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North West Regional Development Agency
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REDUCES
REthinking Sustainable Development in European Regions by Using Circular Economy Business ModelS

Maramures Gateway to traditions

Action Plan for the region of Maramures

CIRCULAR APPROACH OF WASTE MANAGEMENT IN MARAMURES COUNTY

Project Partner
Maramures County Council

2022

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Part I – General information

Project: REthinking Sustainable Development in European Regions by Using Circular Economy Business ModelS – REDUCES

Partner organization(s) concerned: Maramures County Council
Country: Romania

NUTS 2 region: North West Region
NUTS 3: Maramures County

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Part II – Policy context

The Action Plan aims to impact:	□	Investment for Growth and Jobs programme
	□	European Territorial Cooperation programme
	√	Other regional development policy instrument

II.1 Name of the policy instrument(s) addressed:
Policy instrument 5: Regional Development Plan of North West region 2014-2020
The Action Plan "Circular Approach of Waste Management in Maramures County" is prepared in the framework of the project "REthinking Sustainable Development in European Regions by Using Circular Economy Business Models" (acronym: REDUCES) on behalf of the Maramures County Council, as project partner, with influence on the Regional Development Plan of North-West Region 2014-2020 (RDPNWR 2014-2020).

II.2 Further details on the policy context and the way the action plan should contribute to improve the policy instruments
Taking into consideration:
- The learning process and the exchange of experience at interregional level,
- The shared good practices in circular economy,
- The local / regional needs and the stakeholders interests and involvement,

Maramures County Council action plan "Circular Approach of Waste Management in Maramures County" is designed to contribute to the improved regional governance of the waste management policy with a special attention to the construction and demolition waste (CDW), having in mind green transition and decarbonization. Our action plan will also contribute to the extension, modernization and increased efficiency of the actual waste management system, complementing the project that is currently implemented in the region - Integrated Waste Management System in Maramures County.

The Action Plan of Maramures County Council is addressing to the Regional Development Plan of NW Region 2014-2020, **being considered as a new project financed by Maramures County Council** within the priority P4 – Protection of the natural and anthropogenic environment, efficient use of resources and reduction of pollutant emissions; Investment priority P 4.5 - Development of infrastructure environment in the water and waste sectors; Guidance Actions 4.5.3 "Actions on recycling and recovery of recyclable waste, as well as composting of biodegradable waste, including through investments in collection and sorting infrastructure".

The European thematic objective of the Priority 4 related to our Action Plan is: OT6. "Protect the environment and promote the efficient use of resources". The activities foreseen to be implemented in the plan will contribute to the fulfillment of an **Indicator of outcomes and result of RDPNWR 2014-2020** corresponding to the European Thematic Objective 6, namely: **Set of approved measures / management plans / action plans - 8.75 - Target NW region for 2023.** The action plan of Maramures County can be considered as one of the approved action plans that contribute to OT6.

Maramures County Council, as a public authority at county level, is involved in the regional development of the NW part of Romania, being a member of North West Regional Development Council, and thus having an active role in the elaboration and implementation of the strategic documents, like the Regional Development Plan of NW Region 2014-2020, developed by the Regional Development Agency North-West.
Maramures County Council has addressed a letter to the Regional Development Agency North-West, explaining the AP activities and the contribution of the Action Plan of Maramures County in the field of circular economy on fulfilling of relevant indicators of the RDPNWR 2014-2020.

According to the REDUCES project, the self-defined performance indicator for the Policy instrument 5 - Regional Development Plan of North West Region 2014-2020, refers to Number of new cooperations in the field of circular economy, renewable energy, energy efficiency & waste management. Minimum 5 new cooperations will be set up through the 2 Actions of the Action Plan "Circular Approach of Waste Management in Maramures County", by creating operation networks for contributing at the AP implementation.

Other policy instruments that will be taken into consideration to be improved through REDUCES project is the **Waste Management Plan 2019-2025 of Maramures County**, developed by Maramures County Council according to the Law 211/2011 on the waste regime, transposing into national legislation the Directive 2008/98 / EC of the European Parliament and of the Council of 19 November 2008 on waste.

The Waste Management Plan 2019-2025 of Maramures County was improved in 2021 by setting objectives, actions and measures related to the principles of circular economy. The Measure 6 – Package of the circular economy includes 2 actions:

- Action 6.1 Proposals for reviewing of waste legislation;
- Action 6.2 Action plan at county level that is setting clear objectives on several types of waste: municipal, packages, electric& electronic equipment and construction and demolition waste (CDW). Two measures are foreseen for a proper management of CDW in this waste action plan:
  - elaboration and approval of local regulation setting up the condition regarding CDW management for the population as well as for construction companies;
  - elaboration and approval of a guide of good practices for CDW generated by public works , private constructions small and big infrastructure.

Our REDUCES action plan on circular economy will improve the governance of this new policy instrument, through elaborating local Guide on CDW management within Action 1 Efficient Management of the Construction and Demolition Waste.

