Rural Water Supply and Sanitation in Finland
Waste Management, Legislation and Practices

SYKE

Rural Water Supply

Municipalities are not responsible of water supply outside population centres

- One household systems
  - Wells or boreholes
    - Households are responsible of their own water systems and water quality
- Water cooperatives
  - Water is purchased from municipal water networks
    - Cooperative takes care of the investment, operation and maintenance of their own system (network and pumping stations)
  - The cooperative has got its own source for water supply
    - Cooperative takes care of the investment, operation and maintenance of their own system (water intake and treatment, network and pumping stations)

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Rural Sanitation

- Act for Water Services
- On-site Wastewater Treatment Decree (rural sanitation)
  - Pollution must be controlled also in rural areas
    - Pollution unit and purification requirement for one person is defined

Parameter	Unit load g/d	Treatment requirement	Sensible environments
BOD7	50	80 %	90 %
Ptot	2,2	70 %	85 %
Ntot	14	30 %	40 %

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Rural Sanitation

- Cooperatives make the investments and takes care of operation and maintenance
  - Watewater discharged into municipal sewers or traeted in own small-scale tratment plants
- On-site small-scale wastewater treatment
  - Small-scale treatment plant, soil filter or infiltration
- On-site small-scale wastewater treatment, dry toilet
  - Filter for washings, soil filter or infiltration
  - Composting

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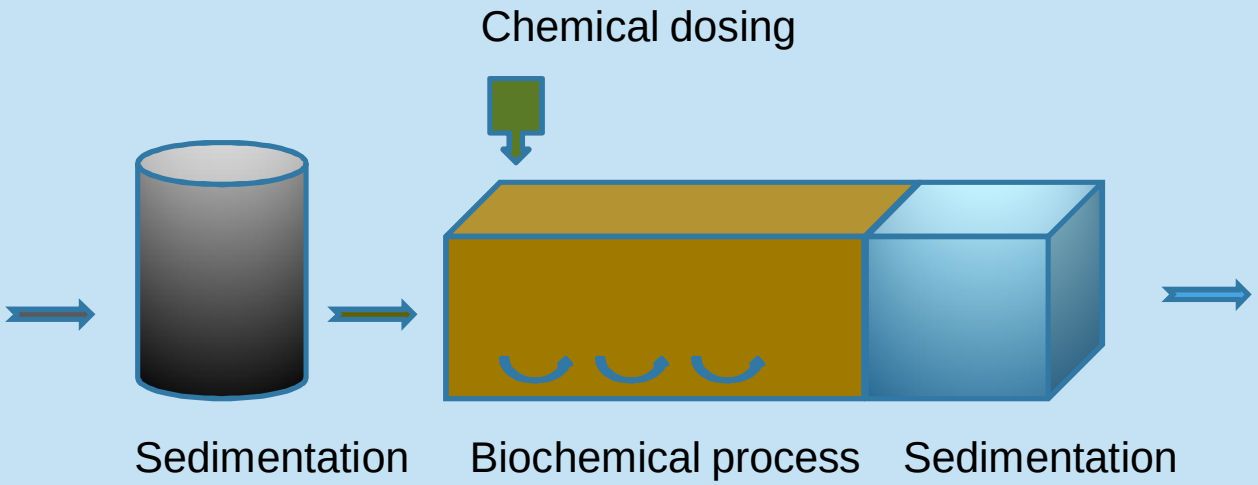
On-site treatment plants for households

On-site small scale treatment plants for households

- Several manufacturers with plants from one to about twenty households
- Batch reactors, biofilters and continuous activated sludge processes with sedimentation and biochemical treatment
- Filters for grey water if household uses dry toilet
- All new plants need CE marking according to EU directives

General simplified process type:



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On-site treatment plants for households

On-site small scale treatment plants for households, batch reactors

- Several manufacturers with plants from one to about twenty households
- Batch reactors with sedimentation and biochemical treatment
- For all wastewater

Sedimentation – biochemical treatment

Sedimentation – pumping – biochemical treatment

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On-site treatment plants for households

On-site small scale treatment plants for households, continuous activated sludge process

- Several manufacturers with plants from one to about twenty households
- Continuous reactor with sedimentation and biochemical treatment
- For all wastewater

Sedimentation – biochemical treatment (activated sludge)

