Date: 12.9.2019

Call for **External Expert FRAMWAT Project**

*Call for the Binding Price Proposal*

For the purposes of the FRAMWAT project of the Interreg CENTRAL EUROPE Programme, GWP Central and Eastern Europe is seeking the **external expert** to contribute to the T2: Effectiveness of the Natural Small Water Retention Measures (NSWRM) listed in Annex 1 with the following tasks:

* Contribution to the development and testing of the Static method (O T2.3./D.T2.2.2) including participation in meetings;
	+ Analysis of the possibility of aggregating NSWRM into groups with equal impact on water balance;
	+ Hierarchy of the impact of NSWRM on the water balance on the scale of the direct catchment;

**Specification**

1. The description of expertise needed is specified in Annex 2.
2. The expertise includes participation in at least three meetings (in period: 15 October 2019 – 15 December 2019).
3. The expertise availability in period: 15 October 2019 – 15 December 2019.
4. Submission dates: Specified in Annex 2.
5. The price offer in the application must be valid from the date of submission of the bid to 90 days.
6. All costs required to submit the bid are purely born by the applicant.
7. All deliverables have to be in English language.

The bid (Annex 2) should list the following items:

1. Daily rate in EUR/expert
2. Estimated amount of days
3. Other cost in EUR, including overhead
4. Total cost in EUR (with/without VAT)

Criteria to be assessed in the Call

The tasks included in this offer can be carried out by person who should meet the criteria described in Annex 3.

To prove the claimed expertise, the following documents need to be attached to the bid:

1. Binding dates and price Annex2
2. List of required experience Annex 3
3. Full name, address, ID of the organization involved in the Call respecting the GDPR Regulation on the protection of personal data Annex 4

Only bids fulfilling all expertise criteria will be evaluated financially.

**Procuring organization**

Global Water Partnership Central and Eastern Europe

Jeseniova 17, 833 15 Bratislava, Slovakia

ID: 42270081

Website: [www.gwpcee.org](http://www.gwpcee.org)

Communication in this Bid: Veronika Vagoova; veronika.vagoova@gwpcee.org; and CC: gwpcee@gwpcee.org

Please provide the price offer electronically by 30 September 2019 by 16:00 to the addresses: veronika.vagoova@gwpcee.org and CC: gwpcee@gwpcee.org

*Note 1: The applicant agrees with the use, storing and processing of the personal details provided for the call to FRAMWAT project partners, Central Europe Programme and controlling institutions, according to the GDPR regulations.*

*Note 2: The selected service provider agrees to abide the performance of the control /audit related to the goods and services supplied at any time during the validity and effectiveness of the Contract by the authorized persons and to provide them with all the necessary co-operation. Eligible persons are in particular:*

*A) The Office of the Government of the Slovak Republic and the persons authorized by it,*

*B) the Supreme Audit Office of the Slovak Republic, the Government Audit Office, the Certifying Body and their authorized persons,*

*(C) The Audit Authority, its co-operating bodies and their designated persons,*

*(D) The plenipotentiaries of the European Commission and the European Court of Auditors*

*(E) Persons invited by the authorities referred to in point (A) to (D) in accordance with the relevant Slovak and EC legislation.*

