conference, **5** LIFE projects closely collaborating, **3** meetings with LIFE projects attended, **6** symposiums of LIFE project attended (1 LIFE projects meeting and 5 NFEPWM LIFE Open Days), **3** study tours / **30** persons attended. See ***Annex E4.2***	awareness and building capacity of Radom on climate adaptation.
E5	*Objective:* Support exchange of knowledge and know-how. *Expected results:* **E5.1** Production and distribution of informational and promotional materials: backpack with print (**100**), t-shirts (**200**), mugs (**50**), pendrives (**100**), pens (**300**), pencils (**300**), bags (**300**), notepads (**300**); Number of individuals receiving the materials (**1 000**) **E5.2** Building partnership with local society: **10** general talks & presentations, **2** workshops, **5** family picnics, **5** public information evenings, continuous social media services; individuals	**E5.1 3 880** items of informational and promotional materials: **50** mugs, **3500** A5 leaflets (**500** in English), **300** paper bags with project logo, **300** A4 notebooks, **100** USB memory sticks, **200** metal pens, **300** pencils, **200** t-shirts, **100** backpacks, **200** stickers, 50 ceramic mug 300 ml, **300** eco bags, **300** hardbound A5 spiral-bound carbonless notebooks, **100** USB memory sticks with a capacity of 32 GB**, 250** recycling pens - grey cardboard body , **300** printed eraser pencils, **70** bidons equipped with a container in which fruit can be placed, **70** bag-type backpacks with drawstring closure, **70** pcs of cooling towels in blue, measuring 30 cm x 80 cm; with attached cover. **3 880** individuals receiving the materials. **E5.2** presentations of the project film for local society – on promotional events and local TV DAMI, concert with a climate, meeting with inhabitants of Obozisko housing estate called	Action objective was fully completed within reporting period and expected results were timely delivered. Project impact was accessed as entirely positive on exchange of knowledge and know-how by applying various well-chosen and effective tools.

	surveyed/volunteered (**50**); Informational picnic attendance (**3 000**)	"Our neighbourhood garden" 17/03/2018, "Feel the holiday climate" June – September 2019 – **50 general talks** with Radom inhabitants, **1 promotional family picnic** over Borki reservoir 28/07/2019 (c.a. **530** attendants), action of trees and brushes planting 2021 – 2022 (**513** trees and **191** shrubs) with over **20 public information meetings**,	
	E5.3 Good practice guidelines (500), **E5.4** Increasing climate resilience in cities (Workshops: **2 groups of 25 people**),	**E5.3** Good practice guidelines (8**00**), **E5.4** Increasing climate resilience in cities (Workshops**: 1 workshop in WMR of 38 people),**	
	E5.5 Competitions for schools (**60 schools / 3 000 individuals)**	**E5.5 59** schools / **396** individuals participating in the competitions for schools;	
	E5.6 Professional TV documentation (**2 films**): **6** broadcasts of a television program; Numbers of views on YT (**2 500**).	**E5.6 3** films and **13** spots, **10** broadcasts on local TV, **760** viewers on YT	

6.3.3 Visible actions

The following project results after the end of project implementation are visible:

- developed expert reports: Vulnerability Assessment, biological, hydrological and biodiversity reports, GIS data base;
- developing large – scale and small-scale BGI, including the Borki reservoir, multifunctional tank over the Potok Północny, polders over the Cerekwianka stream, restored the Mleczna river bed; climaponds, waterboxes, green bus stops and bike shelters, swales and tree trench systems, permeable surface. Establishment of new innovative, demonstrative BGI items brought attention of broad public and media. Several professional climate change circles in Poland and some other cities got attracted to the new developments in stormwater management, biodiversity and adaptation. We also found, that BD responded quickly to creation of new habitat, and many water living and terrestrial animals appeared quite immediately.
- over 4 ha of land in the city transformed to flood protection purposes
- project website, project films, leaflets, promotional materials and installed 43 noticeboards at project target sites highlighting the EC contribution for project implementation
- the results which became (and will become) apparent after a certain time period related to the continuous improvement of target restored – in 14 sites of habitats (from the first implemented adaptation measures we found, that biodiversity responded quickly to creation of new habitat, and many water living and terrestrial animals appeared quite immediately, including on green roofs, climaponds, etc)
- the effects of conducted capacity building actions

- the effects outlined in the project socio-economic impact survey and the survey on project impact on ecosystems services
- results from the transfer and replication actions project (i.e. follow- up projects and initiatives, such us “Walk along Mleczna river” in Spring 2023 with interested organisations of local and higher level).

6.3.4 Project amendments

The most significant amendment in the implementation of the project was extension of its implementation period by 2 years in order to meet all the objectives set forth in the initial proposal. This had an absolute impact on the achievement of the project's goals. If the amendment had not been agreed upon, the project could not have been fully implemented.
First, it made it possible to carry out implementation tasks that had been delayed from the original schedule for reasons described in other chapters. It also allowed to finalize important deliverables such as the reports summarizing the finished implementation process of C actions and monitoring reports. Secondly, we would not have had time to evaluate and test the effectiveness of the adaptation solutions used in the project, which, in the context of the fact that it is a demonstration project, we could not have just confirmed its demonstrative nature.
For details see also chapter ***5.3. Amendment to grant agreement.***

6.3.5 The results of the replication efforts.

- Exchange of experience and know-how on climate adaptation through BGI and territorial multi-level adaptation approach have great potential in terms of transferability and replication. Outputs such as vulnerability assessment, comprehensive approach to new territorial rainwater management, GIS tools, and demonstration BGI items have been shared with other interested parties. The information about launching new BGIs was distributed by media, and have large outreach to the professional water and developers sector. Several institutes and physical persons have contacted beneficiaries asking about the possibilities for BGI replications. Project partners : MR and WMR consulted with UNI Development S.A. BGI solutions planned to be applied in a new 29-hectare multi-stage Idea Estate for Radom inhabitants.
- FPP as a partner responsible for small-scale BGI was contacted by many cities in Poland (Nowy Sącz, Białystok, Opoczno, Zgierz) to discuss the possibilities for the replication of the BGI measures in their territory.
- FPP and UL are partners in 2 large LIFE projects (see *chapter 6.4.5*) – FPP in IP LIFE PL Pilica Basin CTRL and UL in LIFECOOLCITY, in which they contribute the know-how gained in the LIFERADOMKLIMA-PL project.
- Demonstrated in the project small-scale BGI are replicated within Radom city itself. Another green bus shelter is already serving residents waiting for the bus at the bus stop at the junction of Limanowskiego and Wałowa streets. The new green roof at this location was created as part of the implementation of Radom Civic Budget 2021.

6.3.6. The effectiveness of the dissemination activities and comment on any major drawbacks.

Project dissemination activities are considered effective as they have ensured the necessary project outreach and publicity with one major drawback identified, which was the pandemic period 2020 – 2021. The pandemic lockdown made certain activities on the project timetable unfeasible and it was necessary to quickly switch to new online communication tools. This was not easy, given that some activities, such as the art competitions for children, required some limited contact with the 'creators'.

6.3.7 Policy impact

Main project achievements supporting legislation are:

- ✓ Vulnerability Assessment methodology and results were partially used in the Ministerial MPA project ("Let`s Feel the Climate" Adaptation Climate Plans for 44 cities in Poland over 100 000 inhabitants),
- ✓ the results of the VA, demonstration solutions for small BGIs and methodologies for adaptation measures while protecting and developing biodiversity (such as river restoration, SSBS system, application of eco-system approach, etc.) have been applied in the city's planning document - the City Land Use Study. The document was accepted as an official Strategic Document for the City. It replaces land use plans in decision-making processes, which determine the urban design permits for different stakeholders,
- ✓ Specific achievement in terms of policy developments that resulted from the project activities was becoming **a member of the Global Network of Ecohydrology Demonstration Sites of UNESCO's Intergovernmental Hydrological Programme (UNESCO-IHP)** initiated in 2010. At the end of the project, Scientific Advisory Committee of the Ecohydrology Programme of the UNESCO's IHP (International Hydrological Programme), composed of internationally well- known scientists from all over the world invited LIFE-RADOMKLIMA-PL project and the City of Radom to that noble Network.

The project has been labelled as significantly climate and biodiversity related as its measures resulted in increased climate resilience of Radom city and biodiversity in the project implementation sites. This was achieved by the development and implementation of demonstration BGI at a river catchment level and in the inner city aiming to decrease local floods.

The climate and biodiversity orientation of the project expresses in:

- implementation of all BGIs in Radom and its results for the adaptation to climate change and enhancement of biological diversity as a cross-cutting action in the project;
- elaboration of climate change vulnerability assessment for Radom;
- integrating a relatively new subject - adaptation to climate change to local politics, decision making processes, approach to infrastructure management, design of urban area, local consciousness of the topic, etc.

