

**From coastal to environmentally sensitive and peri-urban areas :**

# **Opportunities and challenges of decentralised wastewater management**

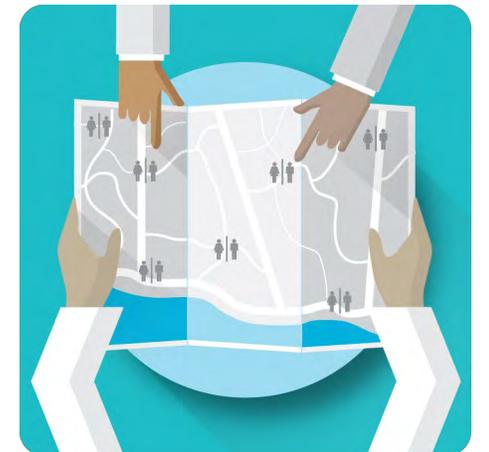


**Keynote address, Philippe Reymond, Eawag  
Durrës, 13 November 2025**



## Scope of application of decentralised wastewater management

- **Coastal areas** : hotels, resorts, villages
- **Rural settlements**: especially in environmentally sensitive areas (e.g. Vjosa valley)
- **Peri-urban areas**: especially large real estate projects
- *Emerging*: resource-oriented projects in urban areas



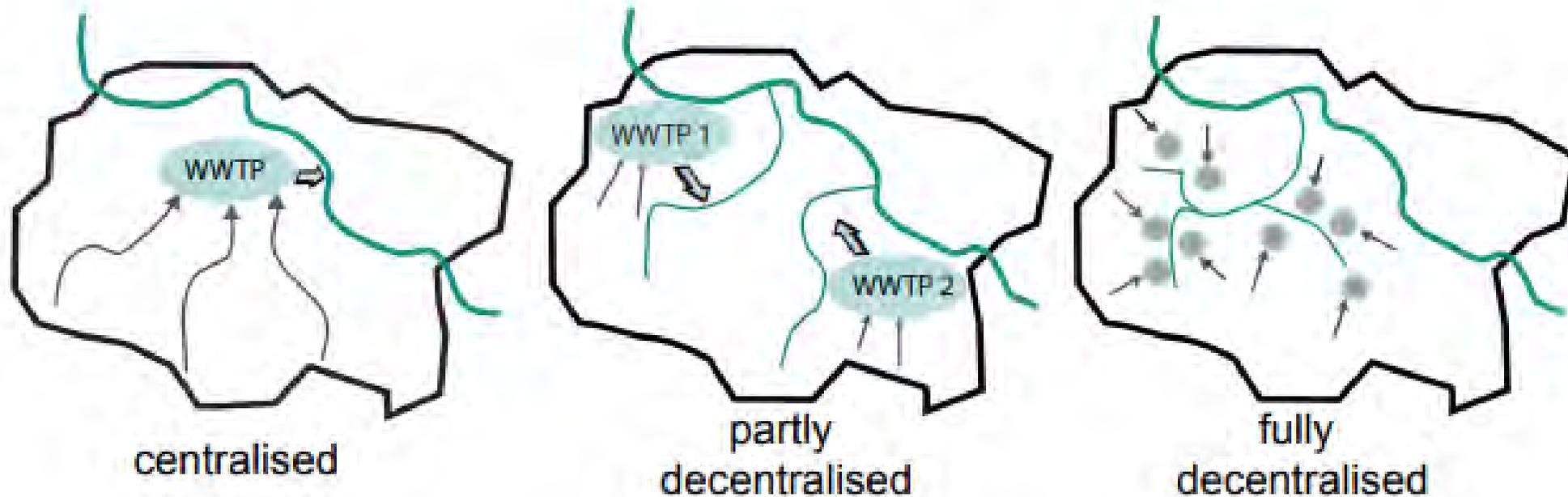
# Why decentralised wastewater management ?

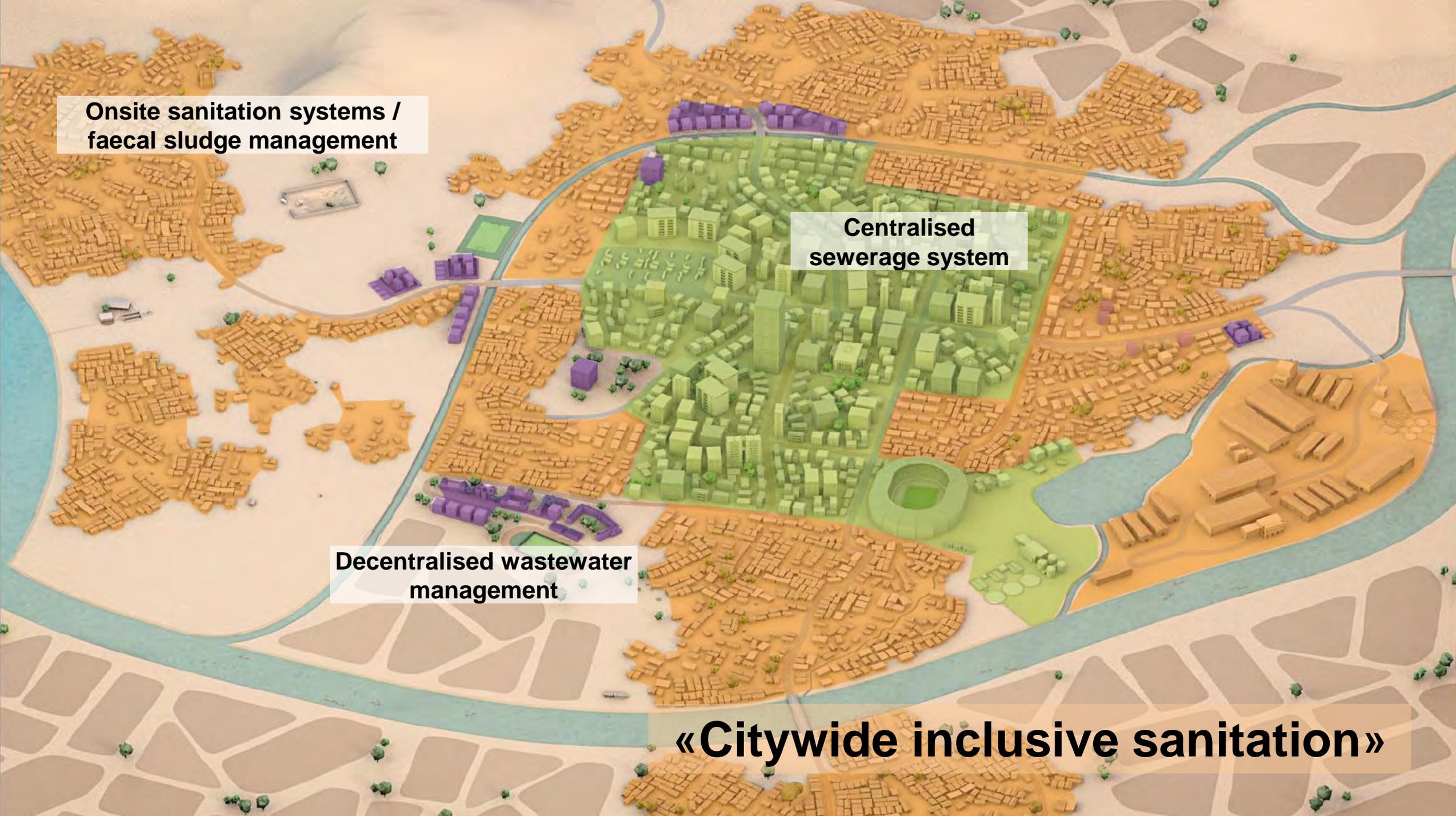
- **Water quality** at beaches, in rivers and lakes
  - ⇒ Albania's Normative Act for coastal areas and the shores of lakes and rivers (2023)
- **Alignment with revised European Union UWWT Directive** requesting secondary treatment for all agglomerations **above 1,000 PE**
  - ⇒ Below 1,000 PE: “appropriate” treatment to be defined by States
- **Urban areas:** secondary/tertiary treatment required, whether centralised or decentralised
- **Climate change** and increasing episodes of water scarcity



# What is decentralised wastewater management ?

*“Sanitation system that collects and treats wastewater at or near its point of generation, using a sewerage network and a small-scale sewage treatment plant.”*





**Onsite sanitation systems /  
faecal sludge management**

**Centralised  
sewerage system**

**Decentralised wastewater  
management**

**«Citywide inclusive sanitation»**



# Citywide inclusive sanitation

Approach guiding the upcoming «**Integrated Sanitation Strategy for Greater Tirana**»

**Funded by**



Schweizerische Eidgenossenschaft  
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Swiss Confederation

Federal Departement of Economic Affairs,  
Education and Research EAER  
**State Secretariat for Economic Affairs SECO**

**Coordinator of Albanian stakeholders :**



**Project duration :** 21 months, April 2024 to June 2026

**Project area:** greater Tirana including  
Tirana, Kamza and Vora Municipalities & Utilities



**In partnership with**

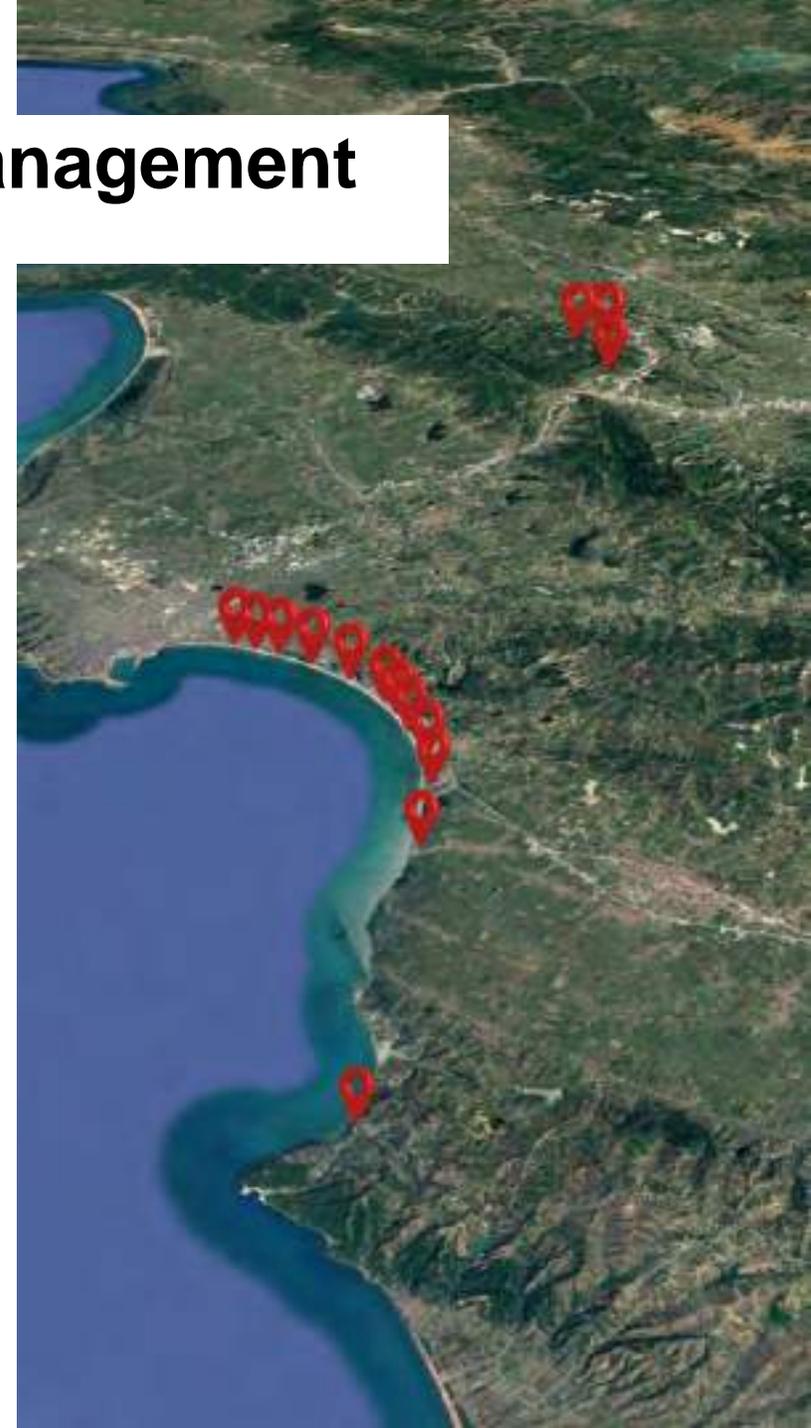
**ECOPSIS** (Switzerland )

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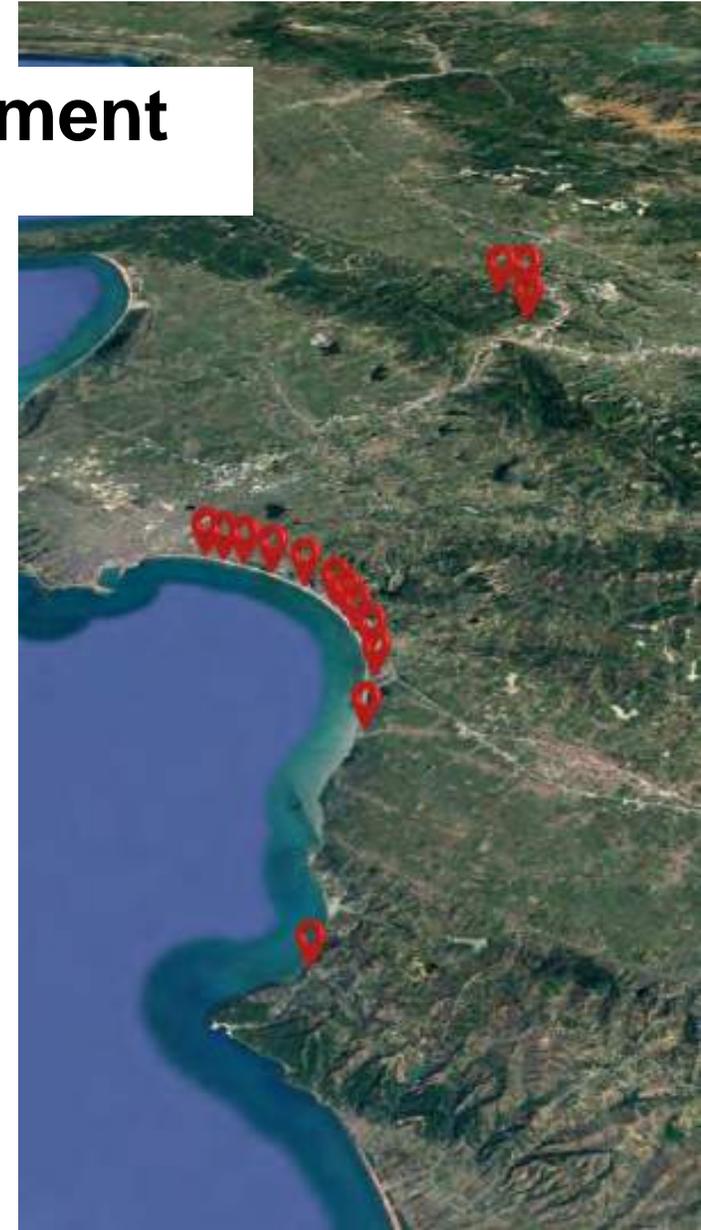
# Opportunities of decentralised wastewater management

- Reduce risk of bad buzz because of faecal contamination of bathing waters
- Less investment in sewer networks and pumping stations
- Local water reuse (and constant source of water!)
- *From a government perspective:* shifting part of the investment burden to the private sector
- Market development and job creation
- Off-grid sanitation services (e.g. public toilets)



# Challenges of decentralised wastewater management

- *From a utility perspective:* how to manage hundreds of plants?
- *From a government perspective:* how to monitor hundreds of plants?
- How to ensure long-term performance ?
- How to get affordable systems (CAPEX and OPEX)?
- Who shall pay, who shall manage?



# Experience from the Balkans

- Aging communal septic tanks in villages
- Individual demonstration projects of constructed wetlands in villages < 2,000 PE
  - ⇒ e.g. multiple instances of constructed wetlands in Kosovo.
- Lack of replication and mainstreaming
- Sometimes, operation & maintenance challenges due to weak municipal capacities

⇒ **How to create an enabling environment ?**



# Lessons learnt from EU countries

*“Governance first, then technology choice.”*

- ✓ Which technologies?
- ✓ Which O&M requirements for each technology?
- ✓ Which management scheme/service model should be in place for the technologies to function on the long-run?
- ✓ Which enabling environment? E.g. operator trainings (1-5 days) and operator network !

⇒ **Technologies + service model**

# How to select a service model?

- *First question:* private ownership or public ownership ?
  - *Second question:* who can do what?
  - The more complex the wastewater treatment system, the higher the skills needed, and so the salary of the technician running the system.
- ⇒ **Selected systems + certain degree of standardisation = economies of scale**
- ⇒ **Centralised management of decentralised systems**

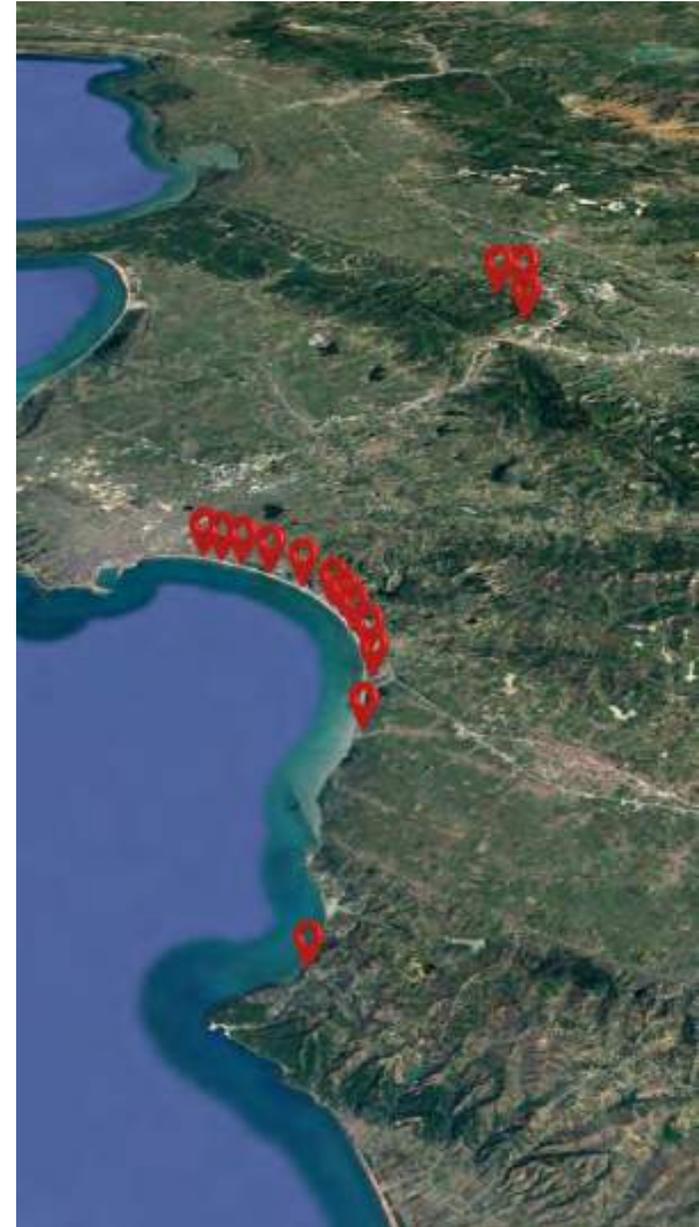
# How to select a service model?

## Different service models:

- Public utility model
- Local management model, incl. intermunicipal associations
- Private O&M service model
- Hybrid model

## Advantages of small-scale systems:

- ✓ No need for permanent staff onsite
- ✓ Harness the potentials of **digitalisation** and **remote monitoring**



# Standardisation of implementation process

## The example of Aquatiris (France)

- > 13,000 systems
- «Sanitation garden» - vertical-flow constructed wetlands
- System licensed for < 20 PE
- Also for agritourisms and larger hotels
- Standardised components
- Franchise system



# Onsite treatment: the potential of source separation

## Greywater:

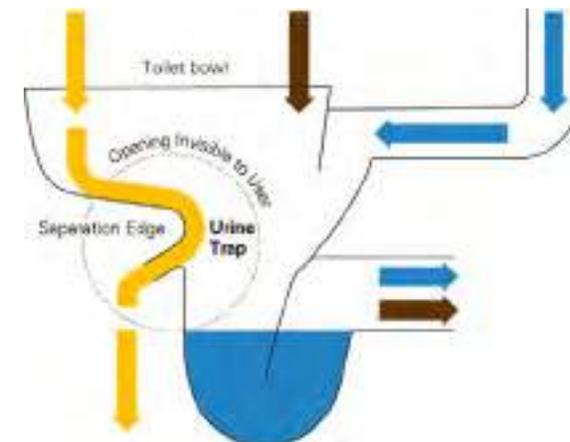
- Easier to treat than wastewater
- Water reuse for irrigation of green spaces, street-washing, firefighting water, cooling systems or toilet flushing.

⇒ Think for example about potential in coastal hotels.



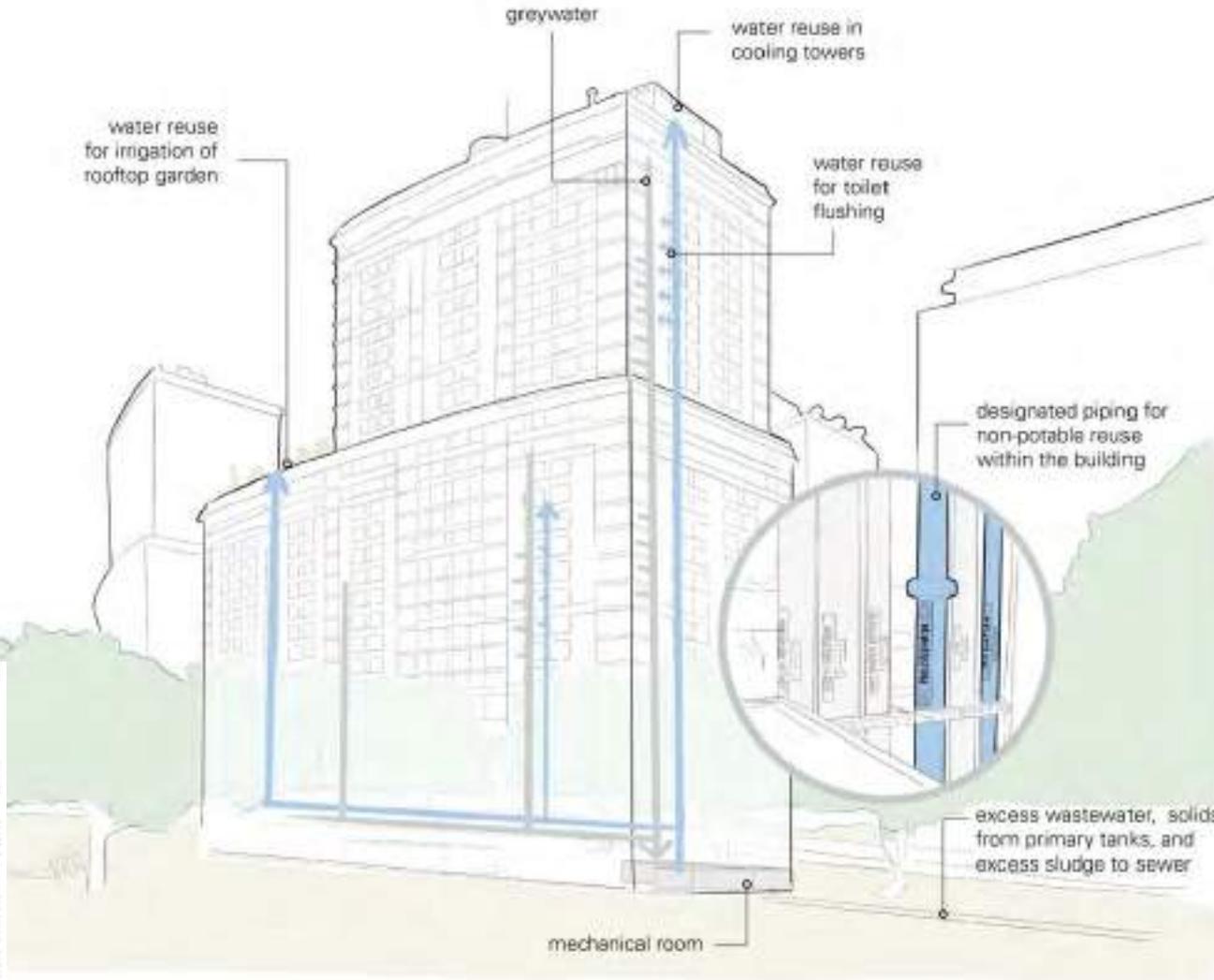
## Urine separation:

- Enables the production of a local fertiliser
- Reduces significantly nitrogen content in the WWTP



*Laufen Save! toilet*

# Circular sanitation toolbox



[www.eawag.ch/en/wh/toolbox](http://www.eawag.ch/en/wh/toolbox)



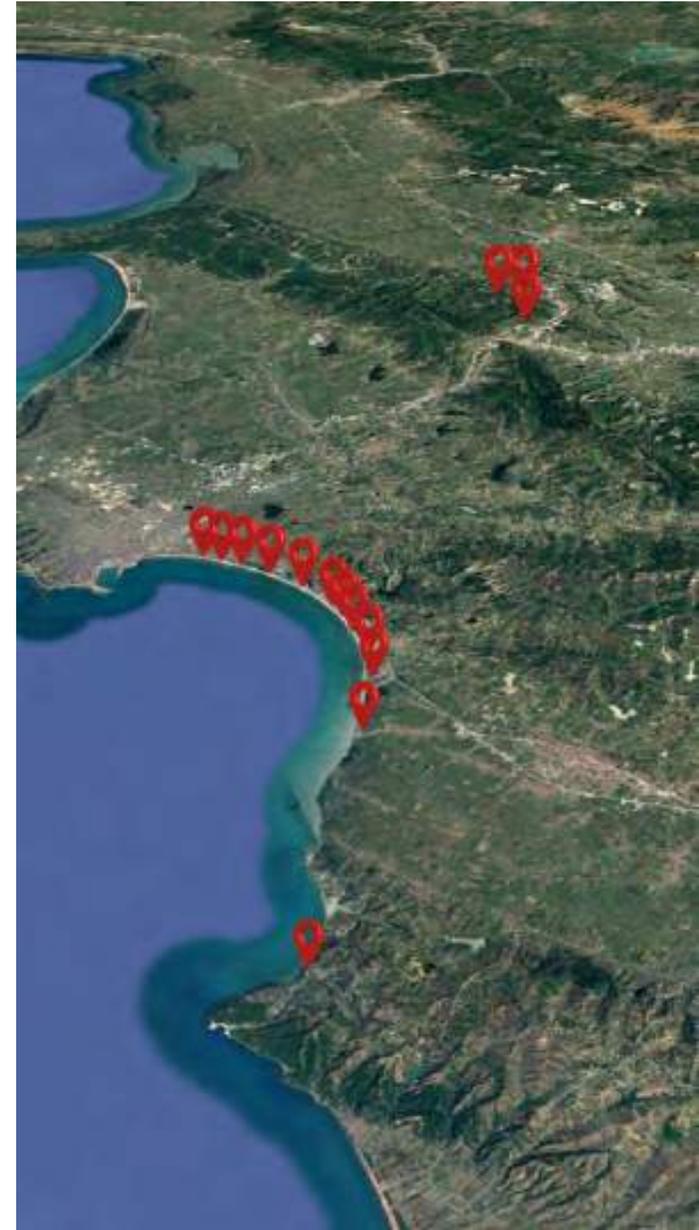
# Off-grid public toilets with delegated O&M services



## Conclusions

Decentralised wastewater management :

- ✓ Enables local water reuse and a more circular approaches
- ✓ Increases climate-resilience at local level
- ✓ Requires a certain degree of standardisation
- ✓ Benefits from the centralisation of certain core functions, like O&M
- ✓ Is part of the «paradigm shift» needed



# Faleminderit për vëmendjen tuaj !