Konstantin Ivanov

Regional coordinator

Global Water Partnership Central and Eastern Europe

**Annex 1: List of Natural Small Water Retention Measures implemented in the FramWat project**

| **Id** | **Name of NSWRM** | **Description** |
| --- | --- | --- |
| A01 | Meadows and pastures instead arable land | Meadows are areas or fields whose main vegetation is grass, or other non-woody plants, used for mowing and haying. Pastures are grassed or wooded areas, moorland or heathland, generally used for grazing. Due to their rooted soils and their permanent cover, meadows and pastures provide good conditions for the uptake and storage of water during temporary floods. |
| A02 | Buffer strips and hedges | Buffer strips are areas of a natural plant cover (grass, shrubs or trees) at the edge of fields, arable land, transport infrastructure and watercourses. They can have several different vegetation configurations, from regular grass to combinations of grass, trees and shrubs.  |
| A03 | Crop rotation | Crop rotation is the practice of growing a number of different types of crops in the same area in subsequent seasons. Rationally used (ie the selection of the right crop) crop rotation can improve soil structure and fertility by alternating the planting of deep-rooted and shallow-rooted plants. The traditional element of crop rotation is nitrogen supplementation through the use of green fertilizer in the order of cereals and other crops.  |
| A04 | Strip cropping along contours | Strip cropping is used to maintain soil fertility and prevent erosion when the slope is steep and long or if there is no alternative method. It consists in alternating strips of closely sown crops, such as hay, wheat or other small grains with rows of crops such as corn, soybeans, cotton or sugar beets. |
| A05 | Intercropping | Intercropping is the practice of growing two or more cereals nearby. The most common purpose of coordinate cultivation is to produce larger crops on a given piece of land by using resources that would otherwise not be used by one crop. Examples of simultaneous cultivation strategies include planting deeply rooted plants and shallow roots, or planting tall plants with shorter crops that require partial shading.  |
| A06 | No till agriculture | Plowing is a mechanical modification of the soil. No-tillage cultivation (also called zero tillage or direct drilling) is a way of growing plants or pastures year by year without disturbing the soil structure through plowing. No-till is an agricultural technique that increases the amount of water penetrating the soil and increases the retention of organic matter and the circulation of nutrients in the soil. |
| A07 | Low till agriculture | Low till agriculture, also known as conservative or limiting plowing, leaves at least 30% of plant residues on the soil surface during intensive soil erosion. This slows water movement, which limits the amount of soil erosion and potentially leads to increased infiltration. Limited crops can be combined with other agricultural inputs, such as green cover / cover plants, mulching, permanent tramlines. |
| A08 | Green cover | Green cover (including ground cover crops or catch crops) refers to crops planted in late summer or autumn, usually on arable land, to protect soil that would otherwise be fallow in winter - soil protection against erosion, overheating and loss moisture. Ground cover plants also improve the soil structure, differentiate the growing system and reduce the loss of soluble nutrients. |
| A09 | Early sowing | Early sowing applies to sowing up to six weeks before the normal sowing season. This allows for earlier and faster setting up of winter crops that can provide protection during the winter period (root network that protects the soil). The period in which the soil is exposed is shorter, therefore erosion and runoff are less significant and water infiltration is better.  |
| A10 | Traditional terracing | Traditional terraces consist of almost horizontal platforms built along the contour line of the slopes, mainly supported by stone walls, used for breeding in hilly terrain. This measure focuses on existing or traditional terracing, because it involves less distortion of the site than modern terracing (significant leveling or cutting with the use of heavy machinery). Because the measure is very labor-intensive and expensive to implement, the goal of the measure will be to maintain the existing terrace, not expansion. |
| A11 | Controlled traffic farming | Controlled traffic farming (CTF) is a system that limits the load on all machines to the smallest possible area of fixed tramlines. The CTF system can reduce track marks from 75% to 15% of the surface. Fixed route paths can be used depending on local variables and constraints. The system can be used both on arable lands and pastures. Pathways in the system used should correspond to 15% of the field's area. The CTF system reduces the surface area of fixed tramlines, thus limiting kneading.  |
| A12 | Reduced stocking density | Farm animals, especially heavy species such as cattle, may have a number of harmful effects on the soil - compaction, destruction of soil structure (poaching) and loss of vegetation. The reduced stocking density will reduce soil compaction, thereby facilitating faster infiltration during precipitation and potentially reducing peak flows and sludge outflow. The measure can be effectively achieved by moving grazing livestock from high risk areas. Regardless of whether the reduction is achieved by directly reducing the density of the farm or moving from high risk areas, it will have an impact on the agricultural activity in terms of direct or alternative costs. The reduced density of livestock density can be combined with the measures used on meadows and pastures and permanent crossing paths (reduction of soil compaction by harassing).  |