The main barrier in more impact of the project on the policy was the political dualism in Radom, i.e., the executive and legislative powers rest in the hands of different parties, which meant that the part of politicians had no interest in supporting the project's activities and its short- and long-term effects. In order to reduce the resistance of the opposing political side to our solutions, we involved the Chairman of the Development Committee of the City Council in our activities, such as the After Life Plan and the meetings at the consultation stage of the technical projects, in order to give this part of the authorities a say in the final shape of the project. Also several times the project representatives took part in the Committee sessions to tell about the project and to dispel any doubts about new solutions taken up in the project.

6.4. Analysis of benefits

6.4.1 Direct / quantitative environmental benefits

Table No. 5: Direct / quantitative environmental benefits

Environmental benefit	**Aim**	**Progress**	**Action**
Climate change vulnerability assessment for Radom	1	1	A3
Increased purification capacity of sedimentation ponds	20%	20%	C1
Increased retention capacity of sedimentation ponds	10%	60%	C1
Borki reservoir retention capacity increased	10%	15,9%	C2

Mitigating extreme flows in Mleczna River	1	1	C2
Creating a water retention capacity in a mulit-use retention area at Potok Polnocny	1	1	C3
Restoration of 400-600m of Mleczna River	1	1	C4
Storm water channel A0 sealed Iron pollution in water reduced and water redirected upstream of Borki reservoir	800m	679 m	C5
Reduction of flow through A0 during dry periods Improvement of water quality by SSBS (N, P, Fe -60%, Suspended solid 80%).	50%	50%	C5
Improvement in water quality in the storm drain during wet periods	20%	20%	C3
Improvement of water quality flowing through SSBS: N, P, Fe	60%	60%	C5
Improvement of water quality by SSBS : suspended solid	80%	80%	C1, C3
Creating a polder on the Cerekwianka river accommodating flows after torrential rain	1,2 ha	2,2 ha	C6
BGI developed and installed Climaponds swales tree-trench systems green roof permeable surface	 ca. 12 items ca. 8-10 items 5 items 1 item ca. 200 m^2	 5 items climabox – 8 items swales and tree trenches -14 items 5 items 65 m2 Rainwater tank 1 000 l	C6
Integration of BD in rainwater management system in Radom and creation of habitats for BD in the city (small-scale BGI)	5 locations	12 locations[7]	C6
Best practice guide on adaptation through rainwater management	500 copies	800 copies	E3
RadomKlima Portal operating	1	1	E1

6.4.2 Qualitative environmental benefits

First in Poland Vulnerability Assessment to climate change developed for a city, elaborated in inclusive process with the city decision makers and other stakeholders.
New way of thinking compiled in the design of the large -scale BGI projects. Conceptual guidelines developed by the projects partners were included in the tender documents as a basis for technical concepts and projects development by external engineering companies.
Climapond first time implemented in Poland (C6). Local know-how and experience was developed and increased along with the project implementation phase.
Concepts and technical projects for (internationally) innovative blue-green (also stormwater retaining and infiltrating) bus stops and bike shelters developed.
BGI solutions contributed to a sustainable development in harmony with human welfare and the conservation of ecosystems.
VA and the resulted GIS Platform constituted the available and useful tool which was and will be utilizable as a risk decision support system giving current data about the weather

[7] *11 „small-scale" BGI (monitored in terms of biodiversity) and Cerekwianka polder*

conditions in Radom. This can be used in particular in system of protection of transport and household.

Economic benefits

The project resulted in increase of Radom resilience to climate change harmful impact, which were also storm water floods. Because of that it also played a great role in mitigating the negative economic impacts of the events in Radom (this way generating savings in the city budget) on:

- disruption of electricity
- disruption of traffic, public transport and communication
- damages of roads and buildings in the city
- health impacts due to potential contact with contaminated water in the reservoirs
- insurance costs.

The savings mainly concern reducing the problem of flooding by retaining rainwater flowing into the city through river systems. The Borki Reservoir together with the colmatation ponds retain almost 30,000 m^3 of water flowing after rainfall through the Mleczna river Radom. The flood polder constructed on the Cerekwianka stream has the capacity to intercept up to 17,000 m^3 of water transported by the river to the city after heavy rainfall. The multifunctional area created on the Potok Północny has the capacity to retain 11,000 m^3 of rainwater transported by river. Together, the systems are able to reduce the amount flowing into the city centre by almost **60,000 m^3**, preventing flooding and uncontrolled inundation in many parts of the city. This could be counted in money as a concrete economic benefit of the project.

In a wider sense, the economic benefits of the project may be found in new business opportunities created in relation to implementation of small-scale BGI: climaponds, climaboxes, green bus stops and bike shelters in Poland. Local developers, public institutions and physical persons who got interested in the project BGI measures are supposed to seek for the opportunities to implement BGI on their properties. Another predictable economic benefit is the stormwater fee. According to the New Water Law in Poland, and based on the calculation of the stormwater retained in the climapond and raingarden, potential costs saving for instance for the Climatic Kindergarten is about 41 € annually (for not disposing water to the savage system). Additionally, part of the retained water can be "recycled" and used for watering the grass areas, bringing further savings.

6.4.4. Social benefits

The following outcomes of measures taken in the projects have the important potential to serve as advantages for social welfare:

BGI in the city increases the quality of life the inhabitants of Radom by offering the better micro-climate and widening the range of ecosystem services for the inhabitants.

The project effects contribute to reduce greenhouse gas emissions by the following impacts:

A result of the projects minimization of the flooding in the major roads in Radom (like Maratonska Street and Warszawska Street) eliminated heavy traffic jams which diminished the air pollution.

In action C5 - providing a flooding polder by the A0 channel reduced the carbon footprint of the pump station which is working on the channel during heavy rains.

During the realisation of the project, video conferences and on-line meetings as well as electronic communication tools instead of paper correspondence were practiced to minimize the harmful environmental impact of travel and paper production.

By watering the inner city the vegetation was maintained on a higher level to reduce one's carbon footprint.

The project staff in administration and municipal company increased knowledge about climate change adaptation and capacities to integrate climate change adaptation into their administrative practice and to implement necessary measures among policy makers and city development designers.
Radom inhabitants and various groups of stakeholders enhanced the knowledge on adaptation to climate change which gives a chance to increase a number of BGI facilities applied in the city.
The data and information base on climate change impacts improved thus giving more adequate tools to work in the topic.

Replicability, transferability, cooperation
As one of the first projects in Poland dealing with adaptation measures, it had demonstrative character so that NBSs applied in Radom can work for many types of cities. The results of the project are supposed to be transferred to other cities using adaptive measures, such as: capacity building, involving local society and administration into the climate adaptation measures, promoting partnership, innovation in management and innovation, development and cooperation, training, education. Those literally implemented in the project as its outputs being *replicated in* other places are:

- Cooperation among various groups of stakeholders in the city strongly fostered through participation in the project WGs.
- The projects of large-scale BGIs presented at various conferences (both scientific and for practitioners), and raised several times considerable interest as real-life examples of first large-scale adaptation measures in Poland, to be further replicated.
- High potential and innovative value of developed small-scale BGIs.
- Experiences related to VA development welcomed in the national level MPA ("Let`s feel the climate" Climate Change Adaptation Plans in 44 cities in Poland) project implementation. The project input to the initiative is crucial and has transferability and replication potential. For the first time, in 2018, systematic actions to improve resilience to climatic hazards in 44 large cities was taken in Europe on such a scale.

2 other LIFE projects took advantage from LIFERADOMKLIMA-PL project applying the project solutions or/ and approach in their applications and scope of the enterprises:
LIFE19 IPE/PL/000005 IFE - integrated Project "Implementation of River Basin Management Plan in the Vistula basin on the example of Pilica river catchment" (IP LIFE PL Pilica Basin CTRL)
LIFE21-CCA-PL-LIFECOOLCITY/101074553 LIFECOOLCITY "IT systems for effective blue-green infrastructure in cities"
Transferability aspects:
1. Multi-level territorial approach in managing extreme flows in cities:
- Mitigating extreme flows to the city by increasing in-stream and landscape retention
- Green-blue infrastructure in the inner city sealed area
- River valley rehabilitation
2. Integration of biological diversity in water management
3. Vulnerability assessment and adaptation options for cities
4. Participatory approach and stakeholder's involvement
5. GIS RadomKlima portal

6.4.6 Best Practice lessons
Cooperation of several groups (researchers, practitioners, decision makers, business) in a common platform (WG) may be a durable and demanding process, yet it does eases constructive confronting different opinions, understanding goals and conflicting interests, and

finally understanding the reasons of why the new approach is needed, and it leads to a change in thinking of adaptation and BD in city water and green areas management.
Even a small implementation in the City landscape, such as Climapond, in already previously green area, make a considerable stimulating effect for biodiversity at all levels – not only to water biota, but it also strongly support terrestrial life (e.g. birds).

