Sustainable and Cost-Effective Wastewater Systems for Rural Areas and Peri-urban Communities

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Women in Europe for a Common Future

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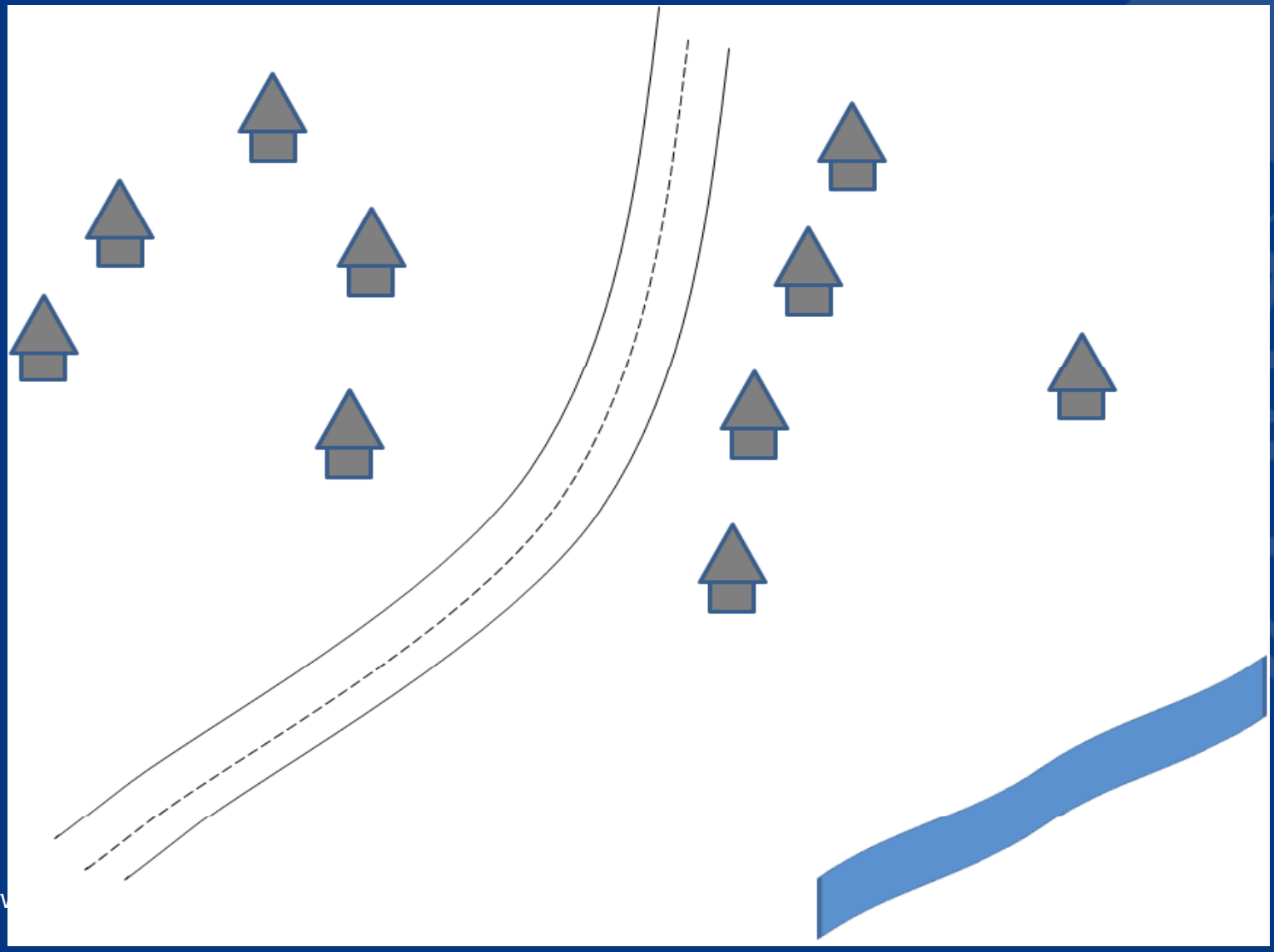
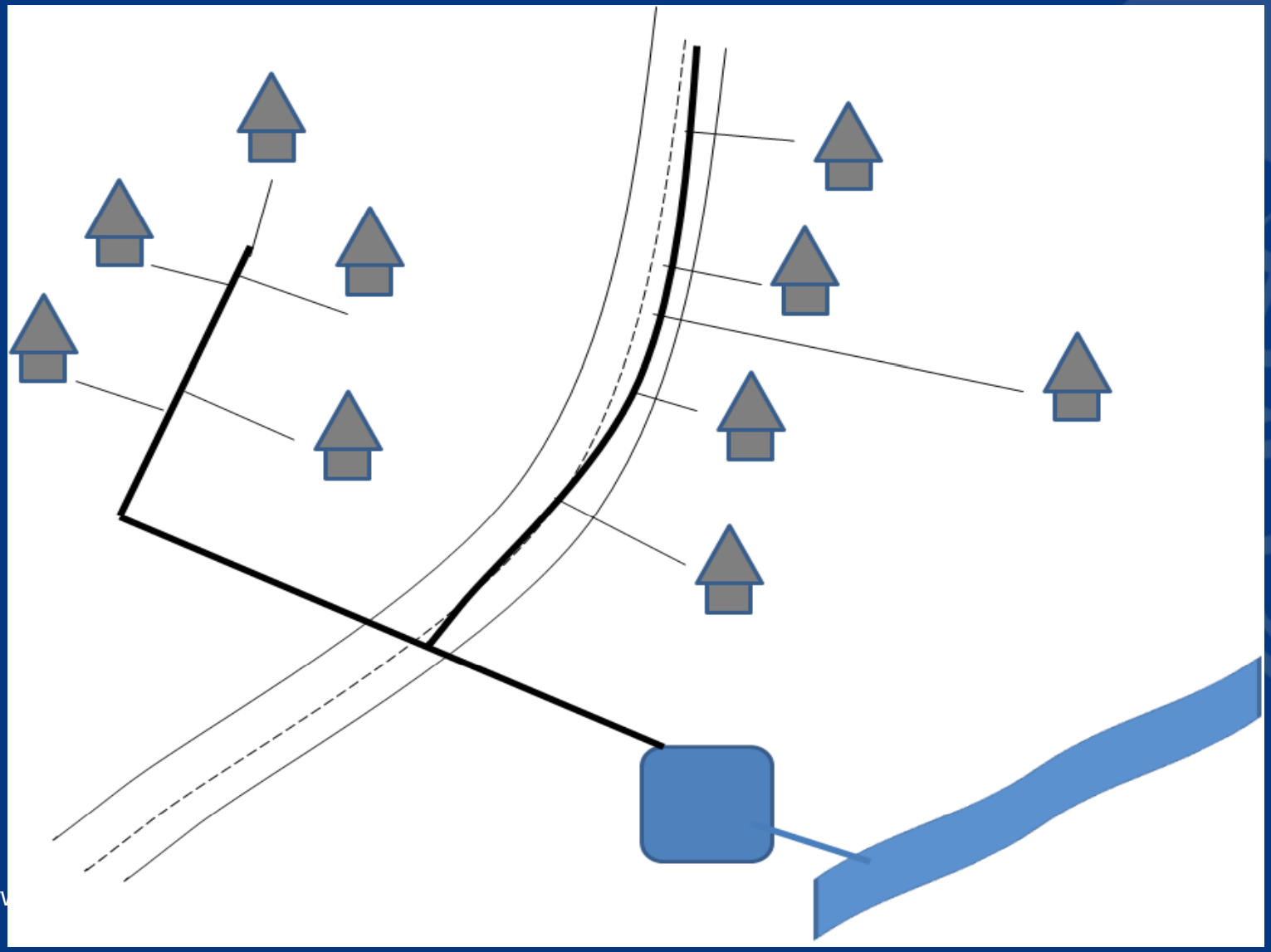
Content