Another important objective of the Waste Management Plan 2019-2025 of Maramures County is reducing the quantity of household waste, that will be achieved by the measure "Action and Policy for Information and Awareness of the Population". Our REDUCES action plan on circular economy will contribute to the implementation of this measure through developing an App software for better connection between citizens and public sanitation services within Action 2 Improved Waste Identification, Sorting and Recycling by Using Software Technology to Inform, Build Capacity and Connect Citizens with the Public Sanitation Services.

Part III – Details of the actions envisaged

Background

Within the interregional cooperation of REDUCES project, the six partner regions identified and analyzed relevant CE business models on five themes: product life extension, product as a service, sharing platforms, renewability and resource efficiency and recycling.

The REDUCES exchange of experience took place within interregional learning events hosted especially online by all project regions. During each event, many national, regional and local stakeholders presented relevant initiatives and policy instruments related to CE themes, and all partners presented regional good practices on CE topics. Also, local stakeholders have been involved in stakeholders meetings for discussing the REDUCES themes, identifying significant local good practices for each CE topic and developing the Reduces Action Plan.

Three business models proposed by Reduces partners on construction topic are considered to be relevant in order to be adapted to the local context, namely Boewhub - Platform for logistics of urban construction projects, Insert - Market for reusable building materials and plants, both good practices proposed by Utrecht and Waste Logics, proposed by Manchester, which aims to monitor value chains from waste management and provides cloud-based waste management software.

Bouwhub - Platform for logistics of urban construction projects is a CE good practice referring at the renewability theme, presented by the partner from Utrecht during the third Reduces interregional meeting hosted online in September 2020, by Utrecht partners. This business model will be adapted to our Action plan, for developing the efficient management of the construction and demolition waste and planning a CDW reuse and recycling center in Maramures, within Action 1.

Insert – Market place for reusable building materials, trees and plants was also presented by Utrecht, during the fourth interregional meeting dedicated to the CE theme – Sharing platforms, hosted online, in December 2020, by the Bulgarian partners. Having a great impact on the reduction of waste, Insert platform is a transferrable idea for the Maramures Action plan for developing the Guide of CDW management within Action 1 and also for developing the cooperation between stakeholders in construction sector in order to create a network that enables repurposing resources and materials from demolition projects.

Waste Logics is a CE good practice on renewability theme, proposed by Manchester partners during the interregional meeting organized by the partners from Utrecht. West Logics offers cloud based waste management software providing 'actionable insights from real-time data' that enable better control and evaluation of valuable waste streams. Based on Waste Logics business model, our Action Plan intends to introduce through the Action 2, a software in order to inform, build capacity and connect citizens with the public services for improving waste identification, sorting and recycling. The Action Plan "Circular Approach of Waste Management in Maramures County" contributes to the transition towards circular economy, taking into consideration also the findings presented within the Status Quo of circular economy in Maramures.

In the elaboration of the action plan in the field of circular economy in Maramures, in addition to the exchange of experience within REDUCES project, other key factors are taken into consideration, such as the framework of the EU and national legislation on circular economy and CDW.

- A **local survey** has been also conducted, related to the current stage of regulation and management of construction and demolition waste in Maramures County. Maramures County Council invited 19 local stakeholders to participate at the survey, from which 12 representatives responded at the questionnaire, on behalf of local authorities, county institutions with responsibilities in environment protection, the Intercommunity Development Association - ADI for Integrated Household Waste Management in Maramures County and also from waste companies. 50% of participants at survey responded that their localities have regulations for CDW management. Among specific responsibilities for the CDW surveillance, the mentioned activities are: monitoring, authorizations issuing, verifying activities etc.
- 75% of respondents consider that controls are carried out in accordance with waste management regulations. The most significant sources of waste generation are: individual constructions, ample private constructions, public constructions, renovation of houses, demolition of industrial sites and old buildings. 50% of responses indicate that their institutions adopted practices/ procedures for the management of public and privates CDWs..
- 25% of respondents consider that at local level the surveillance of public works regarding CDWs is a common practice and 75% of answers reflect that at local level sanctions are imposed when the CDW rules are not followed. Regarding the circularity of CDW, 50% of participants at survey responded that at local level it is foreseen to adopt regulations/ procedures to promote the reuse of CDW, The responses show examples on reusing of CDWs at local level, such us: CDWs are used for road

infrastructure, rural roads, constructions etc. Non-hazardous CDWs are crushed and used for earthworks, etc.

The Action Plan "Circular Approach of Waste Management in Maramures County" propose two actions.

Action 1- Efficient management of construction waste is aimed to identify the sources of construction and demolition waste generation (CDW), to develop a local Guide on CDW management and a feasibility study for a planning a CDW reuse and recycling centre.

Action 2 - Improved waste identification, sorting and recycling by using software technology to inform, build capacity and connect citizens with the public services, the aim is to create a network with relevant actors to improve waste management and to develop and promote an application to inform and connect citizens with public services.

ACTION 1: EFFICIENT MANAGEMENT OF THE CONSTRUCTION AND DEMOLITION WASTE
1.1 Relevance to the project *(please describe how this action derives from the project and in particular from the interregional exchange of experience. Where does the inspiration for this action come from?)*

The action aims to set the **framework for improving the management of CDW**, for better recycling of construction and demolition waste and to stimulate the reuse of construction components.