6.4.7 Innovation and demonstration value:

As to the innovation aspects of the project, we can boast about two patents submitted based on the developed innovation in the project:
1) System for draining, retention and dispersing of runoff water and the devices that compose the system, designed for running water off and the dispersing channel (Patent received on the 20.12.2016; PATENT NUMBER: PAT.233854)
2) Intensive pretreatment chamber of flowing waters, submitted on 2020-09-17, notification number: P.435342.
Radom was the first city in Poland to undertake comprehensive adaptation measures in the systematic development of blue-green infrastructure, with the aim of creating a friendly and healthy space for living and development for its inhabitants, and mitigating the negative effects of extreme climate events. In this sense, the project implemented in Radom, and thus the city as such, has a demonstrative character, mainly by indicating some answers to the question - how to create a space in the city resistant to the negative effects of climate change? Through the application of integrated rainwater (rainwater and snowmelt) management techniques, based on the management and treatment of precipitation at the place of its occurrence in a functioning urban space (existing buildings). The demonstration solutions used in the project combine technical solutions with blue and green infrastructure implemented both in the urban landscape, in the valley and riverbed and in small reservoirs. The aim of these measures is to increase the adaptive potential of the natural system (and thus also the socio-economic system) by increasing water retention and purification, protecting and creating conditions for biodiversity and habitats for valuable species. An important demonstration aspect is the identification of opportunities to adapt existing projects to the requirements of green and blue infrastructure and to ensure the high natural quality of revitalised urban areas, including the improvement of biodiversity. Such an action improves the adaptability of traditionally designed reservoirs to climate change its and their potential to provide ecosystem services - also under the pressure of an uncertain climate. An example is the reservoir on the Potok Północny (a major tributary of the Mleczna River), which was originally planned as a purely engineering facility, i.e. without climate change considerations, but has been adapted to include, in addition to its retention functions, elements that improve the ability of the subject of the project to adapt to climate change (e.g. increased biodiversity of the object, increased self-purification capacity, relevant for low water quality and climate change-induced high temperatures), and the ability to improve the adaptation potential of the city to climate change (e.g. increased transpiration, greenery support).
International level of innovation related to green bus stop and bike shelter design.
National level of innovation related to Climapond.
Local/Regional high level innovation related to cooperation model in the water sector.
Cooperation in WGs leading to new thinking and implementation of innovation.

6.4.8 Policy implications

The project achieved results contribute to **the EU Strategy** on adaptation to climate adopted by The European Commission on 24 February 2021 [COM2021/82 final], **European Climate Law** [COM/2020/80 final] by developing on the ground BGI measures in co-design process, thus building capacity and providing demonstration and know-how for

implementation of adaptation actions in local, regional and national scale. The new EU Adaptation Strategy paves the way for a higher ambition on climate resilience: in 2050, the EU will be a climate-resilient society, fully adapted to the unavoidable impacts of climate change. For this reason, climate change adaptation is an integral part of **the European Green Deal** and its external dimension, and firmly anchored in the proposed **European Climate Law**. LIFERADOMKLIMA-PL project significantly contributes to development of Radom resilience to climate change impacts fulfilling this way the Strategy aim for Europe to adapt to the unavoidable impacts of climate change and become climate resilient by 2050. The project is strongly based on principles of ecosystem approach, eco-hydrology and multi-level territorial approach and make adaptation smarter, swifter and more systemic as the Strategy says.

The strategy supports the further development and implementation of nature-based solutions on a larger scale to increase climate resilience. Blue-green (as opposed to grey) infrastructures are multipurpose, "no regret" solutions and simultaneously provide environmental, social and economic benefits and help build climate resilience. These are exactly the same purposes as the project achieved. Complying with the strategy resolutions, the project addresses also urban climatic analysis at local level, assessment of social sensitivity in the city to improve knowledge base and for local decision making based on cross-sectoral issues. As well as support to local decision making by involving in the project a broad group of decision makers and stakeholders to assure the uptake of the implemented demonstrative innovations and know-how into everyday water management and decision-making. Integrating biodiversity in rainwater by creating micro-meadows, micro-ponds (climaponds) and restoring degraded natural habitats in the urban river valley is also among important strategic measures in towns.

The project main input to the policy in terms of adaptation to climate change manifests in the following achievements of the project:

Specific, worth highlighting achievement of the project was a following distinction. At the end of the project, Scientific Advisory Committee of the Ecohydrology Programme of the UNESCO's IHP (International Hydrological Programme), composed of internationally well-known scientists from all over the world invited LIFE-RADOMKLIMA-PL project and the City of Radom to become a member of the Global Network of Ecohydrology Demonstration Sites of UNESCO's Intergovernmental Hydrological Programme (UNESCO-IHP) initiated in 2010.

experiences of the project were used in the implementation of the Urban Adaptation Plans project (http://44mpa.pl/?lang=en). Ruled and conducted by Ministry of Environment for 44 cities above 100 thousands inhabitants in Poland. The goal of the project was to develop plans that will be in the future implemented by cities. The project contributed therefore to implementation of "A strategic plan of adaptation for sectors and areas sensitive to climate change to the year 2020, with a perspective on the year 2030" (Ministry of the Environment, 2013).

Some of the BGI measures proposed to be implemented in the project (but finally not carried our) are included into the Urban Adaptation Plan for Radom, which was accepted as an official Strategic Document for the City and adopted by the City Council in 10/2019. VA alongside demonstration solutions for small BGIs and methodologies for adaptation measures concerning protecting and developing biodiversity have been applied in the city's planning document - the City Land Use Study which was mentioned many times above.

7 Key Project-level Indicators

The final actual values of the KPIs for the project are introduced in the online KPI database in comparison with the targets at the beginning of the project. See Chapter 5.6. *Compilation of information for LIFE RadomKlima indicator tables (F4).* The table driven from the KPI system is included in ***Annex F4.***

8 Comments on the financial report

8.1 Summary of Costs Incurred

8.1.1 An overview of the costs incurred

Table No. 6 The project costs incurred compared to the approved budget

PROJECT COSTS INCURRED				
	Cost category	Budget according to the grant agreement in €*	Costs incurred within the reporting period in €	%**
1.	Personnel	1 495 482	1 453 484,33	*97,19*
2.	Travel and subsistence	178 284	57 434,51	*32,22*
3.	External assistance	1 809 711	2 784 963,06	*153,89*
4.	Durables goods: total non-depreciated cost	807 456	286 637,88	*35,50*
	- *Infrastructure sub-tot.*	765 181	253 866,41	*33,18*
	- *Equipment sub-tot.*	42 275	32 771,47	*77,52*
	- *Prototype sub-tot.*	0	0	*0*
	5. Land purchase	612 907	298 493,28	*48,70*
6.	Consumables	532 007	399 538,25	*75,10*
7.	Other costs	104 786	80 563,77	*76,88*
8.	Overheads	297 544	297 466,00	*99,97*
	TOTAL	**5 838 099**	**5 658 581,08**	***96,93***

*) If the Agency has officially approved a budget modification through an amendment, indicate the breakdown of the revised budget. Otherwise this should be the budget in the original grant agreement.
**) Calculate the percentages by budget lines: e.g. the % of the budgeted personnel costs that were actually incurred

8.1.2. Explanations to the budget costs and budget shifts between categories subject to a 20% limit:

The completed table above summarizes the project costs incurred compared to the approved contracted budget. In some categories, project spending does not correspond to the planned in proposal budget with 4 % budget shifts between the budget categories within the 20% flexibility limit (see *Cost summary in Consolidated Financial Statement*, ***Annex Fin5, AnnexFin6***). Based on the filled financial statements of all 4 beneficiaries there are some exceptions when comparing declared costs with the costs foreseen in proposal budget as follows:

1. Personnel – at **97,19** % the personnel costs are within the planned amounts in proposal budget and with underspending of nearly 2% by project end. Since the implementation of the project required the acquisition of land (B1, B3) for C3 and C6 actions and necessity to complete the Land Purchase Database and these tasks were assigned to the Municipality of the

City of Radom, from July 2021 the project staff in CB included 2 more people from the Department of Public Real Estate Services and the Office of Real Estate Acquisition and Disposal of Radom City Hall. The increase in staffing caused that the final number of person-days is higher than assumed, but the project budget in the *Personnel costs* category did not increase. It did not violate **the 2% rule** concerning MR and UL as public bodies. The cumulative public contribution is above 102% higher the cumulative non-additional staff costs of these public beneficiaries at project level. Own contribution of MR and UL = **332 717,55 EUR**. Cost of „non-additional" staff in MR and UL = **323 962,20 EUR. <u>The project confirms that the 2% rule is respected.</u>**

2. <u>Travel and subsistence</u> – at **32,22** % incurred travel costs are significantly less than planned in project proposal main reasons for which are related on one hand to COVID-19 travel restrictions and to the fact that as of that time the on-line meetings became common and constant practice of communication replacing traditional trips and they did not incur any travel and subsistence costs. The savings in this category were transferred to other categories demanding additional financial supply, mainly to *External Assistance.*

