SDG6 and groundwater: where are we in Italy?

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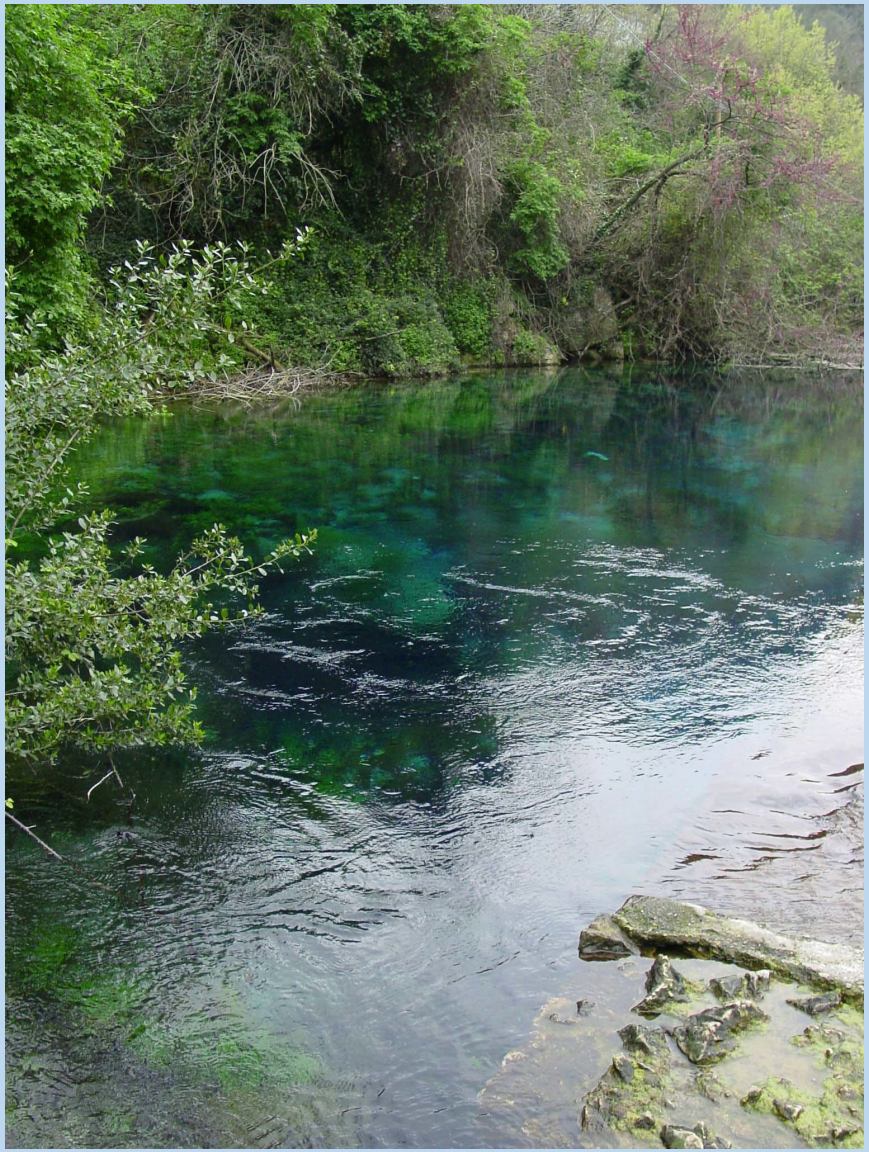
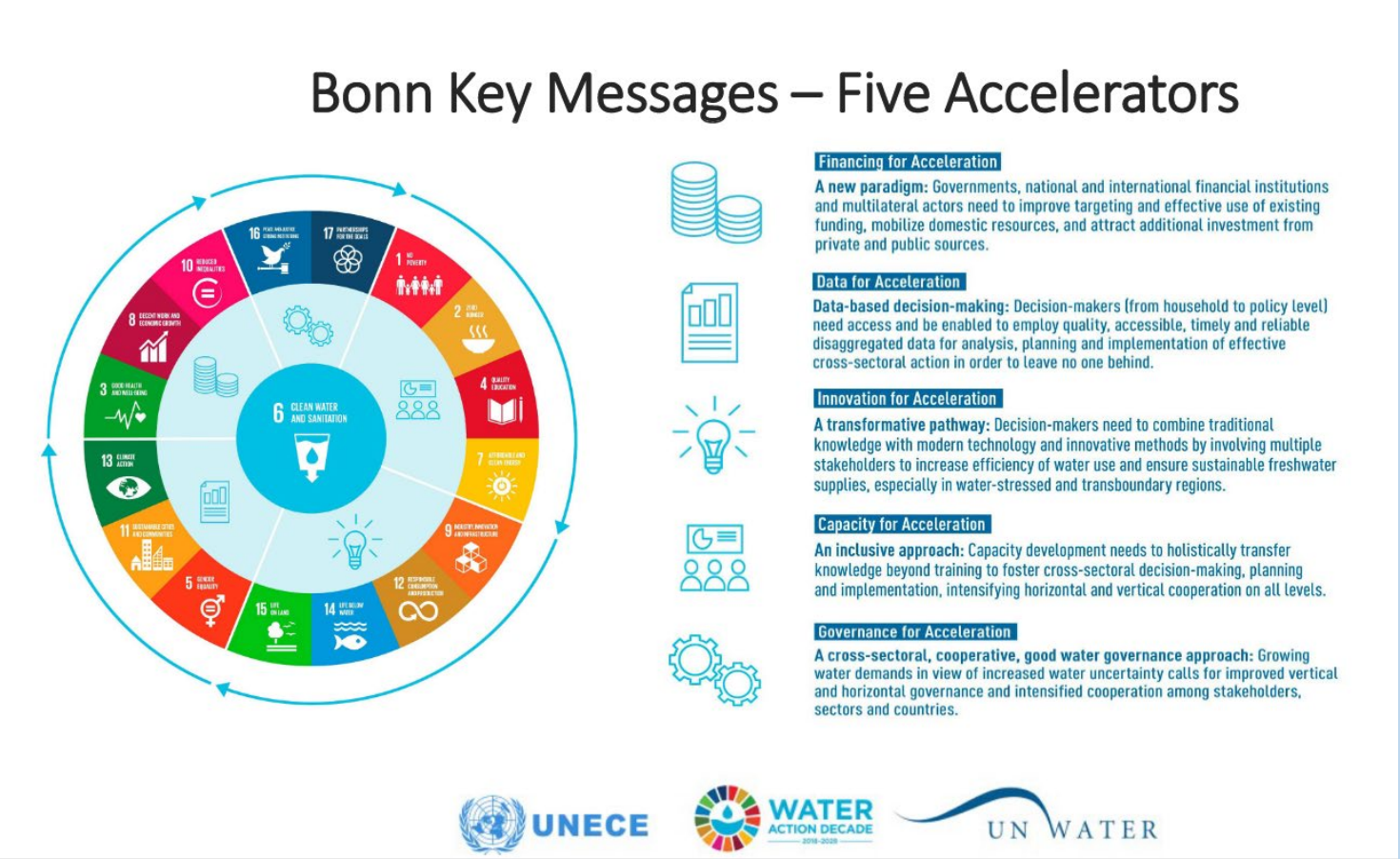
SDG 6: water and sanitation for all

