Water Rennovation in Ukraine
Project no. 22320101

Water Rennovation in Ukraine

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The project is co-financed by the Governments of the Czechia, Hungary, Poland and Slovakia through Visegrad Grants from International Visegrad Fund. The mission of the fund is to advance ideas for sustainable regional cooperation in Central Europe.

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Water management of a city with water shortage

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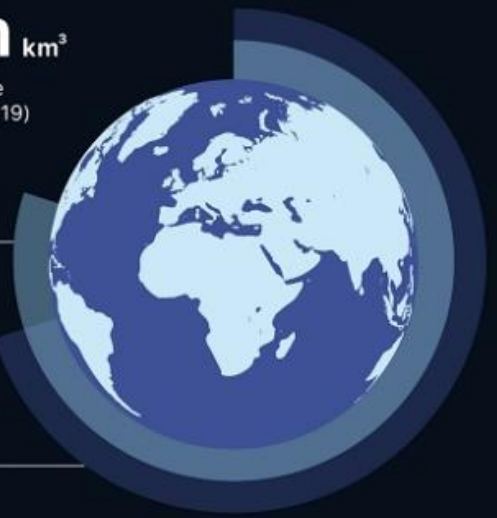
GLOBAL WATER DISTRIBUTION

Freshwater, an essential element for sustaining life, remains an increasingly scarce commodity on a global scale. In an effort to shed light on this pressing issue, the following infographic delves into the availability of water worldwide.

1,386m km³
Total volume of all of the world's water supply (2019)

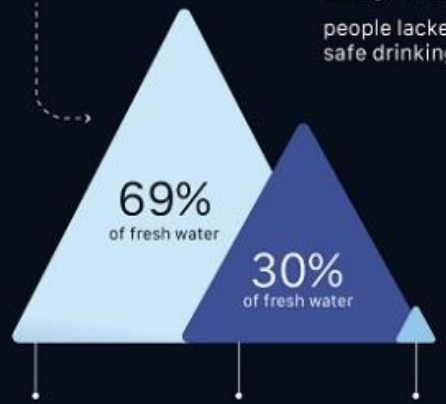


80%
of our ocean floors are unmapped and unexplored (2023)

71%
of Earth's surface is water (2023)

TOTAL GLOBAL WATER (2022)

3% Fresh water



97% Salt water

Glaciers + polar ice caps (2023)

Ground water (2023)

Available as drinking water (2023)

2.1b
people lacked access to safe drinking water (2017)

70%
of the world's freshwater is used for agriculture (2023)

1/5th of the world's population lives in water-scarce areas (2023)

On average, each person receives less than 1,000 cubic meters of water a year (2023)