3. <u>External assistance</u> – the incurred expenditure is over 50% higher than initially foreseen (**153,89** %) with significant overspending this budget category. The reason of that is this budget category was underestimate at the stage of proposal development and not all necessary costs could have been foreseen at that time. Another reason for the increase in this category was the transfer of the amount of eligible costs of PLN 353 938 (EUR 85 062,85) from the category *Durable goods: - Infrastructure* to the category *External assistance* - existing budget item 'Adaptation of land as a natural floodplain (WMR) (financed by NFEPWM)'. The transfer resulted in an amount of eligible costs of PLN 102 875 (EUR 24 724,22) remaining in the *Durable goods - Infrastructure* category. In the *External assistance* category, on the other hand, the amount of eligible costs increased to PLN 6 391 430 (EUR 1 536 069,12). In summary, the amount of total costs after the transfers is: in the *Durable goods - Infrastructure* category PLN 2 849 773 (EUR 684 893,41) and in the *External assistance* category PLN 9 969 690 (EUR **2 396 041,72**). These transfers were approved by Annex No. 9 /694 of 19/07/2022 to the agreement with NFEPWM 550/2015/Wn-07/GW-MR-LF/D. The justification for these changes is the fact that most of the infrastructure produced as a result of the project was put into use in 2021 - 2022 and it would not be possible to reimburse the costs of its depreciation during the project duration, i.e. until 31/12/2022, and, in turn, the expenses incurred for *External Assistance* significantly exceed the project assumptions (changes in market prices since the project budget was estimated in 2013), had already been incurred by the Co-Beneficiary - WMR and met the eligibility criteria. But it must be added that the final costs of *External assistance* also include transfers made by the project beneficiaries other than WMR and MR, but these above calculations sanctioned in Annex 9 concern precisely these two entities. For example: costs related to the task of SSBS construction (C5 in *External Assistance* category) were underestimated in the original budget, therefore savings in category *Personnel* of UL covered foreseen increase of the cost (technical project and construction works on SSBs over the Mleczna river at Sucha Street).The cost of the technical project and supervision of investment works incurred by UL amounted to 3 543,73 EUR while construction works also incurred by UL as above described savings transferred to External Assistance category amount to 27 844, 20 EUR.
It is, however, difficult to estimate exactly which transfers made this category increased by 50%, as beneficiaries also made their own internal transfers between categories and, in particular, allocated their travel savings (which were all too high mainly due to pandemic restrictions) to other categories, mainly *External Assistance.*

4. <u>Durable goods</u>

- Infrastructure – reported infrastructure costs are much lower (**35,50** %) of the planned total in project proposal. Lower incurred costs are due to the reasons described in the

category: *External assistance*.

- Equipment – incurred project costs are lower than originally planned in proposal budget at 7**7,52** %. One of the reasons that the beneficiaries did not spend all foreseen equipment costs is some cheaper items were purchased instead.

5. Land purchase - it was very difficult to accurately calculate the costs of acquiring plots of land for investment in Actions C3 and C6 by plot division. Mainly in the case of task B1, i.e. purchase for task C3. This was due to the fact that many people had very fragmented shares in one plot of land. The cost of acquiring the plot of land also included other costs than just the payment of compensation, but also extracts from the court, appraisals. It was equally difficult to divide these costs into plots, e.g. for a given survey. Hence, we elaborated the methodology used by the Coordinating Beneficiary to calculate the costs of the plots, but also to include only part of these costs in the Individual Financial Statement. And this in turn because of the need to maintain the EU grant % share in the eligible project costs, which for MR is 45,39%. This necessitated adjusting the own contribution in such a way as to obtain this share, knowing the amounts of the LIFE grant and NFEPWM co-financing (reimbursed till the end of 2022 in a certain amount) at the end of 2022. The contracted value of land purchase was **612 907 EUR,** while the final cost reported in that Final Report is **298 493,28 EUR (48,70 %).** The reason for this is that Radom Municipality spent less amount of EU grant than contracted and therefore own contribution was proportionally reduced.

6. Consumables – reported costs reach **75,10** % of planned costs because there were purchased cheaper items.

7. Other costs – at **76,88** % of proposed budget the actual costs level is slightly lower than planned. The main reason for the underspending is also as above, i.e. public procurements on the planned purchases chose the cheaper contractors.

8. Overheads – **99,97 %.**

The total reported costs are **96,92 %** of the project contracted budget.

8.1.2 UL and MR explanations to the 2% rule

UL explanation of the 2% rule concerning UL project budget:

The actual own contribution of the UL was presented in IFS in FUNDING section and included: 1) part of the incurred personnel costs presented in the "Personnel_EMPLOYEES" section in amount of EUR 57 313,09 (collected in table "Beneficiary's own contribution" in the FUNDING section of IFS in position from 1 to 11); the remaining costs of permanent staff included in the “Personnel_EMPLOYEES” section in amount of EUR 52 637.02 were costs financed from EU; in total this gives EUR 109 950,11; 2) half a cost of equipment (depreciation amount) in amount of EUR 10 976,49 (collected in position 13, 16 and 17 in the FUNDING section of ICS in the Beneficiary's own contribution table) and 3) three positions in the "other direct cost" section of ICS amounted of EUR 745,86 (collected in positions: 12, 14 and 15 in the FUNDING section of ICS in the Beneficiary's own contribution table);
In this case the actual and incurred costs of UL contribution to LIFERADOMKLIMA-PL project was EUR 69 035,44. Therefore in correspondence to actual costs of personnel-employees financed by EU in amount of EUR 52 637,02 the 102% rule has been preserved.

MR explanation of the 2% rule concerning MR project budget:

In MR, the own contribution reported in the Final Report amounts to **EUR 299 521.78** against non-additional personnel costs of **EUR 216 012,09.** The own contribution exceeds personnel costs by more than 102%, thereby MR respects the 2% rule. However, MR as a public entity

included alongside UL in the 2% rule, significantly reduced its own contribution due to the need to comply with the % of EU funding indicated in the GA for each Beneficiary. See ***Table No. 8***

MR's actual own contribution to the project incurred for the land acquisition is **EUR 485 455,1** and is reported (due to the above EU contribution limit) at **EUR 298 493,28.**

(reduced by EUR 186,961.82. So the whole MR own contribution is: EUR 485,455.1 + 1,028, 50 (ineligible depreciation cost) = **EUR 486 483,60** and personnel "non-additional" costs **EUR 216 012,09**., i.e. the own contribution is 225% of the personnel "non-additional"costs.

The 2% rule in the project is calculated on the basis of the Individual Financial Statements of MR and UL and according to the amounts shown in these documents. Based on MR and UL IFSs **the 2% rule in the project is respected.**

8.1.3 Explanations to the contracted percentage of EU contribution in the project budget:

At a certain stage (already after MtR) of the project implementation there was a problem with the correct calculation of the percentage of EU grant in the budgets of the co-beneficiaries. We discussed the matter with the project's financial advisor and, after presenting our arguments, we came to the conclusion that the calculation of this share was as follows:

in the first contact with the financial advisor he told us to keep % of EU contribution from FC form which was supposed to be counted from total costs, which are different from eligible costs (in total costs there is also e.g. non-eligible part of depreciation). The Coordinating Beneficiary did not accept the calculation for two reasons:

1. The total % of EU contribution in the project, i.e**. 56,84**% in the Grant Agreement is counted from the **eligible** cost 5 161 565 EUR.
2. In the Financial Statement – first sheet of the Individual Financial Statement - column F „% of **eligible** costs" – the EU contribution in % (and other contributions) is counted from **eligible** costs.

The percentages are calculated on **eligible** costs , i.e. total costs less non-eligible depreciation costs.

As written above, ultimately the financial advisor`s answered as follows:

You are right, the % is calculated based on the total eligible costs while the FC form indicates the total real costs, i.e., including the non-eligible part of depreciation. ***In order to get the correct %, you need to deduct the non-eligible part of depreciation of the total costs in the FC form.***

These percentages counts, when a co-beneficiary's "Declared eligible costs with non-recoverable VAT" is less than the "Contracted eligible cost", i.e. this counts for MR, UL, and FPP.

In the case, that a co-beneficiary's "Declared eligible costs with non-recoverable VAT" is higher than the "Contracted eligible costs", a new percentage can be calculated in order to reach the maximum EU LIFE reimbursement percentage for the whole project, with respect to the maximum eligible costs for the whole project, i.e. this counts for WMR.

All Individual Financial Statements of the co-beneficiaries of the project are in line with the percentages of the EU grant as shown below in table no. 6

Table No.7: The calculation of individual percentage of Union contribution for all project co-beneficiaries.

