AD15

AMOUNT OF RAINWATER CAPTURED IN CADASTRAL AREA

Number	AD15
Indicator name	Amount of rainwater captured in cadastral area
Area	A
Indicator definition	The amount of rainwater captured in the area by the elements of sustainable rainwater management. It can be the capture of rainwater in retention tanks (surface, underground tanks) and its subsequent secondary use, or the capture of rainwater in the elements allowing seepage, (surface or subsurface). The volume of dry reservoirs (dry polders) and water bodies filling primarily for other purposes (ponds) is not included.
Indicator unit	m^3 /pers.
Key words	Rainwater, nature-based solutions, microclimate, biodiversity, summer heat, retention reservoirs, rain gardens
Reason for tracking and usability	Since the 1970s, close-to-nature drainage of cities has been promoted, which is based on the principle of preserving or imitating, as far as possible, the natural drainage features of the site before urbanization. The basis of this concept is the so-called a decentralized method of drainage that deals with precipitation runoff at the point of origin and returns it to the natural water cycle. In the narrowest sense, these are nature-friendly measures and devices that promote evaporation, infiltration and slow runoff into the local water cycle. In a broader sense, this also includes facilities that contribute at least in some way to the preservation of the natural water cycle and to the protection of watercourses, e.g. accumulation and use of rainwater or retention and regulated (delayed) runoff into surface waters or sewers. Thus, the support of precipitation runoff is the support of one of the components of the water cycle. In addition, the capture of rainwater in retention tanks and its subsequent use for irrigation or flushing saves drinking water resources, as well as has a positive effect on slowing down runoff in heavy rainfall.

Completeness, representativeness, validity

A prerequisite for completeness and representativeness is a detailed analysis of the entire administrative territory and good knowledge of all areas.
A prerequisite for sufficient validity is a good knowledge of the actual condition of built-up and impermeable areas and the method of their drainage. All data must be current, based on the actual state. Within Klimasken, the indicator is linked to descriptive indicators (area and share of different types of areas), exposure indicators (share of tropical days and nights, climatic drought), other indicators of sensitivity and adaptive capacity (drinking water consumption) and readiness indicators (area of areas converted to blue-green infrastructure).

The indicator counts the amount of rainwater that is captured and further solves either:
A. retention
or
B. infiltration
A) During retention, retention tanks with possible secondary use, both surface and underground, which have a protective, regulating and storage function are counted.
B) In case of infiltration, various surface and subsurface infiltration devices (infiltration blocks, shafts, rain gardens, infiltration gaps, etc.) are counted.
The first step is to determine the theoretical volume of rainwater (Vr), which will fall on the territory of the city/city district/municipality according to the formula:
Vr = (year*A1*C1) + (year*A2*C2) + (year*A3*C3) (l/year)
year = average annual total precipitation for the given locality, which is a freely available data (e.g. for Bratislava it is approximately 742.9 mm/year: http://www.bvsas.sk/sk/zakaznicka-zona/dalsie-sluzby/zrazkove-vody/).
C = rainwater runoff coefficient for a given area with a given surface type
A1 = area of impermeable and built-up areas (100-75 % built-up area) for the given city/city district/municipality in m2, C1 = 55 %
A2 = area of green areas with partially impermeable surfaces (55 % built-up area) for the given city/city district/municipality in m2, C2 = 30%
A3 = area of green areas with fully permeable surfaces (0-10 % built-up area) for the given city/city district/municipality in m2, C2 = 10 %
From the volume of rainwater (Vr) thus determined, which would flow out of the area, the volume of rainwater which is retained in the area and allowed to soak in and / or leads to the retention elements is deducted.

Description of data processing	
Data source	The source of data is the departments of the city/municipal office/local authority of the city district (mainly the department of spatial plan, greenery or the environment, map GIS data, open data including satellite imaging (CORINE, LandCover, Copernicus Land Monitoring Service – Urban Atlas (land.copernicus.eu), The Landsat Program (landsat.gsfc.nasa.gov), ESRI basemaps (arcgis.com), Google maps (maps.google.com). Identification of areas is also possible according to URBIs (http://urbis.gisat.cz/tool/) and OpenStreetMap (OSM). The average annual total precipitation for a given locality is available on the website of the water management company (for example https://www.stvps.sk/zrazkove-vody/SHMU (data on total precipitation).
Tracking frequency	1 x 2 years (or according to the frequency of Klimasken monitoring)
Urban influence	The indicator covers all elements of sustainable rainwater management, regardless of the owner. The city/city district/municipality can influence the amount and character of elements of sustainable rainwater management only in the areas and buildings under its administration. Buildings and drainage of open spaces on the areas of other owners, the city/city district/municipality can operate by consistent application of VZN (Generally binding regulations), rules in spatial planning, application of appropriate regulations of spatial development and construction through both financial instruments (grant programs) and awareness-raising activities.
Presentation method	The results will be presented in a single Klimasken framework on a five-step scale according to specified intervals:
Responsibility	Klimasken processor, city/city district/municipality