



D.T3.1.5

COMPREHENSIVE FUA-LEVEL STATUS QUO STUDIES

Bydgoszcz FUA

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1. Status Quo analysis

Analysing the FUA level self-assessment on background conditions related to circular water use (D.T3.1.3) and the local public perception assessments (D.T3.1.4) done in the Bydgoszcz FUA, we highlight the following main results.

1.1. Self-assessment on background conditions related to circular water use

For each of the main topics of the FUA-Level status Quo assessment:

1. Climate, Environment and population
2. Water resources
3. Water infrastructures
4. Water consumption
5. Climate change
6. Rules, laws and good practices

we summarise the results highlighting challenges and strengths.

1. Climate, Environment and population

▪ Challenges:

- Average monthly temperature min. and max. is increasing in years 1998- 2018.
- Higher average temperatures is in cities comparing to countryside.
- There is no data regarding the soil sealing in FUA.
- Urban and build up areas consist of 7,7 % of the whole FUA.

▪ Strengths:

- Greenery on urban areas covers large part of the FUA (34,6%), there are 45 parks, from which 31 are located in Bydgoszcz, Myślęcinek is one of the biggest city park in Poland.
- Percentage of green urban areas has increased since 2004.

2. Water resources

▪ Challenges:

- Very low annual precipitation in FUA 543,1 mm (1998 - 2018), the highest 843,3mm, lowest 310,4mm, while in 2018 was 411,2mm.
- National monitoring is located in Toruń, no national monitoring data is available precisely for the City of Bydgoszcz (data from monitoring is available with fee).
- Most of rivers and canals has moderate and weak ecological potential.
- Data missing for few water reservoirs regarding chemical status.

▪ Strengths:

- Second largest river - Brda has good ecological potential.
- 81 000 m³ of water in water reservoirs.
- Ecological status of lakes and water reservoirs are mostly good.
- Usable ground water resources are increasing.

3. Water infrastructures

▪ Challenges:

- There is no dual system water supply network within the FUA.



- No dual system wastewater collection network within the FUA.
- Reuse of large amount of wastewater treated in BTOF in 2018 - 35,698,000 m³.
- Strengths:
 - Very good tap water quality.
 - Low percentage of loss in the water supply network in BTOF - 10,7%.
 - High percentage of households and percentage of industries, connected to the wastewater collection network 79,9%.
 - High percentage of population with access to the water supply network (95,1%).
 - In Bydgoszcz rainwater outlets to the river (79 pcs.) are equipped with sewage treatment consisting of a settling tank and a separator of oil derivatives.
 - Low consumption of water for households (98 l per person per day).

4. Water consumption

- Challenges:
 - No data regarding consumption of bottled water for drinking purposes on municipal or FUA level.
 - No data of Falkenmark Indicator (water availability per capita per year within the FUA) on FUA or municipal level
- Strengths:
 - Low consumption of mineral and spring waters in l/day per person – 0,2 l.
 - Initiatives of municipal waterworks in Bydgoszcz to promote drinking tap water, saving water, educational programmes: Bydgoszcz Water.
 - High water consumption needs of agriculture and forestry (36,3% of overall water consumption) is a potential for wastewater reuse.

5. Climate change

- Challenges:
 - Increase in value and number of days with maximum air temperature.
 - Increase in the length and frequency of heat waves and the growing phenomenon of urban heat island.
 - Increase in the frequency of high intensity and short duration rains.
 - Flood hazard from rivers.
 - Phenomenon of drought resulting in water shortages in the region.
 - Landslides, e.g. caused by heavy rainfall, in areas at risk of mass movements.
 - Concentration of air pollutants and occurrence of winter smog.
 - Increase of frequency of thunderstorms with strong winds.
- Strengths:
 - Modernisation and construction of rainwater system by Municipal Waterworks.
 - Planned implementation of NBS.
 - Bydgoszcz Adaptation Plan to climate change by 2030 - numerous activities are foreseen to mitigate climate changes, with estimated cost nearly 500 mln PLN.



6. Rules, laws and good practices

▪ Challenges:

- No pricing system on the bigger part of FUA area for different water uses (e.g. irrigation, civil, industrial).
- High water price in Bydgoszcz comparing to other municipalities in FUA.
- No legislation about dual water distribution system.
- No legislation about water reuse.
- No legislation about first flush rainwater collection.
- No rules about urban green spaces irrigation.
- A few NBS solutions.