No.	Name of the Beneficiary	Contracted eligible cost per Beneficiary	Contracted EU contri-bution per Beneficiary	Contracted percentage of the EU contribution in the eligible cost	Declared eligible costs with non-recoverable VAT	Percentages to be used in the final reporting
1	MRadom	1 226 018	556 470	45,39%	648 440	45,39%
2	WMR	1 906 977	499 670	26,20%	2 826 817	29,76%
3	UL	748 083	668 245	89,33%	683 080	89,33%

4	FPP	1 280 487	1 209 538	94,46%	1 253 475	94,46%
TOTAL		**5 161 565**	**2 933 923**	**56,84%**	**5 411 811**	**54,00%**

Besides, according to point 7.*How to complete the 'Funding sheet'?* of the document called „LIFE Programme Q&A for the completion of the Financial Statements for Action Grants" *Union contribution includes the amount of payment received from EASME (CINEA now) to co-fund **the eligible** costs that you submitted in the financial statement. In fact the amount should be equal to your declared **eligible costs** multiplied by the contractual agreed % of Union contribution*. As the Grant Agreement stipulates Article I.3 – MAXIMUM AMOUNT AND FORM OF THE GRANT *„The grant (…) shall take the form of: The reimbursement of **56,84%** of the **eligible costs** of the project…"* the percentage contribution of EU grant for every co-beneficiary is calculated towards the **eligible costs** instead of the total cost.

8.1.4 Budget changes between the beneficiaries not subject to a 20% limit:

Between MR and WMR

In order to accelerate the design, simplify necessary procedures and accelerate implementation of the large-scale BGI adaptation actions, the project partners have decided to transfer tasks related to development of the technical concepts and projects from MR to WMR. WMR is authorized to conduct investments in urban infrastructure and, in particular, to carry out works concerning water investments, on behalf of MR. WMR has qualified staff and experience to adequately conduct the design process. Budget shift of **EUR 64 365** (eligible cost in category *Durable goods – Infrastructure*) and **EUR 76 757** (*External assistance*) from MR to WMR (details were delivered in ***[Annex 8.1.1)28/09/2018 Mid-term Report]***. Consent to the transfer of tasks being considered as a minor change not requiring Amendment of The Grant Agreement, was given by the EASME in mail of 31/08/2017. Also savings in MR budget - EU grant part in the amounts as follows:

(2nd pre-financing payment) 318 274,67 PLN / 4,1609 = 76 491,79 EUR

(payment of the balance) = 166 934,91 EUR

Total = **243 426,70** *EUR (the difference between the contracted and declared EU grant contribution in MR project budget)*

The grant was transferred to WMR as the C actions which were implemented by this co-beneficiary were underestimated and eventually exceeded the contractual amounts.

Between MR and UL

The allocated funding for the UL from the National Fund for Environmental Protection and Water Management is 199 998 PLN (48 066,00 EUR)
2nd application for payment from UL - amount of 117 000 PLN
III application for payment from UŁ - amount of 97 500 PLN,
Which gives a total of 214 500 PLN (51 552 EUR by 4,1609 exchange rate, actually 50 678,55 EUR)
The difference amounts to 14 502 PLN (3 485 EUR) by which the contribution of NFEPWM of the grant to the City was reduced.

8.1.5 Explanation of discrepancies in MR IFS due to EUR exchange rate

In the first phase of the project, the wrong PLN/EUR exchange rate was used - on the day of payment and not on the day of incurring the cost (i.e. issuing the invoice). The first requests for payment to the National Fund for Environmental Protection and Water Management were submitted for reimbursement at this rate, and we received the reimbursement calculated in this

way. In a letter from EASME Ref. Ares(2018)6426140-13/12/2018 we received a comment that we should apply the exchange rate related to the month when the cost was incurred, i.e. date of invoice instead of the month when the cost was paid, i.e. date of payment.
This changed the conversion of the amounts from PLN to EUR and thus the whole amounts, hence the difference in the calculation of the amounts in EUR in relation to the refunds received from NFEPWM. A different amount in EUR was received and a different one is reported (in the financial report the EUR exchange rates are already correct).

8.2 Accounting system

8.2.1 Brief presentation of the accounting system(s) employed and the code(s) identifying the project costs in the analytical accounting system.

All project partners had accounting systems enabling identification of the project costs. The codes identifying the project cost in the analytical accounting systems of partners together with descriptions of the accounting systems were delivered in ***[Annex 9.2 Mid-term Report 28/09/2018]***

Coordinating Beneficiary: MRadom

The project had a separate accounting and reporting system within the structure of all financial procedures in Radom City Hall. The accounting system was based on software BDFeFKA by PTH BDF-ELIN Sp. z o.o.
All costs of the project LIFERADOMKLIMA-PL are bookkept on a cost account no. **900.**

Beneficiary: WMR

WMR established separate synthetic and analytical accounts for the project as a part of the existing accounting system (licensed software 'FK' by ZUBIX), enabling control of the project costs. General Accounting Department was responsible for bookkeeping on synthetic accounts, the Project Accountant was responsible for bookkeeping on analytical accounts.
Costs in WMR were bookkept on two accounts (085 - Infrastructure - for tasks where there are fixed assets) and 505 - rest of costs.
The ZUBIX software was in operation until 31/12/2021. From 01/01/2022, the Company's Integrated Information System ZSI was implemented. Synthetic and analytical accounting were in one electronic system.

Beneficiary: UL

UL used an IT accounting system '**ERP.SIMPLE'** for bookkeeping. All costs of the project LIFERADOMKLIMA-PL are bookkept on a cost account:
514-9 / **B1521000000126000**
Since 2005, UL has used the **"REKTORAT**" personnel and payroll IT system. The system contains a complete record of employment history. It included a detailed record of all payments made under employment and other contracts. The system contained information on cost accounts for individual paid funds broken down into appropriate components of remuneration (including basic pay, supplementary bonus, accident, pension and retirement contribution, Labour Fund, contribution to CSFF and others).
Both modules of the system (the HR and the Payroll), could generate sets of ready-made reports according to specific criteria, enabling identification of the project costs, e.g.:
"W44B" sheet was generated according to the cost account for a given project. The print-out showed the names of employees involved in the project, the period for which the print-out and the project's cost account were available (LIFERADOMKLIMA-PL **B1521000000126000)**.
Detailed entries in the HR and payroll module with collective data were exported to **ERP SIMPLE** system.

Details of the system were delivered in ***[Annex no 9.2; Annex no 9.2.3; 28/09/2018 Mid-term Report].***

Beneficiary: FPP

FPP employed a double accounting system, with separate account for the project no. **505 LIFE Radom Klima.** The books of accounts of FPP Enviro are kept using a computer with the use of licensed software "Symfonia finance and accounting" by Sage sp z o.o. in Warsaw. The following was used for the project:

• short name of the project: LIFE Radom Klima
• the following accounting codes:
- 137 bank account of funds allocated to the project
- 235 an account for settlements with employees as part of the project
- 401… account for the costs of materials used for the project
- 402- … external service cost account for the project
- 403-… an account for other direct costs under the project
- 404-… account of salary costs for the project
- 409-… expense account business travel expenses to the project

Due to the detailed cost control, an additional account was introduced to record project costs broken down into individual items of the financial report – 505.

8.2.2 Brief presentation of the procedure of approving costs

Coordinating Beneficiary: MRadom

Apart from the Mayor of Radom, the Project Manager, the Director of the Department of European Union Funds (to confirm costs within the limit of planned expenditures in the Municipal Budget for the Department for a given year and to incur liabilities of up to EUR 1 000) and the Project Director have authorizations to approve costs of the project. They signed within the range of their authorizations every invoice, bill as well as expenditure disposal (concerning personnel costs). Mentioned above staff were holders of the financial means allocated to Department of European Union Funds in Radom City Hall, where the project was conducted. After a cost had been approved by one of the holders, the Chief Accountant in the City Hall finally approved the payment. After payment cost approvals were bookkept in the Accountancy Department.

Salaries were calculated on a basis of timesheets by the 'Life Accountant'. After checking a payment disposal for content, accounting correctness and approval, the document was recorded in the registry # 246 for salary payments for staff employed in EU projects. Staff remunerations were paid from the municipality budget pursuant to the internal regulation of remuneration on 27th day of each month, and in the following month were reimbursed with funds of the project.

Beneficiary: WMR

All invoices were registered in the Financial Accounting Department and then transferred to the proper department according to the content of the invoice. After receiving the document, the LIFE Project team checked its compliance with the contract/order. If the accounting document met conditions, it was stamped with "Accepted for payment" seal, confirmed by signatures of the authorized Company's employees (the Project Director). Then the invoice returned to the Financial Accounting Department, where the transfer was made after approval by two members of the Company's Management Board each time. Accounting documents after they had been substantively and financially checked were forwarded to the General Accounting Department and added to the accounting books in accordance with the instructions on documents (on synthetical accounts of the project) as well as the Project Accountant (on

analytical accounts of the project). No physical payment was needed to book an invoice. As of 01/01/2022, the circulation of accounting documents (invoices, bills, accounting notes) in WMR has been electronic. Consequently, there were additional steps to be taken. Once a document had been submitted "to the journal", it was scanned and, from then on, electronic approval was required at each level of the document workflow.
Salaries were paid on the first working day following the end of the month for which the payment was made under the employment contract. The salaries were recorded on accounting accounts in accordance with the hourly records of working time.
Business trips took place on the basis of a completed form registered in the HR and Administration Department and after obtaining a written consent of a member of the Management Board. Within seven days after return, the employee submitted a business trip order completed for financial settlement with attached bills and tickets to calculate reimbursement of costs. If the employee travelled by his private car, the amount of reimbursement depended on the number of kilometres travelled (confirmed by the Department of Transport and Warehouse Management) according to the rates specified in the relevant regulation of the Minister of Infrastructure. After obtaining the confirmation of an authorized employee of the Financial Accounting Department and a member of the Management Board, the financial settlement of the business trip was forwarded to the payment and bookkept on synthetical accounts of the project by the General Accounting Department as well as on analytical accounts of the project by the Project Accountant.