| A13 | Mulching/fertilization | The mulch is a layer of material applied to the surface of the soil in order to either preserve moisture, improve soil fertility, reduce the amount of weeds, or to improve the visual attractiveness of the area. Mulching as a means of NWRM uses organic materials (bark, wood shavings, grape flesh, nut shells, green waste, crop residues, compost, manure, straw, dry grass, leaves, etc.). When properly applied, it can greatly improve the soil's ability to store water. |
| A14 | Agrotechnics-field water harvesting  | Small dikes around field edges; small channels / grooves around field edges |
| A15 | Deep plowing (removing the plow's sole) | Plowing is the basic cultivation procedure restoring soil production efficiency. It consists in a partial or total cut off from the cane of the role belt and then reversed and crushed. Deep plowing - 20-35 cm (pre-winter plowing). The purpose of deep plowing is primarily to improve the soil structure, give it the efficiency, and accumulate the maximum amount of water from precipitation. Deep plowing significantly reduces the population of pests, diseases and weeds. The plow sole is the result of compaction of the arable layer by passing machines, but mainly plowing at a constant depth. The sole is a barrier to the roots of many crops and a deep chilled frog can solve this problem. Maybe, provided that the profile is deep enough and we will not cause this operation to draw the sterile soil necrosis on top. Compaction adversely affects air-water relations, clogging capillaries and reducing the amount of water available. The plow sole is characterized by lower air permeability, permeability and water capacity than the arable layer and deeper soil profile layers. |
| F01 | Forest riparian buffers | Coastal buffers are areas along streams and other bodies of water. Alluvial rushes most often associated with fallow after forest harvests can also be found in urban, agricultural and waterlogged areas. By maintaining a relatively unobstructed area adjacent to open water, coastal buffers can perform a number of functions related to water quality and a slowdown of the outflow. Typically, buffers have a fixed width of 2 to 20 m. The efficiency of the buffer is approximately proportional to its width. Forest coastal buffers may provide synergies with the agents used in the stream or in the catchment, as they exist in contact between the terrestrial and aquatic environments. |
| F02 | Maintenance of forest cover in headwater areas | Waters of the upper course of the river are the sources of rivers and streams. Forests in the upper reaches of the river can therefore have a beneficial effect on the amount of water and its quality. Indeed, forest soils tend to have better infiltration capacity than other types of soil cover, acting like a "sponge", slowly releasing rainwater. In areas with a convex sculpture, afforestation of the upper reaches of the river can contribute to the stabilization of the slope, which may reduce the risk associated with landslides. Forests often have a high rate of evapotranspiration and high water capacity of tree crowns. Therefore, the forest areas of the upper course of the river are able to reduce the absolute amount of water that can ultimately contribute to the runoff. In addition, forest soils are characterized by high porosity, high content of organic matter, good infiltration capacity and high water retention capacity, enabling delays of water runoff and increasing the infiltration rate (replenishment of groundwater resources). Therefore, forest waters in the upper reaches of the river can play an important role in reducing the risk of flooding. |
| F03 | Afforestation of reservoir catchments | Planting trees in reservoir catchments can have both negative and positive effects. Afforestation of previously non-forest or highly eroded areas can control soil erosion, thus extending the life of the reservoir and improving water quality. Forests in reservoir basins should usually not be managed in the direction of timber production, but should be kept as natural as possible, because fertilization and disturbances of soil structure associated with intensive forest management can have a negative impact on the quality of water in reservoirs. Increased acidification and eutrophication after afforestation of conifers species has also been noted. The use of long-lived indigenous species of deciduous trees for afforestation instead of rapidly growing conifers or eucalyptus trees may bring increased biodiversity benefits while minimizing water loss. Afforestation of the catchemnts of the reservoir may be a part of the program aimed at limiting the risk of flooding. |
| F04 | Targeted planting for 'catching' precipitation | There is evidence to suggest that the loss of tree cover on the slopes of the Mediterranean hill changed weather conditions that caused changes in the amount and duration of rainfall. Change in land use and deforestation associated with it could lead to changes and an open monsoon regime with frequent summer storms over inland mountains into a regime dominated by closed vertical atmospheric recirculation, where feedback mechanisms suppress storms over coastal mountains and lead to increased surface warming during the period summer. Targeted afforestation in some parts of the Mediterranean can be one of the ways to combat drought and desertification. However, care should be taken when selecting areas for afforestation to avoid possible negative effects, as there is evidence that afforestation in a dry environment, especially in mountainous areas, can result in water scarcity in rivers. Local tree species should be used to reduce threats to biodiversity. The overall objective of this measure is to restore and improve the rainfall pattern in the region by changing regional weather patterns. Trees are able to increase the speed of evapotranspiration. If this measure is applied successfully, it will contribute to the mitigation of the effects of climate change. The increase of summer precipitation contributes to topping up groundwater and the aquifer, potentially improving the quantitative state of groundwater. |