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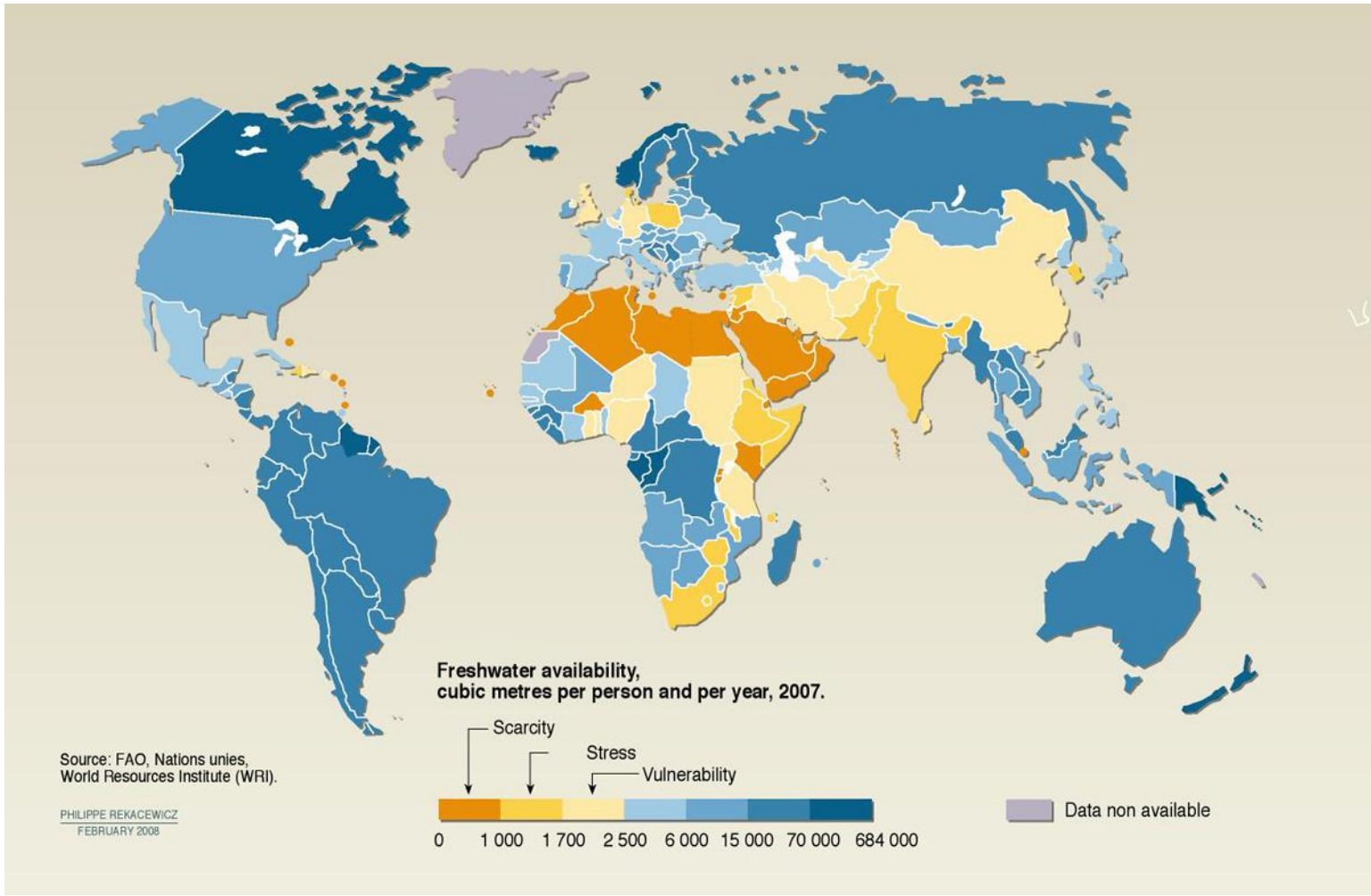

The general characterization of water use

- Municipal
- Agricultural
- Industrial
- Environmental
- Commercial
- Hydroelectric power production

The general characterization of water use

Municipal Utilization

- Domestic Use: Water used in households for drinking, cooking, bathing, washing, and landscaping.
- Public Services: Water used for street cleaning, firefighting, public fountains, and municipal gardens.
- Recreational: Water used in swimming pools, parks, and sports fields.
- Characteristics: Quality is critical, especially for drinking water; usage patterns can be daily and consistent.

The general characterization of water use

Agricultural Utilization

- Irrigation: The most significant use of water in agriculture, involving the application of water to crops to supplement natural rainfall.
- Livestock: Water used for drinking, service water for dairy operations, and other livestock needs.
- Aquaculture: Water used for fish farming, which may include the use of ponds, tanks, or other systems.
- Characteristics: High volume usage; often seasonal; quality requirements vary but generally lower than for drinking water.

The general characterization of water use

Industrial Utilization

- Manufacturing: Water used in the fabrication of products, including processing, washing, and cooling.
- Thermal Power Generation: Water used primarily for cooling in power plants; also includes boiler feed water.
- Mining and Construction: Water used for mineral extraction processes, dust control, and construction activities.
- Characteristics: Quality and quantity needs vary significantly; often involves high-intensity, continuous use; potential for high levels of water pollution.

The general characterization of water use

Environmental Utilization

- Ecological Flow: Water left in or released to water bodies to maintain ecosystems and support biodiversity.
- Wildlife Habitats: Water used to sustain natural habitats, including wetlands, forests, and wildlife reserves.
- Characteristics: No direct human use; critical for ecosystem health and biodiversity; often legally protected or regulated.

The general characterization of water use

Commercial Utilization

- Water used in hotels, restaurants, and other entertainment venues.
- Retail and Services: Includes water used in businesses like car washes, laundromats, and beauty salons.
- Characteristics: Quality needs vary; often consumer-facing, impacting customer experience and business operations.

The general characterization of water use

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Hydroelectric Power Production

Utilizes water flow to generate electricity through turbines.