Beneficiary: UL

Since 2014 UL has been operating an electronic document flow system called EOD. Pursuant to the new Ordinance No. 49 of the Rector of the University of Lodz of 28/12/2015 on circulation of documents and rules of conduct with accounting documents of the UL, each project invoice should be entered into the EOD, where they were accepted:

- At the Faculty level – by funds manager (project manager), which means carrying out substantive and formal-accounting controls
- At the level of other organizational units of the University of Lodz – by the head of this unit or a person authorized by him (e.g. Economic Centre, Department of Inventory and Property Records, Department of Accounts of the UL)
- At the level of the central administration unit – by the Bursar or a person authorized by him and additionally the Chancellor (if the invoice value is greater than or equal to PLN 10,000.00).

In the case of accounting documents of purchases financed from EU funds, in addition to the electronic description in the EOD, the originals of this evidence were accepted simultaneously in accordance with Rector's Ordinance No. 9 of 27/10/2011 on the circulation of documents and rules of proceedings with accounting documents of the UL.

Beneficiary: FPP

Incoming invoices were registered in the company's secretary office and forwarded to the Project Coordinator. The Project Coordinator checked their compliance with an order or contract, approved and described the cost (proper designation to the action and project). Then, invoices were forwarded to the Accounting Department for accounting verification. Invoices described by the Project Coordinator and the Accountant were submitted to the Project Director or the Board Member for approval of the payment. Afterwards invoices returned to the Accounting Department, where the payments were made, and the cost bookkept.
Business trips were based on a travel order and after obtaining a consent of the Project Coordinator, the Project Director or member of the Board. After return, the employee submitted to the Accountant a business trip order completed for financial settlement with attached bills and tickets to calculate reimbursement of costs. If the employee travelled by his private car,

the cost is reimbursed according to the national rates specified in the relevant regulation of the Minister of Infrastructure.

8.2.3 Time registration system

Coordinating Beneficiary: MR

In MR direct personnel costs were charged on the basis of *Method 1 - Hourly rate times actual hours worked*. A default value of 1720 total annual productive hours is used. MR used an amount other than 1720 hours, on the basis of a reliable time registration system. MR established daily recording system of working time based on timesheets, which followed LIFE model template and included identification of project, name of the employee, period covered by the timesheet, number of working hours for the project, other projects and tasks as well as signatures with dates. Timesheets were regularly electronically completed, printed and signed by the employees (usually during the first week of the following month, occasionally with delay due to sick leave or holiday brake), validated by their supervisors and then submitted to the Accounting Office in the City Hall – the payroll division, where the life accountant prepares monthly payment.

Beneficiary: WMR

The working time register was in paper and electronic form. Each project employee kept his own work time record in the monthly cycle in the spreadsheet according to the Life model timesheet. After the end of the month, the document was printed and signed by the employee. Latest by the seventh day of the next month, it was presented to the direct superior for acceptance. If the employee was absent during this period (due to sickness, business travel, leave etc.), he/she performed these activities immediately after returning to the workplace.

Beneficiary: UL

The UL used the HR and payroll system "REKTORAT" to record working hours. The "REKTORAT" system allowed to register absences for individual employee employment, including the division into years. It showed information on the amount of current and unpaid leave, the use of this leave in the selected calendar year and the number of days of annual leave passing to the following year.

Absences included: vacation leave, a rest leave on demand, a day for a mother with a child, a sick leave. The employee himself did not complete this data - it was done by employees of the Pay Department on the basis of relevant documents (holiday applications, sick leave, etc.).

Annual time cards, broken down by months and days, reflected 100% of employee hours worked. It was possible to print such a Work Card for each one employee.

According to UL Rector ordinance no. 144 from 27/07/2018 each one project had time cards showing the amount of time worked in the project, as well as collective work time cards (according to the template from the ordinance) showing total time of the involvement in all projects at University.

Timesheets with hours worked in the project were approved by the Project Manager (for the Project Manager, they are approved by the Dean). Based on timesheets, the Project Manager prepared for each project employee an application for remuneration in the project (the timesheets in the project are the basis for calculating the remuneration).

Beneficiary: FPP

FPP established daily recording system of working time. Timesheets in general followed LIFE model timesheet. All hours worked by an employee were recorded daily in Excel spreadsheets for the project as well as for all other activities/projects. Once a month, the employee prepared a printout of the timesheet and signed it. This was done usually on the last working day of the month or during the first week of the following month. Timesheets signed by an employee

were submitted for approval and signature of the Project Coordinator, the Project Director or Board Member.

8.2.4 Reference to the Life project

All invoices related to the project costs contained a clear reference to the project by including both project number and acronym and information that the project is co-financed from the European Union funds within the LIFE Financial Instrument and from domestic funds of National Fund of Environmental Protection and Water Management. Whenever possible, this information was included in invoice cost description, however in many cases due to technical limitations stamps with project number and project acronym were applied to mark each invoice to ensure a clear reference to the project.

Coordinating Beneficiary: MR

All documentation of costs concerning the project (invoices, bills, expenditure disposals, etc.) were marked with stamps with following text:

1.

„Project LIFE14 CCA/PL/000101 Adaptation to climate change through sustainable management of water in the urban area in Radom City" is co-financed from the European Union funds within the LIFE Financial Instrument and from domestic funds of National Fund of Environmental Protection and Water Management"

2.

„LIFE14 CCA/PL/000101 LIFERADOMKLIMA-PL
Coordinating Beneficiary Radom Municipality
Action/s no…….
Amount in EURO…….
Euro rate …… in ……..
Realization period ……..."

Beneficiary: WMR

Each accounting document (invoices, travel orders etc.) concerning the LIFE14 CCA/PL/000101 project were described with:

- an accounting number with a specific code for the Project,
- the acronym "LIFERADOMKLIMA-PL" and the project number,
- an indication of the task/project action it concerns.

Beneficiary: UL

Originals of accounting documents related to the implementation of the EU financed projects were described according to the Regulation No. 37 of the Rector of the University of Lodz from 07/12/2017 on the circulation of documents and rules of conduct with accounting documents.

Description of an invoice included the "accounting decree" indicating the project cost account. In the case of project it was a cost account **514-9** / **B1521000000126000** with addition of code for funds source: 2.10.02.999.XX for costs from EU, 2.99.02.000.XX for costs from the faculty own or NFEPWM, 4.01.00.001.00 for costs of own contribution, MPK: 210237000 (cost origin place).

The invoice description was accompanied by LIFERADOMKLIMA-PL logos, European Union, Faculty of Biology and Environmental Protection and University of Lodz. Each accounting document was accepted by the project manager whose stamp, containing the project number, confirmed a direct relationship between the cost and the project.

All originals of project documents were stored in separate, assigned to the LIFE + project, binders in appropriate central administration units (e.g. invoices and other accounting documents - in the Accounting Department, civil law contracts – in the Payroll Department).
Pursuant to the new Ordinance No. 49 of the Rector of UL from 28/12/2015 on circulation of documents and rules of proceedings with accounting documents, each invoice and other accounting document related to the implementation of a project financed by the European Commission (including the LIFERADOMKLIMA-PL project) was marked with a bar code valid for Faculty and the letter designation "EU".

Beneficiary: FPP

The supplier/subcontractor was always asked to include the project number and acronym (LIFE14 CCA/PL/000101, LIFERADOMKLIMA-PL) on the invoice. If the reference was omitted the invoice was marked with a stamp with the project number and acronym during validation process.

8.3 Partnership arrangements

After the Grant Agreement had been signed, all beneficiaries signed partnerships agreement related to project implementation, i.e. CB with other 3 associated beneficiaries: UL, WMR and FPP. The Partnership Agreements were signed on 8/01/2016 and sent to EU just after signing on 20/01/2016 (letter number ***LFE.042.2.2016.KJ***). The CB and ABs signed relevant annexes to the Partnership Agreements: on 16/12/2020 concerning extension of the project duration, Annex with WMR signed on 15/04/2019 concerning actions and budget shifts between MR and WMR of EUR 64 365 (eligible cost in category Durable goods – Infrastructure) and EUR 76 757 (External assistance) from MR to WMR. The shifts were confirmed by EASME and considered as a minor change, not requiring Amendment of The Grant Agreement (email communication from EASME to Coordinating Beneficiary ***on 31/08/2017***). Annex no 3 to the Partnership Agreement with WMR signed on 16/03/2023 concerned budget shifts from MR project budget to WMR.