| F05 | Land use conversion | Conversion of land use is a general term for large-scale geographic changes. Afforestation is one of the land transformations in which trees are planted in previously forested areas. Afforestation can take place intentionally or by abandoning marginal agricultural land. Depending on the planted tree species and the intensity of forest management, afforestation may have more or less environmental benefits. The benefits of NWRM include potentially increased evapotranspiration associated with growing forests and better water retention capacity associated with forest soils. The biggest environmental benefits are probably related to the planting of indigenous deciduous species and low-intensity forestry. Plantation forestry with exotic species may be less beneficial for the environment. It should be mentioned that afforestation in arid areas can cause or exacerbate water scarcity. Although afforestation can reduce the available amount of water on a local scale, forest cover increases the supply of water on a regional and global scale, in particular by intensifying the water cycle. |
| F06 | Continuous cover forestry | Forest maintenance covers a wide range of forest management practices that can have beneficial hydrological effects. The main idea is to reduce the number or size of the cutbacks. Some definitions of continuous forestry include the statement that no clearings will be greater than 0.25 ha. Protection / maintenance of forest areas provides an unbroken 'canopy' of trees, and the surface of the soil is never exposed. An unbroken tree canopy will be characterized by greater interception than a place with discontinuous tree coverage. Ensuring that the soil is never exposed will reduce sludge production. |
| F07 | Water sensitive' driving | Driving in the field has potentially serious negative consequences for water quality. Some of these damages can be minimized or mitigated if vehicle drivers apply a few simple precautions. Avoiding wet driving whenever possible will reduce soil compaction and rutting. Rutting can concentrate flow paths and lead to increased erosion. In colder regions of Europe, riding on frozen soils will also reduce compaction and 'damage'. Driving parallel to the contour line of the slope of the hills will reduce the potential for rutting and concentration of flow paths, but it may not always be feasible, especially in areas with a high gradient. The use of a cover or specially designed mats for cutting while driving in the field during forest felling can help to reduce soil compaction and rutting. Reducing tire pressure on unpaved forest roads can also be considered as one of the aspects of this action. |
| F08 | Appropriate design of roads and stream crossings | Access roads to the forest and other roads in rural areas often cross streams and other small watercourses. The construction and material used in forest road construction can have a strong impact on the risk of erosion and water quality in streams. Bridges or culverts used to cross these watercourses must be appropriately designed to minimize negative impacts on the aquatic environment. Poorly designed or poorly implemented crossroads can have many negative effects on the aquatic environment, including increased sediment mobilization and changes in flow patterns.  |
| F09 | Sediment capture ponds | The sediment capture ponds are ponds located in forest ditch networks to slow down the water velocity and cause suspended materials to settle. The ponds that capture the sediments are the most useful for managing the effects of construction and maintenance of ditches and road works. While they are mainly used in forests, ponds that capture sediments can be a useful temporary measure to preserve the quality of water on construction sites or near the mine. They can also be useful for capturing sludge in agricultural outflows. Sludge collecting ponds have a limited lifespan, depending on the amount of suspended material in the incoming water. However, ponds can be maintained by removing accumulated sediment. The catchment area, hydraulic properties of ditches, flow rate and soil characteristics are among the factors affecting the functioning of ponds that capture sediment. Effective functioning to a large extent also depends on the knowledge and skills of specialists designing and implementing this action. |
| F10 | Coarse woody debris | Coarse woody debris in canals and streams has many ecological and hydrological benefits. The thick wood rubble consists of large parts of dead trees: tree trunks, branches that fall in or are deliberately placed in streams. Thick wood rubble can be placed with a different degree of naturalness. Rumah can be used to create dams that effectively limit / slow the flow of water. In some extreme cases, riparian trees can naturally fall into streams. The thick wood rubble in the stream usually slows the speed of water flow and can reduce the peak of flood waves. In addition to its role in slowing down the flow and facilitating sediment accumulation, thick wood debris can improve water biodiversity, retaining food and providing additional habitats, such as refuges and spawning grounds. |
| F13 | Peak flow control structures | Ponds or small reservoirs on ditches (channel or side) to reduce the volume and velocity of high discharge are aimed at reducing the flow velocity in forest ditch networks. Flow control structures are ponds / reservoirs designed to limit the rate at which water flows out of a ditch network. Because structures slow down the flow of water, they help to control sediments and can reduce the size of flood waves. Ponds or small reservoirs on ditches will have a limited lifetime, because the accumulated sediment will fill the ponds to some extent. However, ponds can be maintained by removing accumulated sediment. |
| F14 | Overland flow areas in peatland forests | Backwaters, floodplains in the area of forest ditches - areas intended for flooding in the spring at a high water level, which improve the retention capacity of the area and biodiversity. |