- Systems for sanitation / wastewaster collection and treatment
- Constructed wetlands
- Innovative sanitation options
- Barriers
- Simplified sewerage
- Wastewater stabilisation ponds

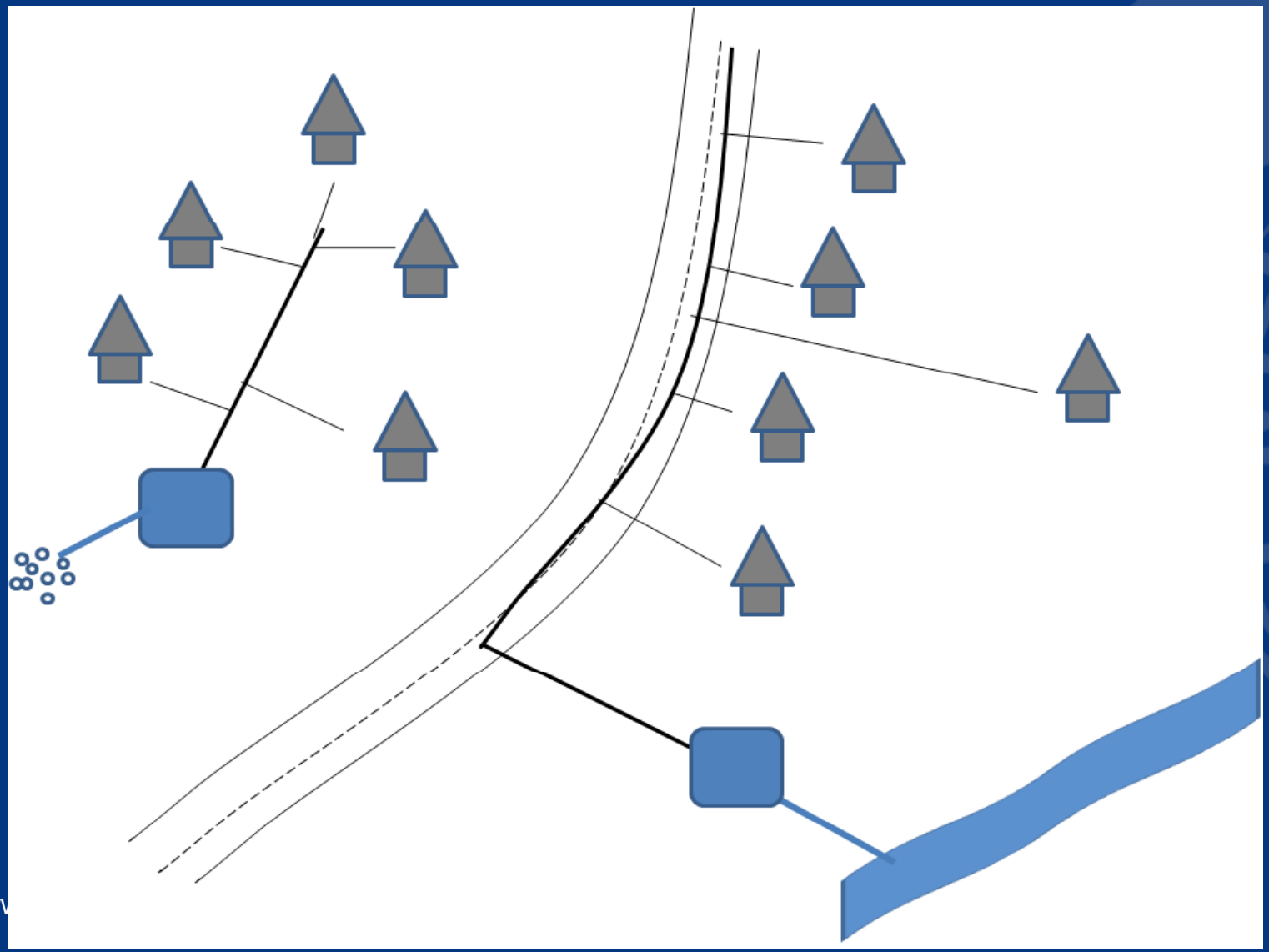


Which sanitation and wastewater collection and treatment system is the best?