The Action 1 foreseen to be implemented in our action plan until July 2023, will contribute to the fulfillment of an **Indicator of outcomes and result of the policy instrument - RDPNWR 2014-2020** corresponding to the OT 6, namely: **Set of approved measures / management plans / action plans - 8.75 - Target NW region for 2023,** the action plan of Maramures County being considered as one of the approved action plans at regional level. In this respect, the Action 1 will be implemented by the environment department of Maramures County Council and local stakeholders, with financing from Maramures County Council, as new project within the Regional Development Plan of NW Region 2014-2020 - the Guidance Actions 4.5.3 "Actions on recycling and recovery of recyclable waste, as well as composting of biodegradable waste, including through investments in collection and sorting infrastructure".

Based on the interregional learning within Reduces project and taking into consideration the needs at county level, the envisaged activities of the Action 1 are:
A1.1: Creation of local Guide on CDW management
A1.2: Preparation of technical documentation for a CDW collection, reuse and recycling centre

Within Maramures status quo study of circular economy developed in the first stage of REDUCES project, waste management and, in particular CDW management, were identified as significant issues for our region. The only unit for CDW crushing in Maramures is available in Borsa, a concrete crusher with the capacity of 10.000 tones/year. The main practice currently employed for the recovery of CDW is backfilling or landscaping mainly using inert waste (non-hazardous, such as sand, gravel, concrete, bricks, tiles, etc.) that is usually crushed.

In Maramures County, responsibilities for CDW management depend on the type of constructions: individual households, public works, large construction projects and large-scale infrastructures. For individual households, Local Public Authorities (LPA) takes full responsibility of the CDW management through delegated Operators (part of the sanitation service). For public works and large construction projects, the waste holder is the sole responsible for CDW management. LPAs can only establish standards of good practices and information management, but cannot impose specific treatment/recovery solutions.

A Guide for CDW management that include best practice regulation is needed in order to control CDW and set the ground for CDW monitoring. The technical documentation for creating CDW collection, reuse and recycling centre within the composting and temporary storage platform is needed for improving the CDW management in Maramures. The operationalization of CDW centre in Maramures will contribute to the development of circular economy approach in Maramures, thus ensuring the sustainability of REDUCES project.

Link to REDUCES project

During the REDUCES webinars and meetings, series of good practices related to renewability, resource efficiency & recycling and product-life extension have been presented, in order to facilitate the interregional learning. The good practices in circular economy were further analyzed during the exchange of experience workshops. The case studies, their environmental impacts and development potential in each region, were further evaluated according to the standards set in the common evaluative framework. The good practices have been complemented by topic-specific presentations of enterprises applying these business models in the region.
Based of these learning activities of Reduces project, two good practices, coming from Utrecht, Netherlands, attracted our attention and the interest of Maramures stakeholders, being considered as reference for the first action of the Maramures Action Plan.

INSERT market place for reusable building materials, trees and plants, having as main topic the environment, resource efficiency and sharing platforms
The objective from INSERT is to create a network that enables repurposing resources and materials from demolition projects.
The core of INSERT's proposition is an online marketplace (marktplaats.insert.nl) for materials and resources. On this online marketplace companies can post or look for available resources and materials from a wide range of categories, such as trees, heating installations and ceiling systems. Besides, INSERT provides material and resource inventories, storage facilities, and consults on circularity and applying reused materials. The combination of the online platform and services provided, enable the Foundation INSERT to reach its circular ambitions. Momently 32 partners are involved in, or make use of, the services provided by the initiative and over 800 materials from 130 project locations are offered on the online Marketplace.

The project is a source of inspiration for the Action Plan of Maramures Country and its high transferability potential is helping the process. The building and demolition industry is one of the major consumers of raw (virgin) materials, and also the major contributor to waste. This is the case for the Netherlands and in other European countries/regions, but this is the case in Maramures County as well. Based on these facts, making better use of resources in the building and construction sector is an urgency in other regions as well.

In order to elaborate the Guide for CDW management, we will create a local network, taking into consideration the structure of the network presented within Insert good practice. In addition, the range of CDW categories used by Insert Platform will be a baseline for us to analyze the sources of generation and predominant types of CDWs in Maramures. Following the INSERT model, the guide will include recommendation related to creating an online platform presenting the CDW categories, quantities, sources of generation and locations, connecting stakeholders from the construction sector and stimulating the market for reuse and recycling.

The second inspirational case study comes also from the region of Utrecht, in Netherlands. **Bouwhub - Platform for inner-city building projects logistics**

Bouwhub is a logistical hub to minimize the environmental impact for building projects in inner-city building projects. The hub is situated at the edge of town and takes in materials in for the outfitting phase; like tiling, pipe fittings, drywall, for several project, repackages the materials to fit the daily needs for each of the projects in the area it services. The hub limits traffic into the projects, collates the deliveries, lowers the number of deliveries. Planning the daily work, subcontractors are provided with necessary materials on site. Materials resulting from construction and demolition projects are collected and separated in waste and potential reuse materials. The use of any hub is benefiting construction projects, given the possibility of sharing materials and components and also finding purpose for the waste.