- The SDG 6 aims at ensuring availability and sustainable management of water and sanitation for all in the world.
- In 2020 it was estimated that
  - 26% of the total population (2 billion) still lacks safely managed drinking water,
  - 46% lack safely managed sanitation and
  - 29% lack basic hygiene (sdgs.un.org/goals/goal6).
- Today we know that reaching sufficient standards in the water access is fundamental to combat pandemics such as covid-19



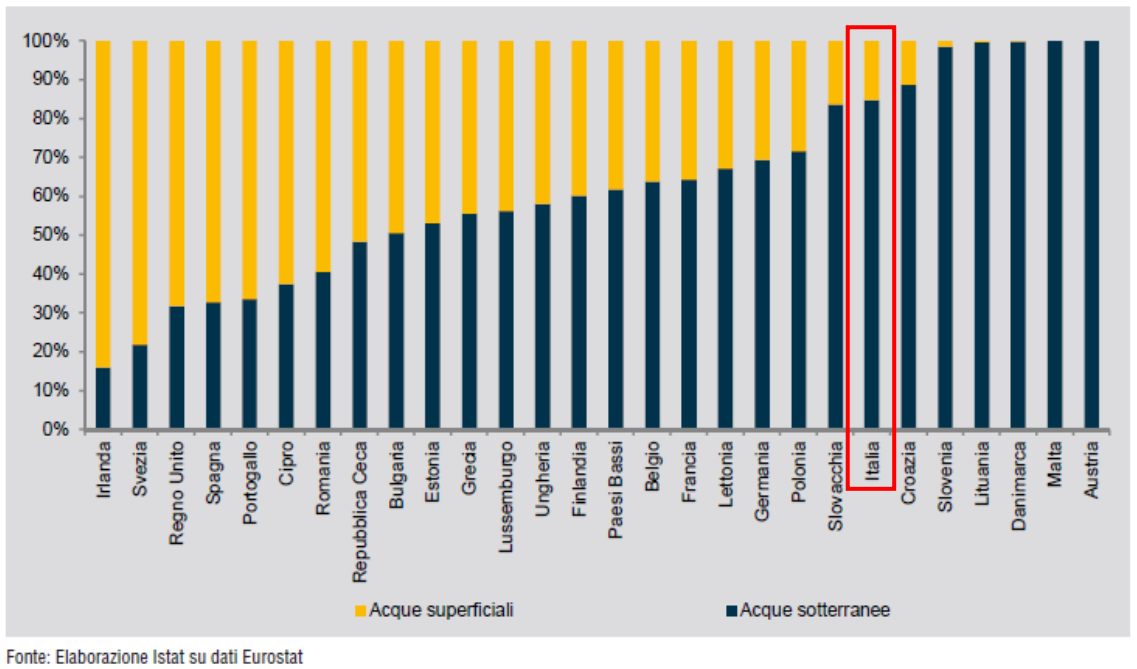
Accelerating the SDG6 cross-sectoral implementation



- Financing: more effective use of existing funding, attract additional investments (private/public sources)
- Data-based decision-making
- Innovation: combine traditional knowledge and innovative methods
- Capacity development and inclusive approach
- Governance: cross-sectoral, cooperative, good water governance approach

https://waterdialogues4results.com/key-messages/

SDG6 and groundwater: how important is groundwater in our everyday life



Share of groundwater and surface water in the drinking water supply in the UE-28

- At the global level, **half of the water withdrawn for domestic use comes from groundwater** (UN World Water Development Report 2022)
- In the EU, groundwater supplies **65% of drinking water** with shares ranging from 15% to 100% (**85% in Italy**).
- About **24% of the total groundwater body area in the EU-27 is in poor chemical status** and 9% in poor quantitative status (2016 WFD reporting).
- Considering both poor chemical and quantitative status, about 29% of the EU's groundwater body area lacks capacity to meet the needs of ecosystems and people (EEA 2022).

General overview in Italy

Location

- Geographical region: Southern Europe, Europe
- SDG region: SDG Europe and Northern America