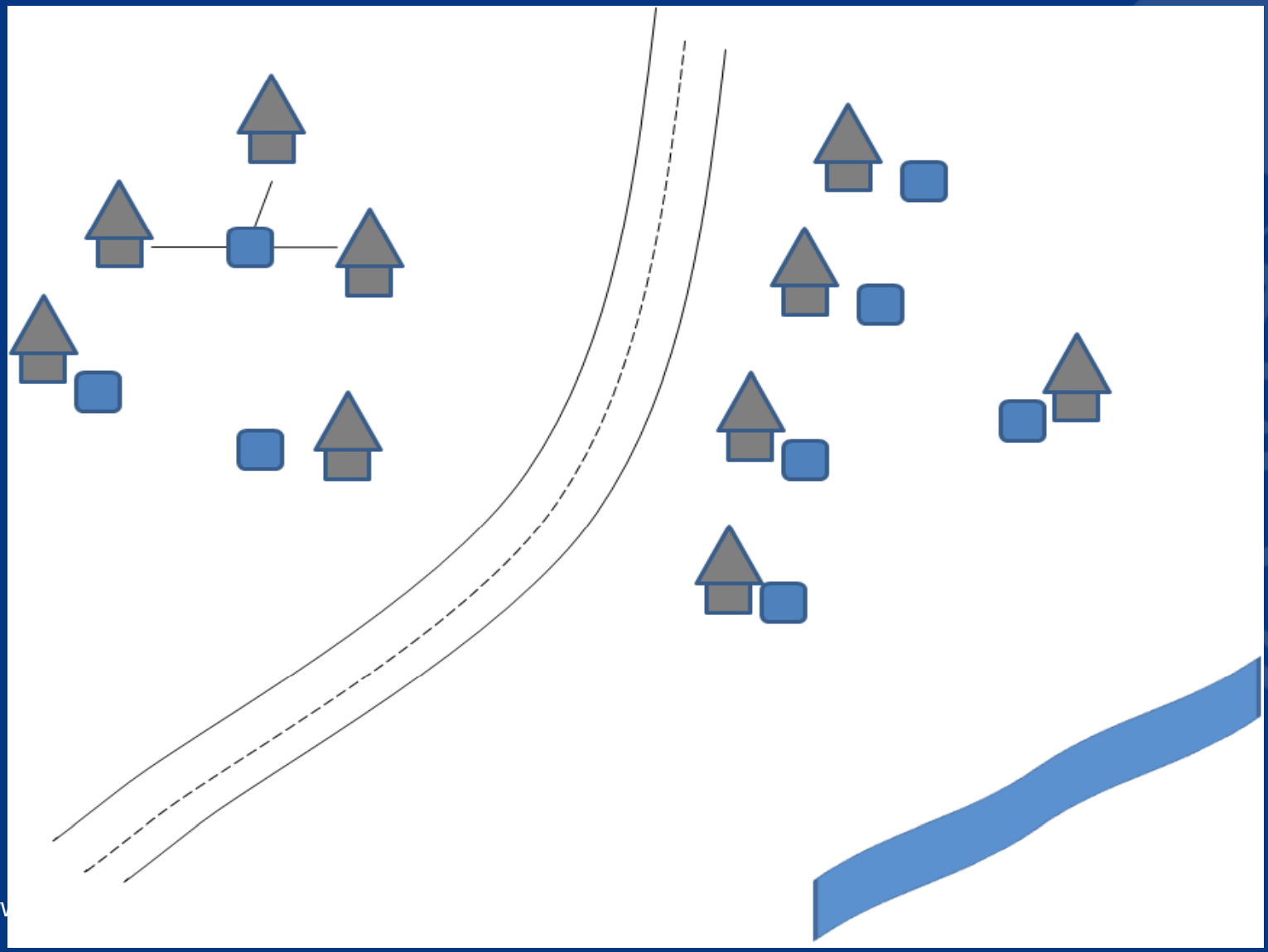
Centralised System



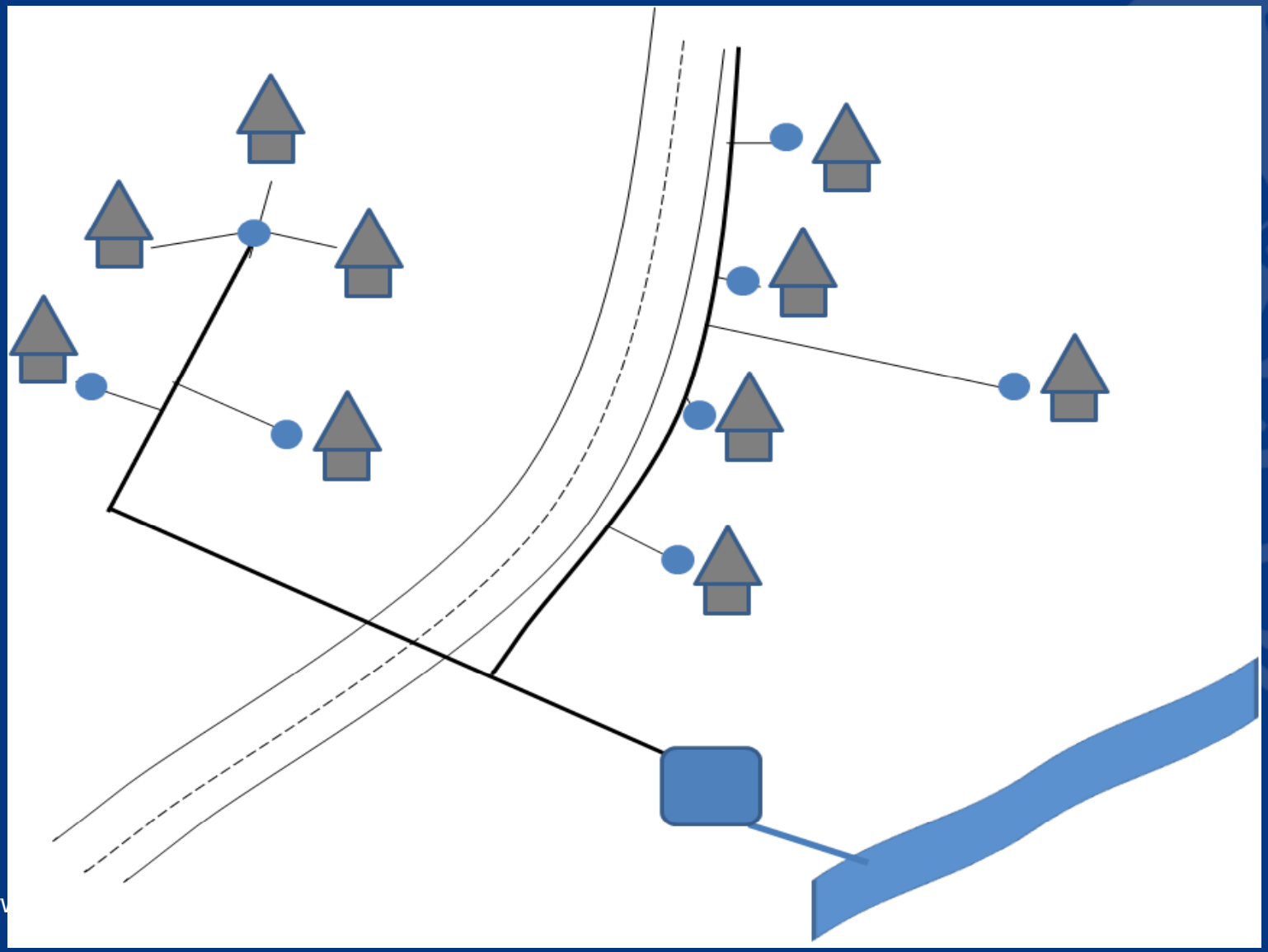
Semi-centralised System



On-site System



Combined On-site and Centralised System