| N01 | Basins and ponds | Reservoirs and ponds that stop water are reservoirs that store surface runoffs. Ponds (eg retention pond, flood storage tank, shallow water storage reservoir) store water in dry weather and are designed to accommodate water collected during intense rainfall. Reservoirs and ponds have a large potential for storing run-off waters. The total capacity corresponds to the capacity of the reservoir or the capacity available in the pond (total capacity minus the volume of water already in the pond before rainfall). The tanks do not serve for long-term storage. The limitation and storage of surface runoffs therefore contribute to reducing the risk of flooding as an alternative to flood walls.  |
| N02 | Wetland restoration and management | The Ramsar Convention defines Wetlands as "areas of swamps, marshes and peat bogs or reservoirswaters, both natural and artificial, solid and periodic, with standing or flowing waters, sweet waters,brackish or salt (including seawater, the depth of which at the outflow does not exceed 6 m) ". Wetlands provide water retention, increase biodiversity and improve water quality, they are the most important land "stores" of organic carbon. Reclamation and management of wetlands may include: technical, spatial activities on a large scale (including the installation of ditches for re-watering or liquidation of embankments to enable flooding / flooding); technical small-scale measures, such as cutting down trees; changes in land use and agricultural measures, such as adaptation of cultivation practices in wetlands. These activities can improve the hydrological regime of degraded wetlands and generally improve the quality of habitats. The creation of artificial wetlands in urban areas can also contribute to reducing the scale of floods, improving water quality and improving habitat and landscape. |
| N03 | Floodplain restoration and management | The flood plain is an area bordering the river, which naturally provides space to stop the flood. Soils in flooded areas are generally very fertile and are often used as agricultural land after dehydration. Flood plains in many places have also been separated from the river by dikes, berms or other structures designed to control the flow of the river. They were also covered with older settlements.In this way, the main roles of floodplains were lost due to land drainage, intensive urbanization and river drainage. The aim of the activity is to restore their retention capacity and ecosystem functions, by re-connecting the flood plains with the river. |
| N04 | Re-meandering | River meander is a form, a fragment of a river bed resembling a loop or arc (a form associated with the tortuous course of a river bed), which allows to reduce the speed of water. Canalization is one of the ways to adapt the watercourse to the needs of shipping and agriculture. Restoration of the river's meandering consists in creating a new meandering route of the watercourse or reconnection of cut meanders, which slows down the flow of water. The new form of the river bed creates new flow conditions and very often has a positive effect on sedimentation and biodiversity. Newly formed or re-connected meander also provide habitats for a wide range of aquatic and terrestrial plant and animal species. |
| N05 | Stream bed re-naturalization | The restoration of the natural condition of the bed consists in removing concrete or other hard structures from the riverbed and replacing them with plant structures. The restoration of the natural state of the stream bed has the potential to reduce the risk of flooding. By varying the width of the channel and depth it is possible to increase the water holding capacity in the watercourse. The differentiation of the water flow rate contributes to the slowdown of flows and regulation of erosion and sedimentation. The restoration of the natural shape of the river bed, banks and river flow helps to catch the path of pollution through sedimentation, filtration through vegetation and island formation. The design parameters related to the restoration of the natural state of the stream bed will vary significantly, depending on the length and size of the river. The measure is often used together with the following NWRM measures: shore stabilization, floodplain reconstruction and management, and restoration of river meanders. |
| N06 | Restoration and reconnection of seasonal streams | Seasonal streams or periodic rivers are rivers for which surface waters cease to flow at some point in space and time. They cover a large part of the global river network and are characterized by dynamic exchange between terrestrial and aquatic habitats. These habitats support water, semi-aquatic and terrestrial fauna. Seasonal streams provide basic ecosystem services to the public, including flood protection and irrigation. The number and distribution of seasonal streams and their natural intermittent flow systems are changed by climate change, water intake and transfers between basins. Despite constant changes, seasonal streams are under-researched and protection management is inadequate. The reconstruction and re-joining of seasonal streams with the river therefore consists in restoring lateral connections, diversifying flows and ensuring the proper functioning of seasonal streams to improve water retention. |
| N07 | Reconnection of oxbow lakes and similar features | Oxbow lakes are usually formed in valleys of meandering rivers by cutting meanders (cut off a fragment of a river). They are quickly disappearing by silting and backfilling with sediments from floods and vegetation. Reconnection with the river involves removing barriers between the main channel and the oxbow lake, improving the overall functioning of the river by restoring lateral communication, diversifying flows and cleaning the section of the current oxbow river to improve water retention during floods. |