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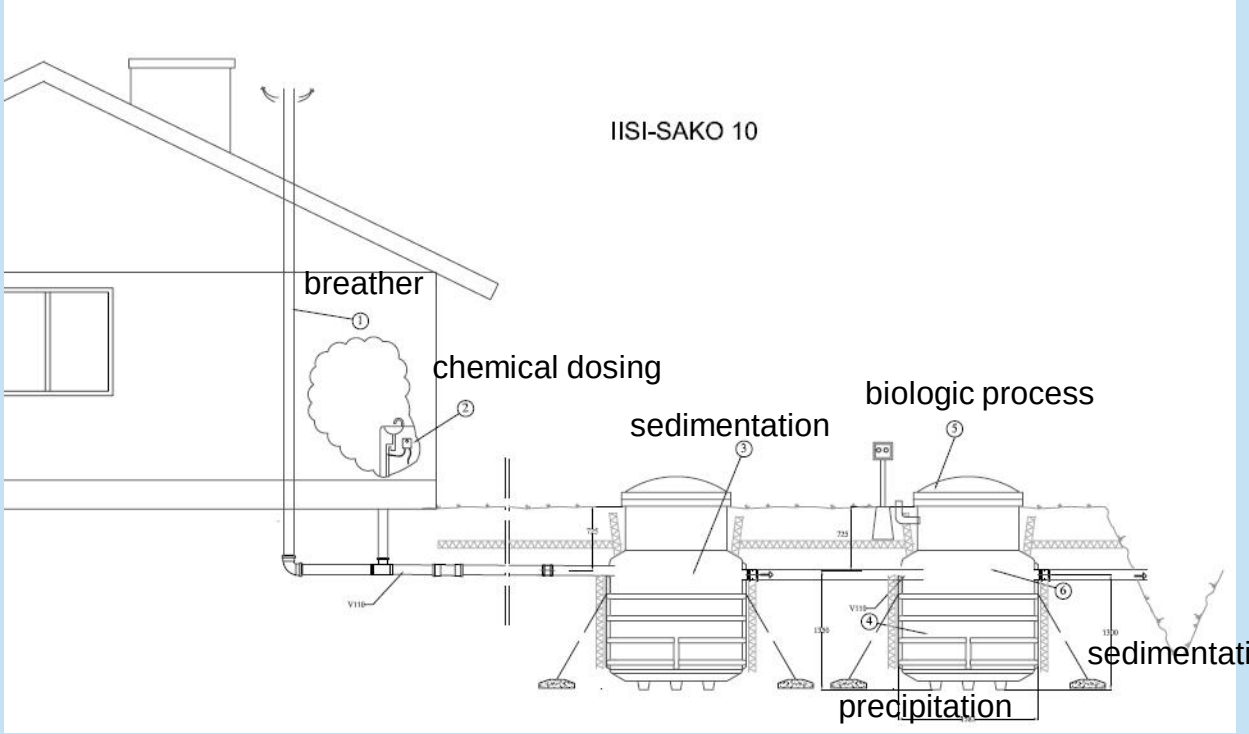
On-site treatment plants for households

On-site small scale treatment plants for households, biofiltering

- Few manufacturers with plants for one household
- Continuous reactor with sedimentation and biochemical treatment (trickling filter)
- For all wastewater



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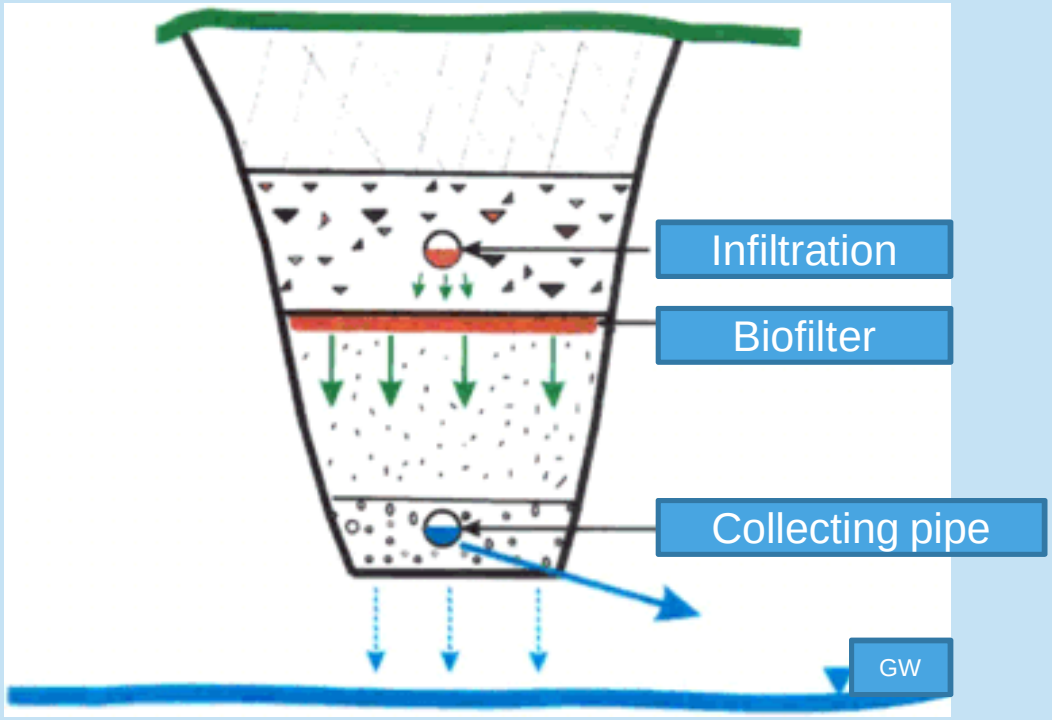
Soil Filter for Wastewater Treatment



