Implementing the Water Framework Directive

(protection of vulnerable groundwater resources in Hungary)

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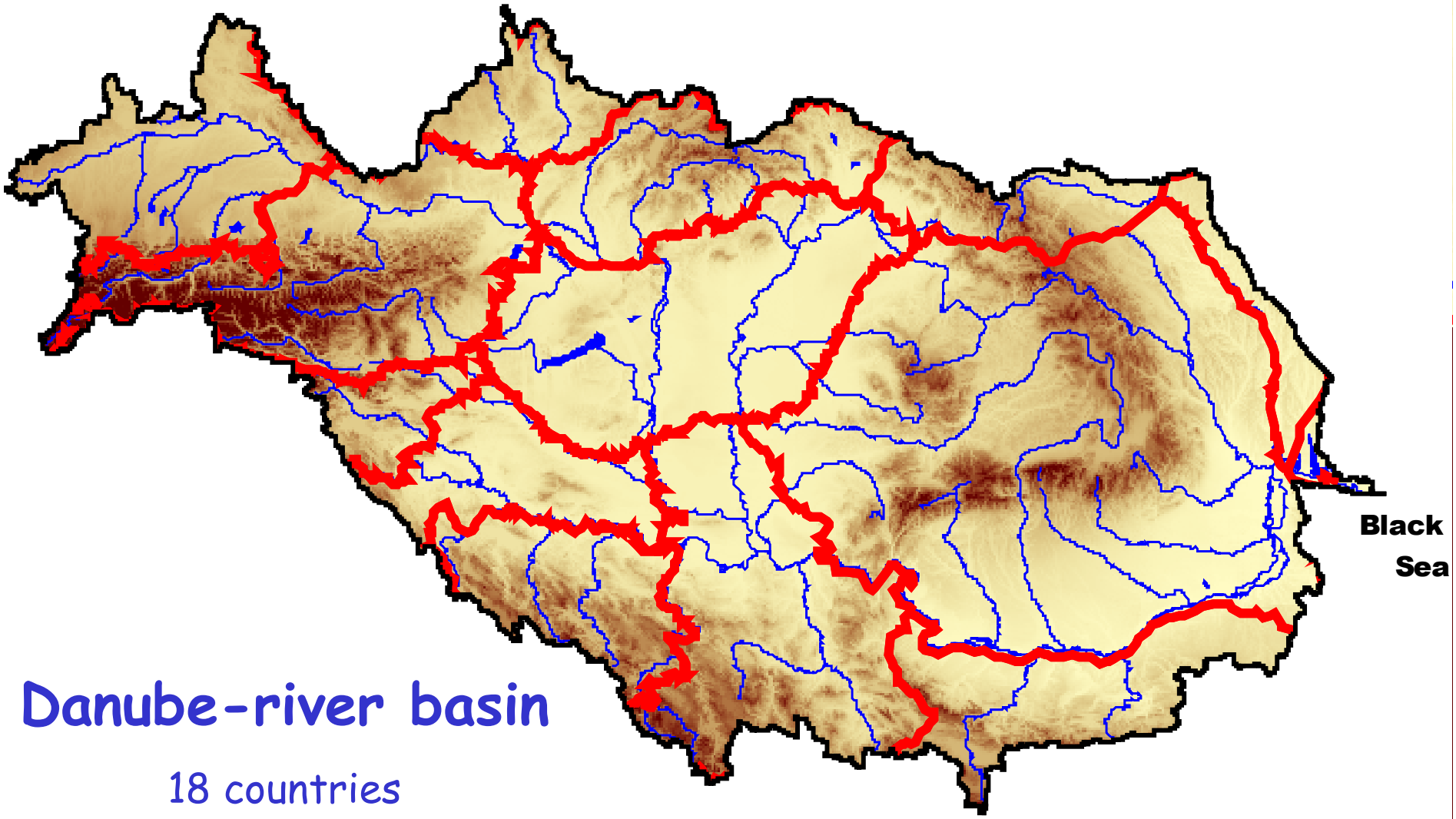
Statements of the Water Framework Directive

- Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such.
- The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater.
- Our mission is in the scope of the WFD
  - To prevent the deterioration of aquatic ecosystems
  - Long-term protection of available water resources
  - Enhanced protection of the aquatic environment
  - To ensure the progressive reduction of pollution of surface- and groundwater
  - To achieve the „good water status" until 2015

Where is Hungary in Europe?