The BouwHub is a great example to follow in the case of new CDW reuse and recycling centres, as the one planned in Maramures. We will use the Bouwhub experience in developing the Guide for CDW management that will include good practices regulation and planning the CDW centre, taking into consideration the requirements of space for loading and unloading, space tor storage and security, transportation, cooperation between involved actors, as well as the service provided.

1.2 Nature of the ACTION 1 (*please describe precisely the content of action 1. What are the specific activities to be implemented?*)

The Action 1 has as main goal to **set the framework for improving the management of CDW** by the Guide for the management of CDW recovery and recycling based on the analysis of CDW sector in Maramures and by the technical documentation for a creating a CDW centre in Maramures.

From this perspective, we propose a number of 2 activities:

Activity A1.1: Creation of local Guide on CDW management

- Initiating cooperation networks among public authorities, construction companies, sanitation companies, public institutions with role on waste control, as the first step in identifying reuse opportunities for various components and waste. The public authorities take responsibilities to organize, manage and coordinate the collection of waste, including CDW, resulting from construction works which do not requires a building/demolition permit.
- Identifying CDW main sources of generation, predominant types, quantities generated, locations for collection, storing and sorting. Next step could be to develop an online platform in order to make available the data, connect the various stakeholders from the construction sector and stimulate the market for reuse and recycling, following the INSERT model.
- Elaboration of the local Guide on CDW management in Maramures, that will include local regulations and best practice regulations taking into consideration the structures of BouwHub and Insert platforms and in close cooperation with local public authorities from Maramures.
- Dissemination of the local Guide on CDW management among public authorities and other stakeholders from Maramures.

Activity A1.2: Preparation of technical documentation for a CDW collection, reuse and recycling centre

Preliminary steps: Due to a critical situation in the implementation of the project Integrated Waste Management System in Maramures that is facing important delays caused by landslides near the main Center for Waste Management, and the necessity to perform works for reinforcing the land, Maramures County Council decided to build near Baia Mare a composting and temporary storage platform, in order to solve the waste problem

until the main Center for Waste Management will be operational. In this respect, the location of this composting and temporary storage platform has been identified, the land property has been settled and the feasibility study is currently under elaboration.

The composting and temporary storage platform is designed to be used in two distinct stages, contributing to the sustainability of the Reduces Action Plan:
- A stage that will run until the completion of the remaining investment elements not executed from the Waste Management System Maramures project, including their operationalization, estimated to be finalized by the end of 2023. In this first stage, the objective will manage the municipal waste from Maramures County;
- Another stage after the commissioning and operationalization of the SMID project Maramures, consisting in ensuring the management of CDWs and uncontaminated biodegradable waste.

This requirement to use the composting and temporary storage platform in the second stage as a construction and demolition waste center was included in the specifications for the feasibility study based on the experienced gained within REDUCES project.

The main expected **outputs** of the Action 1 are:

- Local Guide on CDW management elaborated and disseminated in order to be adopted by local councils;
- Feasibility Study elaborated for a composting and temporary storage platform that will ensure the management of construction and demolition waste after the operationalization of the Waste Management System Maramures project and recommendations drafted for the operationalization of the new CDW centre.

1.3 Stakeholders involved *(please indicate the organizations in the region who are involved in the implementation of the action 1 and explain their role)*

- Maramures County Council is the public authority at county level and has competencies regarding the establishment, organization, management and coordination of integrated waste management systems, as well as the carried out specific activities[1].
County Council will act through the Department for Environment for creating the local GUIDE for CDW management, as well as for preparing the technical documentation for the new CDW management centre.
Maramures County Council will close cooperate with the Regional Development Agency North West for demonstrating the influence of the policy instrument, with local stakeholders and construction companies for developing the local Guide for the CDW management, will finalize the feasibility study and will develop recommendation for the operationalization of the CDW centre. As partner in Reduces project, The RDUCES project team of Maramures County Council will monitor the Action Plan implementation.

- Intercommunity Development Association - ADI for Integrated Household Waste Management in Maramures County (ADI IHWMMM) is the association of 76 local administrations from Maramures and Maramures County Council, with the aim of taking over their responsibilities of managing waste. They are responsible to adopt organizational measures necessary for implementation separate waste collection system, in order to transporting them to treatment facilities; provide waste data, manage waste operators, plan waste strategies and implement all requirements of the county waste plan. ADI Maramures will be responsible with the implementation of the activity A1.1 and A1.2, in close cooperation with the Reduces project team from Maramures County Council. Maramures County Council is member of ADI Maramures and the President of Maramures County Council is also the President of ADI Maramures, so the cooperation aspects will be established taking into account the existing procedures between the 2 institutions.

[1] The Maramures County Waste Management Plan, 2021

- **Local public authorities** from the county are responsible to organize, manage and coordinate the activity of CDW collection from abandoned construction works on their administrative territory. In the sense, of the Action Plan they will get involved in developing of local Guide on CDW management and application of the regulation for CDW management.

- **Environmental Protection National Guar, Commissariat Maramures county**, the authority responsible for controlling the environmental requirements application, for identifying abatements and finding the trespassers, in this case companies, individuals breaking the CDW collection rules and public authorities failing to create conditions, at least for CDW collection and sorting, will be involved in developing the local Guide of CDW management in Maramures.