- Capacity and Production Data: Global hydropower capacity continues to grow, with significant contributions to renewable energy sources. Production varies by river flow and reservoir capacity.
- Employment: The sector employs a range of professionals from engineers to operational staff, dependent on the scale of facilities.
- Characteristics: Requires significant infrastructure investment. It is influenced by geographical and climatic conditions.

Water Situation of Debrecen

- Many cities in the world are founded next to rivers, lakes, sea shores
- Tócó river
- Lakes in the southern part of Debrecen
- Great Forest
- Water supply is based on groundwater

Water Situation of Debrecen

- Water Challenges: Debrecen faces significant water management challenges, including water scarcity, declining groundwater levels, and environmental degradation.
- Local challenges:

- Improvement of environmental conditions in Debrecen is essential for enhancing the quality of life.

- Rehabilitation of the water supply of Great Forest and the lakes surrounding Debrecen is urgent

- New, huge industrial investments (battery factories, BMW)

Introduction to CIVAQUA Program

- Overview: The CIVAQUA program is a multi-purpose water utilization initiative aimed at improving social welfare, agricultural productivity, and environmental sustainability in Debrecen and its surrounding areas.
- Objectives:

- Multi-purpose water supply from the Tisza river

- Restoration and conservation of the Great Forest and the surrounding lakes

- Economic recovery and improved living standards

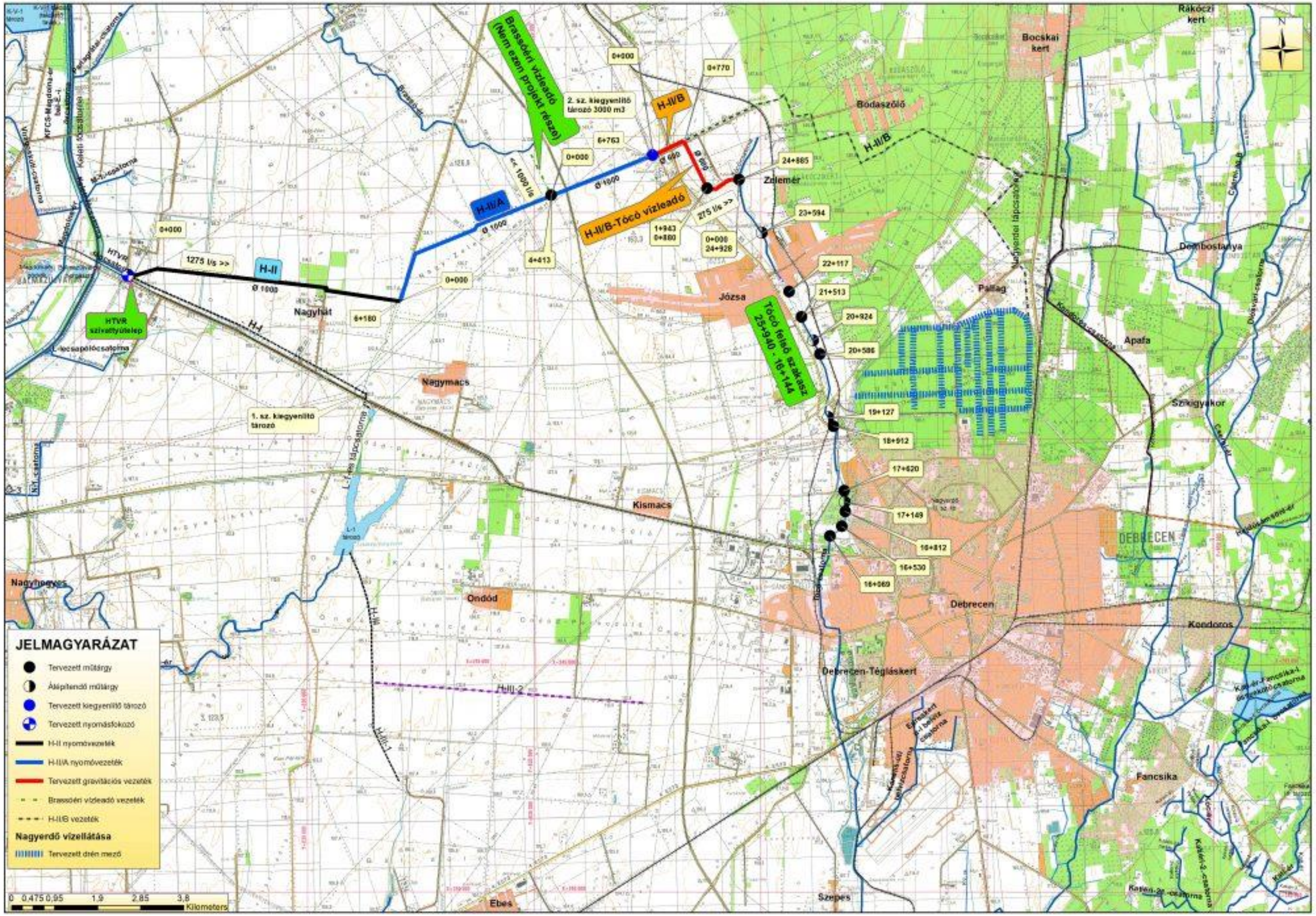
Introduction to CIVAQUA Program

- CIVAQUA represents a regional development approach that simultaneously meets the needs of water management and nature conservation.