Selection of the best wastewater treatment and collection system

No solution fits all

Depends on the site characteristics

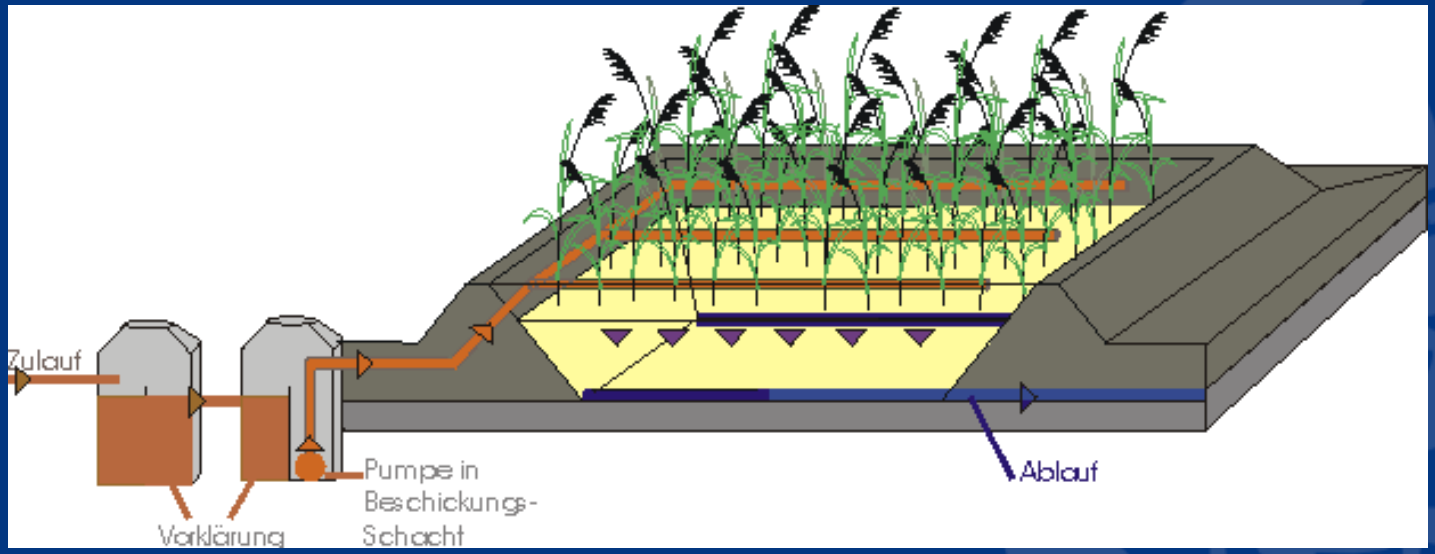
- Water availability, quality and demand
- Housing density / space availability
- Potential for re-use of water and nutrients
- Climate and soil conditions
- …