- **Maramures Environment Protection Agency** will be also involved in elaborating local Guide of CDW management and in consulting for planning of the new CDW centre.

- **Roads & Bridges Maramures Company** is responsible for the construction and maintenance of the Maramures county roads, being an important actor in the construction sector. The activities performed by the company are generating important quantities of CDW. Therefore, they are directly interested in valorizing the asphalt, concrete and other materials resulting from road construction and maintenance and have the opportunity to reuse these materials in the construction of new roads.

1.4 Timeframe of Action 1 – 10 Months: 01.08.2022 – 30.05.2023

Activity	Timeframe	Responsible	Results
Activity A1.1 Create local Guide on CDW management	10 months	**Maramures County Council** and **ADI IHWMMM**	- Regulations approved by Maramures County Council and disseminated; - Best practice regulations on CDW management elaborated and disseminated
Activity A1.2 Preparation of the technical documentation for a CDW collection, reuse recycling centre	10 months	**Maramures County Council** / ADI IHWMMM / Roads and Bridges Maramures Company	- Feasibility study approved for composting and temporary storage platform that will ensure the management of CDW after the operationalization of the Waste Management System Maramures project; - Recommendations for the operationalization of the new CDW centre

1.5 Costs *(please estimate the costs related to the implementation of action 1)*
Activity A1.1: This activity is performed by public servants and therefore do not imply any costs, possible the staff training will come with a cost, estimated cost 3.000 Euro
Activity A1.3: Preparation of technical documentation for a CDW collection, reuse and recycling centre (composting and temporary storage platform that will ensure the management of CDW after the operationalization of the Integrated Waste Management System Maramures project.) Estimated cost 26.000 Euro
The total cost of the action is 29.000 Euro.

1.6 Funding sources *(please describe how action 1 will be financed. Is it through the policy instrument(s) indicated in part II):*
The funding source foreseen are the county and local budget.

Fig. 1 The future composting and temporary storage platform that will ensure the management of CDW after the operationalization of the Integrated Waste Management System Maramures project.

1.7 Risks

Action 1 encloses activities under responsibility of the County Council, Local Administrations and ADI IHWMMM. The possible risks and measures to overcome theme are presented in the above table:

Risk category	Possible risks	Level of probability	Measure
Regulatory/ institutional risks	Lack of interest from Local Authorities	Low	Meetings and awareness raising activities on organized for public authorities
	Challenges for elaboration of the local Guide on CDW management (activity A 1.1)	Low	Close collaboration of environmental experts from Maramures County Council with ADI IHWMMM, public authorities and sanitation companies. If needed external experts will be consulted

1.8 Monitoring methodology

Implementation Timeframe of the Action Plan "Circular Approach of Waste Management in Maramures County" A1 – 10 Months: 01.08.2022 – 31.05.2023. All activities will be performed in parallel.

ACTION/ Activity	Phase II of REDUCES project – 10 Months: 01.08.2022 – 30.05.2023											
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
A1 – EFFICIENT CDW MANAGEMENT											Project closure	Project closure
A1.1 Local Guide on CDW management												
A1.1 Preparation of technical documentation for CDW centre												

The REDUCES project team of Maramures County Council will monitor the implementation of activities foreseen in the Action 1 of the Action Plan, according to the timeframe and the expected results.

ACTION/ Activity	Indicators of verification and monitoring
A1.1 Local Guide on CDW management	- CDW Network and new cooperation established: at least 4 companies, 76 public authorities, 2 public institutions with responsibilities in control of CDW; - 3 Stakeholders meetings (1 meeting/ 4 months). - Local Guide for CDW management elaborated, approved by Maramures County Council; transmitted to 76 public authorities; - Dissemination in the CDW Network; dissemination in the local media
A1.3 Preparation of technical documentation for a CDW centre	- Feasibility study elaborated for composting and temporary storage platform that will ensure the management of CDW after the operationalization of the Waste Management System Maramures project; - Recommendations elaborated and approved by Maramures County Council for the operationalization of the new CDW centre

1.9. Dissemination:

- Website of Maramures County Council and website ADI Waste Maramures: at least 3 articles/ year
- Social media: Facebook of Maramures County Council
- 3 Press releases/ year
- Articles on local media: minimum 6 articles/ year

ACTION 2: IMPROVED WASTE IDENTIFICATION, SORTING AND RECYCLING BY USING SOFTWARE TECHNOLOGY TO INFORM, BUILD CAPACITY AND CONNECT CITIZENS WITH THE PUBLIC SERVICES

2.1 Relevance to the project *(please describe how this action derives from the project and in particular from the interregional exchange of experience. Where does the inspiration for this action come from?)*

Action 2 was envisaged as an addition to the Action 1 providing a technological tool that will ensure a better connectivity between public authorities, waste management companies and citizens concerning the CDW and other types of waste produces at local level.