- The development is being carried out by a consortium of the National Directorate General for Water Management and the Tiszántúli Water Directorate, in cooperation with the Municipality of Debrecen.
- The current investment is the first phase of the CIVAQUA program: the 'CIVAQUA-Tócó project,' funded by European Union and Hungarian state support totaling 15.748 billion forints.

Introduction to CIVAQUA Program

Visegrad Fund

- The project involves several key components:
- Renovation of the HTVR pumping station north of Debrecen with a new pump installation and construction of new courtyard pressure pipes.
- Construction of 1,000 mm diameter pipelines (H-II and H-II/A) totaling nearly 15 kilometers.
- Development of a 3,000 m^3 reinforced concrete balancing reservoir at Debrecen-Józsa (elevation difference 63m)
- Delivery of water to the Tócó source area via a 600 mm diameter gravity pipeline approximately 2 kilometers long.
- Revitalization of the Tócó Valley with the construction of 14 weir structures, four bottom steps, and a 23,000 m^3 reservoir.


JELMAGYARÁZAT
Tervezett műtárgy
Átépítendő műtárgy
Tervezett kiegyenlítő tározó
Tervezett nyomásfokozó
H-II nyomóvezeték
H-II/A nyomóvezeték
Tervezett gravitációs vezeték
Brassóéri vízleadó vezeték
H-II/B vezeték
Nagyerdő vízellátása
Tervezett drén mező
0 0,475 0,95 1,9 2,85 3,8
Kilometers
Brassóéri vízleadó
(Nem ezen projekt része)
2. sz. kiegyenlítő tározó 3000 m3
H-II/B
H-II/A
H-II/B-Tócó vízleadó
H-II
1275 l/s >>
<< 1000 l/s
275 l/s >>
Ø 1000
HTVR szivattyútelep
Tócó felső szakasz 25+940 - 16+144
1. sz. kiegyenlítő tározó
Zelemér
Józsa
Nagyhát
Nagymacs
Kismacs
Ondód
Nagyhegyes
Debrecen
Debrecen-Tégláskert
Bodaszőlő
Bocskai kert
Rákóczi kert
Pallag
Apafa
Szikigyakor
Dombostanya
Kondoros
Fancsika
Szepes
Ebes
0+000
0+770
6+763
24+865
23+594
22+117
21+513
20+924
20+586
19+127
18+912
17+620
17+149
16+812
16+530
16+069
4+413
6+180
1+943
0+880
24+928

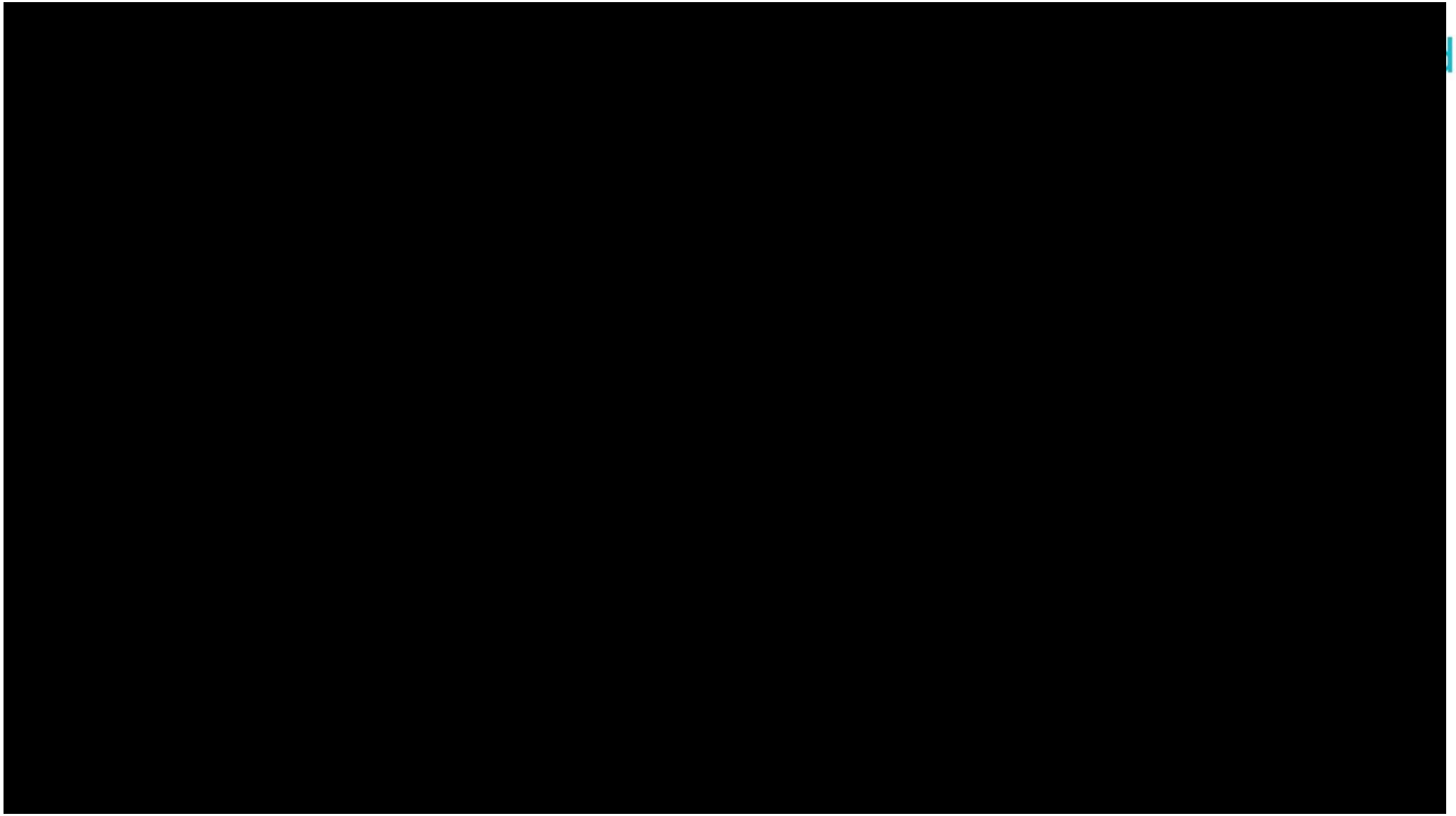
Results of the First Phase

- First phase finished in November 2023
- Environmental Benefits:

- Transport of the water from Tisza river to the Tócó river
- Tisza river –> Eastern Main Canal -> 15 km of new pipeline -> Tócó canal -> Tócó river
- Improved water quality and availability.
- Restoration of natural habitats.

- Economic and Social Benefits:

- Increased agricultural productivity through irrigation.
- Improved recreational facilities boosting local tourism.



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The Second Phase of CIVAQUA Program

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- Planning Stage: The second phase is currently in the design phase, focusing on further enhancing water management and expanding the project's benefits.
- The Civaqua program will have an additional Phase 2/a and Phase 2/b. In Phase 2/a, the water from the Tisza will be directed to the Great Forest. In Phase 2/b, the water will reach the recreational lakes and reservoirs in the eastern part of the city, including Lake Vekeri.
- Future Goals:

- Expansion of irrigation systems.

- Further development of recreational areas.

- Continued environmental conservation efforts.

Expected Benefits of the Second Phase

- Long-term Impact:
- - Sustainable water management practices.
- - Strengthened local economy through tourism and agriculture.
- - Enhanced quality of life for residents.

Conclusion

- Summary: The CIVAQUA program is a critical initiative for sustainable water management in Debrecen, providing significant environmental, economic, and social benefits.
- Next Steps: Successful completion of the second phase will further enhance the region's water management and overall development.

UD Main building

Visegrad Fund

Békás Lake

Visegrad Fund

Stadium

Visegrad Fund

Water Tower

Visegrad Fund

Visegrad Fund

Thank you for you attention