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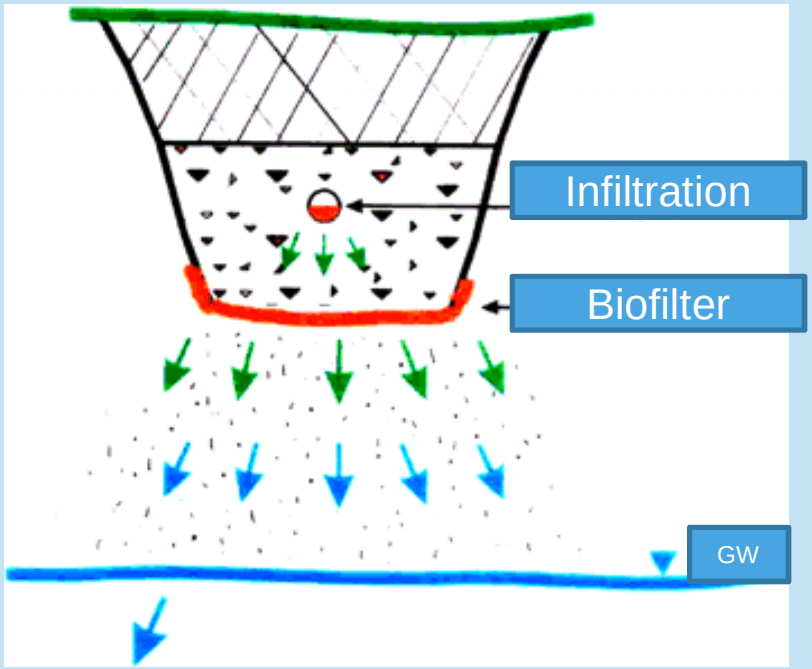
Infiltration Field for Wastewater Treatment



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On-site treatment, costs

Treatment facility	Investment cost euros/household	Operation cost euros/year
On-site small scale treatment plant	7 000 – 15 000	Electricity < 100 Chemicals < 100 Maintenence 200
Soil filter	3 000 – 5 000	Close to 0, small electricity and chemical costs if pumping and P removal

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Pricing

- Municipal water utilities invoice combined drinking water and wastewater fee
  - Connection fee, for investment
  - Fixed monthly fee, for fixed costs of the water utility
  - Consumption fee €/m3
- Average fee for one household house is 4,83 €/m3 and for apartments 3,96 €/m3
- Average water consumption is 150 l/d/person, this means that monthly water bill is about 2 % of the households total income (4 persons, 2 working)

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Waste Management Legislation and Strategies in Finland

- EU Directives are implemented into national law – sometimes even stricter national regulations
- Biowaste strategy (2016: max 25 % of biodegradable waste to landfills)
- National Waste Plan until 2016:
  50 % material recovery, 30 % energy recovery
- Waste Act and Decrees, redrafted (EU Waste Strategy etc.)
- Environment Protection Act and Decree
- Decrees of Council of State (eg. for construction waste)
- Decrees of the Ministry of the Environment
- Municipal waste management regulations (orders by municipalities)

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The Waste Hierarchy

- **Prevention**
- **Re-use**
- **Recycling**
- **Recovery (energy)**
- **Disposal**

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Waste Policy Principles in Finland

- **Prevention**: The production and harmful impacts of waste shall be reduced and if possible prevented at source.
- **Polluter Pays**: The producer of waste takes responsibility of the cost for waste management.
- **Producer Responsibility**: Manufacturer and importer bears the responsibility for waste management, instead of waste producer (certain product groups).
- **Precautionary Principle**: Potential problems related to wastes and waste management should be anticipated and avoided.
- **Proximity Principle:** Waste should be disposed of close to their source.
- **Self-sufficiency Principle:** The EU and member states should remain self-sufficient with regard to the disposal of waste

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