| N08 | Riverbed material renaturalization | The restoration of natural erosion and accumulation processes is associated with renaturative action in a given area (bringing the aquatic environment to its original state to the greatest extent possible, with the least human interference in the natural processes in the river). Enabling lateral erosion, accumulation and change of the watercourse route - meanders are formed, the speed of water outflow decreases (slowdown of water runoff from the area of ​​use) in connection with the launch of oxbow lakes. In case of operation, the watercourse route is more winding (unregulated), which promotes the development of local species of fauna and flora. In order to counteract the deep erosion in the riverbed, open-walled anti-ridge dams are built, whose task is to segregate and stop the transport of wood rubble and rock rubble during freshets. |
| N09 | Removal of dams and other longitudinal barriers | Barriers and other longitudinal barriers are obstacles that cross a section of the river across and cause discontinuities in the transport of sediments and fauna, as well as change the depth and flow dynamics in both the previous and subsequent sections. Their removal consists in completely destroying the obstacle, restoring the slope and the profile of the longitudinal river, thus enabling the re-establishment of natural river dynamics as well as the continuity of sediments and ecology. Some dams and weirs are built to regulate river flow and erosion. It is necessary to assess the possible negative effects of removing the dam and the option of mitigating them. Each situation should be considered individually. The measure can be combined with the restoration of communication between floodplains, oxbow lakes and other retention reservoirs to reduce the risk of flooding. Removal of longitudinal barriers restores the continuity of the river, defragments the stream's habitats and improves their quality. This contributes to the improvement of the hydromorphological quality elements and to the improvement of the ecological status by providing a greater variety of (migratory) fish and other aquatic communities (eg invertebrates of the bottom zone and macrophytes).  |
| N10 | Natural bank stabilisation | The river bank may consist of natural and / or artificial elements along the river's current. In the past, many artificial banks of concrete or other types of retention walls were built, which limited the natural tides of the rivers. This can lead to river degradation, increased river flows and speeds, increased erosion and reduced biodiversity. The natural stabilization of the shore consists in restoring their ecological components, thus reversing such damages and allowing the shore to stabilize, as well as allowing for a more free flow of the river. Natural solutions are preferred, such as bioengineering, but land-based methods may be needed in the case of strong hydrological limitations. The banks are mostly steep, between 3: 1 and 1.5: 1. It is recommended to use local materials (soil and species of vegetation) for long-term sustainable development and to allow for the re-establishment of a natural exchange between the river and groundwater. The measure is often implemented jointly with the restoration and management of floodplains and wetlands.  |
| N11 | Elimination of riverbank protection | The removal of concrete edge reinforcements causes a slowdown of water runoff, increased humidity of neighboring areas, increased water infiltration area. Concrete edge fortifications can be replaced in some cases with biological fortifications, which also affects the water treatment processes. |
| N12 | Lake restoration | The lake is a natural reservoir, the object of small water retention. It can store water (for control, flood prevention) and provide water for many purposes, such as water supply, irrigation, fishing, tourism, etc. The lake is also an important habitat for many plant and animal species, including wading birds. Restoring lakes involves expanding their structure and functioning where they have been drained or degraded in ancient times. The design will vary considerably depending on the extent of restoring, the current and existing appearance of the lake and the scale. Lakes are natural reservoirs that provide water for various applications (eg recreational, ecosystem and irrigation). The capacity of the lake to store the flowing water corresponds to the total volume of the lake reduced by the area already flooded with water. Hydraulic infrastructure can be built or modified to increase the total lake capacity.  |
| N13 | Restoration of natural infiltration to groundwater | Groundwater is a part of infiltrated water, which is a water resource for human population and activity. Previous landscape modifications have reduced the ability to infiltrate many European soils, thereby reducing the rate at which rainfall is able to penetrate and feed aquifers from groundwater. Restoration of natural infiltration to groundwater makes it possible to reduce runoff from surrounding areas and improve the condition of groundwater aquifers and the availability of water. Natural cleaning processes associated with infiltration can improve water quality. This measure can also be called "artificial loading of groundwater" in engineering literature. The mechanisms for restoring or increasing the natural infiltration capability include:surface structures facilitating / increasing infiltration (such as, for example, infiltration pools);indirect subsurface recharging - the ability to infiltrate increasesthrough wells drilled in the unsaturated zone; direct subsurface charging - infiltration / top-up of aquiferthrough wells reaching the saturated zone. |