Land

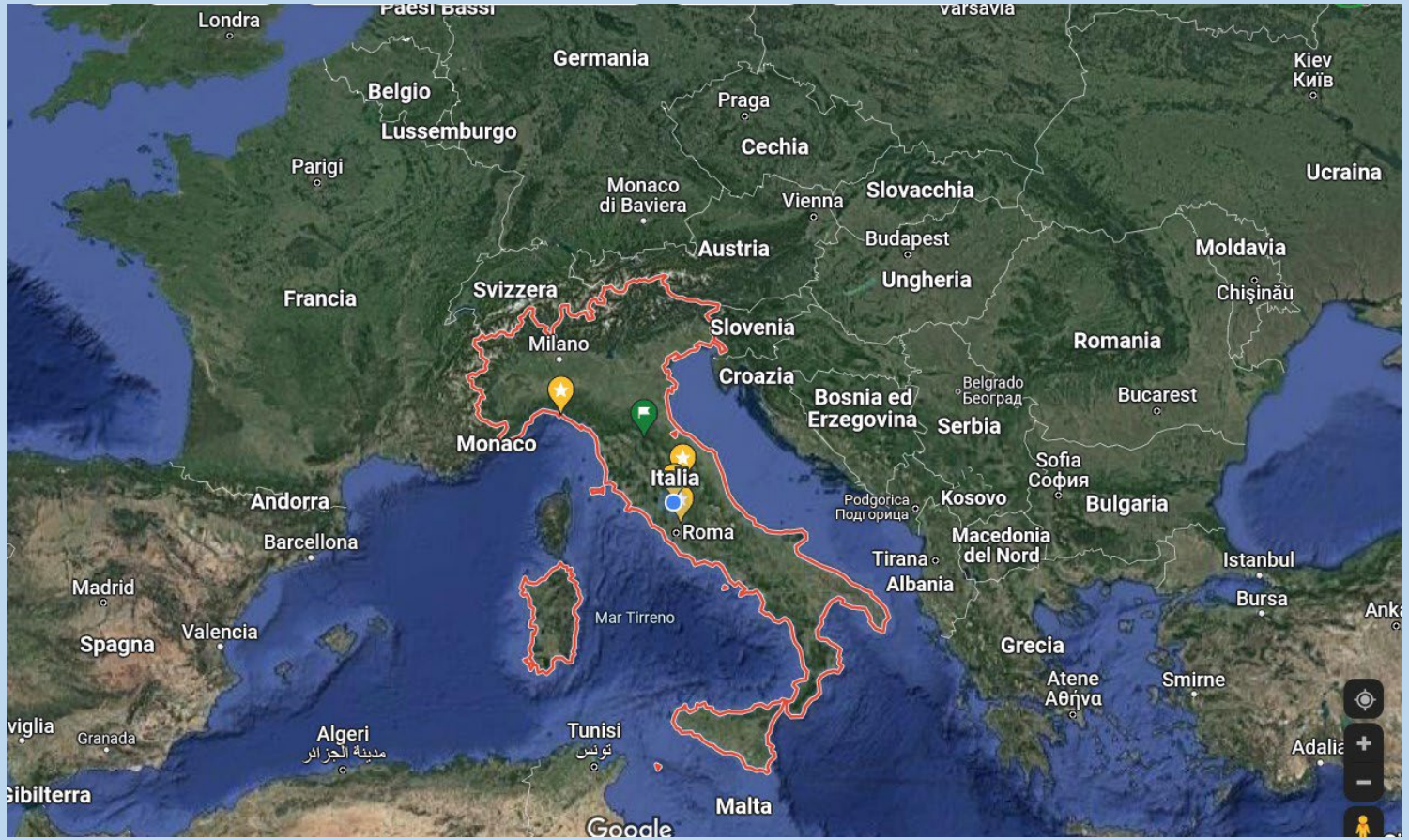
- Total area: 302.073 km²
- Land area: 294,140 km2 (2018)
- Land use by sector: 43% agriculture, 32% forest and 25% other (2016)

People

- Total population: 60,431,283 people (2018)
- Population density : 205 people per km2 (2018)
- Urbanisation: 70% lives in urban areas and 30% lives in rural areas (2018)

Economy

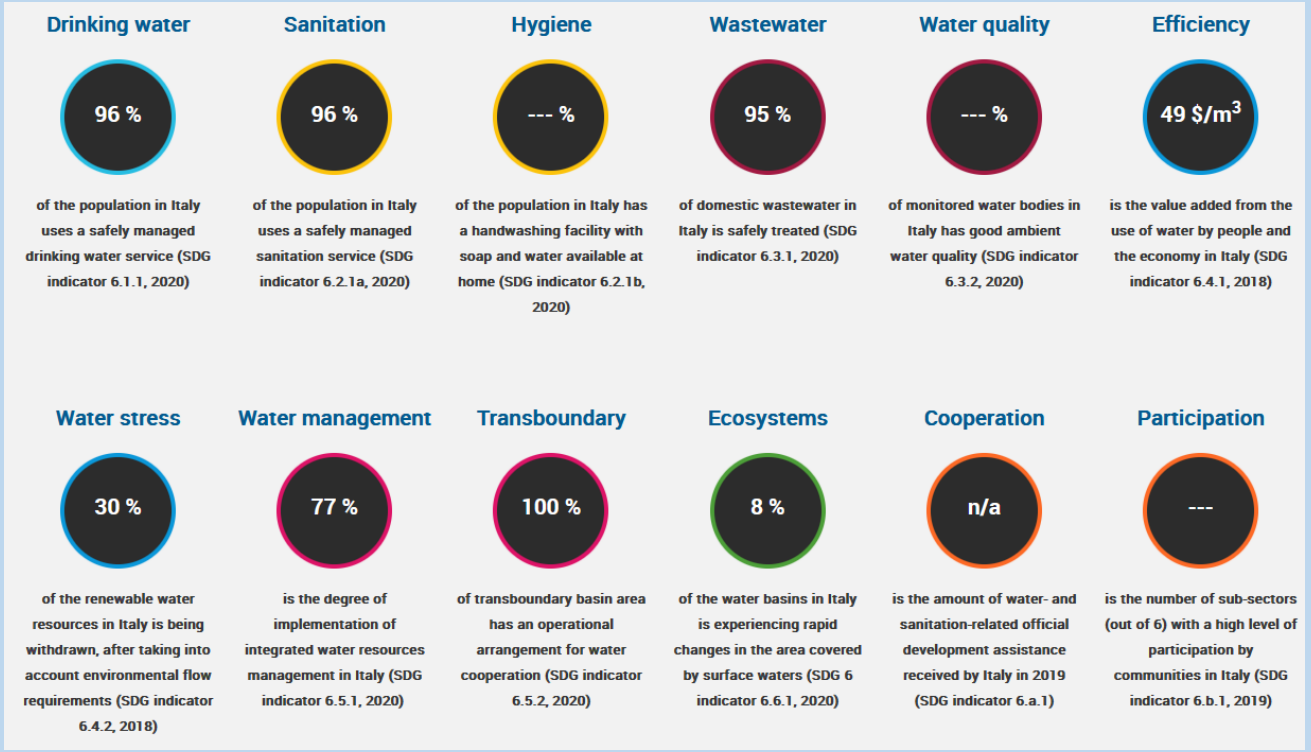
- Total GDP: 2,159,753,790,958 USD per year (2018)
- GDP per capita: 35,739 USD per year (2018)
- Value added by sector: 2% from agriculture, 66% from services and 22% from industry (2018)



https://www.sdg6data.org/country-or-area/Italy

General overview in Italy

- In Italy, the situation measured by the 11 global indicators to track progress towards SDG 6 (https://www.sdg6data.org/) shows a high rate of population having access to drinking water, sanitation services and public wastewater treatment
- DRINKING WATER ≈100% (≈4% self supply)
- SANITATION SERVICES ≈ 96% (public services + private household)
- WASTEWATER TREATMENT ≈95% (public services 70% (ISTAT)+ private households)
- IWRM ≈ 77% (enabling environment, institutions and participation, management instruments, financing)
- TRANSBOUNDARY 100% (agreements for cooperation with Switzerland, France, Slovenia)
- ECOSYSTEMS 8% (gain between baseline (2001-2005: 3,551 km^2), and latest five year period (2011-2015: 3627 km^2)