The Action 2 foreseen to be implemented in our action plan until July 2023 - will contribute to the fulfillment of an **Indicator of outcomes and result of the policy instrument - RDPNWR 2014-2020** corresponding to the OT 6, namely: **Set of approved measures / management plans / action plans - 8.75 - Target NW region for 2023,** the action plan of Maramures County being considered as one of the approved action plans at regional level. In this respect the Action 2 will be implemented by the environment department of Maramures County Council and Intercommunity Development Association - ADI for Integrated Household Waste Management in Maramures County (ADI IHWMMM), with financing from Maramures County Council, as new project within the Regional Development Plan of NW Region 2014-2020 - the Guidance Actions 4.5.3 "Actions on recycling and recovery of recyclable waste, as well as composting of biodegradable waste, including through investments in collection and sorting infrastructure".

According to the legislation, the local administrations have the obligation to organize, manage and coordinate individually or by mandating the inter-community development associations, the waste collection, recycling / recovery and treatment being directly responsible for fulfilling the global recovery objectives (65% of the generated amount). In the county of Maramures, this responsibility has been transferred to the Intercommunity Development Association - ADI for Integrated Household Waste Management in Maramures County (ADI IHWMMM), legally established association of 76 cities and communes and Maramures County Council.

Regarding the additional policy instrument addressed –County Waste Management Plan in Maramures County (2019-2025) (CWMP) the current data presented from 2021, depicts a poor performance in terms of selective waste collection and recovery, while recovery targets are far from being met, the image of the county suffers from illegal waste storage and quality of life is affected.

In order to act directly on the causes and create conditions to reach the waste recovery objectives and targets, the CWMP proposes to extend the separate collection system for recyclable waste (paper and cardboard waste; plastic and metal waste; glass waste from household and similar waste, including from public services) to all communities in the county; further implement "pay as you throw" instrument; increase capacity of the existing sorting facilities by modernizing them; extending the separate collection of bio-waste from parks, gardens and markets, the collection of biodegradable waste from urban areas from the population and from economic agents; extension of individual composting of bio-waste in rural households, management of CDW etc.

In this context, awareness and education of the entire population is an urgent need. An improved access to information and education and better connectivity of citizens to public services, facilitated by a software technology (Software/App) is highly supporting a better identification of the waste flows and more efficient waste sorting. The functions of the software application, once used, will contribute to informing and educating citizens, to improving public services, will facilitate the connectivity of citizens to them and in the medium and long term will contribute to increasing the quality of life and comfort level of citizens.

Link to Reduces project

Within the on-line interregional learning event with the topic Product as a Service, hosted by Utrecht in September 2020, the partner from Greater Manchester promoted the best practice Waste Logics, that was considered interesting by our stake holders, especially by the Intercommunity Development Association - ADI for Integrated Household Waste Management in Maramures County (ADI IHWMMM).
During our local stake holders meetings the best practices presented by our partners in all 5 topics of CE have been analyzed and Waste Logics was considered valuable and adaptable to our regional needs.

Waste Logics – a software for waste data analysis is the case study that inspired the proposed action, came from the city of Bolton, Greater Manchester in UK. Waste Logics is a private company that is based in Manchester but actively working with 160 Waste Management companies in UK, Republic of Ireland, US, Cyprus, Australia, and New Zealand.

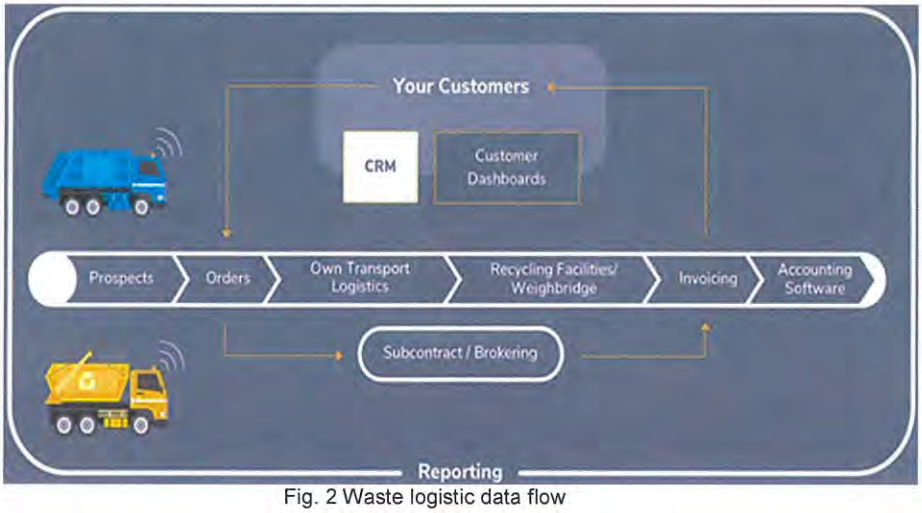

Fig. 2 Waste logistic data flow

Waste Logics provides a 'track and trace' system that uses data aggregation to provide insights into the value chains in waste management, reducing landfill of waste, thus providing a service contributing to the delivery of a data product. It offers cloud-based waste management software that effectively enables data to be used to manage waste operations and materials flows more effectively.

Effectively, Waste Logics:
- Helps waste management companies analyses data to inform decisions about how to improve their status on what is able to be recovered/recycled and diverted from landfill;
- Clients makes this data available to their customers offering 100% transparency. They can illustrate the carbon emission saving for the waste producer that is achieved by processing the waste the way they do rather than it going to landfill;
- Helps its clients better optimize the routes for the fleet each day, making them more cost effective for our client and the environment.