Tool for selection

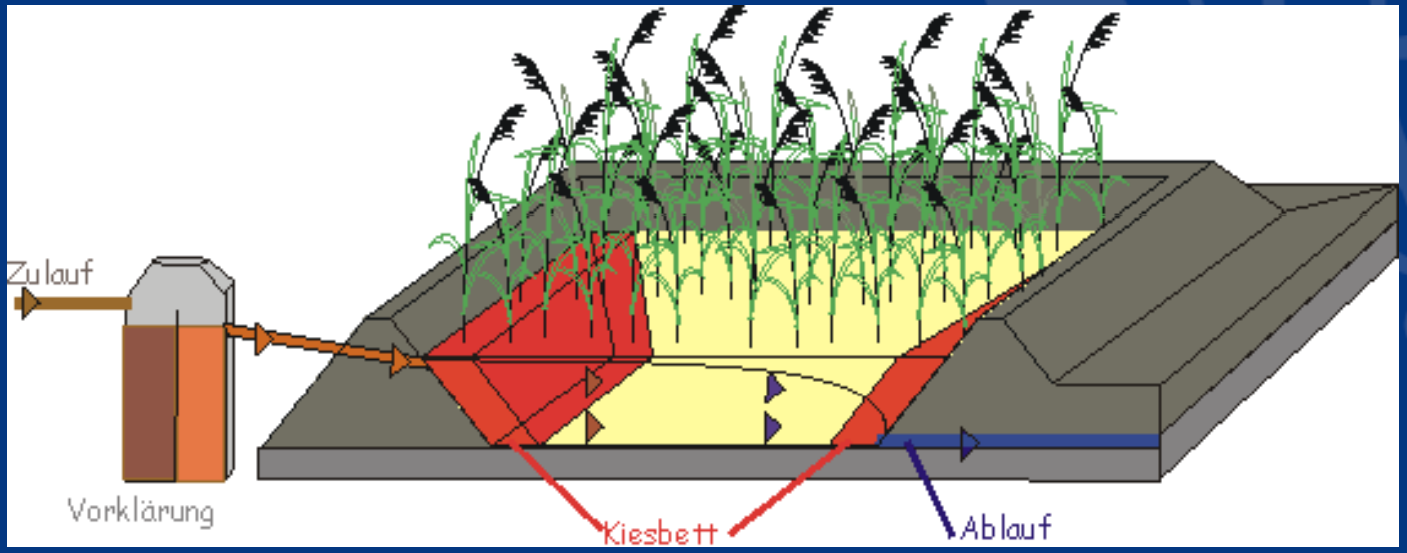
- Comparison of different concepts/variants (wastewater collection, treatment and re-use)
- Cost comparison of the whole system (investment, operation & maintenance costs over e.g. 50 years)

Constructed Wetland - Planted soil filter - Scheme

Vertical flow



Horizontal flow



Source: www.bodenfilter.de

Physical pre-treatment

Effluent

Onsite constructed wetland for domestic wastewater in Hannover, Germany

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Onsite constructed wetland for greywater in Hamburg, Germany

Semi-centralised constructed wetland

- Hundreds of examples in Germany/Austria
- Here: pictures from Bruck, 30 families

Advantages of constructed wetlands (planted soil filter)

- Good efficiency (COD and nutrient removal)
- Cheaper than conventional technical system (operation and maintenance costs)
- Few, if any, electro-mechanical equipment
- Zero or low energy consumption
- Easy operation and maintenance
- No smell, no flies
- Natural system, esthetical look

New sanitation concept, Germany

Water free urinals, urine diverting toilets
Urine storage tanks
Composting of faecal matter
Constructed wetland for greywater

TUHH
Hamburg University of Technology

OtterWasser GmbH

New sanitation – hut in the Austrian alpes

Physical pre-treatment

Constructed wetland

Modern dry sanitation in Sulitsa, Stara Zagora, Bulgaria

Cultural center

Urine diverting dry toilet

Constructed wetland for greywater

Urine tanks

Earth Forever
Caring for the Future

Modern dry sanitation in areas without reliable water supply – school sanitation Vrata, Romania

New toilet building attached to the school

UDD toilets and urinals

Barriers of implementing constructed wetlands and innovative sanitation

- Considered as low-tech and not modern
- Not accepted by the authorities
- Not known in the population
- Worries about hygienic problems
- Lack of regulation on re-use of water and nutrients (in spite of WHO guidelines)

➢ Demonstration projects needed

➢ National state of the art/regulations/incentives missing