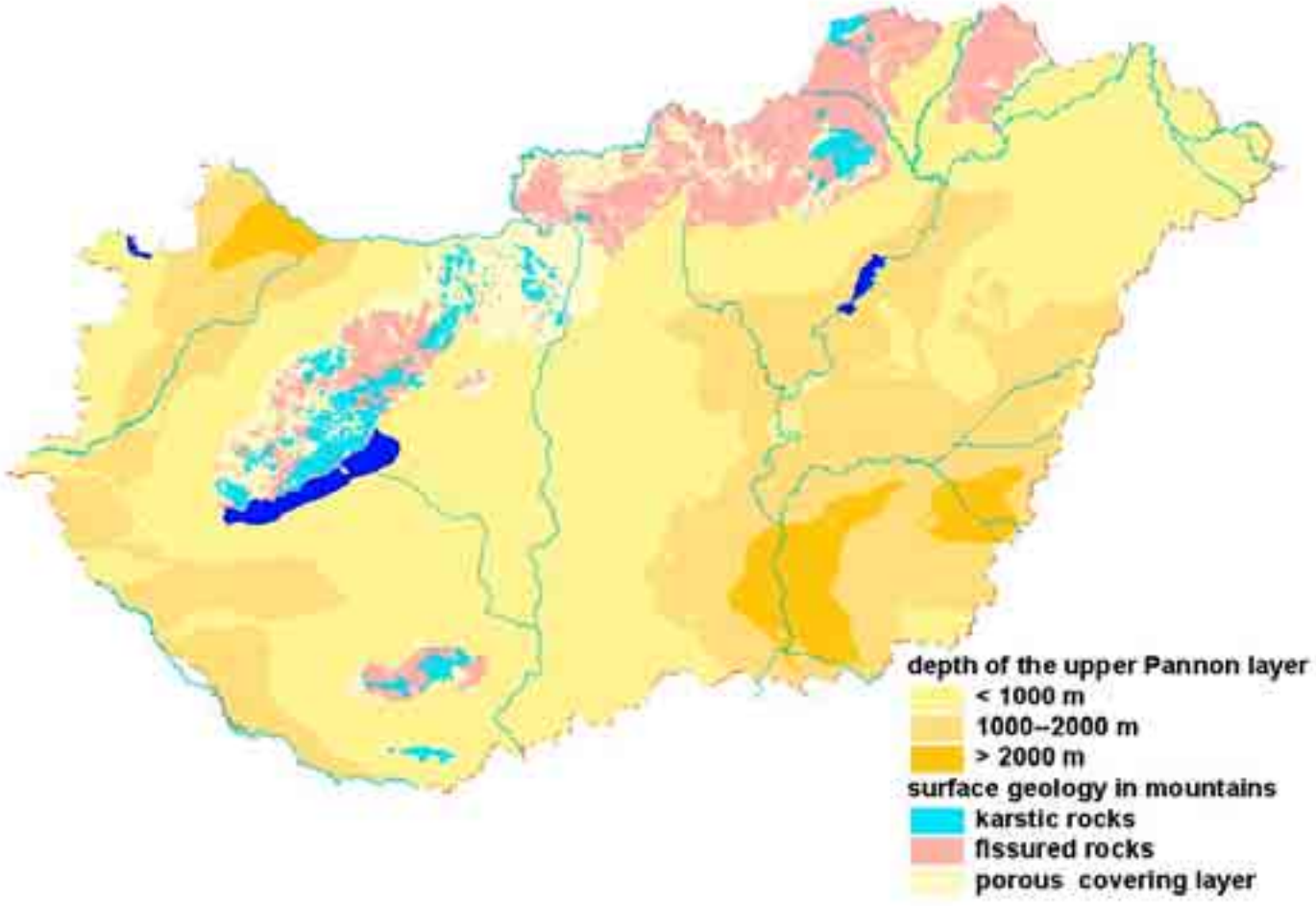
Danube-river basin

18 countries

Hungary is situated within the drainage basin of the River Danube, in the lowest part of the Carpathian Basin

Except cooling water, 2/3 of the total use is from groundwater,
95 % of the drinking water is from groundwater