The key to Waste Logics success to the traceability/transparency tools they offer, is allowing visualization and integration of the multiple processes involved in waste recovery and reprocessing. By using data-insights to enable better decision making, improve efficiency, link stakeholders together to enhance the value chain etc. its shows the importance of big data services around supporting transition to the Circular Economy.

Similar with the main features of Waste Logics App, the structure of Maramures App will be designed to link the local stakeholders involved in waste management, adapted to the Maramures context: local public authorities (as policy makers at local level), waste companies (as service providers) and citizens (both clients and civil society that influence the local policies). Within our modules "Citizens and small businesses" and "Waste Company", from the Orders and Job Entry module of Waste Logics we will adapt the following features: "see container availability", "individual service types", "pricing updated", "customer type, area, container size, waste type etc". The Maramures Waste App will also include a module Report that will be inspired by the Report module of Waste Logics, monitoring the information campaigns, the citizens' feedback and the local authorities' actions.

2.2 Nature of the ACTION 2

Taking into consideration the structure and several features of West Logics, the Action 2 proposes a different approach in which, by using the application, all the intended users will become partners and will collaborate to solve a local problem

Digitization has become extremely important in all areas, being proven that the most used equipment in everyday life are mobile phones. As such, a mobile application has undeniable advantages: it can be accessed anywhere, attracts and retains loyalty..

The different use consists in integrating the open data series provided by the Public Administrations and generating data that can later become, through anonymization, open data useful for understanding the city, facilitates the collaboration between actors: Public Administrations, ADI IHWMMM, Waste Companies and citizens and has the support of the stakeholders and of the working group that will be formed and that will continue the development in time of the application.

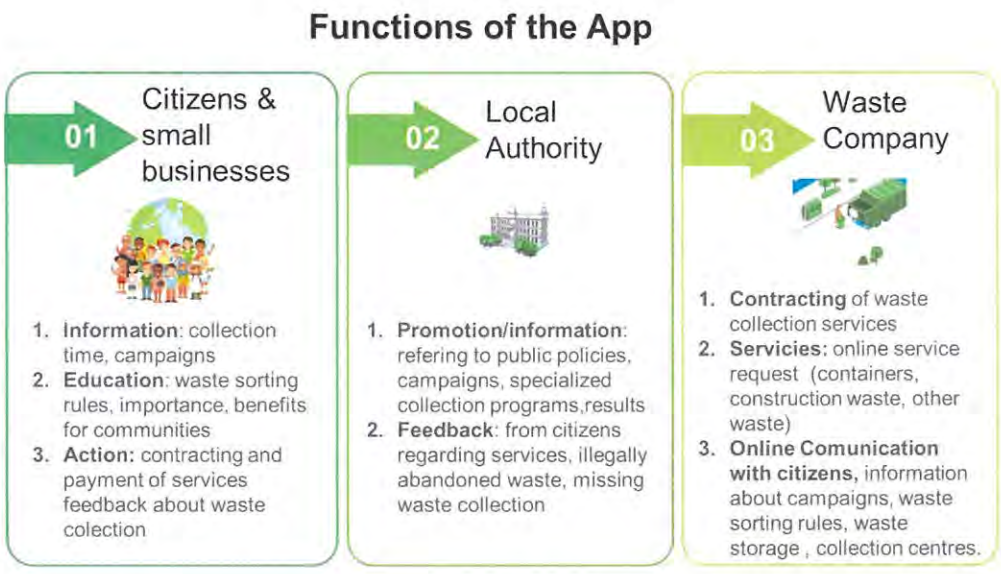

Fig 3: The functions of the App

The Action 2 envisages to create an App that will be customized to be used by a defined community and further on it will be very easy to:

(1) adapted to any other community by entering specific information;

(2) upgraded, by adding new functions as needs are identified. In fact, ADI consists of 76 Local Authorities potential users and interested in replicating this experience in their communities. The opportunities are enormous, we will practically create and pilot a model with unlimited potential for replication and scaling, in similar contexts, using the experiences gained, including the potential to generate income after the project, which will allow maintenance, continuous modernization and adaptation to new communities.

Proposed activities under Action 2:

Activity A2.1: **Develop a network gathering all actors for the intended users that should become partners and collaborate to improve waste management and solve a local problem**.

- Define the community to apply it;

- Analyze and define the requirements of the system within at least 4 working meetings and group discussions.

Activity A2.2: **Elaborate the terms of references for software services and conduct the public procurement**

- Assess future needs to be covered by the App for different stakeholders groups such as citizens and small business, public authorities waste company;
- Choose and plan the procedure according to the national legislation;
- Define ToR and standards the most important document that will establish the technical requirements for the App;
- Submission of tenders and award according to national legislation using SICAP;
- Contract concluded

Activity A2.3: **Developing and promoting the App software** in the following steps:

- Establishing the requirements for hardware and software and developing the general architecture of the system and the functions of the system;
- Implementation and testing of program units - designing the software from the previous stage, transposition into program modules and checking how the program meets its specification;
- System integration and testing - integrating and testing modules as a complete system to ensure that information requirements are met;
- Operation and maintenance of the system - is the actual use by the beneficiary, when possible design and programming errors and omissions in the initial information requirements are discovered and resolved.
- Promoting the App by using synergies with ADI IHWMMM campaigns and other local initiatives, in systematic approach. Promotion and communication in Media and Social Media (FB, websites, local press).