The signed agreements clearly regulates (they are in force in the durability term, i.e. within 5 years after the end date of the project – to 31/12/2027) distributions of project income (EC financial contribution) together with the responsibilities for preparation and submission of project technical and financial reports. Also covers the preparation of financial reports under the project. Prior to each foreseen project financial report, each beneficiary is obliged to prepare respective Individual Financial Statement approved by respective accountant and Director, based on which project team (financial expert in FPP) prepares the Consolidated cost statement under the project which is submitted to EASME/CINEA on behalf of the Coordinating beneficiary.

The First and the Second Pre-financing payments were received after project start/approval of Midterm report and respective amounts were transferred as shown in the Consolidated Cost Statement in the Financial report and in the Table No. 7 below. Two pre-financing payments in a total amount of 2 053 746,10 EUR (8 545 432,15 PLN) were received by the Coordinating Beneficiary from EU/EASME on 9/12/2015 and 17/12/2018. According to the Grant Agreement stipulations, CB distributed to all 4 beneficiaries bank accounts (shown below), i. e. 1st payment on 7/01/2016 and 2nd payment on 27/12/2018 and for MR rest of the amount 01/2019.

The amounts of pre-financing were determined according to the share of partners in the project implementation and agreed in the Partners Agreements. Since the beneficiaries' haven`t been spending money in the same pace it has been agreed subsequently to re-distribute not used funds among beneficiaries (see the table below), which were considered as budget shifts

between beneficiaries, which in accordance with the provisions of Article II.22 of the Grant Agreement are not encumbered by a threshold of 20% of the eligible costs.

To reimburse the eligible costs from NFEPWM, the associated beneficiaries (WMR and UL) every Request for payments submitted to the Coordinating Beneficiary all billing documents required as annexes. The reimbursement of costs incurred in the project by MR, WMR and UL has amounted to EUR **6 494 305 PLN / 1 560 793 EUR (**by EUR exchange rate from the Grant Agreement 4,1609**) / 1 429 870,60 EUR of declared costs (by different EUR exchange rates due to Art.II.23.4 of The Grant Agreement – on the day when the cost was incurred)**, from which:

- ✓ 50 681,40 EUR (214 500 PLN) for UL;
- ✓ 1 323 559,75 EUR (6 035 549,82 PLN) for WMR;
- ✓ 55 629,49 EUR (244 255,18 PLN) for MR.

CB 14 times transferred payments to the associated beneficiaries in Polish zlotys on 2 separate accounts – one for payments from EASME and the other for payments from NFEPWM. 10 times as a reimbursement of the costs incurred from NFEPWM and 4 times of UE grants: 2 pre-financing payments and 2 transfers for WMR from MR savings:

- ✓ 307 102,67 PLN / 4,1609 = 73 806,79 EUR
- ✓ 11 172,00 PLN / 4,1609 = 2 685 EUR.

Beneficiaries Bank Account numbers:
MR - Bank Pekao S.A., PL32 1240 3259 1111 0010 4817 7815
FPP - Bank Pekao S.A., PL 44 1240 5211 1111 0010 5221 5547
UL - Bank Pekao S.A., PL38 1240 3028 1111 0010 6611 9181
WMR - Bank Pekao S.A, PL 95 1240 5703 1111 0010 6605 6095

Table No. 8 The first and the second Pre-financing payments for the Beneficiaries made by CB

Name of the beneficiary	**Preliminary breakdown (2016)**	**New breakdown (2018)**	**Breakdown 2018**	**Total**
1st pre-payment 7/01/2016 **Exchange rate 4,1878** **880 176,90 EUR** **3 686 004,82 PLN**			2nd pre-payment 27/12/2018 **Exchange rate 4,1485** **1 173 569,20 EUR** **4 868 551,83 PLN**	1st and 2nd pre-payments **2 053 746,10 EUR** **8 545 432,15 PLN**
MR	**195.689,70**	**120.471,21**	**271.451,77**	**391.922,98**
	819.509,33	504.509,33	1.126.117,67	1.630.627,00
FPP	**244.217,33**	**319.435,79**	**524.824,27**	**844.260,06**
	1.022.733,21	1.337.733,21	2 .177.233,48	3.514.966,69
UL	**214.909,40**	**214.909,40**	**252.869,62**	**467.779,02**
	899.997,59	899 997,59	1.049.029,62	1.949.027,21
WMR	**225.360,50**	**225.360,50**	**124.423,54**	**349.784,04**
	943. 764,70	943.764,70	516.171,06	1.459.935,76

8.4 Certificate on the financial statement

Radom Municipality was not obliged to perform the project audit, but for the reasons described in the chapter *5. Administrative part*, we decided to do this.
The following auditing company was chosen in a public procurement procedure to carry out audit in the project:

‘BETA’ Auditing Beata Rękawek , ul. Czapli 43, 02-781 Warsaw,
NIP: 951-150-79-92 REGON: 141174819

“BETA” Auditing was also hired by FPP to perform the financial audit concerning only this partner because its budgeted EU contribution reached 750 000 EUR (1 209 538 EUR). “BETA” company performed procedures regarding the cost declared in 4 Beneficiaries Financial Statements for the period from 16/07/2015 till 31/12/2022.

The Certificate for the whole project (all partners) is included in ***Annex F2.;*** for FPP in ***Annex F2.1***

8.5 Estimation of person-days used per action

Table No. 9: Estimated % of person-days spent by 31.12.2022

Action type	Budgeted person-days	Declared person-days	Estimated % of person-days spent
Action A: Preparatory actions	2 811	3 994,5	142,10
Action B: Purchase/lease of land and/or compensation payment for payment rights	18	255,75	1 420,83
Action C: Implementation actions	2 188	2 432	111,15
Action D: Monitoring and impact assessment	1 246	1 037,75	83,29
Action E: Communication and Dissemination of results	2 280	1 386	60,79
Action F: Project management (and progress)	3 096	5 783	186,79
TOTAL	**11 639**	**14 889**	**127,92**

The total number of person-days amounts to 14 889 and exceeds the contractual number by 3 250 person-days = **127,92%**

The number of person-days by group of actions vary from the contractual number due to the 24 months extension of the project duration. The extended number of person-days did not exceed the contracted budget in the categories concerning costs of personnel.

The table below presents the estimated allocation of the project costs incurred by actions compared to initially foreseen allocation. As clearly seen the highest spending and in the same time underestimated cost in the project proposal budget is linked to Action C3, but the overall project declared costs do not exceed overall contracted costs.

Table No. 10: The allocation of project costs incurred by actions

№	Action name	Budgeted costs, EUR	Final report costs, EUR
A.1	Establishment and operationalization of two working groups on: 1) integrating climate adaptation in local decision making and strategies; and 2) blue-green infrastructure and biodiversity	131 457	36 069,72
A.2	Biological inventory in the project area	44 390	21 333,95
A.3	Spatial analysis and climate change vulnerability assessment of the Radom urban space	144 752	64 653,52

A.4	Hydro-dynamic modelling to optimize water purification in sedimentation ponds	67 875	77 336,58
A.5	Concepts and projects for the urban climate adaptation measures implementation	465 601	353 881,90
B.1	Purchase of land for action C3	245 435	67 759,61
B.2	Purchase of land for action C5	97 094	1 737,57
B.3	Purchase of land for action C6	273 078	246 046,46
C.1	Adaptation of sedimentation ponds and weir at Borki reservoir	442 013	418 964,10
C.2	Management of extreme flows in Borki reservoir	481 249	138 941,45
C.3	Improvement of water quality, mitigation of flows and biodiversity in Potok Północny	352 370	1 101 853,36
C.4	Restoration of Mleczna River valley	249 544	201 360,47
C.5	Adaptation of the A0 rainwater channel for improving of the water quality outflows to the Mleczna River	376 766	424 696,36
C.6	Construction of innovative green-blue infrastructure for storm water management in the inner-city	772 629	991 633,17
D.1	Monitoring of climatic conditions and surface runoff	43 925	33 985,42
D.2	Assessment of hydrological effects of adaptation measures (C1-C6)	57 771	99 127,65
D.3	Monitoring of social-economic effects of the project	32 022	16 925,98
D.4	Assessment of the effectiveness of the adaptation measures for water quality improvement	93 469	79 128,39
D.5	Monitoring of biodiversity	82 215	34 826,62
E.1	Project website	119 793	69 167,33
E.2	LIFE noticeboards	10 080	18 536,43
E3	Layman's report	19 513	5 031,94
E4	Networking activities	248 991	79 055,65
E5	Other awareness-raising and dissemination activities	250 033	152 345,68
F1	Project management	407 306	312 358,93
F2	External financial audit	11 112	13 213,32

F3	After-LIFE plan	10 700	6 179,75
F4	Compilation of information for LIFE RadomKlima indicator tables	9 450	6 196,51
Total direct project costs		**5 540 633**	**5 361 115,08**
Overheads		**297 544**	**297 466,00**
Total project costs		**5 838 099**	**5 658 581,08**