GROUNDWATER AQUIFERS

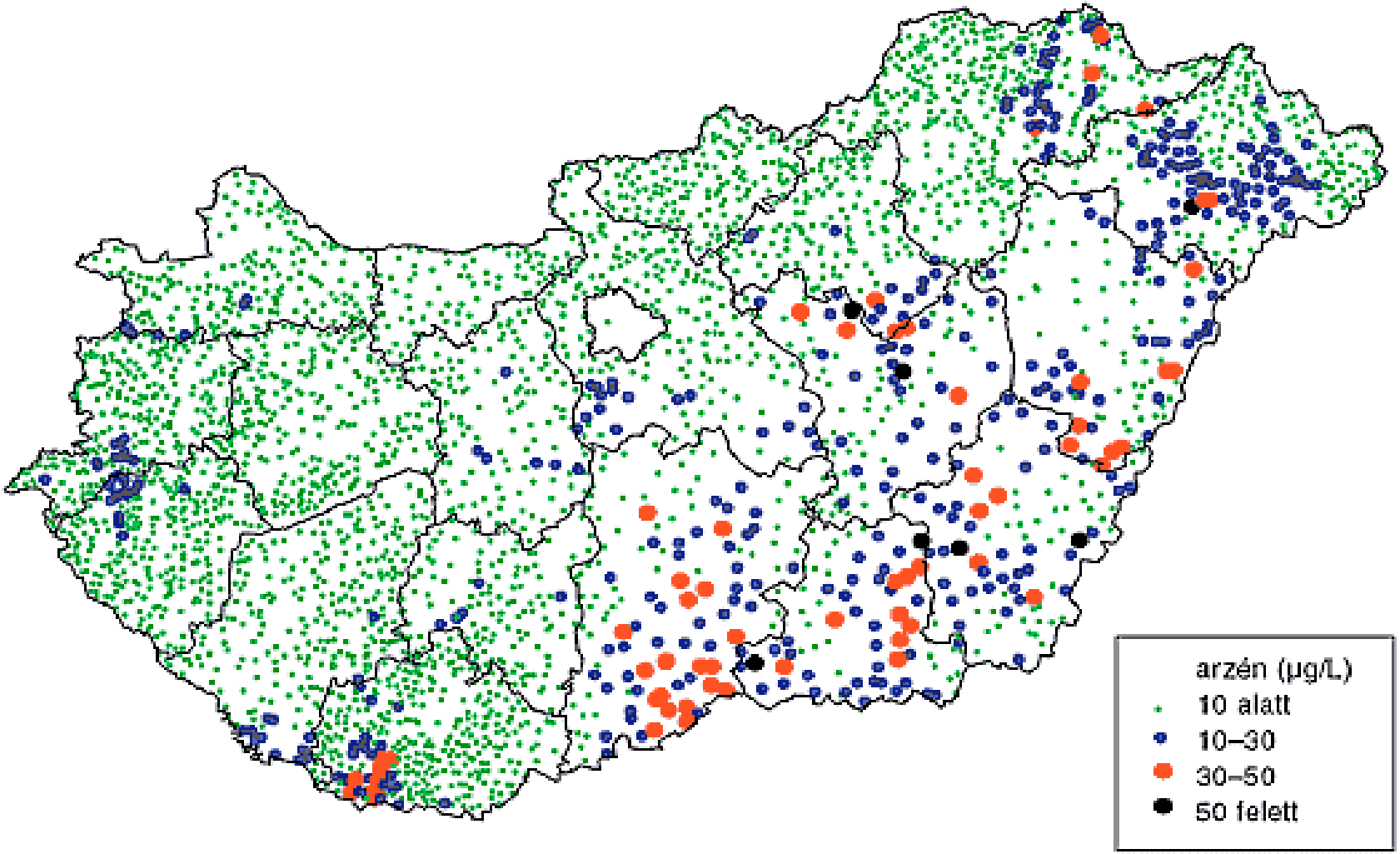


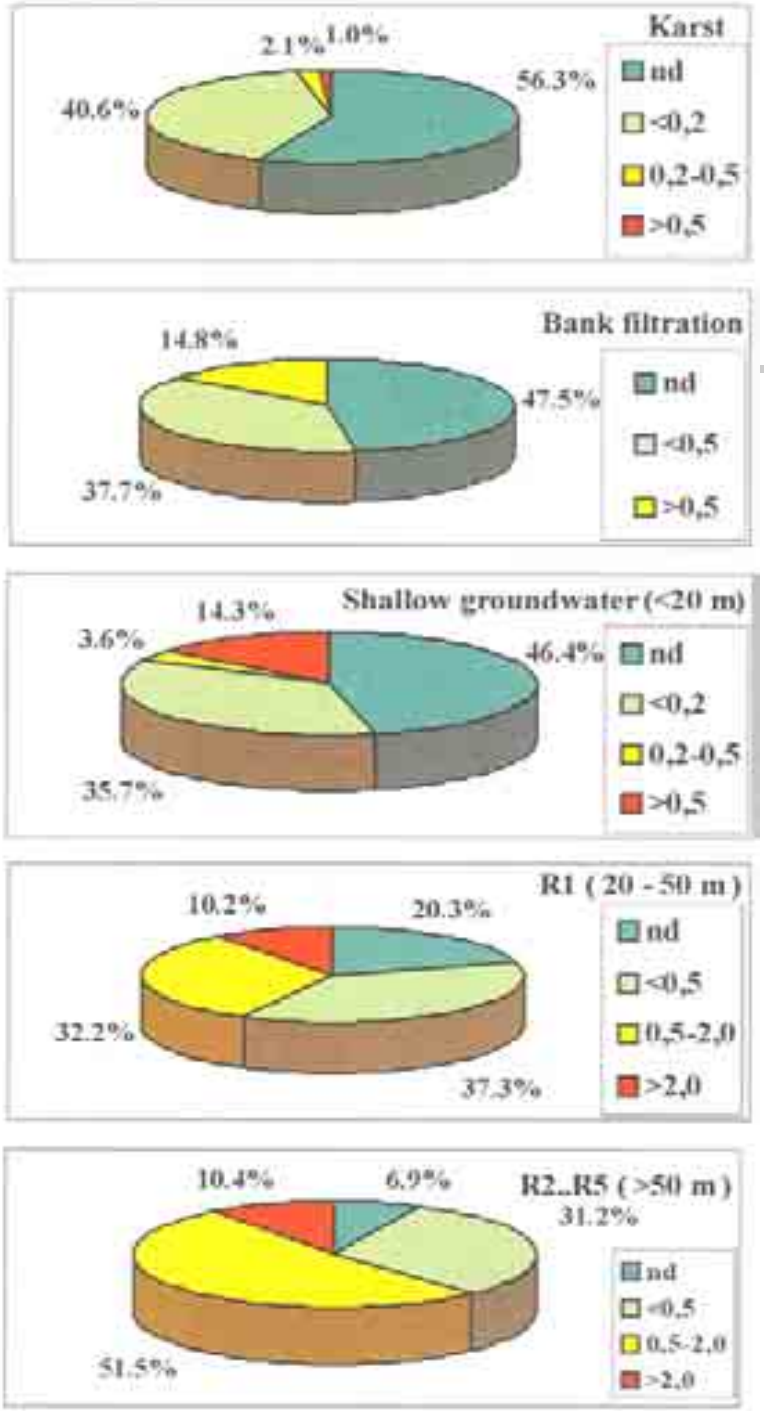
- groundwater resources are available almost everywhere
- thick alluvial deposits in the major part of the country
- karstic aquifiers in the mountinous regions

Why to protect groundwater sources and recources?

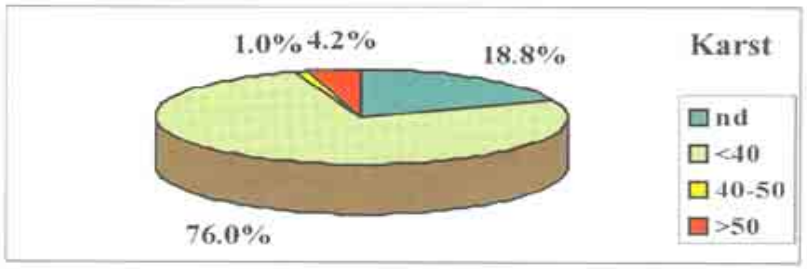
- During the period of waterworks building we haven't dealt with the safety of drinking water supply
- 65% of drinking water demand is exploitated from sensitive or vulnerable groundwater sources and resources
- Over 500 public waterworks have obtained drinking water from sensitive or vulnerable groundwater sources and resources
- Without protection these groundwater resources may be contaminated
- Present contaminations of groundwater resources are growing
- Remediation is not practical and is very expensive
- Prevention is better and cheaper

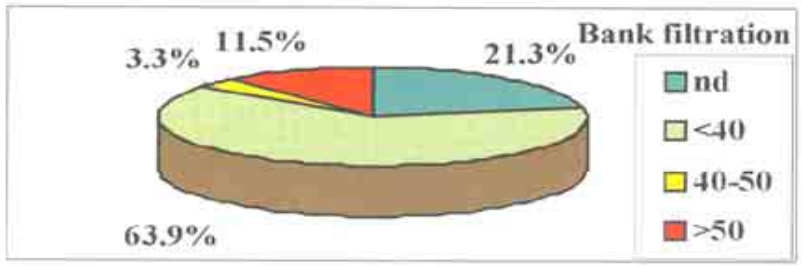
Range of arsenic contamination in Hungary