The expected outputs of Action 2 are:

- Operational Network with stakeholders engaged and informed community for using the App;
- Better waste collection will improve the life conditions of neighborhoods, the localities from Maramures and will help meeting waste recovery objectives;
- App to be used on large scale by the public authorities, citizens and sanitation companies.

2.3 Stakeholders involved *(please indicate the organizations in the region who are involved in the implementation of the action1 and explain their role*)

Maramures County Council, through its Department for Environment, in cooperation with ADI IHWMMM will support the creation of the community, participate in all working session, including representative citizens, elaborate and launch the public tender, will be part of the community, and together with waste operators will provide main specifications for software requirements and architecture and information on waste collection rules, schedule, campaigns, interact with users for waste collection services.
Local Administrations will promote the App, use the generated data and ensure a high number of users.
Software Developer will develop, test, maintain and extend the App. The Reduces project team of Maramures will monitor the activities.

2.4 Timeframe of Action 2 – 10 months: 01.08.2022 – 31.05.2023

Activity	Timeframe	Responsible	Results
Activity A2.1: Develop a network gathering all actors for the intended users. Define the community to apply it	10 months	Maramures County Council & ADI IHWMMM, Local Administrations, Waste Companies, NGOs	A group of stakeholders engaged The community defined for applying the App
Activity A2.2: Elaborate the terms of references for software services and conduct the public procurement	2 months	Maramures County Council & ADI IHWMMM	Software developer selected
Activity A2.3: Developing and promoting the App software	8 months	Software developer, ADI IHWMMM, Local administrations Waste Companies	App developed, Press releases elaborated and disseminated

2.5 Costs (*please estimate the costs related to the implementation of action 2*)
Activity A 2.1: Develop a network gathering all actors for the intended users; Define the community to apply it; Organizing working sessions to analyze and define the requirements of the system – no cost
Activity A. 2.2: Elaborate the terms of references for software services and conduct the public tender – no cost
Activity A 2.3: Developing and promoting the App software – estimated cost 32.000 Euro for development; including maintenance

TOTAL= 32.000 Euro

2.6 Funding sources (*please describe how action 2 will be financed. Is it through the policy instrument(s) indicated in part II*):

ADI budget; Alternatively Maramures County Council Budget

2.7 Risks
Action 2 encloses activities under responsibility of the County Council, Local Administrations and ADI IHWMMM. The possible risks and measures to overcome theme are presented in the above table:

Risk category	Possible risks	Level of probability	Measure
Regulatory/ institutional risks	Lack of interest from Local Authorities and sanitation companies	Low	Meetings and awareness raising activities on the importance of separate waste collection and recycling for public authorities. The sanitation companies will be explained the business benefits of the App.
Procedural risks	Risks regarding public procurement tender and procedures	Low	Elaboration of tender specifications and correct service contracts, including real / updated information.
Stakeholder's risk	The number of users is lower than expected	Medium	Intense promotion of the App during campaigns, through web portals of Public Administrations, sanitation companies, social media, etc.
Risks related to App	The App does not work properly	Medium	Establishing quality indicators during the development of the application; testing in cycles and improving accordingly.

2.8 Monitoring methodology

Implementation Timeframe of the Action Plan "Circular Approach of Waste Management in Maramures County" A2 – 10 Months: 01.08.2022 – 31.05.2023

The Actions 1 and 2 will run in parallel, during 10 Months.

ACTION/ Activity	Phase II of REDUCES project – 10 Months: 01.08.2022 – 31.05.2023											
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
A2 - IMPROVED WASTE MANAGEMENT BY SOFTWARE											Project closure	Project closure
A2.1 Develop a network												
A2.2 Terms of references for software												
A2.3 Developing and promoting the App software												

The REDUCES project team of Maramures County Council will monitor the implementation of activities foreseen in Action 2 of the Action Plan, according to the timeframe and the expected results.

ACTION/ Activity	Indicators of verification and monitoring
A2 - IMPROVED WASTE MANAGEMENT BY SOFTWARE	
A2.1 Develop a network to define the App	- Group of stakeholders and new cooperation created: Maramures County Council, ADI IHWMMM, local administrations, sanitation companies, NGOs, public institutions with responsibilities in waste control, citizens; - Community defined for applying the App; - Requirements of the system defined during at least 4 working meetings and group discussions
A2.2 Terms of references for software	- 1 public procurement carried out; - 1 Software developer selected
A2.3 Develop and test the App software	- 1 App developed by following the requirements; - 1 System tested and delivered; - Press releases disseminated (min 3)
A2.4 Promoting the App	- Promotional Materials disseminated (min 4)

2.9 Dissemination:

- Website of Maramures County Council and website ADI Waste Maramures: at least 3 articles / year
- Social media: Facebook of Maramures County Council
- 3 Press releases / year
- Articles on local media: minimum 6 articles / year

Date:_____

Name of the organization(s): Maramures County Council

Signatures of the relevant organization(s): _____

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