

# Small Water Retention Measures



**Human activity**, such as the construction of drainage systems, the sealing of surfaces as a result of urbanisation, and the regulation of rivers and changes of land use, have **contributed to altering the water cycle**, which has resulted in an **increased frequency of extreme events**, such as **floods and droughts**. Besides being harmful to humans, these events also negatively affect the natural environment, and increase pollution to surface and groundwater. In addition, it should also be noted that climate change might further exacerbate the issue.

## Small Water Retention Measures are an excellent solution because

they increase landscape resilience against the effects of climate

they improve the water conditions in the river basin

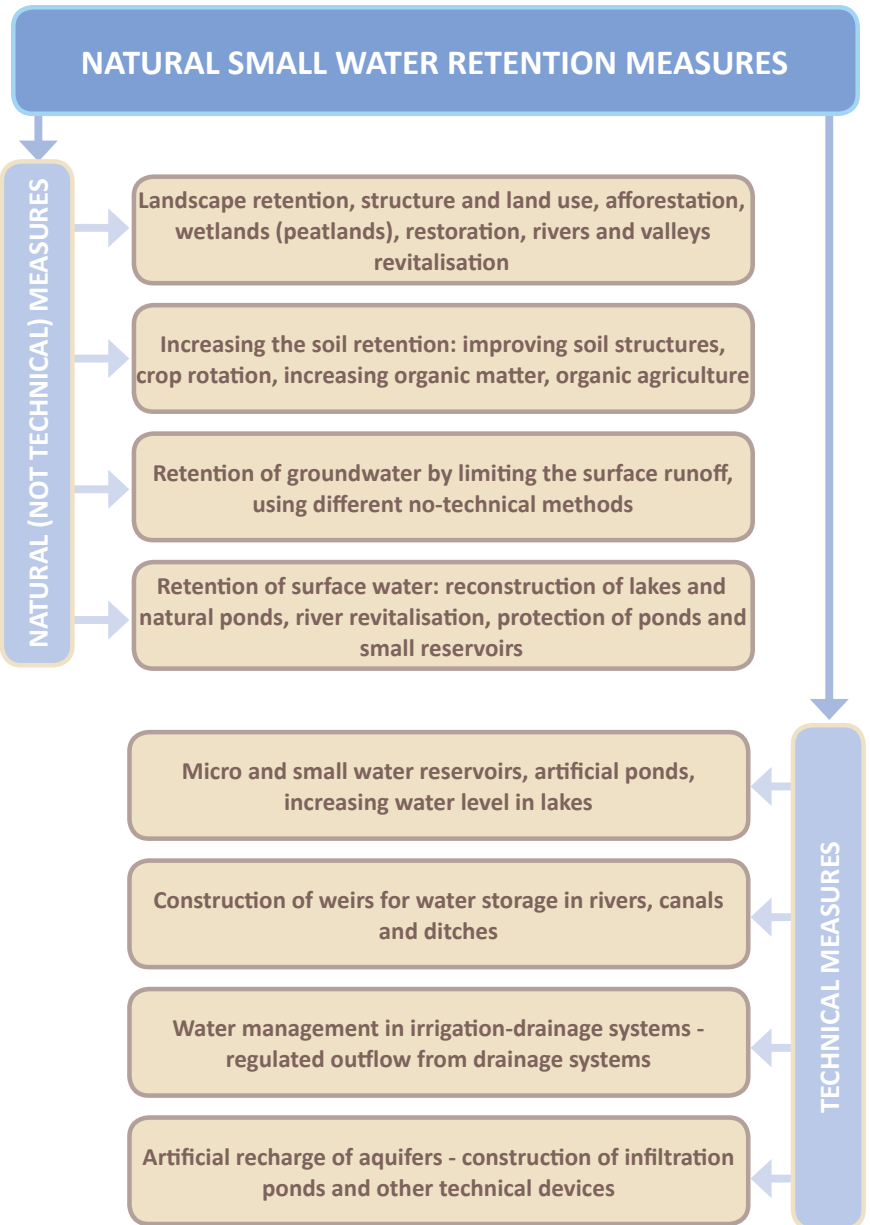
they help retain water in the land during wet periods, and then to make this water more available for ecosystems, agriculture and forestry during drought periods

they preserve biodiversity of habitats that are strongly related to water resources, including habitats and species of a great natural value

Natural Water Retention Measures (NWRM) are defined as *“measures that aim to safeguard and enhance the water storage potential of landscape, soil and aquifers by restoring ecosystems, natural features and characteristics of water courses and using natural processes”* (EU Commission, 2014).

## Small water retention vs. Natural retention

Natural small water retention measures include technical measures for improvement of retention capacity of the catchment area. Small water retention means not only the retention of surface water with water or damming up watercourses, but also agricultural practices, phyto land improvement and afforestation to increase the retention of soil, regulation of rivers such as changes in cross-section troughs and longitudinal slope and the use of natural floodplains and landscape depressions.



Miętne, Poland, 2014, credit: Majercakova/GWP CEE





## *Benefits of natural small water retention measures*

Small retention measures have positive social, economic and environmental effects. The most important benefits are:

- Improving the natural retention capacity, which, contributes to the potential for an increased amount of water that can be naturally stored in the environment, and used for alimentation of water courses during droughts. It is a good example of integrated water resources management;
- Increasing the water retention capacity of a catchment, which can significantly limit unfavourable impact of climate change, as well as the investments accelerating water runoff from the catchment;
- Satisfying the needs of water dependent forest and swamp ecosystems, as well as the improvement of the state of environment as a result of elevation of groundwater tables;
- Increase of groundwater aquifers alimentation, which causes the increase of groundwater resources;
- Fulfilling some of economic demands, for example, water reservoirs can be used as water intakes for firefighters, bathing resorts, fish ponds, water intakes for irrigation or watering holes for wild animals;
- Improvement of natural values of environment, improvement of biodiversity of agricultural landscape by the restoration of wetlands, small ponds, creation of natural aquatic fauna and flora enclaves, creation of human friendly micro climate;
- Protection of surface water quality, retention of suspended matter, cleaning of rainwater from nutrients (nitrogen and phosphorous);
- NSWRM do not only contribute to improving the water balance (i.e. the decrease of discharge variability), but are also important elements of protection of biodiversity in rural and urban areas, as well as water quality protection, particularly from diffuse pollution.





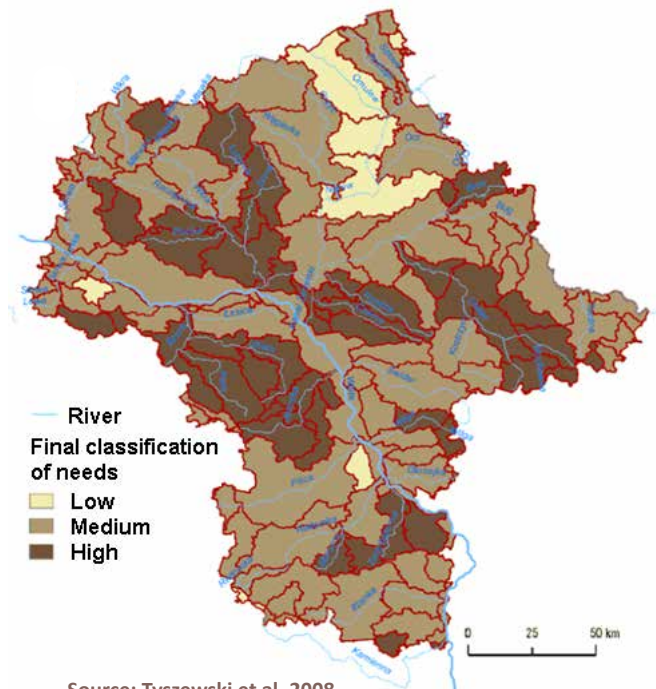
## Guidelines on Natural Small Water Retention Measures

The Guidelines represent one key step on the way to fulfilling the Global Water Partnership vision of a water-secure world which harnesses the productive power of water and minimises its destructive force.

### The Guidelines provide more information on:

- What are technical and non-technical measures to increase water retention
- How to choose the catchment for the retention measures?
- How can we evaluate the results of NSWRM in terms of flood protection, drought mitigation, and biodiversity increase?
- How can we incorporate the natural water retention measures in the River Basin Management Plans, Flood Protection Management Plans and Drought Management Plans?

GIS based tool for identifying the areas which are most suitable for the NSWRMs



## Case Studies

The Guidelines are complimented by the Case Studies, examples of different small retention measures already in action from Central and Eastern Europe.

### The Guidelines were developed to support:

individuals, civil society and policy makers, on how to plan and construct different kinds of small water retention measures that lower flood risk and store water for dry periods.

Falenty, Poland, 2014, credit: Majercakova/GWP CEE

The *Guidelines* are an outcome of the Integrated Drought Management Programme (IDMP CEE), which supports the governments of Bulgaria, the Czech Republic, Hungary, Lithuania, Moldova, Poland, Romania, Slovakia, Slovenia and Ukraine in the development of drought management policies and plans. It also builds the capacity of stakeholders to use a proactive integrated drought management approach and tests innovative drought management approaches.

Information about IDMP CEE and the Guidelines:



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