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 temperature min. and max. is increasing in years1998- 2018.
- Higher average temperatures is in cities comparing to countryside.
- Average relative humidity is slightly decreasing over 20 years.
- There is no data regarding the soil sealing in FUA.

■ Strengths:

- Decreasing population living in the city and increasing population living on suburbs and villages. In the period of 20 years the decrease in the city in FUA is 6,1%, in the countryside increase 37,7%.
- Urban and build up areas consist of 7,7 % of the whole FUA (28 730 ha).
- 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 law 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 data is available precisely for the City of Bydgoszcz.
- Considering high percentage of agricultural land the rainwater is not sufficient to meet the needs of agriculture.
- Most of rivers and canals has moderate and weak ecological potential.
- No data available for chemical status of rivers and canals.
- Data missing for few water reservoirs regarding chemical status.

- Strengths:

- Main river – Brda has good ecological potential.
- Nearly all rivers and canals has very good chemical quality.
- 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 first flush rainwater collection technique implemented.
- 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 water tap 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%).

4. Water consumption

- ■ Challenges:
- High annual volume of freshwater extracted from the ground, surface water, other sources - 46 812 361m3 (out of which Bydgoszcz extracts 45,2%)
- Reuse of water coming from consumption of water for needs of the national economy and population (per person per day – 239 l).
- Reuse of water coming from consumption of water for households (per person per day–98 l).
- 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.
- Public water management companies.

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 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 rainwater collection.
- No rules about urban green spaces irrigation.
- Lack of 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 of 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.

Respondents were asked at which level they operate (Local, Regional, National).
24 respondents took part in the quastionnary, out of which 75% work on local level, 20% on regional level and 12% on national level (some of the respondents work covers more than one level).

What is the degree of existing expertise and which are the competence building needs in <u>water governance area </u>at the different levels?
(scale 1- low, 2- medium , 3- high)

Water Governance	Local level	Regional level	National level
existing expertise	1.6	1.4	1.3
competence building needs	2.4	1.9	1.8

Comments: Respondends answered that the degree of existing expertise in water governance is at low degree at all levels and the needs for comptetence building is at medium degree at all levels, while in local level there ist he highest need.

Water efficiency

Water efficiency (for example: cistern with throttle valve Potentials to avoid wastewater, Water efficiency at consumer level, Water saving devices and technologies, Water audits, etc)	Local level	Regional level	National level
existing expertise	1.5	1.3	1.2
competence building needs	2.2	1.9	1.8

Comments:
Respondends answered that the degree of existing expertise in water efficiency is at low degree at all levels and the needs for comptetence building is at medium degree at all levels, while in local level there ist he highest need.

Water Loss Reduction (for example: leakage management, Indicators for water loss, Benefits and barriers to water loss reduction programmes, etc)	Local level	Regional level	National level
existing expertise	1.4	1.2	1.2
competence building needs	2.1	1.9	1.8

Comments:
Respondends answered that the degree of existing expertise in water loss reduction is at low degree at all levels and the needs for comptetence building is at medium degree at all levels, while in local level there ist he highest need.

Rainwater Management (for example: centralised discharge in combined and separate sewer systems, Decentralised rainwater management, Decentralised rainwater management measures including Rainwater harvesting and utilisation, Rainwater retention and Rainwater infiltration, etc)	Local level	Regional level	National level
existing expertise	1.6	1.4	1.4
competence building needs	2.5	2.1	1.9

Comments:
Respondends answered that the degree of existing expertise in rainwater management is at low degree at all levels and the needs for comptetence building is at medium degree at all levels, while in local level there ist he highest need.

Greywater Recycling (for example: quality requirements for greywater recycling and reuse, Technical and operational requirements, Reuse options, Treatment technologies, Benefits of greywater recycling, etc)	Local level	Regional level	National level
existing expertise	1.3	1.2	1.2
competence building needs	2.2	1.9	1.9

Comments:

Comments:

Respondends answered that the degree of existing expertise in grey water recycling is at low degree at all levels and the needs for comptetence building is at medium degree at all levels, while in local level there ist he highest need.