List of annexes

Table No. 11: List of annexes to the Final Report

Action code	**Action / sub-action code / Annex ref. No**	**Deliverables Name / Annex name**	**Milestones Name**	**Status of the deliverable / milestone**
A1	*Establishment and operationalization of two working groups on: 1) integrating climate adaptation in local decision making and strategies 2) blue-green infrastructure and biodiversity*			
	A1	None / WG meetings	None	Achieved
A2	*Biological inventory in the project area*			
	-	Biodiversity baseline report	Environmental inventory conducted. Data collected and analysed.	Delivered with MtR
A3	*Spatial analysis and climate change vulnerability assessment of the Radom urban space*			
	-	Vulnerability assessment report	Vulnerability assessment of the Radom area conducted	Delivered with MtR
A4	*Hydro-dynamic modelling to optimize water purification in sedimentation ponds*			
	-	Hydro-dynamic modelling to optimize water purification in sedimentation ponds	None	Delivered with MtR
A5	*Concepts and projects for the urban climate adaptation measures implementation*			
		Concepts, technical projects and permits for the implementation actions	Environmental Impact Assessment procedure finalized	Achieved
	A5.1 Concepts, technical projects and permits for large scale BGI			
	A5.1	Dates of obtaining projects and permits for large – scale BGI		Achieved
	A5.1.1	Documents for Borki reservoir and colmatation ponds		
	A5.1.2	Documents for Mleczna river		

		restoration		
	A5.1.3	Documents for Cerekwianka polders		
	A5.1.4	Documents for A0 and SSBS by Sucha Street		
	A5.1.5	Documents for SSBS on Potok Północny		
	A5.2 Concepts , technical projects for small scale BGI			
	A5.2	Concepts, technical projects and permits for small scale BGI		Achieved
B1	*Purchase of land for action C3*			
	B1/ B1	Documents proving the dedication of land for the implementation actions/ Documents proving the dedication of land for C3 action	Land purchase contract signed – B1	Achieved
B2	*Purchase of land for action C5*			
	None	None	Lan purchase contract signed – B2	Not achieved
B3	*Purchase of land for action C6*			
	B3 / B3.1	Documents proving the dedication of the land for action C6 signed and sent to EU / Documents proving the dedication of the land for action C6	Land purchase contract signed – B3	Achieved
B1,B3	B1.B3.1	Map of acquired land and Nature 2000	None	
	B1.B3.2	Explanation about "conservation clauses" in Polish land register	None	
C1, C2, C3, C4, C5, C6	C1_C6	Photographic documentary of large - scale BGI	None	-
C1 C2	*Adaptation of sedimentation ponds and weir at Borki Reservoir*			
	Management of extreme flows in Borki Reservoir			
	C1and C2	Report from maintenance of the sedimentation ponds and of the upper weir	None	Achieved
		Report on the performed reservoir cleaning and adaptation activities		
	C1.C2	Report from maintenance of the sedimentation ponds and Borki reservoir		
C3	*Improvement of water quality, mitigation of flows and biodiversity in Potok Północny*			
	C3 / C3	Report on the implemented SSBS / extended detention area on the Potok Północny / Report on implemented SSBS on Potok Północny	None	Achieved

C4	*Restoration of Mleczna River Valley*			
	C4 / C4	Report on Mleczna restoration / Report on Mleczna restoration	None	Achieved
C5	*Adaptation of the A0 rainwater channel for improving of the water quality outflows to the Mleczna River*			
	C5	Report on the constructing a sequentional sedimentation – biofiltration system	Start of first implementation action	Achieved
	C5.1	Report on canal A0		
	C5.2	Report on SSBS over Sucha Street		
C6	*Construction of innovative green-blue infrastructure for storm water management in the inner city*			
	C6	Report summarizing the finished implementation process	Accomplished works in the implementation action	Achieved
	C6.1	Report on constructing polders on Cerekwianka Stream		
	C6.2	Report summarizing the finished small- scale BGI		
	C.6.2.1	Report summarizing the finished small- scale BGI – photographic documentary		
	C6.2.2	Scans of school reference letters about small BGI		
D1	*Monitoring of climatic conditions and surface runoff*			
	D1 / D1.1	Reports including the first data from D1 monitoring Report on the meteorological data collected 2018 Report on the meteorological data collected 2019/ Weather stations report	Accomplished D1 monitoring action	Achieved Since the weather stations were installed in 2018, the report for 2017 was impossible to compile. Instead of that the report covering the deliverables for D1 action includes meteorological data collected 2020
D2	*Assessment of hydrological effects of adaptation measures (C1-C6)*			
	-	Reports including the first data from D2 monitoring	Accomplished D2 monitoring action	Delivered with MtR
	D2 / D2	Final monitoring report / Report of assessment of hydrological effects of adaptation measures (C1-C6)		Achieved
D3	*Monitoring of social-economic effects of the project*			
	D3 / D3	Final monitoring report / Monitoring of social economic effects of the project	Accomplished D3 monitoring action	Achieved
D4	*Assessment of the effectiveness of the adaptation measures for water quality improvement*			
	D4 /	Reports from the first data from D4 monitoring	None	Delivered in MtR
	D4	Final monitoring report / Report of assessment of water quality improvement		Achieved

D5	*Monitoring of biodiversity*			
	D5	Final monitoring report	None	Achieved
	D5.1	Summary Final Report on the Biodiversity Impact of the Project		
	D5.2	Report on Ornithological after implementation monitoring 2021-2022		
	D5.3	Report on Batrachofauna after implementation monitoring 2021-2022		
	D5.4	Report on Ichtiological after implementation monitoring 2021-2022		
	D5.5	Report on Enthomological after implementation monitoring 2021-2022		
	D5.6	Report on Flora habitats after implementation monitoring 2021-2022		
	D5.7	Report on EDNA monitoring 2016 - 2022		
E1	*Project website*			
	E1.1	Statistics of the project website	None	Achieved
E2	*LIFE noticeboards*			
	E2	List of noticeboards	None	Achieved
E3	*Networking activities*			
	E3	Layman`s report	Layman`s report published	Achieved
E4	*Networking activities*			
E4.1		None	None	Achieved
	E4.1.1	Conference at the opening of the project		
	E4.1.2	Conference at the closure of the project		
E4.2		*Collaboration with other LIFE project on climate change*		
E4.2	E4.2.1	Events with promotional materials	None	Achieved
	E4.2.2	Collaboration with other LIFE project on climate change		
	E4.2.3	List of students engaged in the project activities		
E4.3	*Study tours*			
E4.3	E4.3	Study tours	None	Achieved
E5	*Other awareness-raising and dissemination activities*			
E5	E5	Promotional materials and TV documentation	None	Achieved
	E5.1	Informational and promotional materials		
	E5.1.1	Short version of VA in EN and PL		
	E5.2	Building partnership with local society		
	E5.2.1	Tools for building partnership with local society		
	E5.2.2	Articles in media		

	E5.3 E5.3	Best Practice Guidelines/ Best Practice Guidelines		
	E5.4	Competitions for schools		
	E5.6	Professional TV documentation - Cities and climate change; accepting the challenge		
F1	*Project management*			
	F1	Final progress report and audit report	Key new project staff hired	Achieved
	F1	Project management		
F2	*External financial audit*			
	F2	External financial audit of the project	None	Achieved
	F2.1	External financial audit of FPP Enviro		
F3	*After Life Plan*			
	F3/ F3	The "After Life plan will be a part of the project final report and will be published After Life Plan / After LIFE Plan	None	Achieved
F4	*Compilation of information for LIFE RadomKlima indicator tables*			
	F4	Compilation of information for LIFE RadomKlima indicator tables	None	Achieved

Financial Annexes to the Final Report		
No	**Annex name**	**File type/**
Fin1	Financial Statement of the Individual Beneficiary MR	.xlsm
Fin2	Financial Statement of the Individual Beneficiary UL	.xlsm
Fin3	Financial Statement of the Individual Beneficiary WMR	.xlsm
Fin4	Financial Statement of the Individual Beneficiary FPP	.xlsm
Fin5	Consolidated Financial Statement with all 5 forms duly filled in signed and dated	.xlsm
Fin6	Consolidated Financial Statement with all 5 forms duly filled in, signed and dated	.pdf of signed sheets
Fin7	Financial Statement of the Individual Beneficiary MR	.pdf of signed sheets
Fin8	Financial Statement of the Individual Beneficiary UL	.pdf of signed sheets
Fin9	Financial Statement of the Individual Beneficiary WMR	.pdf of signed sheets
Fin10	Financial Statement of the Individual Beneficiary FPP	.pdf of signed sheets
Fin11	Three highest invoices in UL in the budget categories	.pdf
Fin12	Three highest invoices in MR in the budget categories	.pdf
Fin13	Three highest invoices in WMR in the budget categories	.pdf
Fin14	Three highest invoices in FPP in the budget categories	.pdf
Fin15	Position of the Tax authority on VAT recovery for FPP	.pdf