| N14 | Re-naturalisation of polder areas | Polder is a low-lying area of ​​the land (usually a natural flood plain) surrounded by embankments known as a barrier that creates an artificial hydrological entity, which means that there is no connection to external waters other than through manually operated devices. Restoring its natural state consists in strengthening polders with natural properties that allow for better storage of water in watercourses inside the polder, as well as for the increase of biodiversity. Restoring the natural state of the polder areas has a significant impact on the storage of water in the river (water is stored in watercourses and water nooks inside the polder, and not pumped out of the polder). It also has a positive effect on infiltration and water retention in soil.  |
| D01 | Regulated outflow from drainage systems | Effect of proper regulation of water outflow from drained areas through various types of water devices (dams, other damming structures, ponds, objects used to cover surface waters, etc.) - water retention in dry periods (retention of spring and thaw waters) and enabling / flow control (drainage of ditches) in wet periods to prevent local floods. The key preliminary activity is the development of detailed principles of water management in extensively drained areas. Examples of technical measures are: reconstruction, modernization and construction of damming devices: weirs, valves, monks, steps to use water for irrigation, slowdown of surface water outflow, protection of peat soils, counteracting erosion on watercourses with large falls, raising the level of groundwater at adjacent areas (if possible with social restrictions), supplementation and modernization of drainage facilities in terms of maintaining ecological balance of biotopes. |
| D02 | Water damming in ditches, wires with constant crest (valleys) | Permanent (all-year) damming is a simple solution, not requiring service, carried out with the use of damming structures (weirs, gates, thresholds, etc.) located in a valley outside the river. The effect of the action is to increase the waterlogging of the area (counteracting the effects of drought), flood protection of the lower lying areas (slowing down the outflow of waters). Permanent damming eliminates the occurrence of high variability of soil moisture. The action works primarily on wasteland, forest areas - no social restrictions. |
| D03 | Active water management on a drainage system (river valleys) | The total of measures involving the adaptive control of water outflow from drained areas resulting from the analysis of the current humidity and meteorological forecasts. In particular, it concerns the control of inflow and inflow of water on weirs and active regulation of the level of valves with the use of innovative solutions for improving retention and irrigation. |
| D04 | Construction of micro reservoirs on ditches | The measure consisting in the construction of micro reservoirs, to which water is supplied through a network of ditches. Reservoirs built on ditches perform primarily retention function - they are a water storage, but also slow down the flow of water from the area and additionally to a certain extent fulfil water cleansing functions and constitute a habitat for fauna and flora (improvement of biodiversity). |
| D05 | Infiltration reservoirs and ditches (similar to N13) | In reservoirs and ditches, rainwater is kept and simultaneously infiltrated. The reservoir has a bottom and walls that allow water infiltration. The volume of the tank is designed to stop the entire amount of run-off rainwater. |
| D06 | Construction of reservoirs on outflows from drainage systems | In infiltration reservoirs and ditches, rainwater is kept and simultaneously infiltrated. The reservoir has a bottom and walls that allow water infiltration. The volume of the reservoir is designed to stop the entire amount of run-off rainwater. |
| T01 | Polders, dry flood protection reservoirs, sediment trapping dams | The measure that relies on construction / planning in the catchment basin: polders (usually the flood plain area, during the river flooding period allows for overflow of the excess water and its natural retention), dry flood protection reservoirs (their entire capacity is designated for flood protection purposes, these are reservoirs that collect water only during floods, except for fences, their bowls are used for agriculture as meadows and pastures - there are no intensive crops) and anti-rubble dams (dams whose main purpose is to retain sediment, mainly rubble on the fraction of wleczyn and wleczyn, and thus, protection of areas located below the structure before floods and rubble). |
| T02 | Widenning or removing of flood protection dikes | The construction of flood embankments, the purpose of which is flood protection, in fact, limits river flood areas and increases water levels and flow rates. Moving the embankments away from the river bed brings significant benefits.The dike may then be lower, and thanks to the greater capacity of the embankment, the level of freshets will decrease, and the flow rate will decreaseflood waters, the river banks will be less damaged and vegetation. If widening or removing of flood protection dikes is not possible, then it is recommended to make culverts or local depressions in order to allow controlled flooding land falls at higher water levels in the river. Because of this measure, it is possible to reduce the erosive trend of the channel and to create a nature close to the development of the flood plains. In the acquired floodplains, it is possible to recreate oxbow lakes in the inter-embankment and enrich ecosystems. |
| T03 | Construction of small reservoirs on rivers (dammed reservoirs) | Small reservoirs on the river - artificial water reservoirs, which were created as a result of water river water damming by the water structure (damming up). They can perform several functions: flood control, water supply function, recreation. Small water reservoirs are one of the basic tools allowing to increase the catchment retention. Due to their construction, the surface runoff is reduced, which indirectly leads to the culmination of the flood wave in local river channels (storage of rainwater). |