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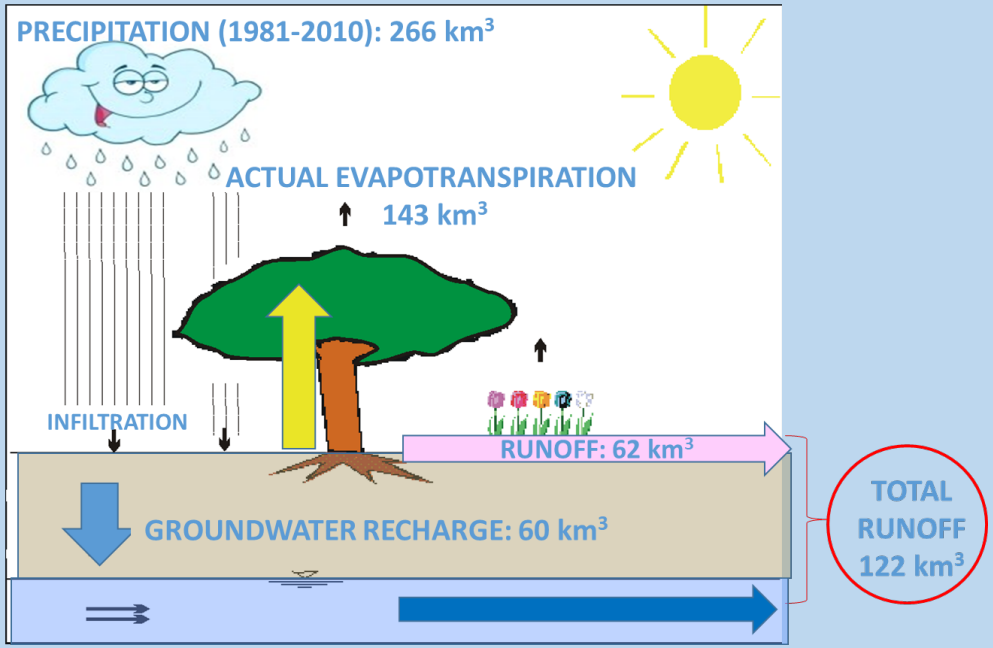
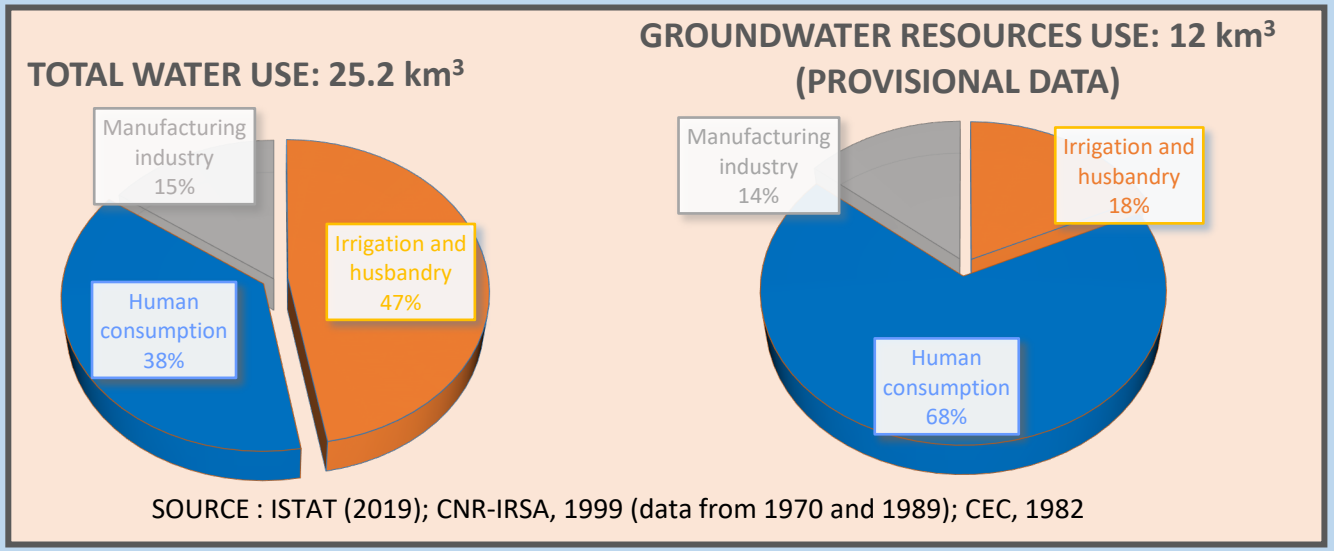
Water resources and withdrawal in Italy, total and per capita

Long Term Average Annual Precipitation (1981-2010)

Total precipitation	904 mm
Actual evapotranspiration	488 mm
Runoff	212 mm
Groundwater recharge	204 mm



ISTAT-ISPRA, National Water Balance (BigBang model, groundwater balance at the national scale)

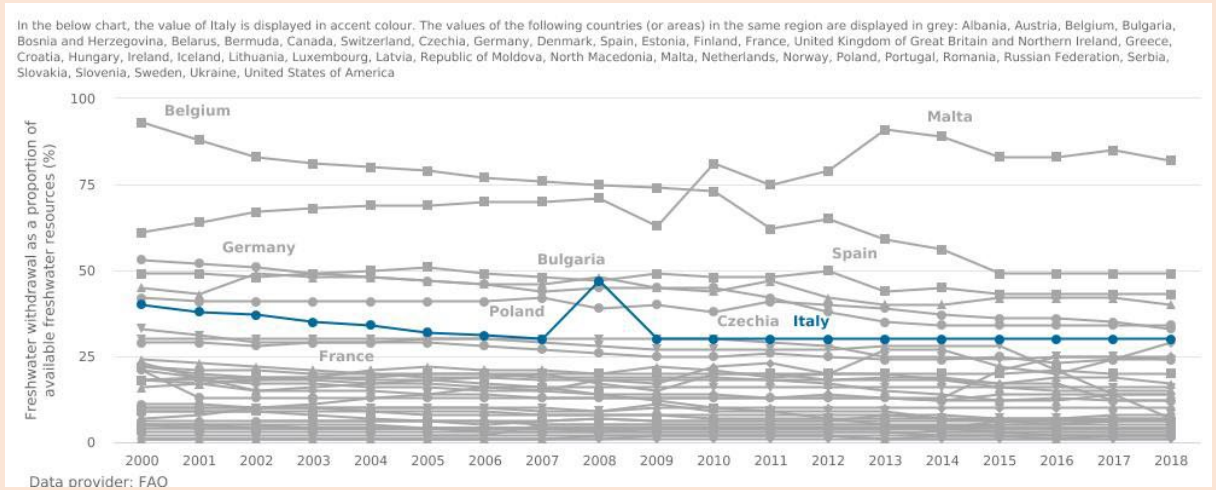


SOURCE : ISTAT (2019); CNR-IRSA, 1999 (data from 1970 and 1989); CEC, 1982

Long-term average annual precipitation : 832 (mm/year) (2017)
Renewable water resources: 3,223 m³ per capita (2017) → 193 km³
Water withdrawal (including energy): 576 m³ per capita (2015) → 34 km³
Environmental flow requirements: 41 % of the renew. water resources (2017)

https://www.sdg6data.org/country-or-area/Italy

Indicator 6.4.2: Level of water stress



Freshwater withdrawal as a proportion of available freshwater resources in Italy

https://www.sdg6data.org/country-or-area/Italy

Water stress decreased from 40% to 30% from 2000 to 2018. Possible reasons include:

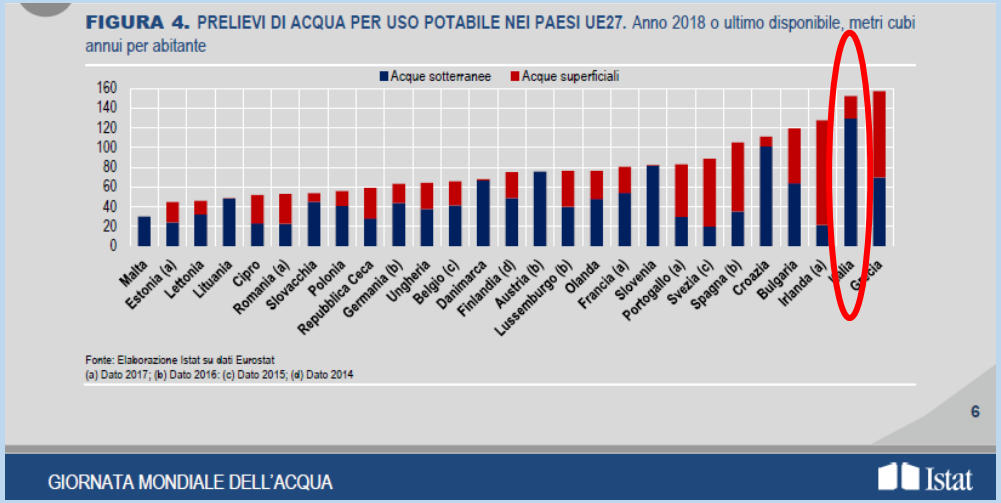
DECREASE OF WATER STRESS

- Industrial processes have increased efficency
- Circular economy
- Industrial activity has been largely delocalized
- More efficent use of water for irrigation
- Less water demaning crops
- Earlier seeding
- Human consumption is nearly constant

INCREASE OF WATER STRESS

- Losses from networks are increasing (>40%) (but measuring systems are now more efficent)
- Irrigation slightly increased because of T increase (more attention to forecast and modeling of availability/demand; the distribution of the deficit among the users starts earlier)

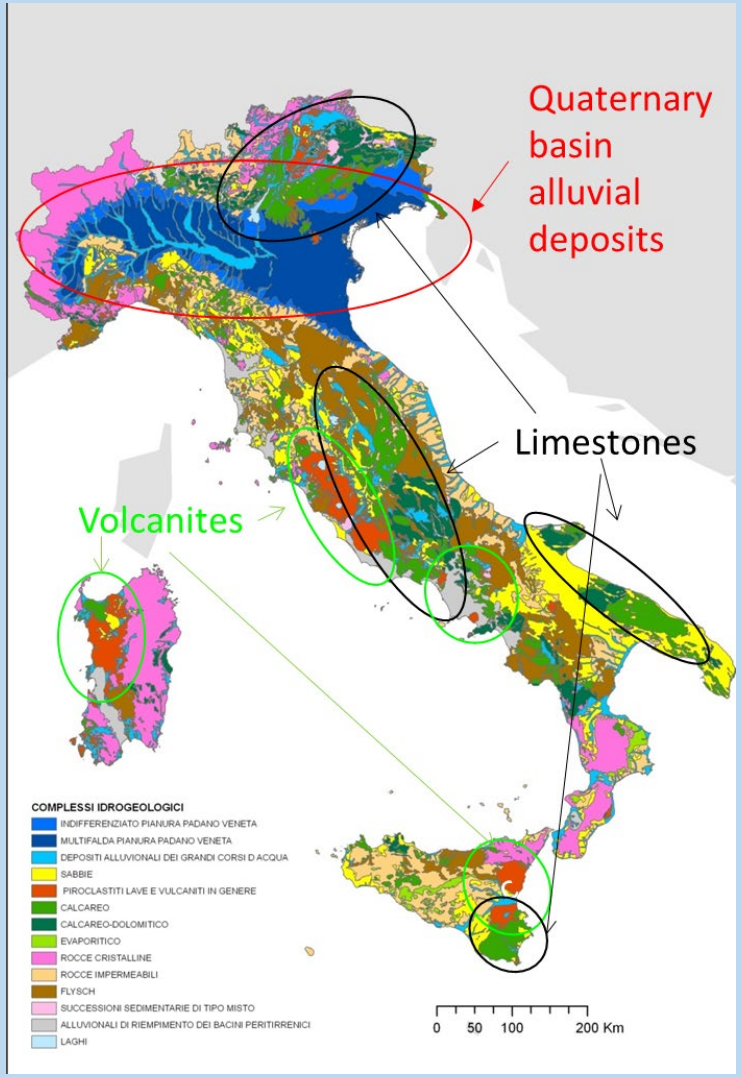
Share of groundwater/surface water for human consumption

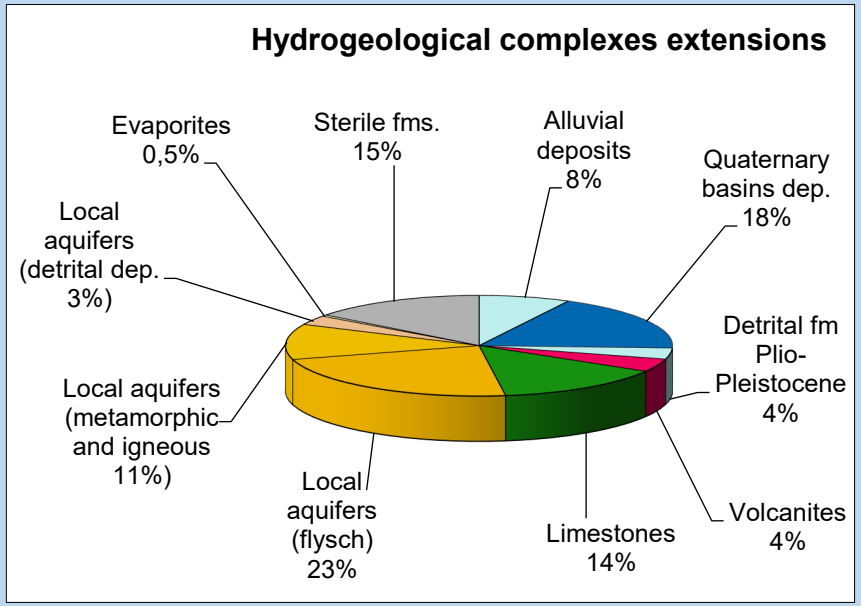


- In Italy **85 %** of the public water supply for human consumption is **groundwater**.
- The daily water abstracted is more than **400 L/d/inhabitant**, which is about the double of the median demand in Europe.
- 4.9 billion m3/year were supplied to users, corresponding to **220 liters per inhabitant per day**
- The losses from the public water supply networks add up to **42%**, which correspond to **156 L/d/inhabitant**.
- **0.4%** of Italian households complained of irregularities in the service of water supply in their homes (2018)
- **17,897** urban wastewater treatment plants are in operation (2015)
- **59.6%** (population equivalents) of the potential civil pollutant loads flow into secondary or advanced plants (which represent 44.2% of the treatment plants).
- Around **28% of Italian families** express low confidence in tap water and prefer bottled water.
- Italian families spend monthly around 14€ for the tap water furniture and 12€ for mineral water.
- Natural groundwater withdrawals used for mineral/bottled water production in 2018 amounted to **16.8 million cubic meters** (+1.7% compared to 2017).
- In 2020, 40.6% of Italian people aged 14 and over say they are concerned about water pollution and 67.4% declare that they are careful not to waste water, confirming the growing awareness about the natural resources of our planet.

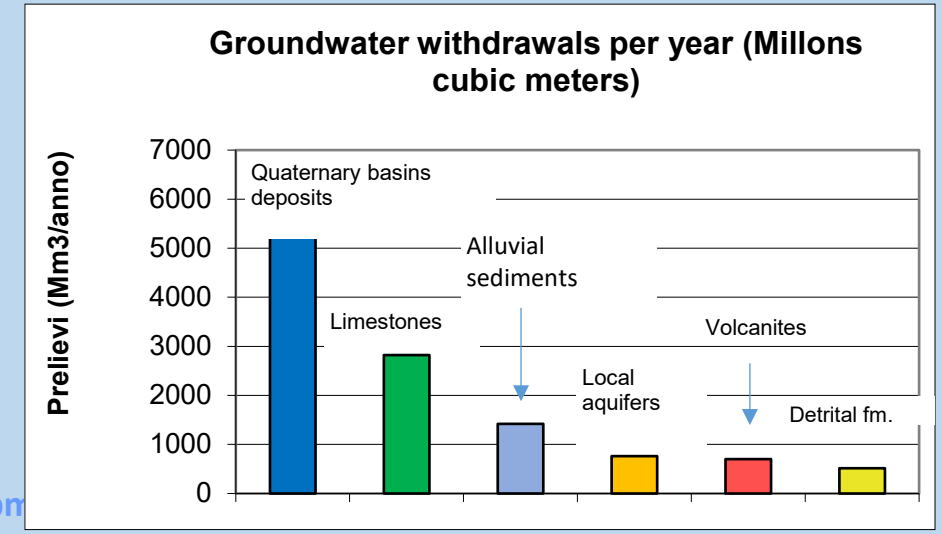
(ISTAT, 2019)

Groundwater resources distribution in Italy



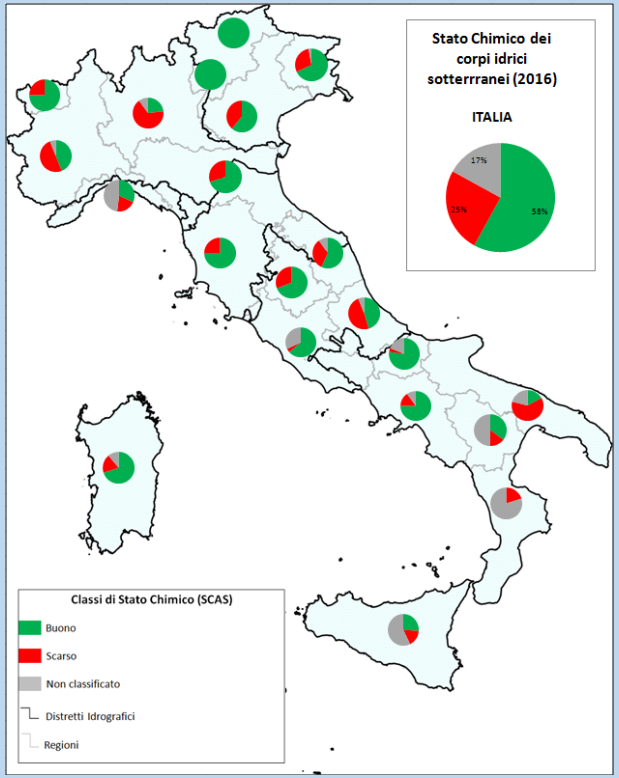


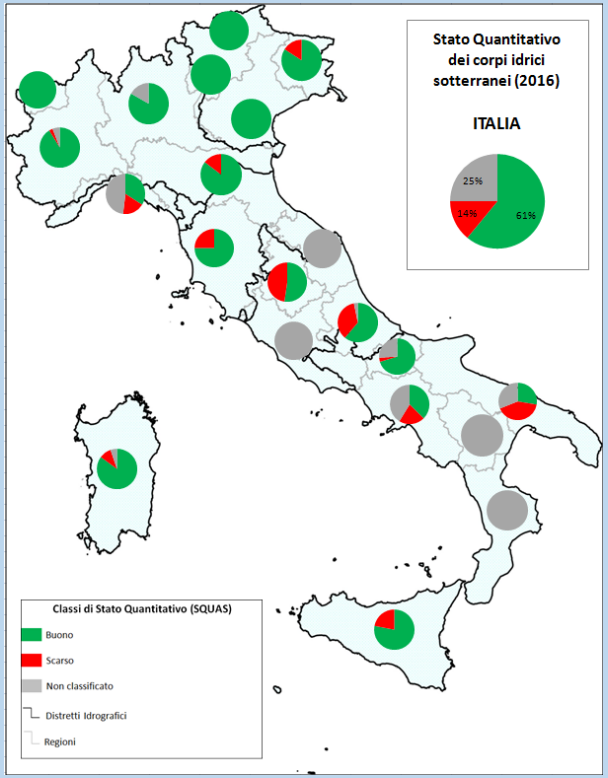
≈94% of groundwater is withdrawn from ≈50% of the territory



Mouton, Mangano, Fried – Inventory of the groundwater resources in Italy. Commission of the European Communities, 1982

Groundwater bodies chemical and quantitative status

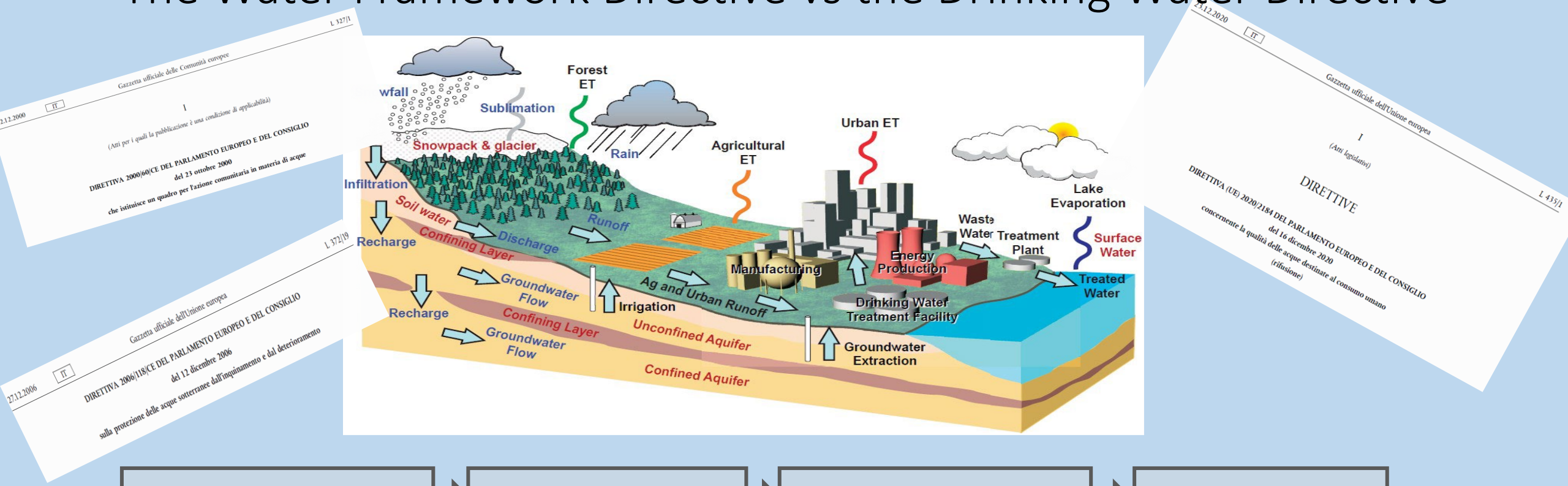




WFD 2000/60/CE Reporting 2016 (ISPRA 2021) for chemical/quantitative status; covering 82.6%/75.2% of groundwater bodies

- Monitoring data in Italy (2016 reporting) shows that **34.4%** of groundwater is in poor chemical status, **57.7%** in good status and **7.9%** is unknown.
- For the quantitative status **9.2%** of groundwater is in poor status, **77.3%** is in good status and **13.5%** is unknown (ISPRA 2021)
- Nitrates and pesticides due to agriculture still are the main reason for failure.
- Sulfates and chlorides (coastal areas), metals, chlorinated compounds and aromatic compounds are also frequently found in groundwater
- Since 2016 in Italy PFAS are analysed (exceedances for PFOA in 12 regions and 2 provinces)

The Water Framework Directive vs the Drinking Water Directive



RECHARGE AREA → ABSTRACTION AREA → DISTRIBUTION → TAP

Water Management Plans — **Water Safety Plans**

WFD/GWD

DIRECTIVE UE/2020/2184 ADOPTS A RISK BASED APPROACH FOR THE SAFETY OF DRINKING WATER

SURVEILLANCE AT THE TAP IS CONNECTED TO THE MONITORING IN THE WATER BODY AND PRESSURE ANALYS INTHE (GROUND)WATER BODY

DWD

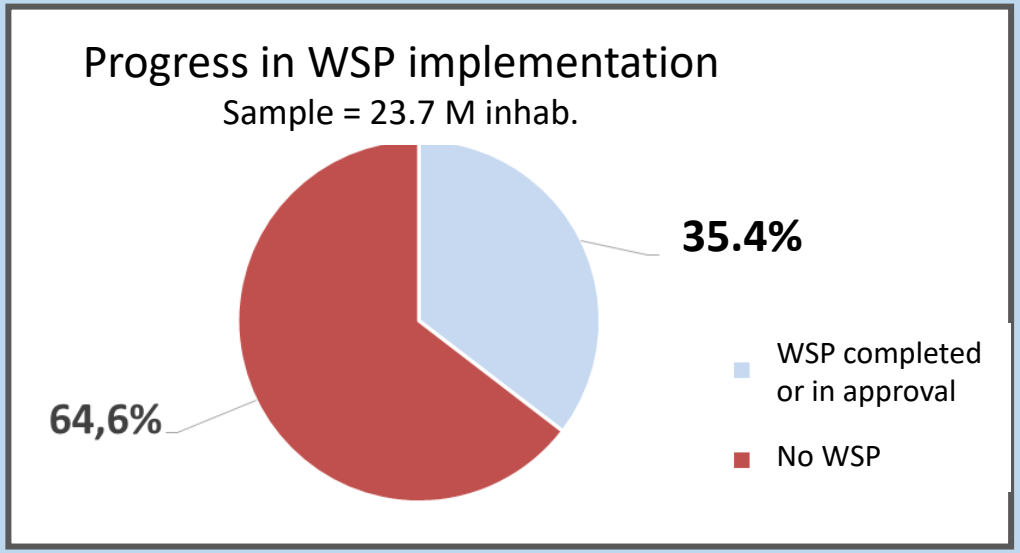
The Water Safety Plans

- The water supply and sanitation risk management strategy in Italy is now based on the Water Safety Plans (WSPs), in line with the new Drinking Water Directive (UE/2020/2184). WSPs approach is a fundamental tool to comply with the SDG 6.
- The implementation of WSPs in Italy has been a voluntary choice of water suppliers so far but it will become compulsory after the entry in force of the new DWD in January 2023.
- A higher level of health protection through the prevention of water contamination at the source will increase the confidence of consumers in tap water and help in reaching the goals.

Water safety plans implementation in Italy (survey on 30 water suppliers)

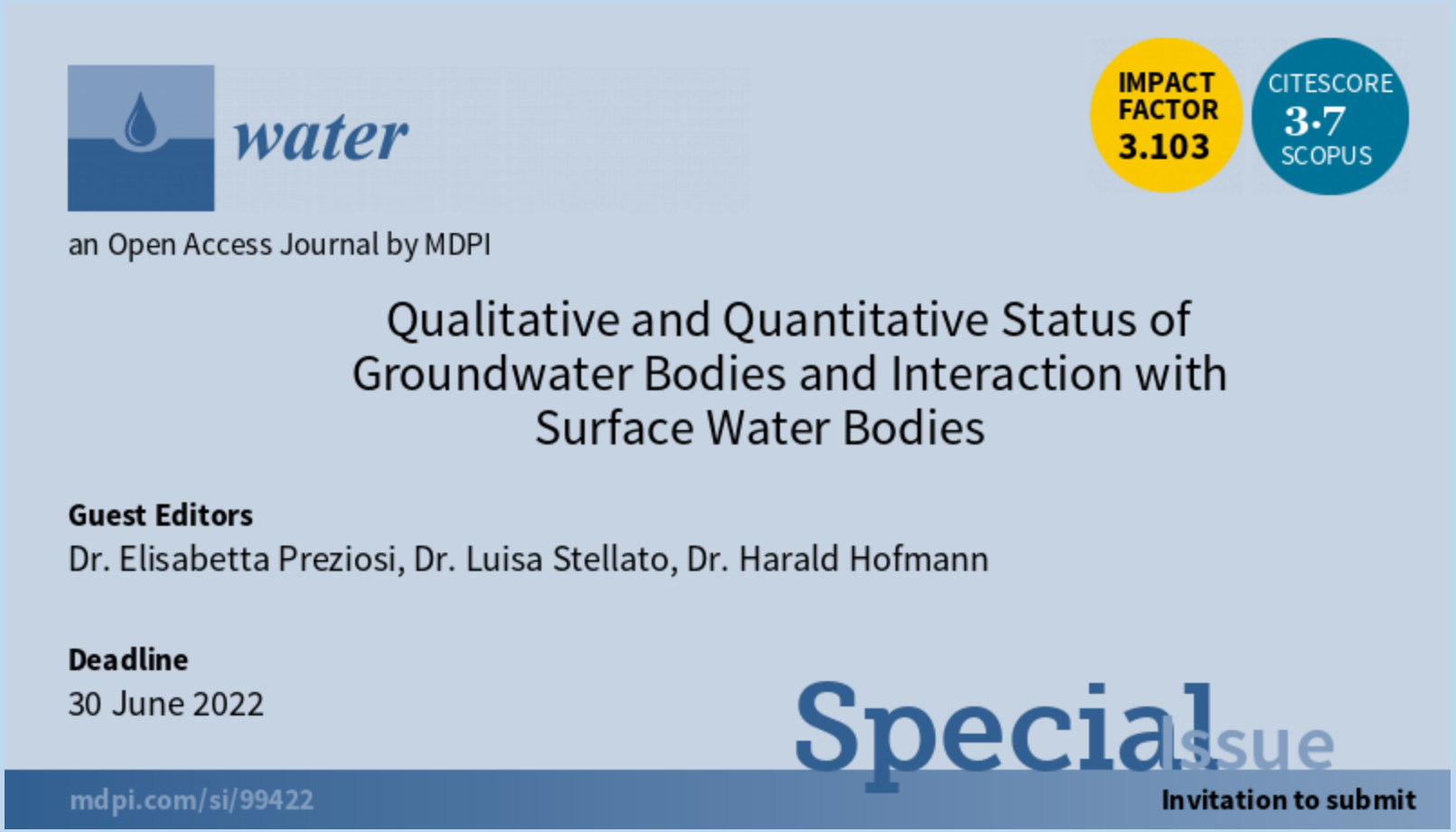
- WSPs after their implementation need to be evaluated and approved by the Italian National Health Institute; surveillance of WSPs is performed by the Ministry of Health, regions and other stakeholders
- Survey of 30 water suppliers (data provided by Utilitalia, 2022)
  - Populations served = 23.7 million inhab.(40.1 % of total pop.)
  - Water distributed = 1.87 billion m3/year
  - WSP completed for 8.4 million inhab (35.4 %)

(waiting for the final approval)



Take home message

- Urgent need for actions for the accelerating SDG6 cross-sectoral implementation : Financing, Data, Innovation, Capacity, Governance
- In Italy high rate of population having access to drinking water, sanitation services and public wastewater treatment
- Increase consumer confidence in tap water and decrease the use of bottled water
- Information and participation → increase citizen involvement to increase awareness and trust → Water Oriented Living Labs
- More data: water statistics and water accounts are produced with an increasing territorial detail
- Water Safety Plans implementation, integrating the WFD and DWD objectives, will support the amelioration of groundwater quality, hence a decrease of the water treatment levels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