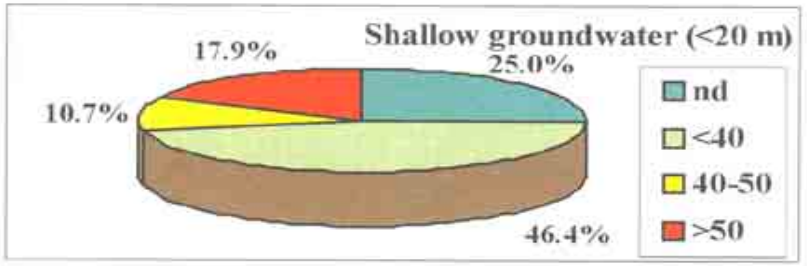


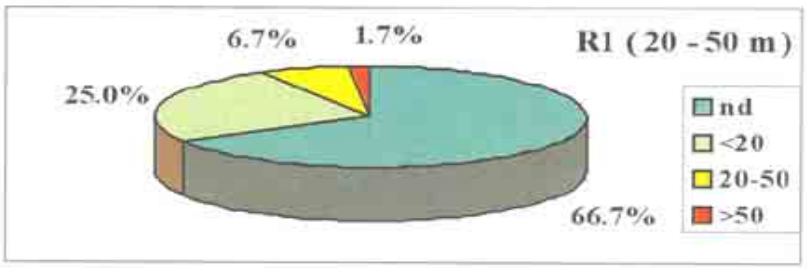


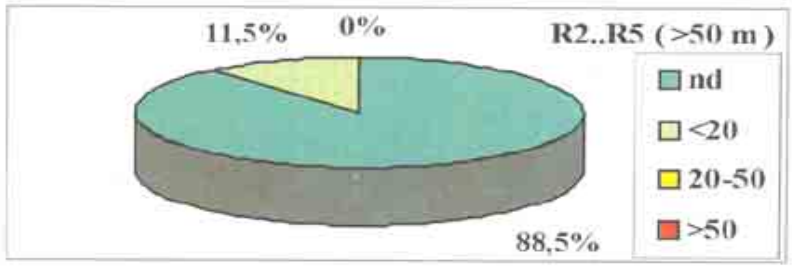
Distribution of Ammonium in the various types of water (data of the year 2000)





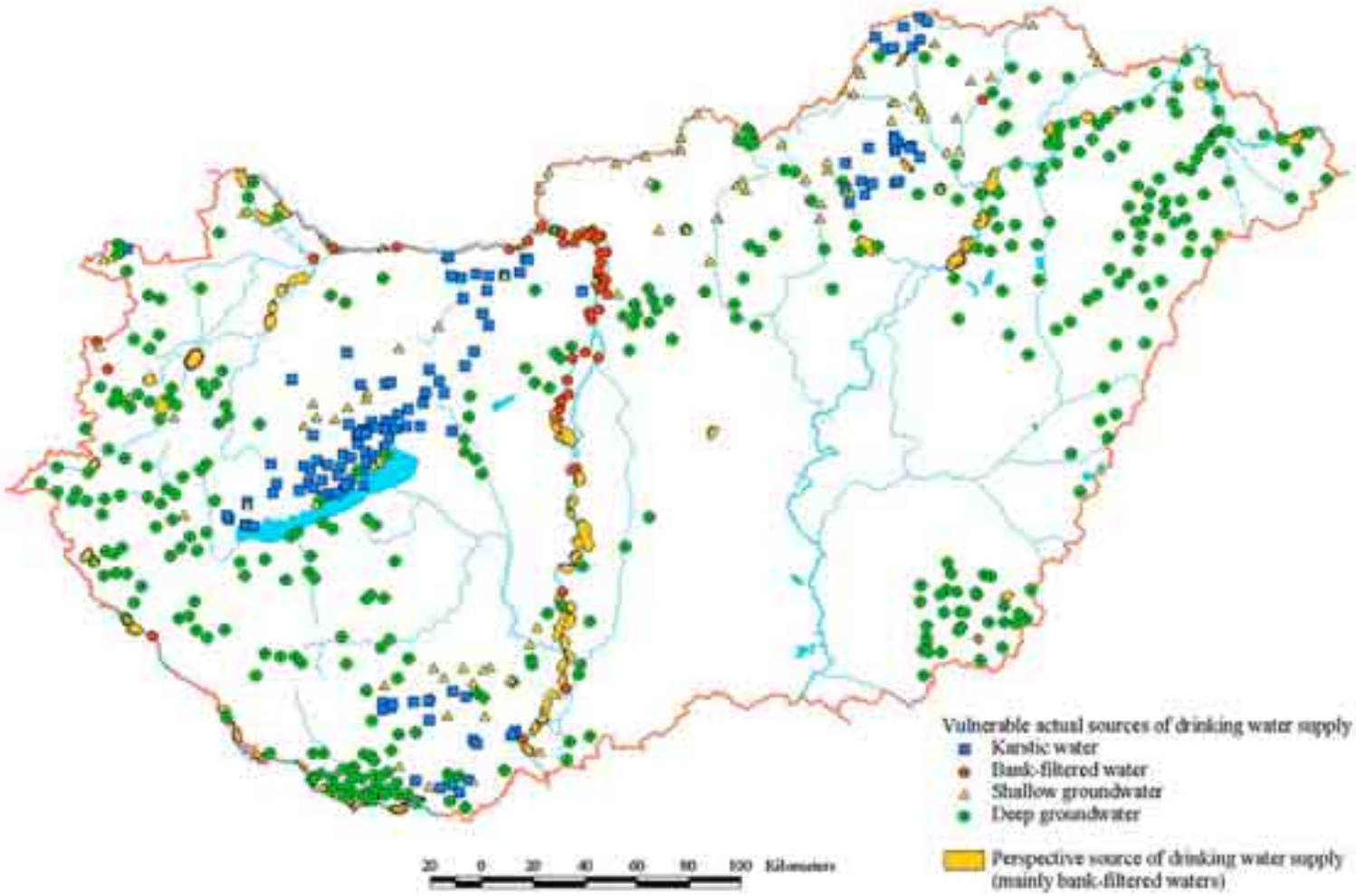




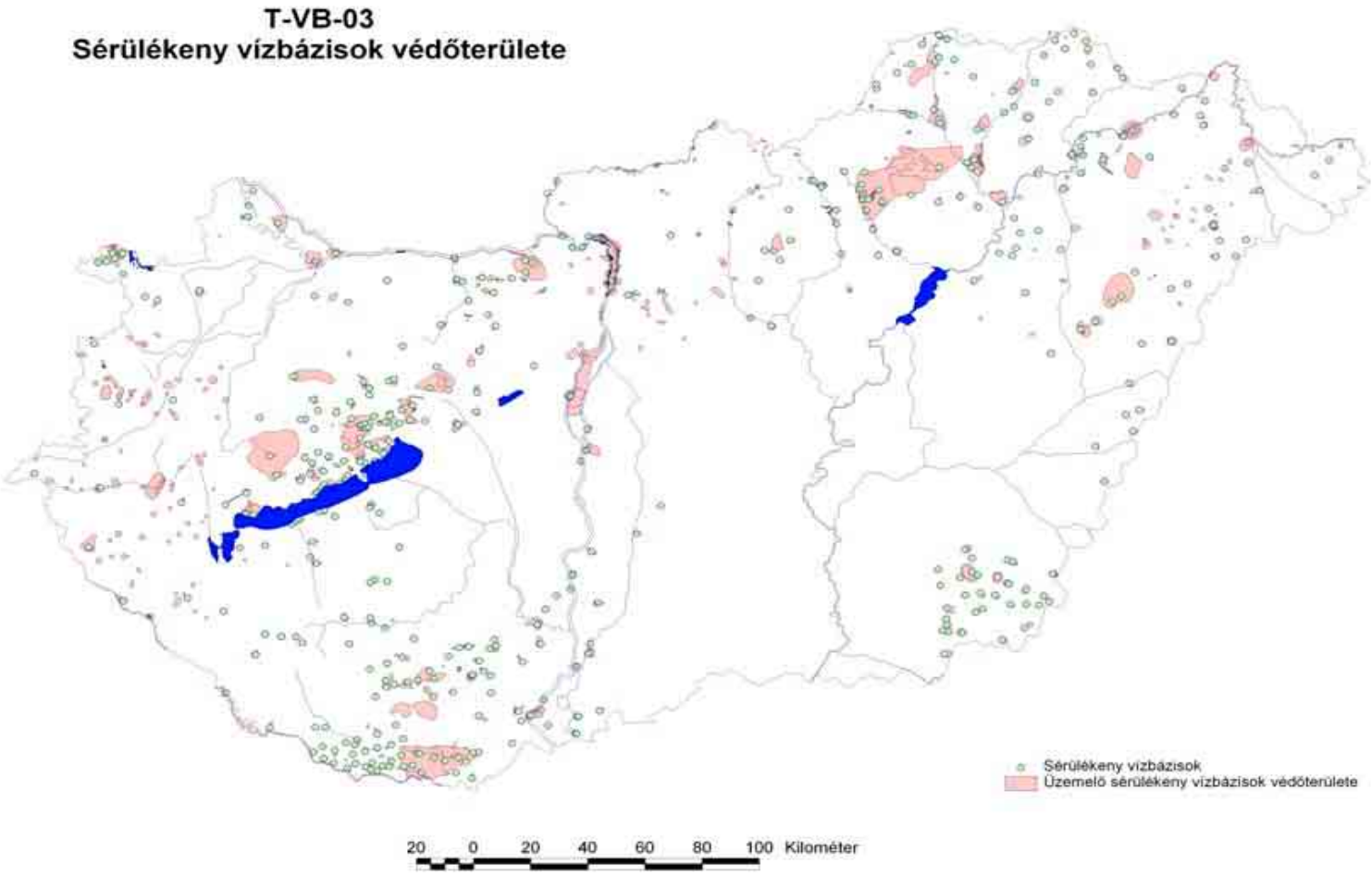


Distribution of Nitrate in the various types of water (data of the year 2000)

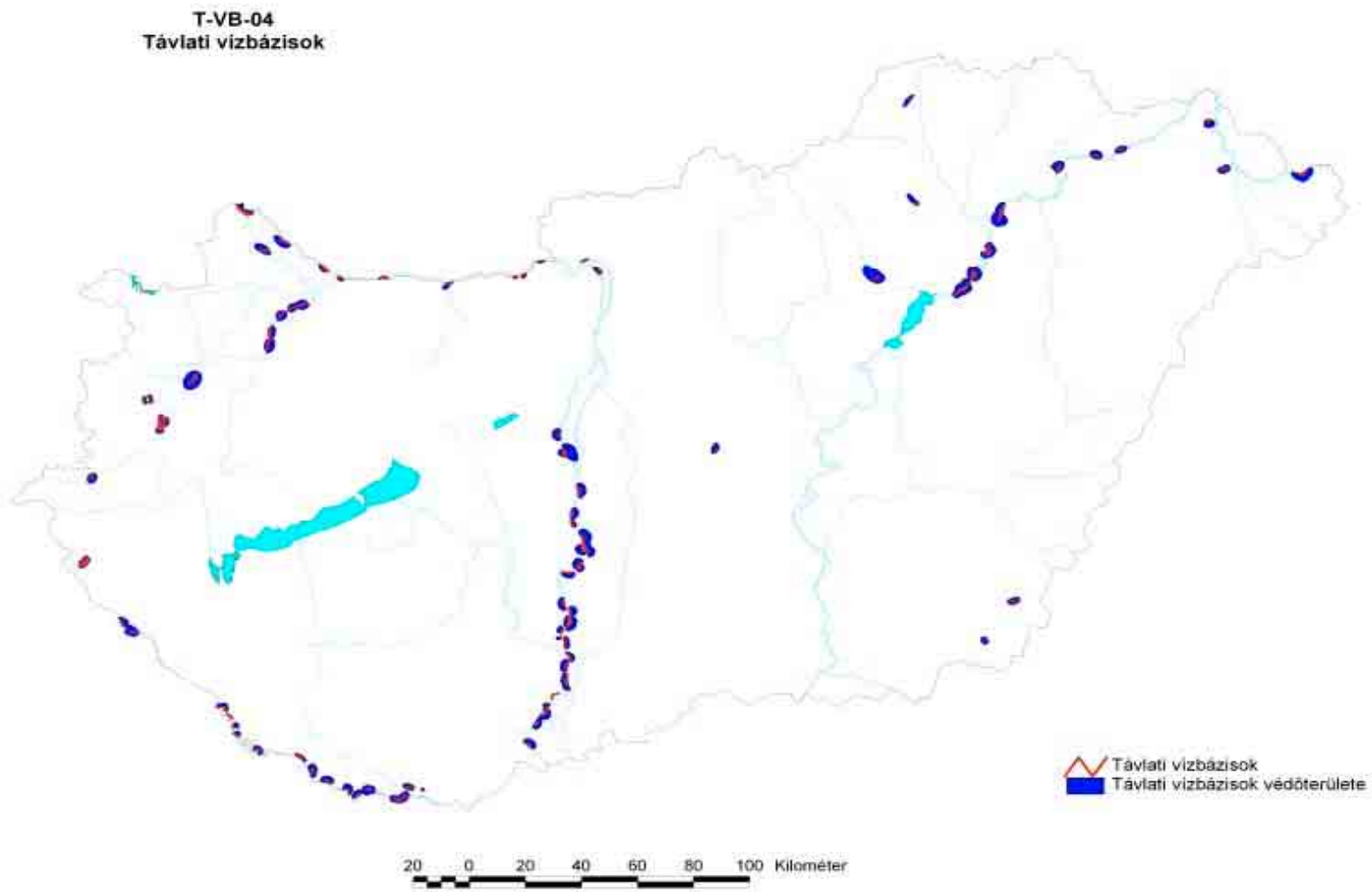
Operating and prospective vulnerable drinking water



Vulnerable groundwater sources in drinking water supply



Vulnerable unused local ground water resources

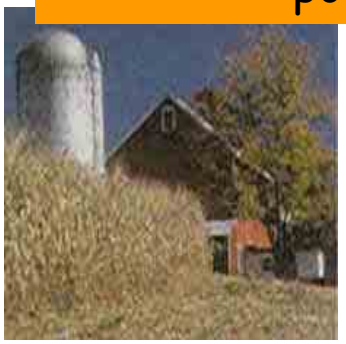


Difficulties of protecting programmes

- Nobody knows the numbers of pollution
- No information on the behavior of pollutant matter in soil, unsaturated zone and groundwater
- No information on hydrogeological processes
- You're the last to get information about present day's polluters and contamination processes

Main polluters


population

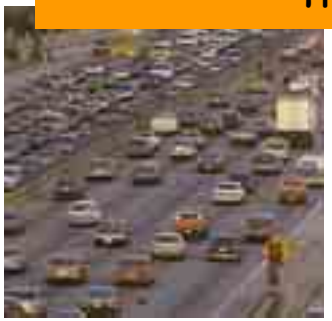
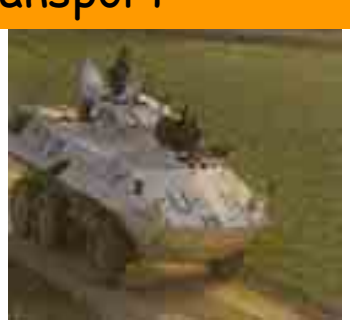




agriculture



transport


industry



Action programme in Hungary
(2249/1995. Gov. Decision)

- Enumerate the sensitive groundwater resources
- Prepare an action programme for diagnostic of sensitive groundwater recources
- Make the methodology for diagnostic
- Plan the timetable of diagnostic
- Identify the vulnerable groundwater resources by diagnostic
- Continue the protection programme of unused sensitive groundwater resources

Methodology of groundwater protection programme

- Delineation of the protection areas
- Inventory of the pollution sources
- Design and implement of the monitoring system
- Determination of hydrogeological protection area
- Assessment and prognosis (distinguishing the potential and the actual pollution sources, pollution processes, transport models)
- Proposal of measures for safe water supply
- Cost /benefit analyses on alternatives
- Decision making
- Official resolution on the protected area
- Implementation of the selected alternativa
- Safeguarding

Detailed process of drinking water base's protection 1.

Diagnostical phase I. section

- Data collecting, completement of existing data
- Modeling of underground infiltration sphere
- Additional examinations on field
- Shaping the model into more punctual hydrological evaluation, decision about water basises capability for being injured

Diagnostical phase II. section

- Working out of measuring and observing system
- Exploration of polluting sources
- Shaping the hydrogeologycal model into more punctual
- Determination of protecting form and area
- PR activity
- Completion of putting-in safe project, on which the indication of protecting areas can be based

Detailed process of drinking water base's protection 2.

Phase for placing in safety

- Indication of hydrogeologycal protecting area by water law's decision
- Forming of the protecting area, enforcement of restictions

Phase for keeping in safety

- Operate of measuring and observing system, assesement of conditions, taking the measurements considered necessary
- Annual reports about the operation of protecting area's measuring and observing system
- Revision in every 5 years

Groundwater protecting zones law
(123/1997. Gov. Decision)

5 different protection zones

- Inner zone with 20 days travel time
- Outer zone with 6 months travel time
- „A" hidrogeological zone with 5 years travel time
- „B" hidrogeological zone with 5o years travel time
- „C" hidrogeological zone, means the whole catchment area

Vulnerable and sensitive groundwater resources and their protection

Responses and restrictions by Groundwater Protection Law (123/1997.)

INBO, Dakar Event

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