**Annex 2: Binding dates and price**

*For the purpose of financial evaluation, please fill in the following items*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Outcome | Submission date | Estimated amount of days | Daily rate (EUR) | Total sum (EUR without VAT) | Total sum (EUR with VAT) |
| ***D.T2.2.1 – Static method to assess cumulative effect of NSWRMs in the river basin***  |
| Analysis of the possibility of aggregating activities into groups with equal impact on water balance | 30.10. |  |  |  |  |
| Hierarchy of the impact of activities on the water balance on the scale of a direct catchment | 15.10. |  |  |  |  |
| Other costs (including overheads) – travel to at least three meetings as well as communication with project leader (University of Life Sciences) or procuring organization (GWP CEE) |  |  |  |  |  |
| **GRAND TOTAL** |  |  |  |  |  |

**Annex 3: List of required experience for contractor**

1. Degree: Ph.D. in the field of: water management or environmental engineering

*Provide information confirming degree ………….*

2. Professional experience: Minimum of 20 years of professional experience in the field of water management in the last 30 years.

*Provide information confirming the experience stated above: ……………………….*

3. Active participation in the implementation of at least 5 reports / projects in the field of analysing the impact of various types of activities (technical or non-technical) on the balance of surface waters in a lowland catchment and at least 1 in the upland or mountainous catchments.

*Provide information confirming the experience stated above: ……………………….*

4. Co-author of a minimum of 10 scientific articles in the field of surface water balance modelling.

*Provide information confirming the experience stated above: ……………………….*

**Annex 4: GDPR - Consent to processing of personal data**

***Name: Global Water Partnership Central and Eastern Europe
ID: 42270081
Tax ID: 2120410160
Address: (SHMU), Jeseniova 17, 833 15 Bratislava, Slovakia***

Consent to the registration and processing of personal data according to Act No.18 / 2018 Coll. and Regulations (EU) 2016/679

Pursuant to Act No.18 / 2018 Coll. on the protection of personal data and the European Parliament Regulation and Council (EU) 2016/679 of 27 April 2016 on the protection of individuals with regard to the processing of personal data; the free movement of such data and repealing Directive 95/46 / EC on the protection of personal data I voluntarily agree to manage, process and store my personal data to company Global Water Partnership Central and Eastern Europe which are mentioned in the CV, motivation letter and other job search attachments that I have provided to the above-mentioned company by e-mail, in order to be stored in the database to find a suitable candidate for External Expert.

The consent can be revoked at any time, otherwise, the consent expires after 3 years from the day

its granting and data will be anonymized and further used solely for statistical purposes.

Date:

Name:

Signature: