

WATER MANAGEMENT SCHOOL

1° International Training Course

URBAN WATER RESOURCES MANAGEMENT for AFRICA
Rome, Link Campus University
22 January–3February 2018

SUSTAINABLE DEVELOPMENT and WATER RESOURCES MANAGEMENT

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Presentation Outline

0. Main principles on Water Management
1. Physical features of Italy and surface and groundwater status assessment
2. Administrative structure and water governance
3. State-of-the-art of Water Technology in EU and Italy
4. Water Service (supply and sanitation) settings
5. OECD Principles on Water Governance

Water Use: Main principles

Water is public property and represent a resource which must be protected and used with a solidarity approach.

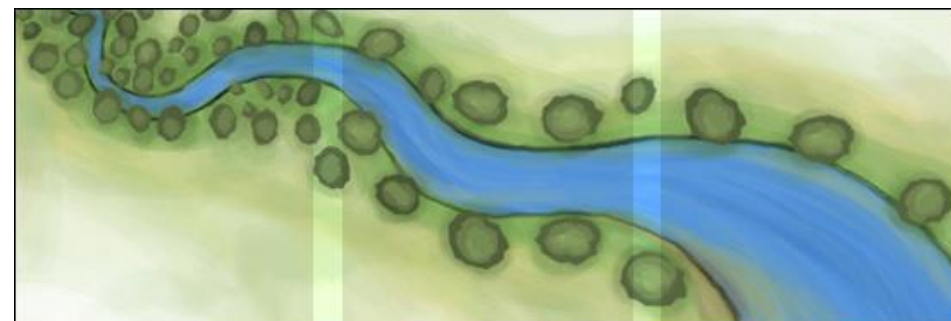
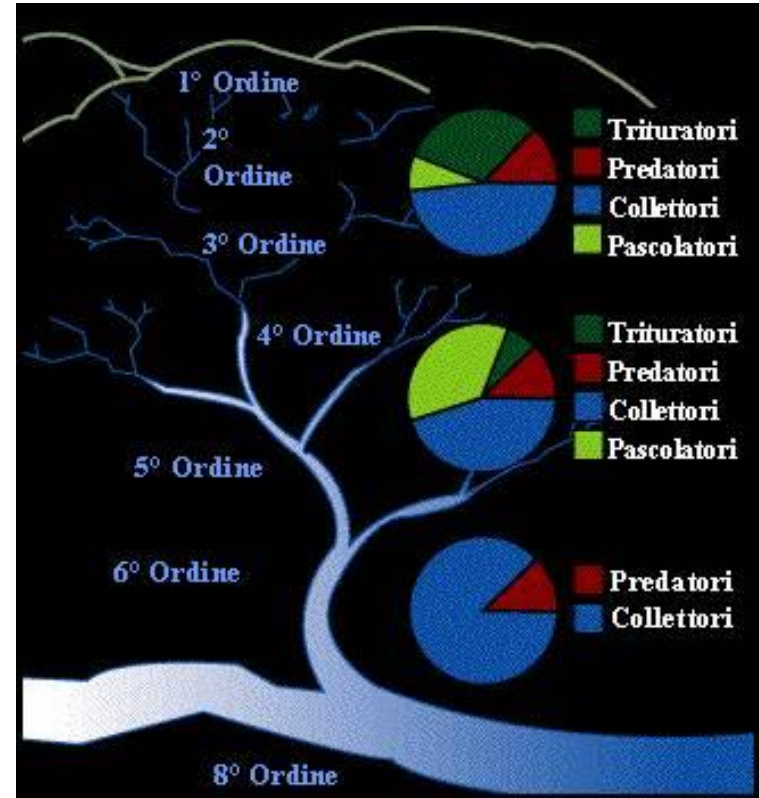
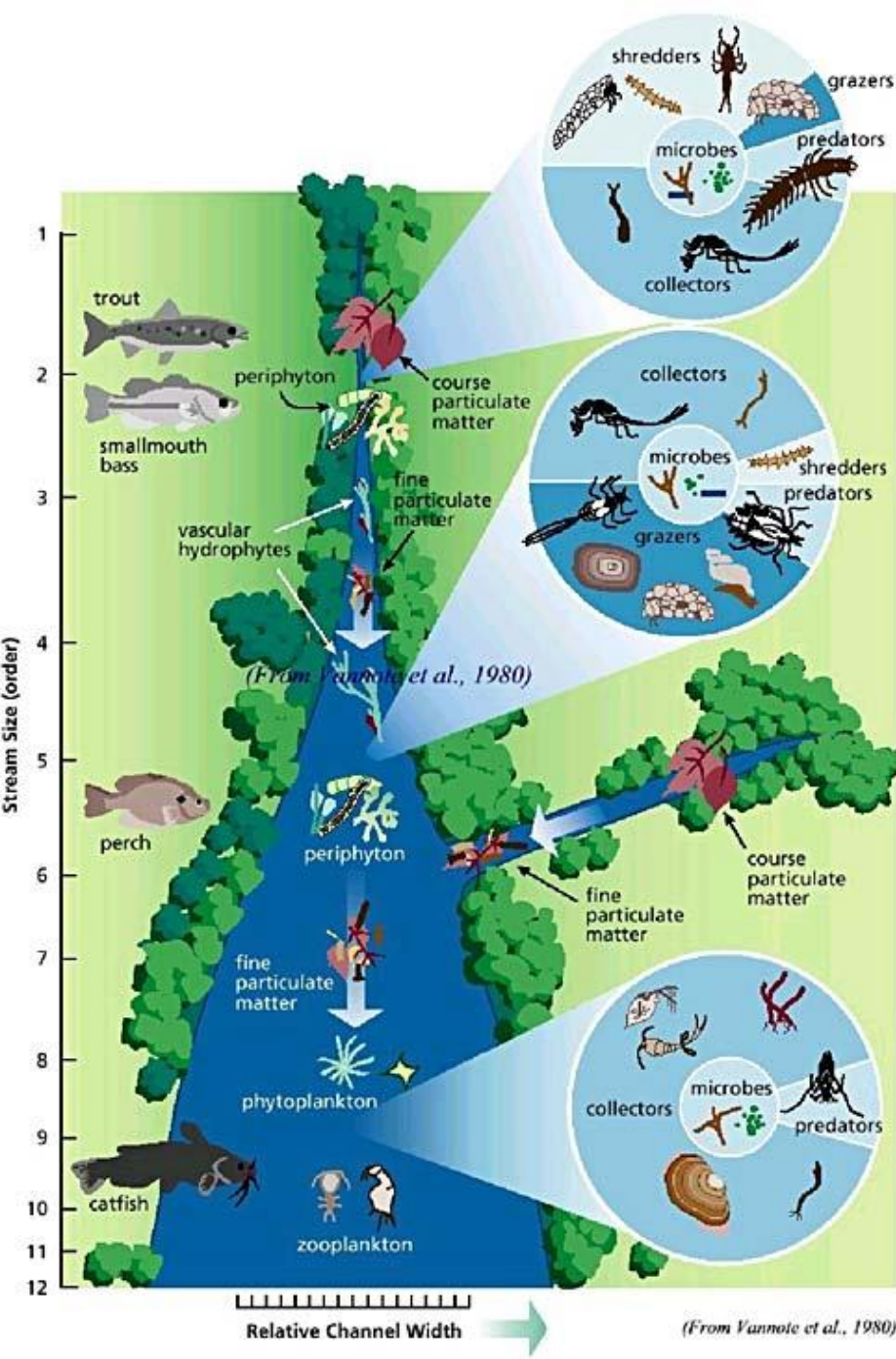
Every water use must take into account the needs of the future generations and their right to benefit of a good water environment

Water uses must be voted to water saving and water conservation in the way to not destroy water related heritage, the capacity of supporting water life, water ecosystems, the agriculture, water fauna and flora, geomorphologic processes and the idrological cycles.

Human consumption is a priority in comparison with other uses of the same water body. Other uses are permitted only if there is enough resource and there is not any risk of deteriorate the quality of the water body for the human consumption.

Ecological Approach:

- Natural condition
- Ecological functions



River Continuum Concept

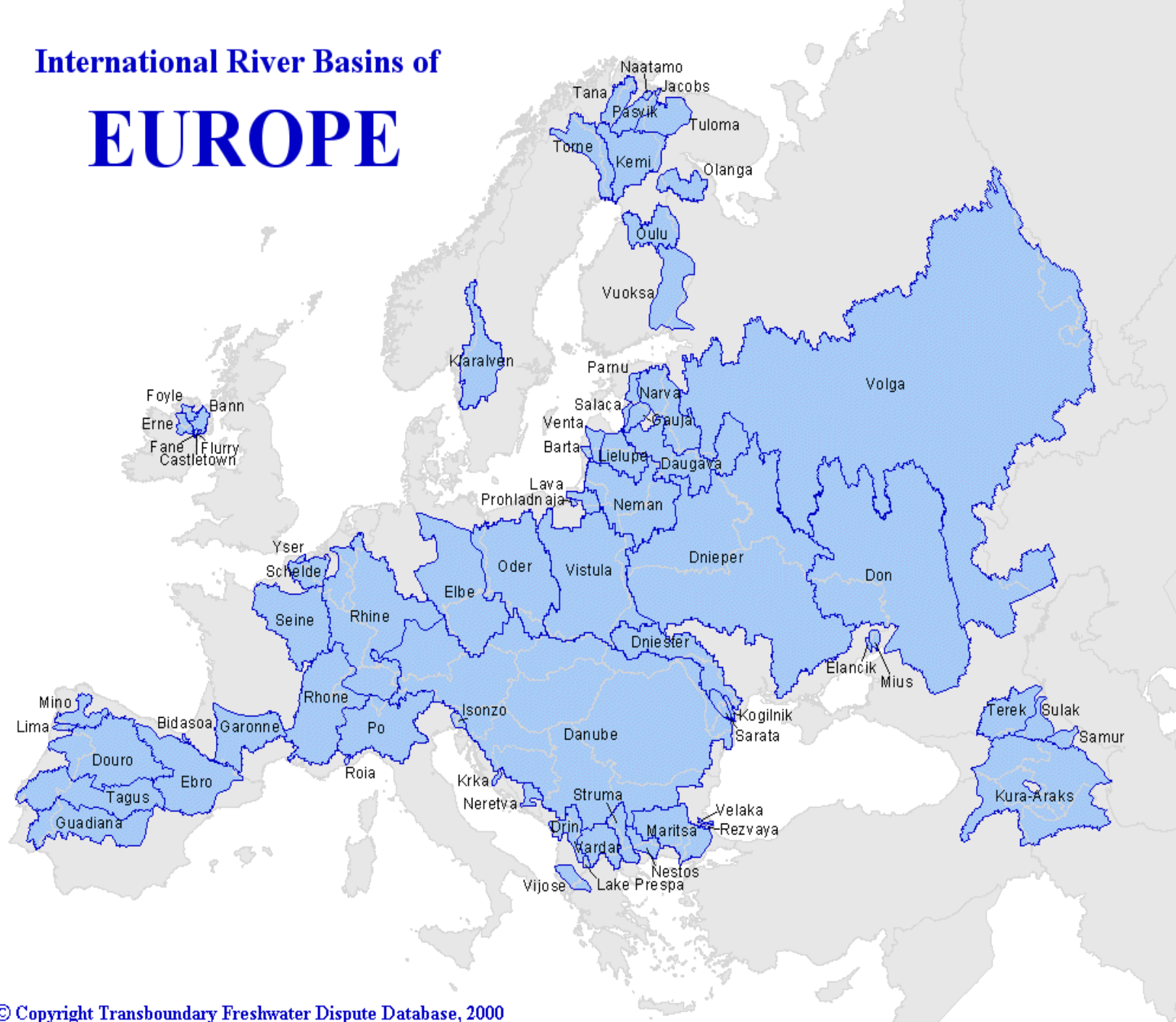
**River Basin(RB)
Approach**

**Principal
European RBs**



International River Basins of

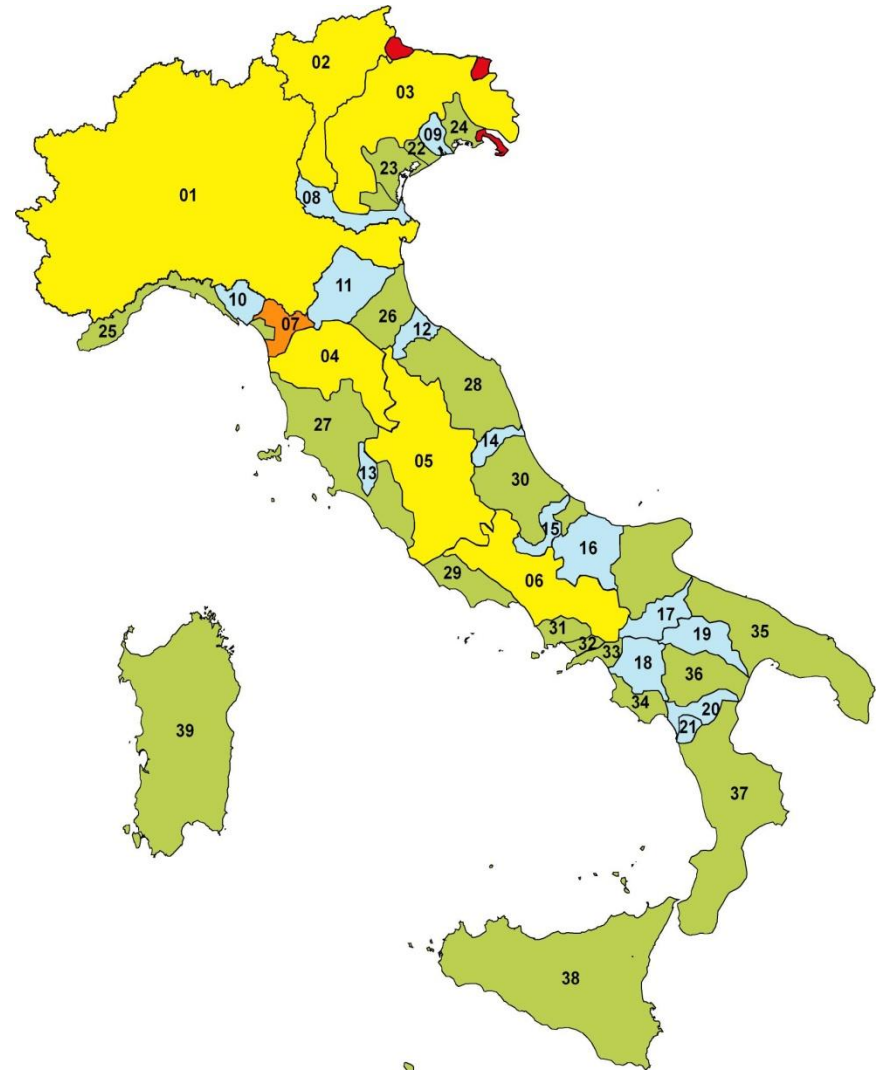
EUROPE



1.

Physical features of Italy
and
surface and groundwater status assessment

Geographical structure of Italy



The EU Water Framework Directive (WFD)

The water assessment in Italy responds to EU WFD

WFD Objectives

achieve good ecological status

achieve good chemical status

achieve good quantitative status

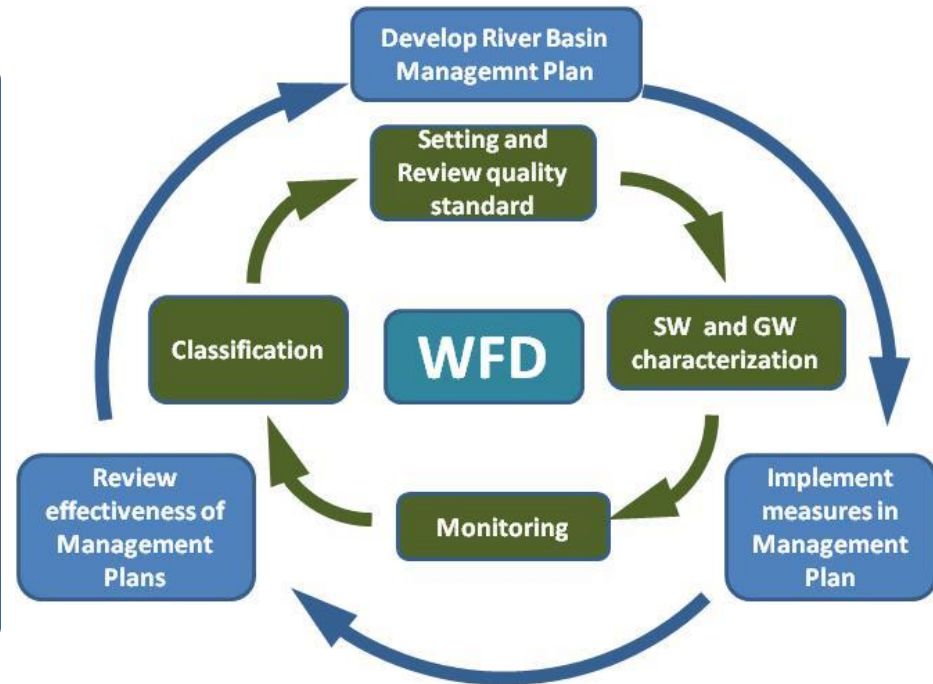
for all surface and groundwater

To protect

Human health

Water supply

Natural ecosystem



WFD: Protect and manage all European water, based on natural and hydrological standard: the RIVER BASIN

The RIVER BASIN approach is the best way to manage water

The main tool for water protection and management is the River Basin Management Plan (based on a six-year period)



Hydrological features of Italy (catchment layer and River Basin District - RBD)

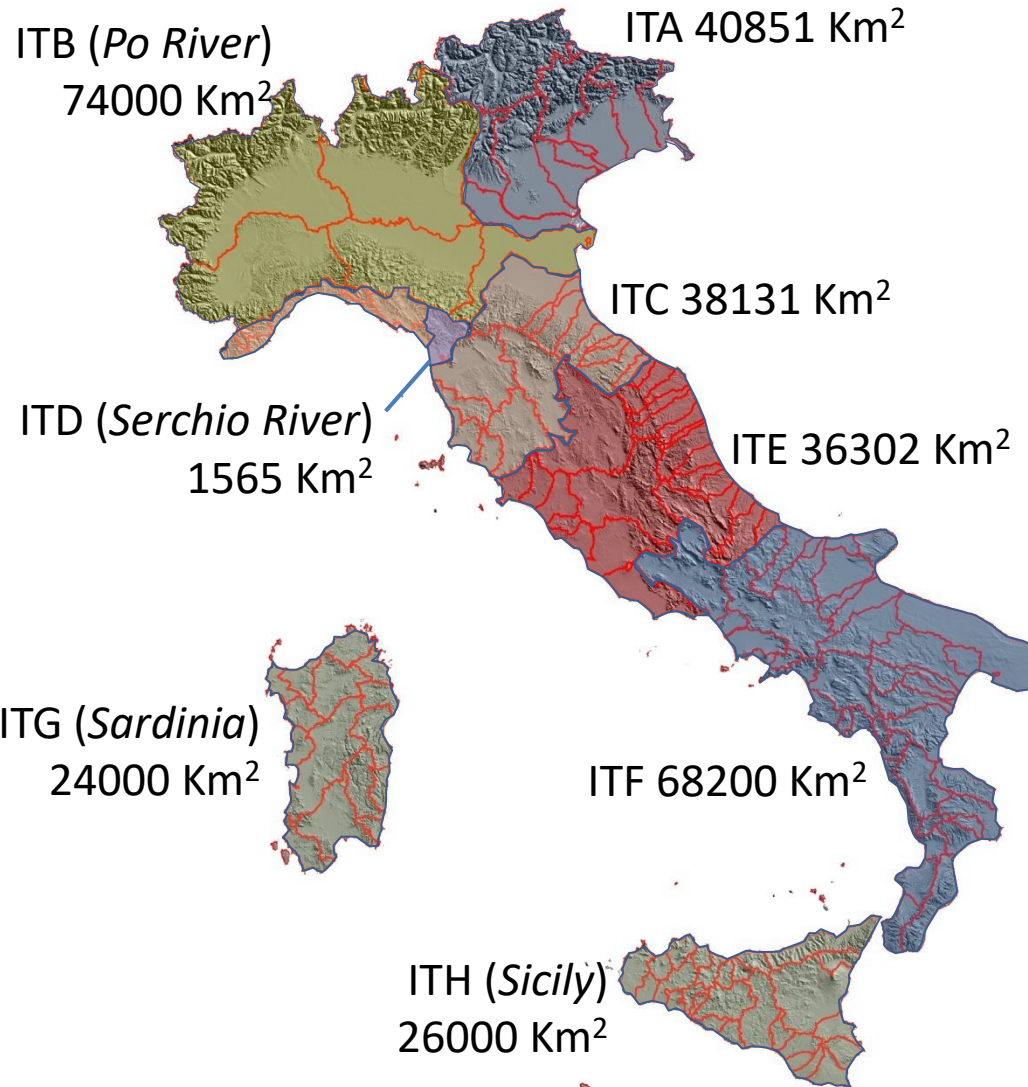
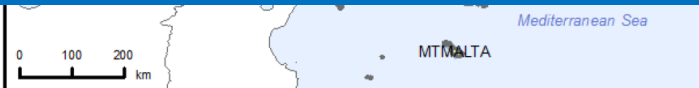
Italy has a total surface of about 300.000 sq km and a population of 60 million inhabitants

According to the Water Framework Directive (2000/60/CE) Italy is divided in 8 River Basin District

The largest one is the Po RB District (74000 sq Km), which corresponds to the Po catchment area

Po river is the longest in Italy, with a length of 655 Km and an average discharge of 1500 cum/s

The flow regime of Italian rivers is characterized by large flow variation between the minimum flow (in summer in the southern regions) and sudden winter floods



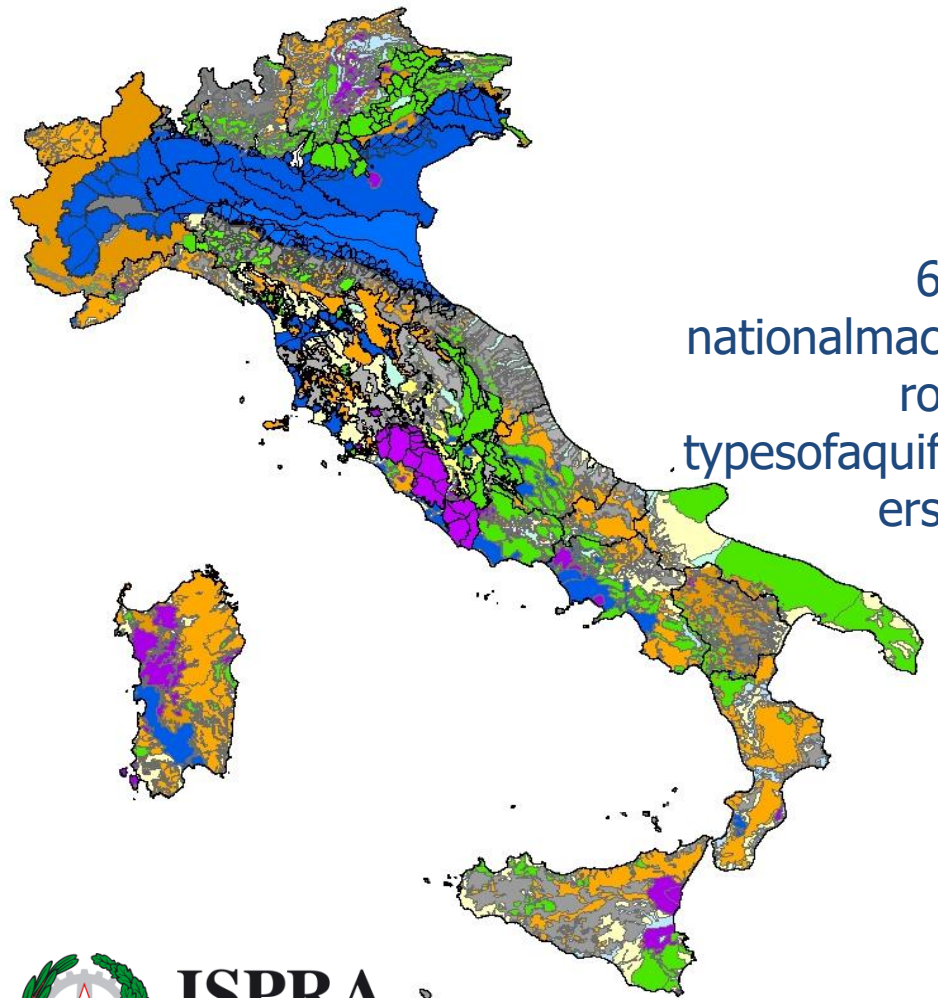
Source **ISPRA** (<http://www.sinanet.isprambiente.it/it/sia-ispra/download-mais/bacini-idrografici-principali>)




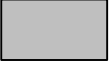

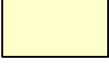


ISPRA

Istituto Superiore per la Protezione e la Ricerca Ambientale

Hydrogeological features of Italy (Hydrogeological complex)

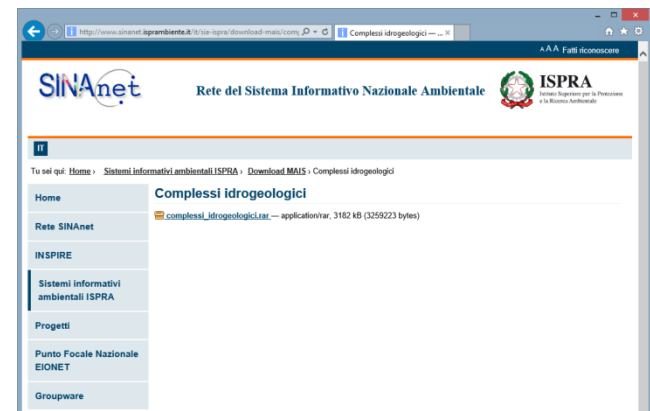


-  Quaternary alluvial plains (local / regional aquifers)
-  Carbonatic (incl. karstic) Hydrogeological structures (main regional aquifers)
-  Volcanic complex (local aquifers)
-  Flysch, arenaceous-clay structures (*aquicludes*)
-  Crystalline – metamorphic complex (local aquifers) (Alps, Calabria, Sardinia)
-  Detrital sedimentary rock



ISPRA

Istituto Superiore per la Protezione e la Ricerca Ambientale



Source ISPRA <http://www.sinanet.isprambiente.it/it/sia-ispra/download-mais/complessi-idrogeologici/view>

Water resources in Italy (LTAA 2001-2010)

ITB Po Basin 74000 km2	10 ⁶ m ³
Precipitation	54724
ActualEvapotr.	35913
Total outflow	48481
AquiferRecharge	5652

ITA Easternalps 40851 Km2	10 ⁶ m ³
Precipitation	33020
ActualEvapotr.	21735
Total outflow	15549
AquiferRecharge	7755

ITALY 309049 Km2	10 ⁶ m ³
Precipitation	245.457
ActualEvapotr.	148.501
Total outflow	122.884
AquiferRecharge	59.193

ITD Serchio 1565 km2	10 ⁶ m ³
Precipitation	2457
ActualEvapotr.	701
Total outflow	1597
AquiferRecharge	761

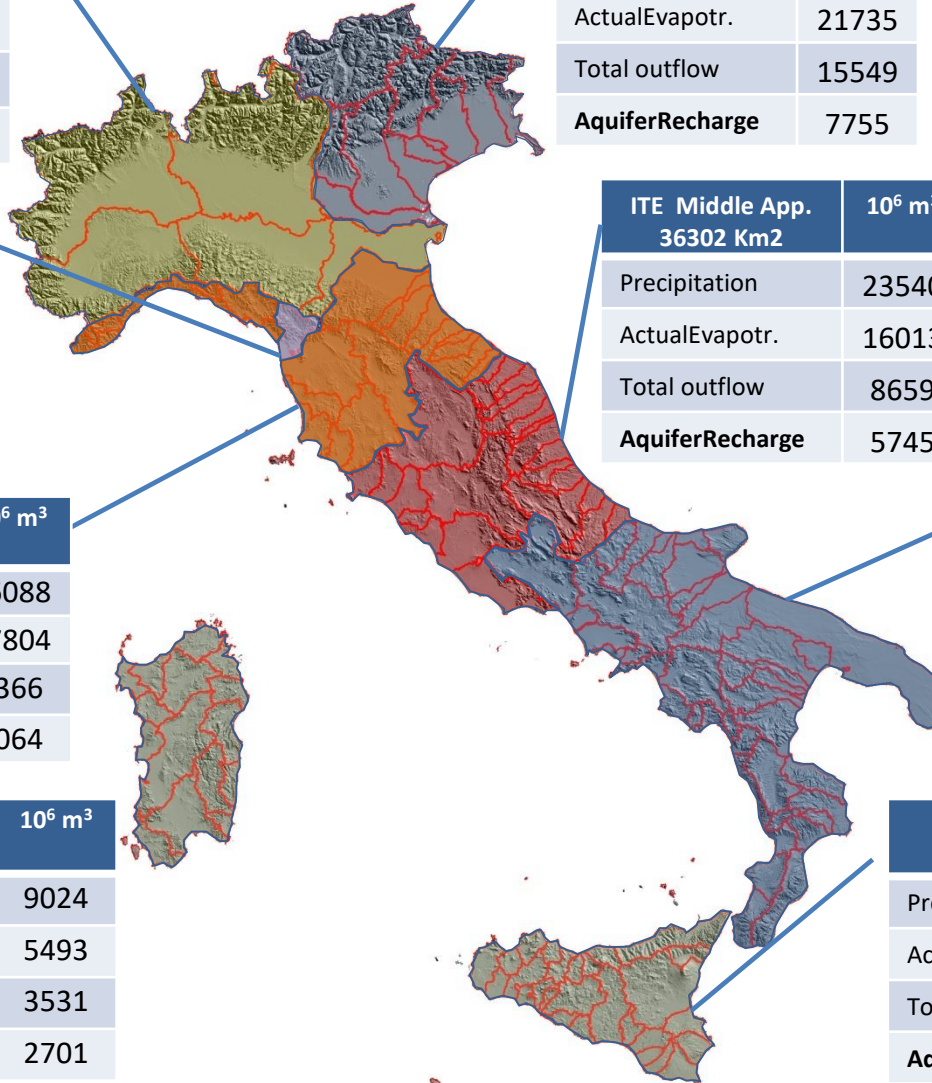
ITE Middle App. 36302 Km2	10 ⁶ m ³
Precipitation	23540
ActualEvapotr.	16013
Total outflow	8659
AquiferRecharge	5745

ITC Northern App. 38131 Km2	10 ⁶ m ³
Precipitation	26088
ActualEvapotr.	17804
Total outflow	8366
AquiferRecharge	4064

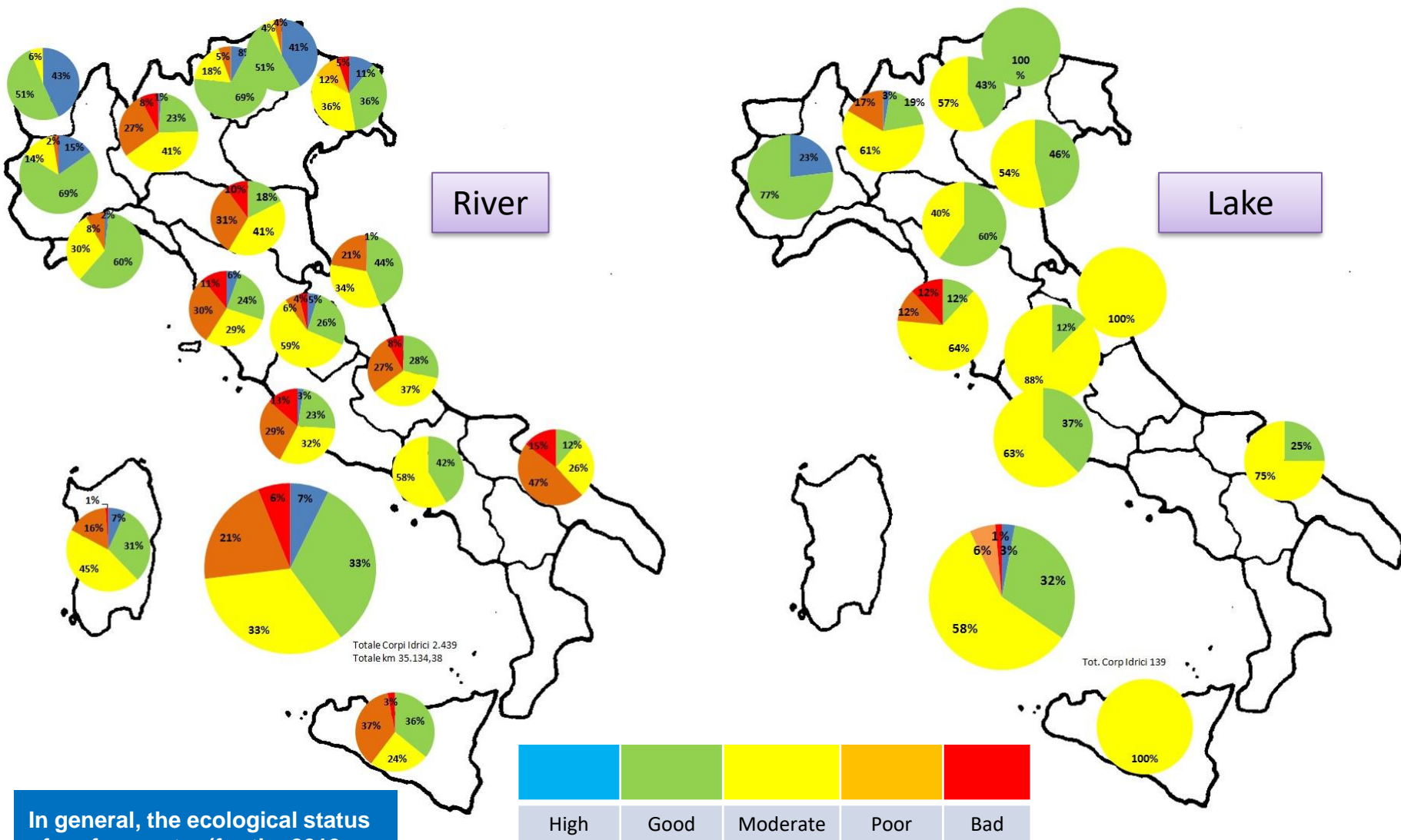
ITF South. App. 68200 Km2	10 ⁶ m ³
Precipitation	37869
ActualEvapotr.	26037
Total outflow	11237
AquiferRecharge	8146

ITG Sardinia 24000 Km2	10 ⁶ m ³
Precipitation	9024
ActualEvapotr.	5493
Total outflow	3531
AquiferRecharge	2701

ITH Sicily 26000 Km2	10 ⁶ m ³
Precipitation	9858
ActualEvapotr.	7365
Total outflow	2492
AquiferRecharge	1717

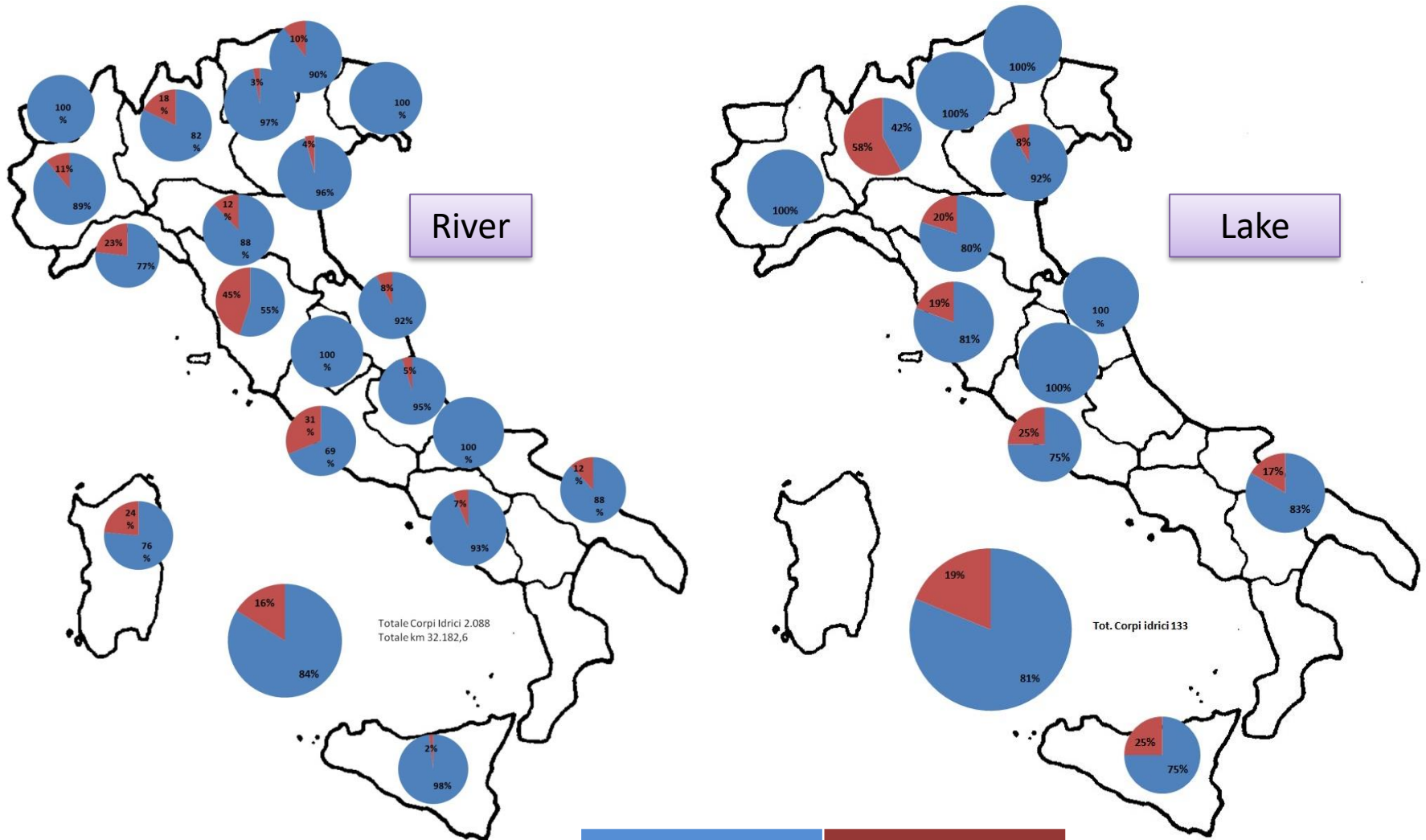


Ecological status (Fieldclassification 2010-2012)



In general, the ecological status of surface water (for the 2010-2012 period) is between good and moderate

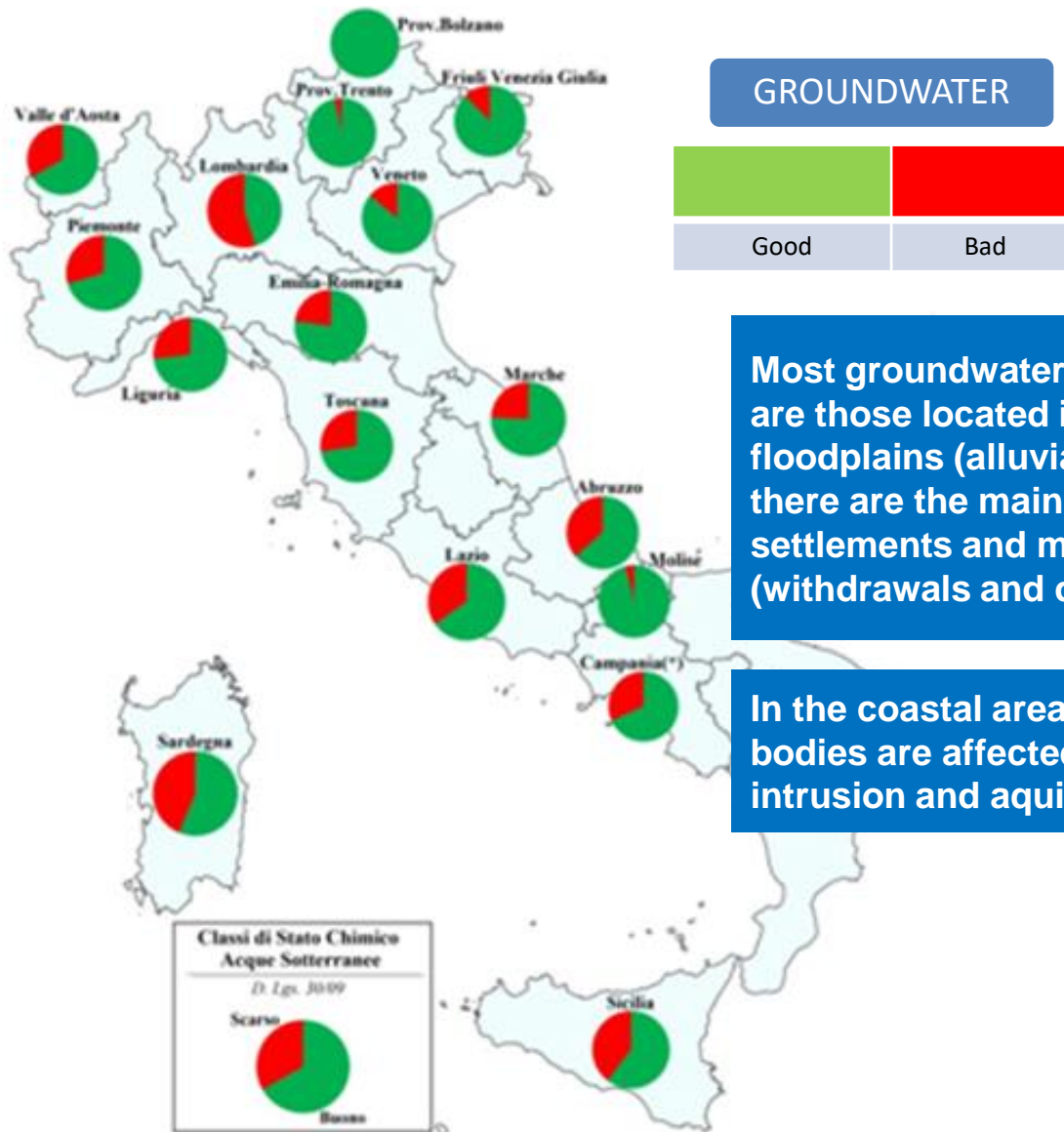
Chemical status (Fieldclassification 2010-2012)



In general, the chemical status of surface water (2010-2012 period) is good but there are many surface water bodies that need a qualitative improvement



Groundwaterchemical status (SCAS) (sampling station 2013)



2.

Administrative structure
and
water governance

RIVER BASIN APPROACH

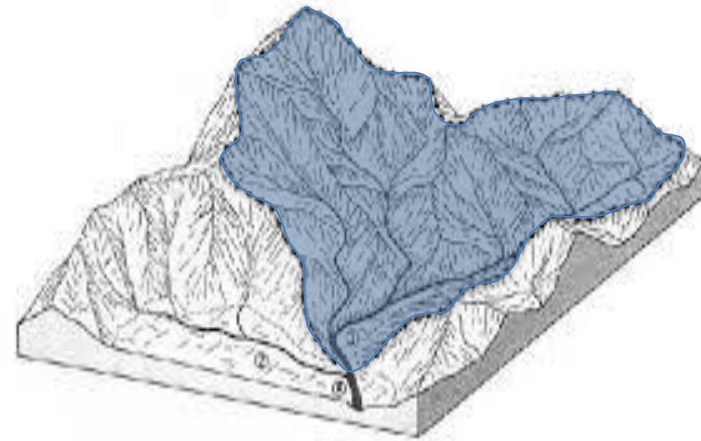
- ***IWRM Concept*** – Integrated Water Resource Management, for both water quality and quantity purposes, should be carried out at the most appropriate physical and geographical scale: this is the *catchment scale*. Therefore it is extremely important to match the administrative area with the **delimitation of main river basins and sub-basins.**

RIVER BASIN APPROACH

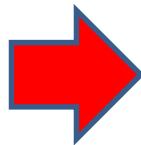
RIVER BASIN



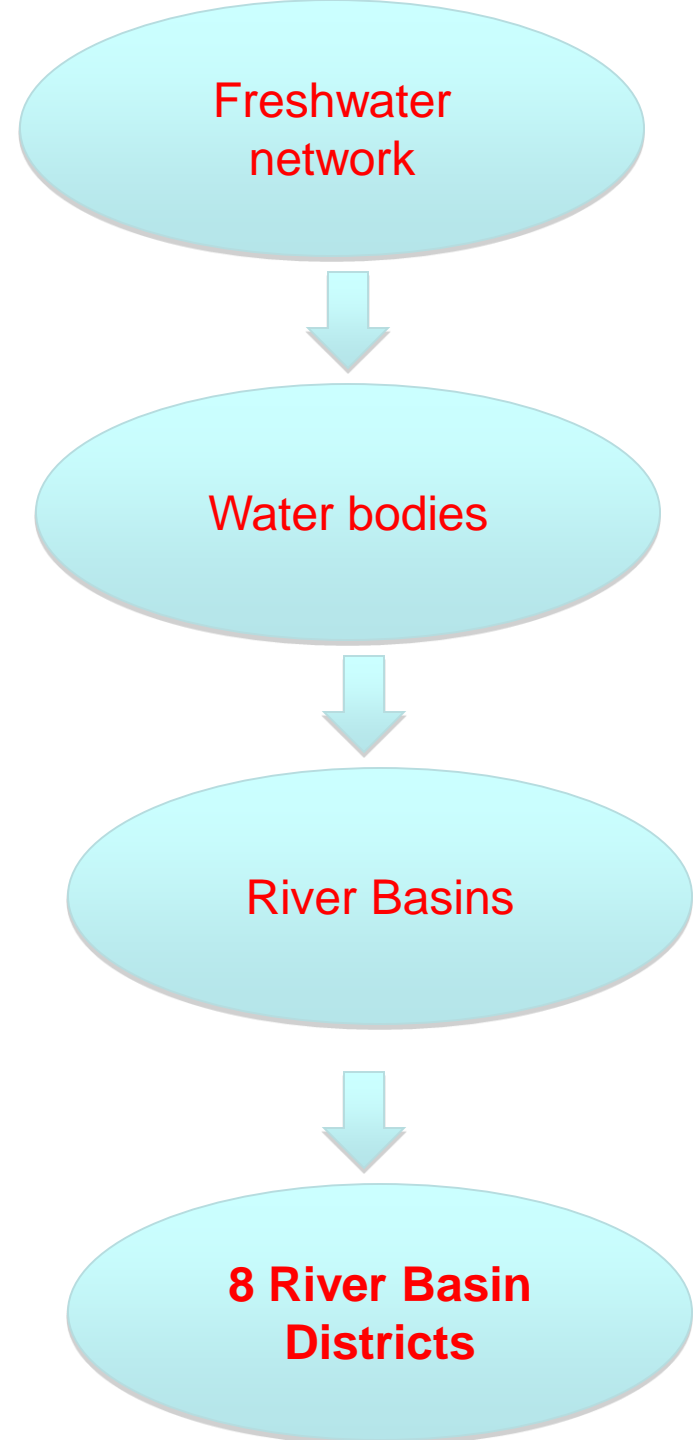
The territory in which all rivers and surface run-off flow through a series of streams, rivers and lakes toward a particular point (lake or a river confluence) and fall in a water course



RIVER BASIN
DISTRICT



Territorial unit: one or more neighboring river basins and their associated groundwater and coastal waters, which is the main management unit of the river basins.



DELIMITAZIONE DEI DISTRETTI IDROGRAFICI DL 152/06

AUTORITA' DI BACINO



Regions, Provinces and Municipalities



Institutional setting

- Italy's water institutional organisation is characterised by multiple actors involved at central government level, and a wide range of authorities at the subnational level.
- The main governance challenges lie in the need to integrate different sectoral and territorial institutions in water strategic planning and design at central government level, and to co-ordinate activities across diverse subnational actors and

National level (Ministries)

- **The Ministry of the Environment, Land and Sea (IMELS):** Since 1999, the IMELS has been responsible for water policy and co-ordinating river basin authorities. It is in charge of planning, priority-setting and establishing overall frameworks for water resources management and water services provision (quality, continuity, access and tariffs).

Other ministries involved in water management:

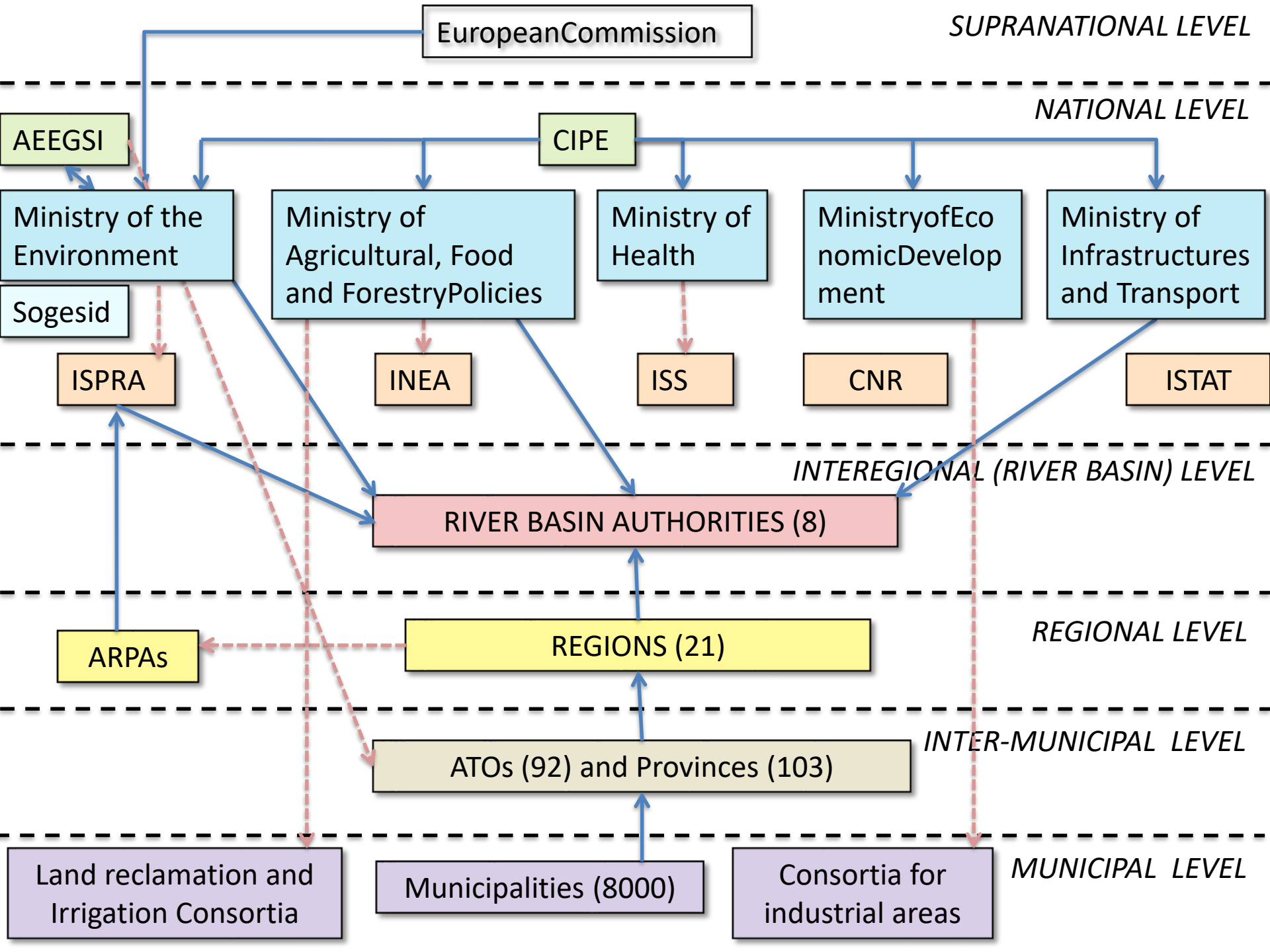
- **the Ministry of Agricultural, Food and Forestry Policies (MIPAAF),** which plays a crucial role in strategic planning, priority-setting, information, monitoring and evaluation related to water for irrigation agricultural practices and related to nitrogen and pesticide use;
- **the Ministry of Infrastructure and Transport (MIT),** which manages national scale infrastructure (*i.e.* long-distance water transfers);
- **the Ministry of Economic Development (MISE),** which plays an equivalent role regarding water use by industries;
- **the Ministry of Health,** which oversees drinking water standards and is involved in water monitoring, including that of bathing waters.

National level: central Authorities, Agencies and Institutes

- **Inter-ministerial Committee for Economic Planning (CIPE)**, decides about financial programmes.
- **Regulatory Authority for Electricity, Gas and Water (AEEGSI)**, since 2011, responsible for monitoring implementation of water services, proposing rules for tariff definition and tariff setting, as well as protecting customers' interests.
- **The Institute for Environmental Protection and Research (ISPRA)**, under the IMELS, is responsible for technical support for defining rules, norms and standards for water discharges, collecting geophysical and meteorological data, and co-ordinating the action of Italy's regional environmental protection agencies (ARPAs), which operate in each region.
- **SOGESID**, in house providing society of IMELS, it performs technical assistance to central and local administrations on environmental issues.
- **Institute for statistics and data management ISTAT**, responsible for data collection and management, periodically producing reports and figures on statistics.
- **National Research Centre (CNR) and National Water Research Institute (IRSA – CNR)**, responsible for scientific research on water disciplines.
- **National High Institute for Health (ISS)**, responsible for the research on the field of human and environmental health.
- **National Institute for the Economy applied to the Agricultural Sciences (INEA)**, responsible for information collection and data processing on economic aspect in agricultural policies.

Subnational level

- **Regions (and provinces)**, which are responsible of all the administrative tasks in water management. Regions oversee quality and quantity monitoring of surface and groundwater (ARPAs), design plans for water use, update planning instruments, and regulate water service investment plans. They are also responsible for water licensing, compliance monitoring, and administrative non-compliance response.
- **River basin authorities**, which are responsible for drawing up river basin management plans and ensuring consistency between the river basin plans and European, national, regional and local rules.
- **Optimal Management Area Entities (Authorities) - AATOs**, which are inter-municipal structures responsible for contracting and overseeing the provision of drinking water and wastewater services to the population in areas under their jurisdiction. They develop technical and financial plans, select operators, decide on service levels and tariffs, and enforce water service contracts. All local authorities covered by an AATO adhere to it and take part in its decision making and management process.
- **Reclamation and Irrigation Boards**, farmers associations which control land reclamation and water distribution for irrigation. They are managed by associations of landowners.
- **Local communities**, which take part in the implementation of water management plans adopted by each region; their competences therefore vary across the country.

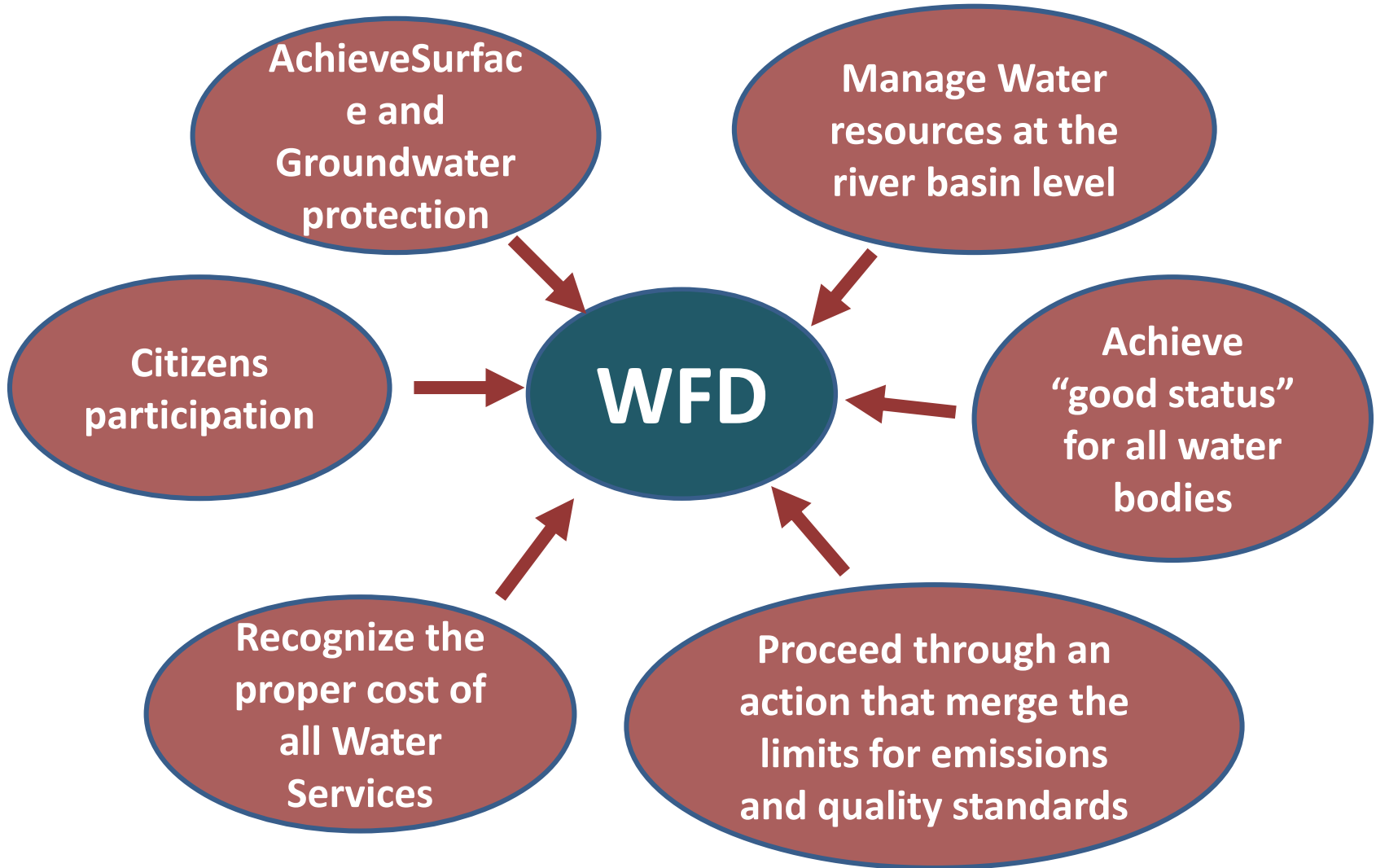


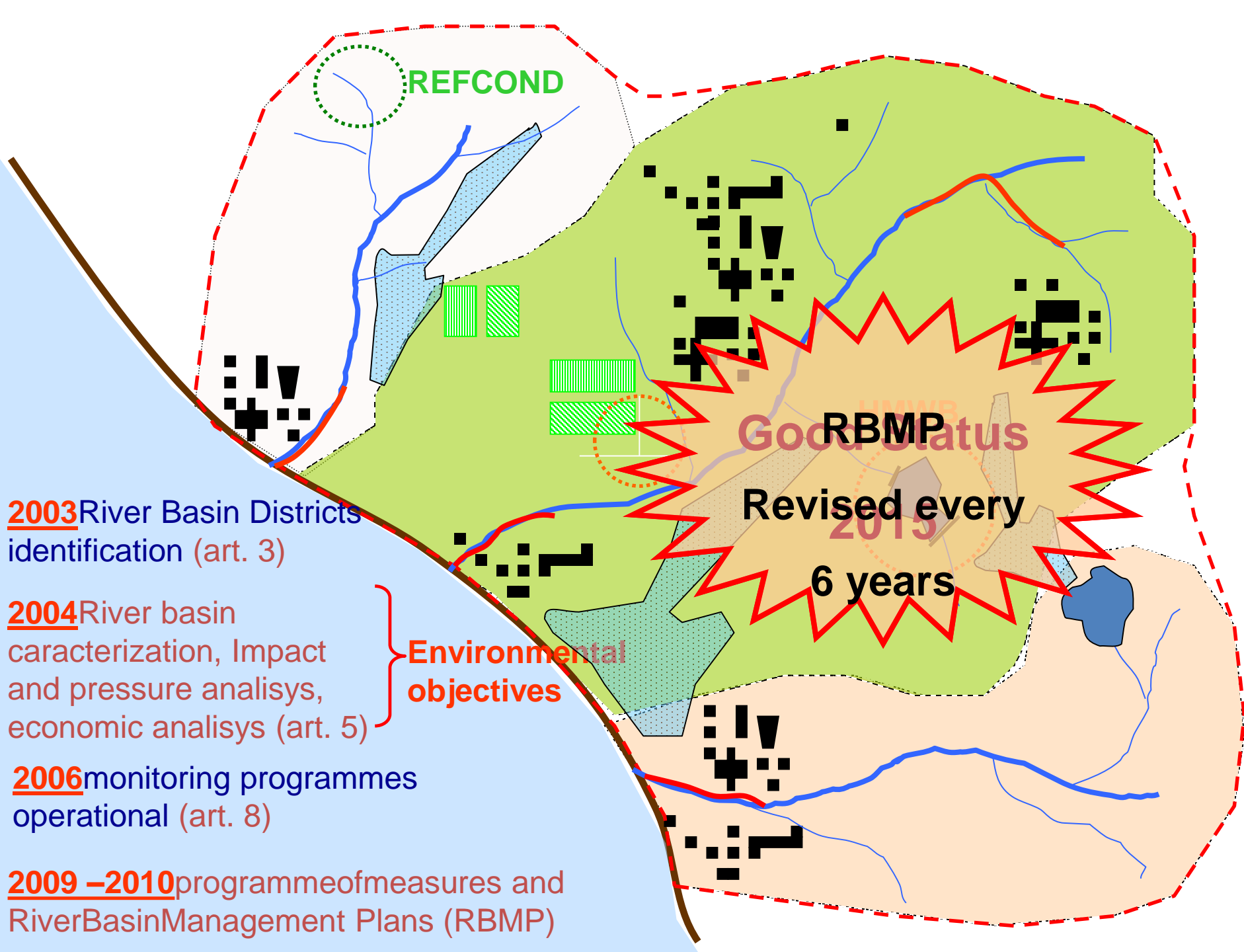
3.

State-of-the-art of Water Technology in EU
and Italy

EU Water Framework Directive (WFD)

WFD achievements





REFCOND

RBMP
Good status
Revised every
6 years

2015

Environmental objectives

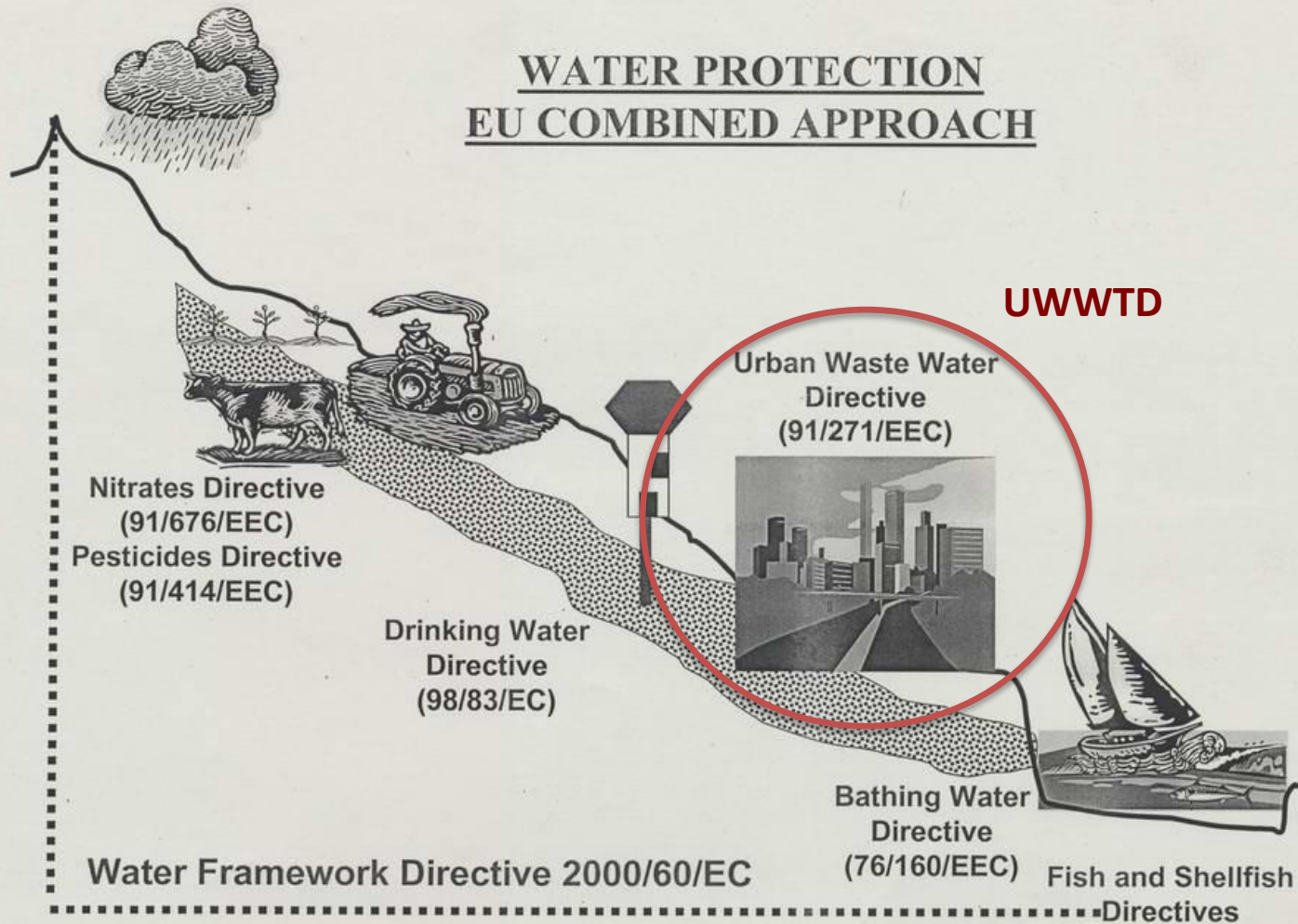
2003 River Basin Districts identification (art. 3)

2004 River basin characterization, Impact and pressure analysis, economic analysis (art. 5)

2006 monitoring programmes operational (art. 8)

2009 –2010 programme of measures and River Basin Management Plans (RBMP)

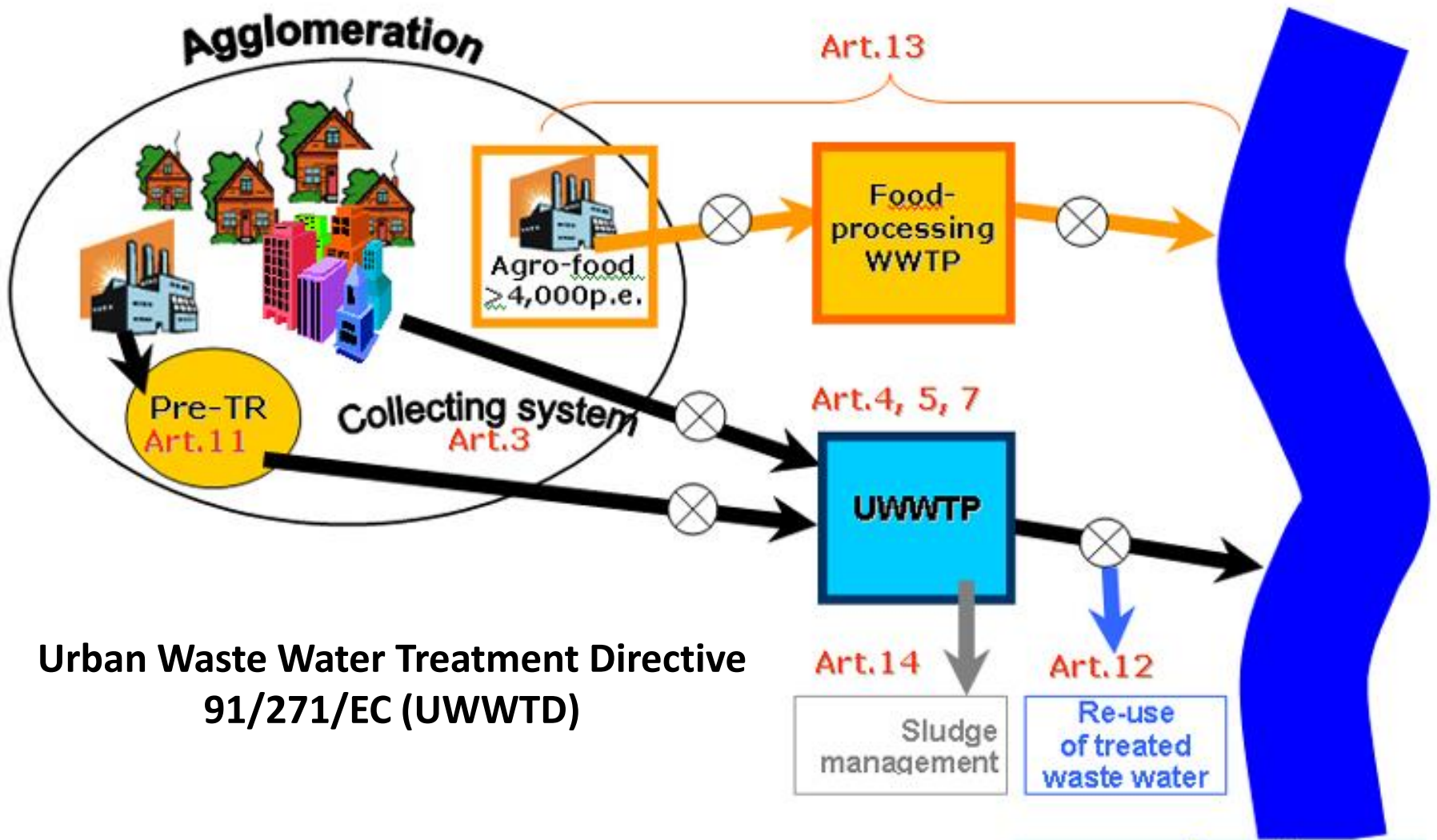
WATER PROTECTION EU COMBINED APPROACH



EUROPEAN COMMISSION

- ✓ use of best available techniques for point source discharge
- ✓ application of best environmental practices for diffuse pollution

Agglomeration



Urban Waste Water Treatment Directive 91/271/EC (UWWTD)

Legend:

Pre-TR	= pre-treatment
Agro-food	= food-processing industries
UWWTP	= urban waste water treatment plant
Agro-food >4000p.e.	= food-processing industry
Art.3, 4, 5, 7, 11, 12, 13, 14	= articles of the Directive 91/271/EEC

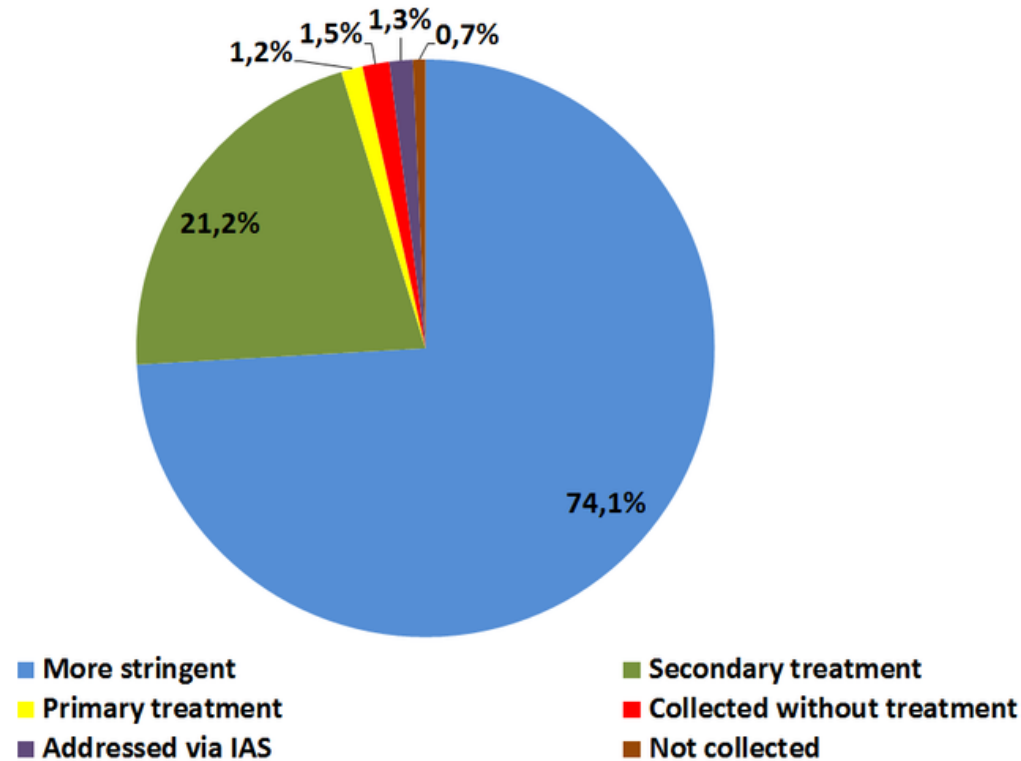
Receiving areas:
sensitive area, catchment of
sensitive area, normal area,
less sensitive area

Urban Waste Water Treatment Directive 91/271/EC (UWWTD)

✧ Secondary treatment is the basic level that should be provided, with more stringent treatment being required in **sensitive areas** and their catchments;

✧ For certain discharges in coastal waters treatment may be less stringent (i.e. primary treatment) under certain conditions and subject to the agreement of the European Commission;

✧ For agglomerations with a population equivalent of less than 2000 but equipped with a collecting system, **appropriate treatment** must be provided.



Type of waste water treatment in EU big cities (agglomerations of more than 150 000 p.e.) expressed as % of total generated load treated

Parameters	Concentration	Minimum percentage of reduction (¹)	Reference method of measurement
Biochemical oxygen demand (BOD ₅ at 20 °C) without nitrification (²)	25 mg/l O ₂	70-90 40 under Article 4 (2)	Homogenized, unfiltered, undecanted sample. Determination of dissolved oxygen before and after five-day incubation at 20 °C ± 1 °C, in complete darkness. Addition of a nitrification inhibitor
Chemical oxygen demand (COD)	125 mg/l O ₂	75	Homogenized, unfiltered, undecanted sample Potassium dichromate
Total suspended solids	35 mg/l (³) 35 under Article 4 (2) (more than 10 000 p.e.) 60 under Article 4 (2) (2 000-10 000 p.e.)	90 (³) 90 under Article 4 (2) (more than 10 000 p.e.) 70 under Article 4 (2) (2 000-10 000 p.e.)	— Filtering of a representative sample through a 0,45 µm filter membrane. Drying at 105 °C and weighing — Centrifuging of a representative sample (for at least five mins with mean acceleration of 2 800 to 3 200 g), drying at 105 °C and weighing

(¹) Reduction in relation to the load of the influent.

(²) The parameter can be replaced by another parameter : total organic carbon (TOC) or total oxygen demand (TOD) if a relationship can be established between BOD₅ and the substitute parameter.

(³) This requirement is optional.

Requirements for discharges from urban waste water treatment plants to sensitive areas

Parameters	Concentration	Minimum percentage of reduction (%)	Reference method of measurement
Total phosphorus	2 mg/l P (10 000 - 100 000 p. e.)	80	Molecular absorption spectrophotometry
	1 mg/l P (more than 100 000 p. e.)		
Total nitrogen ⁽²⁾	15 mg/l N (10 000 - 100 000 p. e.)	70-80	Molecular absorption spectrophotometry
	10 mg/l N (more than 100 000 p. e.) ⁽³⁾		

⁽¹⁾ Reduction in relation to the load of the influent.

⁽²⁾ Total nitrogen means : the sum of total Kjeldahl-nitrogen (organic N + NH₃), nitrate (NO₃)-nitrogen and nitrite (NO₂)-nitrogen.

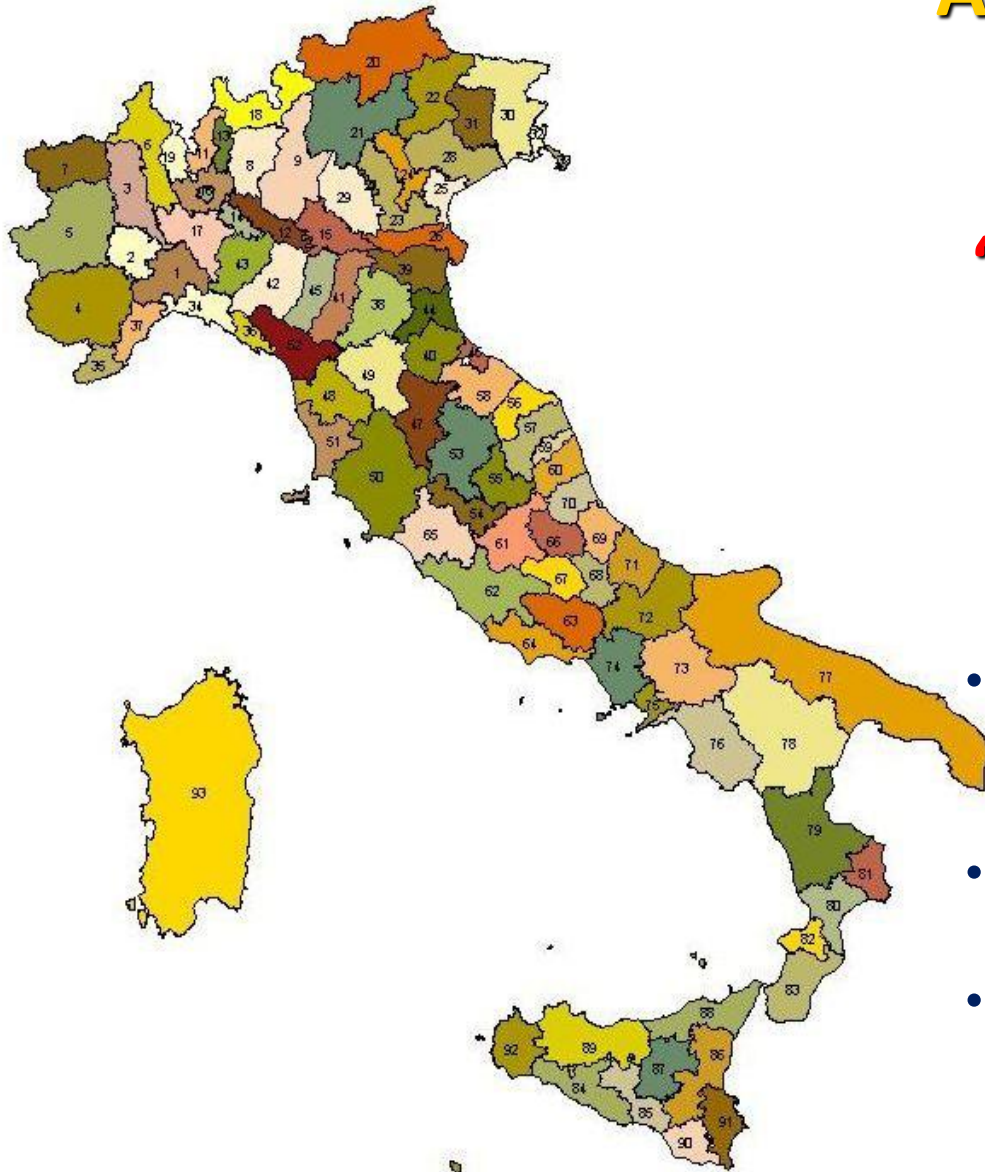
⁽³⁾ Alternatively, the daily average must not exceed 20 mg/l N. This requirement refers to a water temperature of 12° C or more during the operation of the biological reactor of the waste water treatment plant. As a substitute for the condition concerning the temperature, it is possible to apply a limited time of operation, which takes into account the regional climatic conditions. This alternative applies if it can be shown that paragraph 1 of Annex I.D is fulfilled.

3.

Water Service (supply and sanitation) settings

ATO: “Optimal Management Areas”





To carry out the
“Integrated Water Service”
(supply and sanitation)

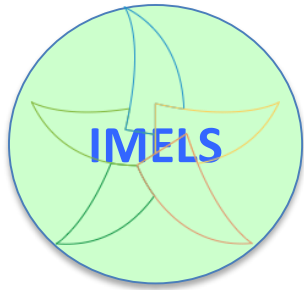


Integration:

- To manage the whole Water Cycle (from the abstraction to the discharge)
- To overcome the fragmentation of the management
- To apply a sustainable development approach (social, environmental and economic sustainability)

Water Service (supply and sanitation): Main Actors involved

-  The National Regulator (AEEGSI)
-  The Region
-  The body for the Optimal Management Area cooperation (AATO)
-  The industrial manager of the integrated water service



 **Autorità per l'energia elettrica il gas ed il sistema idrico**

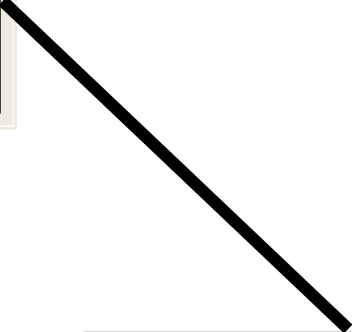
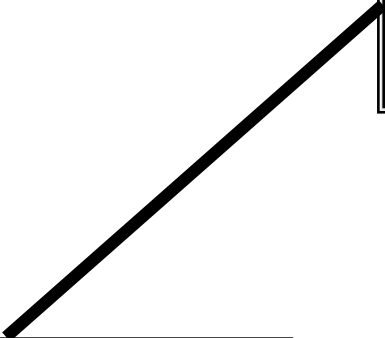
Parliament



**Local Government
(AATO)**






Household/consumer

**Service Provider
(public or private)**



The role of the ATO Authority

*The Authority of the optimal management area draw up the ATO plan for the assignment of the management of the water service. The **ATO Plan** contain:*

-  **Survey of the existing infrastructures**
-  **Program of Interventions**
-  **Organizational and management schemes**
-  **Economic and financial programs**
-  **Establishment of the tariff applied to the users**

The ATO Plan

The ATO Plan is the main tool for the organization of the Integrated Water Service within the ATO, ensuring an efficient, effective and sustainable service. In general the Plan is the key instrument for activating and governing the Integrated Water Service

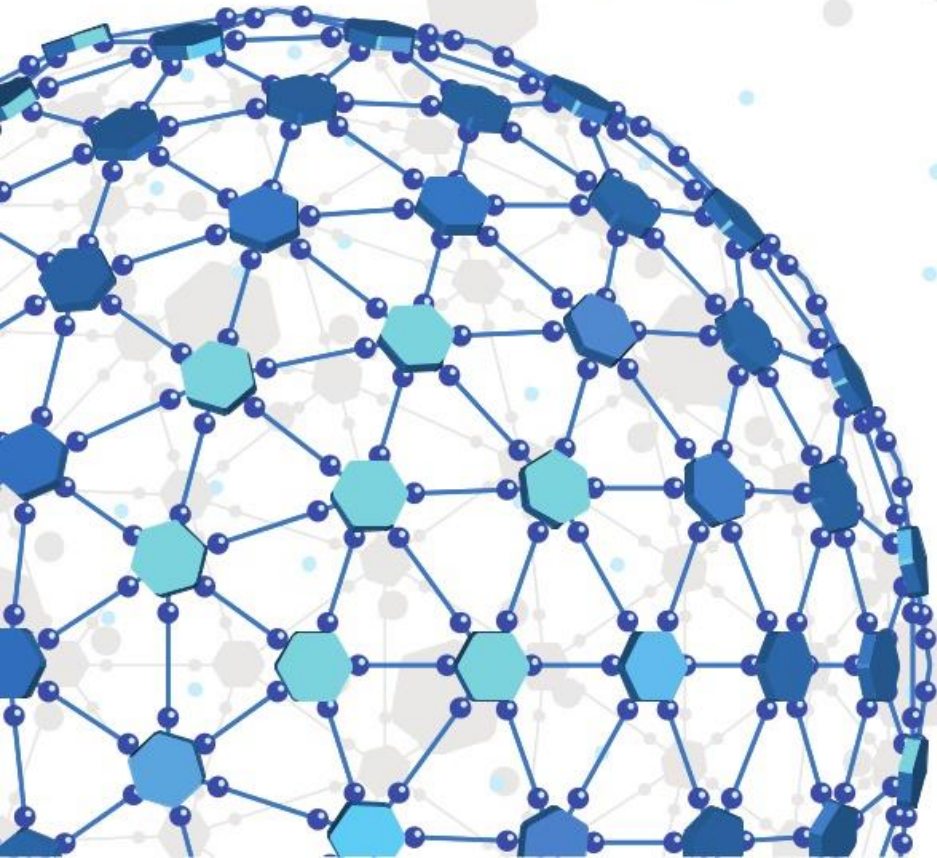
The plan allow the ATO Authority to **establish the objectives** for the quality and the quantity of the service, to **determine the investments** necessary to meet those objectives, to **decide the water pricing** approach and decide upon the **assignment of the management**

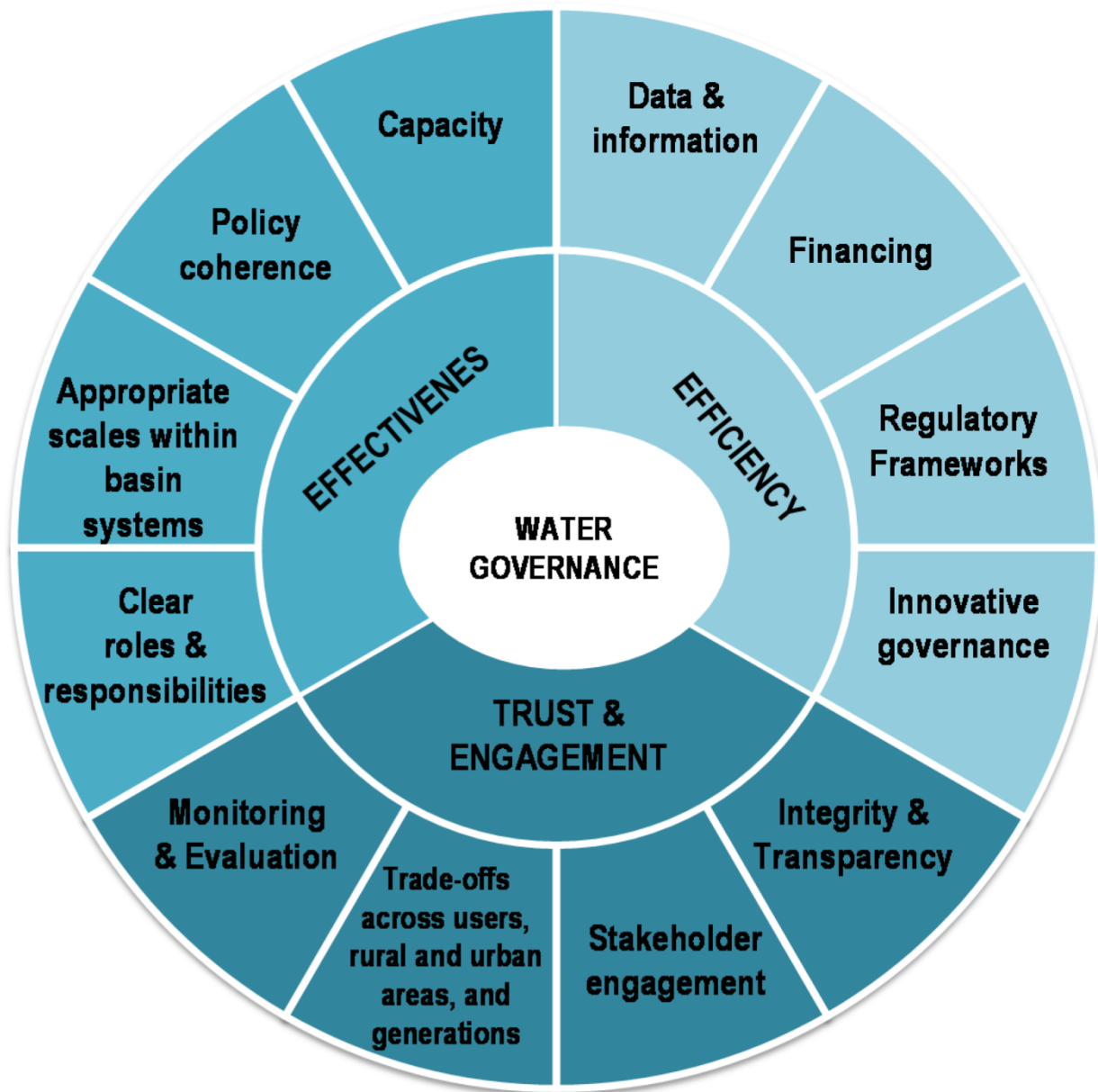


OECD Principles on Water Governance

Welcomed by Ministers at the OECD Ministerial
Council Meeting on 4 June 2015

Directorate for Public Governance and Territorial Development





Enhancing the *effectiveness* of water governance

Principle 1. Clearly allocate and distinguish roles and responsibilities for water policymaking, policy implementation, operational management and regulation, and foster co-ordination across these responsible authorities.

To that effect, legal and institutional frameworks should:

- a) Specify the allocation of roles and responsibilities, across all levels of government and water-related institutions in regard to water
 - Policy-making, especially priority setting and strategic planning;
 - Policy implementation especially financing and budgeting, data and information, stakeholder engagement, capacity development and evaluation;
 - Operational management, especially service delivery, infrastructure operation and investment; and
 - Regulation and enforcement, especially tariff setting, standards, licensing, monitoring and supervision, control and audit, and conflict management;
- b) Help identify and address gaps, overlaps and conflicts of interest through effective co-ordination at and across all levels of government.

Principle 2. Manage water at the *appropriate scale(s)* within integrated basing governance systems to reflect local conditions, and foster co-ordination between the different scales.

To that effect, water management practices and tools should:

- a) Respond to long-term environmental, economic and social objectives with a view to making the best use of water resources, through risk prevention and integrated water resources management;
- b) Encourage a sound hydrological cycle management from capture and distribution of freshwater to the release of wastewater and return flows;
- c) Promote adaptive and mitigation strategies, action programs and measures based on clear and coherent mandates, through effective basin management plans that are consistent with national policies and local conditions;
- d) Promote multi-level co-operation among users, stakeholders and levels of government for the management of water resources; and,
- e) Enhance riparian co-operation on the use of transboundary freshwater water resources.

Principle 3. Encourage policy coherence through effective *cross-sectoral co-ordination*, especially between policies for water and the environment, health, energy, agriculture, industry, spatial planning and land use through:

- a) Encouraging co-ordination mechanisms to facilitate coherent policies across ministries, public agencies and levels of government, including cross-sectoral plans;
- b) Fostering co-ordinated management of use, protection and clean-up of water resources, taking into account policies that affect water availability, quality and demand (e.g. agriculture, forestry, mining, energy, fisheries, transportation, recreation, and navigation) as well as risk prevention;
- c) Identifying, assessing and addressing the barriers to policy coherence from practices, policies and regulations within and beyond the water sector, using monitoring, reporting and reviews; and
- d) Providing incentives and regulations to mitigate conflicts among sectoral strategies, bringing these strategies into line with water management needs and finding solutions that fit with local governance and norms.

Principle 4. Adapt the level of *capacity* of responsible authorities to the complexity of water challenges to be met, and to the set of competencies required to carry out their duties, through:

- a) Identifying and addressing capacity gaps to implement integrated water resources management, notably for planning, rule-making, project management, finance, budgeting, data collection and monitoring, risk management and evaluation;
- b) Matching the level of technical, financial and institutional capacity in water governance systems to the nature of problems and needs;
- c) Encouraging adaptive and evolving assignment of competences upon demonstration of capacity, where appropriate;
- d) Promoting hiring of public officials and water professionals that uses merit-based, transparent processes and are independent from political cycles; and
- e) Promoting education and training of water professionals to strengthen the capacity of water institutions as well as stakeholders at large and to foster co-operation and knowledge-sharing

Enhancing the *efficiency* of water governance

Principle 5. Produce, update, and share timely, consistent, comparable and policy-relevant water and water-related *data and information*, and use it to guide, assess and improve water policy, through:

- a) Defining requirements for cost-effective and sustainable production and methods for sharing high quality water and water-related data and information, e.g. on the status of water resources, water financing, environmental needs, socio-economic features and institutional mapping
- b) Fostering effective co-ordination and experience sharing among organisations and agencies producing water-related data between data producers and users, and across levels of government;
- c) Promoting engagement with stakeholders in the design and implementation of water information systems, and providing guidance on how such information should be shared to foster transparency, trust and comparability (e.g. data banks, reports, maps, diagrams, observatories);
- d) Encouraging the design of harmonised and consistent information systems at the basin scale, including in the case of transboundary water, to foster mutual confidence, reciprocity and comparability within the framework of agreements between riparian countries; and
- e) Reviewing data collection, use, sharing and dissemination to identify overlaps and synergies and track unnecessary data overload.

Principle 6. Ensure that governance arrangements help mobilise water finance and allocate *financial resources* in an efficient, transparent and timely manner, through:

- a) Promoting governance arrangements that help water institutions across levels of government raise the necessary revenues to meet their mandates, building through for example principles such as the polluter-pays and user-pays principles, as well as payment for environmental services;
- b) Carrying out sector reviews and strategic financial planning to assess short, medium and long term investment and operational needs and take measures to help ensure availability and sustainability of such finance;
- c) Adopting sound and transparent practices for budgeting and accounting that provide a clear picture of water activities and any associated contingent liabilities including infrastructure investment, and aligning multi-annual strategic plans to annual budgets and medium-term priorities of governments;
- d) Adopting mechanisms that foster the efficient and transparent allocation of water-related public funds (e.g. through social contracts, scorecards, and audits); and
- e) Minimising unnecessary administrative burdens related to public expenditure while preserving fiduciary and fiscal safeguards.

Principle 7. Ensure that sound water management *regulatory frameworks* are effectively implemented and enforced in pursuit of the public interest, through:

- a) Ensuring a comprehensive, coherent and predictable legal and institutional framework that set rules, standards and guidelines for achieving water policy outcomes, and encourage integrated long-term planning;
- b) Ensuring that key regulatory functions are discharged across public agencies, dedicated institutions and levels of government and that regulatory authorities are endowed with necessary resources;
- c) Ensuring that rules, institutions and processes are well-co-ordinated, transparent, non-discriminatory, participative and easy to understand and enforce;
- d) Encouraging the use of regulatory tools (evaluation and consultation mechanisms) to foster the quality of regulatory processes and make the results accessible to the public, where appropriate;
- e) Setting clear, transparent and proportionate enforcement rules, procedures, incentives and tools (including rewards and penalties) to promote compliance and achieve regulatory objectives in a cost-effective way; and
- f) Ensuring that effective remedies can be claimed through non-discriminatory access to justice, considering the range of options as appropriate.

Principle 8. Promote the adoption and implementation of *innovative water governance practices* across responsible authorities, levels of government and relevant stakeholders, through:

- a) Encouraging experimentation and pilot-testing on water governance, drawing lessons from success and failures, and scaling up replicable practices;
- b) Promoting social learning to facilitate dialogue and consensus-building, for example through networking platforms, social media, Information and Communication Technologies (ICTs) and user-friendly interface (e.g. digital maps, big data, smart data and open data) and other means;
- c) Promoting innovative ways to co-operate, to pool resources and capacity, to build synergies across sectors and search for efficiency gains, notably through metropolitan governance, inter-municipal collaboration, urban-rural partnerships, and performance-based contracts; and
- d) Promoting a strong science-policy interface to contribute to better water governance and bridge the divide between scientific findings and water governance practices.

Enhancing *trust and engagement* in water governance

Principle 9. Mainstream *integrity and transparency* practices across water policies, water institutions and water governance frameworks for greater accountability and trust in decision-making, through:

- a) Promoting legal and institutional frameworks that hold decision-makers and stakeholders accountable, such as the right to information and independent authorities to investigate water related issues and law enforcement ;
- b) Encouraging norms, codes of conduct or charters on integrity and transparency in national or local contexts and monitoring their implementation;
- c) Establishing clear accountability and control mechanisms for transparent water policy making and implementation ;
- d) Diagnosing and mapping on a regular basis existing or potential drivers of corruption and risks in all water-related institutions at different levels, including for public procurement; and
- e) Adopting multi-stakeholder approaches, dedicated tools and action plans to identify and address water integrity and transparency gaps (e.g. integrity scans/pacts, risk analysis, social witnesses)

Principle 10. *Promote stakeholder engagement for informed and outcome-oriented contributions to water policy design and implementation*, through:

- a) Mapping public, private and non-profit actors who have a stake in the outcome or who are likely to be affected by water-related decisions, as well as their responsibilities, core motivations and interactions;
- b) Paying special attention to under-represented categories (youth, the poor, women, indigenous people, domestic users) newcomers (property developers, institutional investors) and other water-related stakeholders and institutions;
- c) Defining the line of decision-making and the expected use of stakeholders' inputs, and mitigating power imbalances and risks of consultation capture from over-represented or overly vocal categories, as well as between expert and non-expert voices;
- d) Encouraging capacity development of relevant stakeholders as well as accurate, timely and reliable information, as appropriate;
- e) Assessing the process and outcomes of stakeholder engagement to learn, adjust and improve accordingly, including the evaluation of costs and benefits of engagement processes;
- f) Promoting legal and institutional frameworks, organisational structures and responsible authorities that are conducive to stakeholder engagement, taking account of local circumstances, needs and capacities; and
- g) Customising the type and level of stakeholder engagement to the needs and keeping the process flexible to adapt to changing circumstances.

Principle 11. Encourage water governance frameworks that help manage *trade-offs* across water users, rural and urban areas, and generations, through:

- a) Promoting non-discriminatory participation in decision-making across people, especially vulnerable groups and people living in remote areas;
- b) Empowering local authorities and users to identify and address barriers to access quality water services and resources and promoting rural-urban co-operation including through greater partnership between water institutions and spatial planners;
- c) Promoting public debate on the risks and costs associated with too much, too little or too polluted water to raise awareness, build consensus on who pays for what, and contribute to better affordability and sustainability now and in the future; and
- d) Encouraging evidence-based assessment of the distributional consequences of water-related policies on citizens, water users and places to guide decision-making.

Principle 12. Promote regular *monitoring and evaluation* of water policy and governance where appropriate, share the results with the public and make adjustments when needed, through:

- a) Promoting dedicated institutions for monitoring and evaluation that are endowed with sufficient capacity, appropriate degree of independence and resources as well as the necessary instruments;
- b) Developing reliable monitoring and reporting mechanisms to effectively guide decision-making;
- c) Assessing to what extent water policy fulfils the intended outcomes and water governance frameworks are fit for purpose; and
- d) Encouraging timely and transparent sharing of the evaluation results and adapting strategies as new information become available.

<http://www.oecd.org/env/watergovernanceprogramme.htm>

THANK YOU

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