▪ Strengths:

- Promotion and education (leaflets, lessons for schools, information programmes in TV Woda Bydgoska).
- Bydgoszcz Adaptation Plan to climate change by 2030.
- Guideline for blue and green infrastructure (elaborated by Bydgoszcz waterworks).
- Strategy for the Development of Green Areas for the City of Bydgoszcz.

1.2. Water efficiency and reuse related public perception assessments

Analysing of the FUA level water efficiency and reuse related public perception assessments (D.T3.1.4), we summarise the results highlighting challenges and strengths.

▪ Challenges:

- Many respondents did not know the concept of water footprint beforehand (66%) and most did not know the volumes of water usage in the production of consumer products (58%).
- Many respondents did not know the value of water losses in the water network caused by leaks (65%).
- A smaller number of respondents is aware of the possibility of reusing used water (grey water) in households (64%).
- Intensified promotion of NBS solutions and implementation of financial incentives for citizens in the area of NBS.

▪ Strengths:

- Vast majority of respondents declared their willingness to change their habits (87%) to save water used in the production of goods.
- 96% of respondents turn off the water while shaving and brushing their teeth, and 96% ensure that the water system is free of leakage and in good condition.
- 76% of respondents drink tap water, 64% of people use rainwater for plants watering.
- Most respondents are aware of their expenses (76%).
- Respondents are aware of the methods of reusing rainwater (84%) and express positive attitude toward the popularization and use of such solutions (95%).

There is a general awareness of the need to save water, many of the respondents use popular methods of saving water, focusing mainly on individual habits, such as turning off the water or equipping bathrooms and kitchens with appropriate water saving devices.

Respondents are also very open to use more advanced water recovery systems at the level of both the individual household and the entire city. They also look favorably at introducing greenery to the city as a method of using rainwater (here on the example of green roofs).



When it comes to the fears of the respondents, they seem to coincide with the recent negative climate issues. For example, floods in the minds of respondents are considered to be a weak threat where torrential rain or drought are treated as a greater threat.

The respondents are aware of the necessity of sustainable water resources management and are open to changes.

1.3. Conclusions

Important document is Bydgoszcz Adaptation Plan to climate change by 2030 which was created in response to one of the most important environmental problems. The plan indicates the vision, primary goal and specific objectives of the city's adaptation to climate change, which should be achieved through the implementation of selected adaptation activities. Same document is available for Toruń, second largest city in FUA, but not to other municipalities in FUA.

The city belongs to the areas with the lowest annual rainfall (512 mm) in the country, however, the amount and diversity of forms of water environments plays an increasingly important role in shaping the spatial and functional structure of the city, especially its landscape.

Bydgoszcz has sufficient water resources for water supply to recipients within the administrative boundaries of Bydgoszcz and for the neighboring municipalities concerned. Currently, work is underway to organize and expand the storm water drainage system in the city of Bydgoszcz.

Water management is among 4 sectors most sensitive to climate change in the city of Bydgoszcz.

Climate change forecasts for Bydgoszcz based on climate models developed on the basis of meteorological data show that in the perspective of 2050 the continuation of currently observed trends and the following changes can be expected by 2050: an increase in the number of days with maximum temperature and an increase in heat waves, a downward trend in unfavorable phenomena associated with the occurrence of low temperatures in winter, an increase in the frequency of inter-day temperature changes, an increase in the annual amount of precipitation is expected, the occurrence of extreme precipitation, a decrease in the number of days with snow cover, the risk of drought in the horizon. (Bydgoszcz Adaptation to Climate Change Plan by 2030). The increase in the intensity of days with precipitation will create an opportunity for the development of retention and use of accumulated water for irrigation of urban vegetation (instead of using tap water). Retained water can also be used to keep streets clean. Legal and financial instruments may be introduced to encourage the collection and use of rainwater on its own

Regarding public perception assessment it would be advisable to continue campaigns aimed at raising public awareness of the possibilities and solutions available, where you can additionally supplement this with knowledge on how to implement these solutions on a regional and local scale through bottom-up initiatives (petitions and contact with local governments with a request to implement the above solutions).

Awareness of the water footprint and the impact of other activities not directly related to the use of water (e.g. shopping habits) on overall water management and exploitation of water resources should definitely be increased.