



The need and challenges for sustainable and cost-effective wastewater treatment in rural and sub-urban areas in Bulgaria

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WECF

Women in Europe for a Common Future

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Sustainable Water and Sanitation Projects

by WECF & Partner Organisations in the EU and the EECCA region

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The map displays project locations across the EU and EECCA region, with yellow dots indicating the centers of activity for each country. Each dot is connected to a detailed box containing information about the projects and partner organizations.

- Belarus**
Our partner organisations: ECOPROJECT PARTNERSHIP

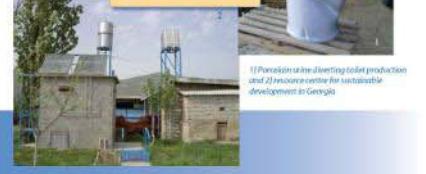
- Ukraine**
Our partner organisations: BIVC, BIAH-BA, VOZCIVDENTS

- Romania**
Our partner organisations: EUROTELEMAN, FEMEI PENTRU IMPROVAREA CIVILIEI - MEDICAL ET SANITA, SLODZIA, O BLO

- Bulgaria**
Our partner organisations: EARTH 4 EVER, ECO WORLD

- Moldova**
Our partner organisations: ECOTOP, ECO-SPECTRUM, ECO-THEAS, WISDOM

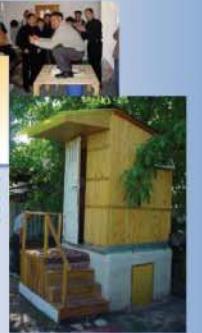
- Azerbaijan**
Our partner organisations: EKOT

- Georgia**
Our partner organisations: FOUNDATION CAUCASUS ENVIRONMENT, GEMAL, FOL / GREENS MOVEMENT OF GEORGIA, RICA, PHOS, TEMA, USAID

- Uzbekistan**
Our partner organisations: MEHRIBAN

- Armenia**
Our partner organisations: AWHIC, CHARITABLE WOMEN, ECOLORE CLUB

- Tajikistan**
Our partner organisations: ASPD MAIL, YEC, SAFO

- Kazakhstan**
Our partner organisations: YOUNG GUARDS OF NATURE, INCOM, HIGAM

- Kyrgyzstan**
Our partner organisations: SOCIAL UNION AGERBEC, ALGA, BISH, CAAM, HENIC, DEGEL, UMSOM

- Afghanistan**
Our partner organisations: KATAQIB, e.v.


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Water and Sanitation projects by WECF and partner organisations:

- Construction of urine diverting dry toilets for households, public places and schools
- Production of urine for agriculture
- Construction of solar heated dry toilets
- Demonstrating the effects of urine as a fertilizer
- Building soil filters and remediated wetlands for treatment of wastewater
- Monitoring of drinking water quality
- Cleaning and construction of drinking water wells
- Developing Water Safety Plans with involvement of schools
- Establishment of demonstration centres for sustainable development

WECF The Netherlands, Friday, Germany day 2006

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Legal framework in the EU

- Urban Waste Water Treatment Directive -UWWTD (1991/271/EEC)
- Water Framework Directive - WFD (2000/60/EC)
- Guide for Extensive Wastewater Treatment Processes adapted to small and medium sized communities (500 to 5,000 population equivalents) 2001
- Integrated Pollution Prevention and Control Directive
- Nitrates Directive

Legal framework in the EU

	Agglomerations with up to 2,000 PE	Agglomerations with up to 2,000 PE having a wastewater collection system	Agglomerations with 2,000 – 10,000 PE	Agglomerations with 2,000 – 10,000 PE discharging to sensitive areas
Urban Wastewater Treatment Directive applies	no	yes	yes	yes
Requirements		Provision of a wastewater treatment system	Provision of a wastewater collection and treatment system	Provision of a wastewater collection and treatment system
Discharge requirements: Removal of		Organic matter * (BOD, COD, SS)	Organic matter * (BOD, COD, SS)	Organic matter * (BOD, COD, SS) Nutrients** (N, P)
Water Framework Directive applies	yes	yes	yes	yes
Requirements	Setting up measures to achieve a good water and groundwater status and to protect drinking water			
	=> Provision of sanitation and wastewater treatment			

* Biochemical oxygen demand [BOD₅ at 20°C]
 Chemical oxygen demand [COD]
 Total suspended solids [SS]

25 mg/l O₂ (70-90 % percentage of reduction)
 125 mg/l O₂ (75 % percentage of reduction)
 35 mg/l (90 % percentage of reduction)

Urban Waste Water Treatment Directive

- applies to settlement areas >2000 pe*)
- minimum standards for waste water treatment
- fully flexible on the means to achieve the objective, thus open to - and encouraging - innovation and alternative solutions
- alternative solutions to centralised sewerage systems permitted even within in urban settlement areas, if same level of environmental protection is achieved

*) smaller settlement areas covered by the objective of the Water Framework Directive ('good quality for all waters, as a rule by 2015')

Population in agglomerations with less than 2,000 pe in different countries

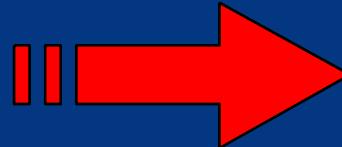
Country	pe in millions	% of total population
Bulgaria	1.9	24 %
Czech Rep.	2.7	26 %
Germany	7	9 %
Poland	15	39 %
Romania	2	9 %
Slovakia	1.7	31 %

(partly from GWP 2007)

Why do we need to manage wastewater also in rural areas?

Wastewater contains:

- Pathogens
- Nutrients
- Organic matter



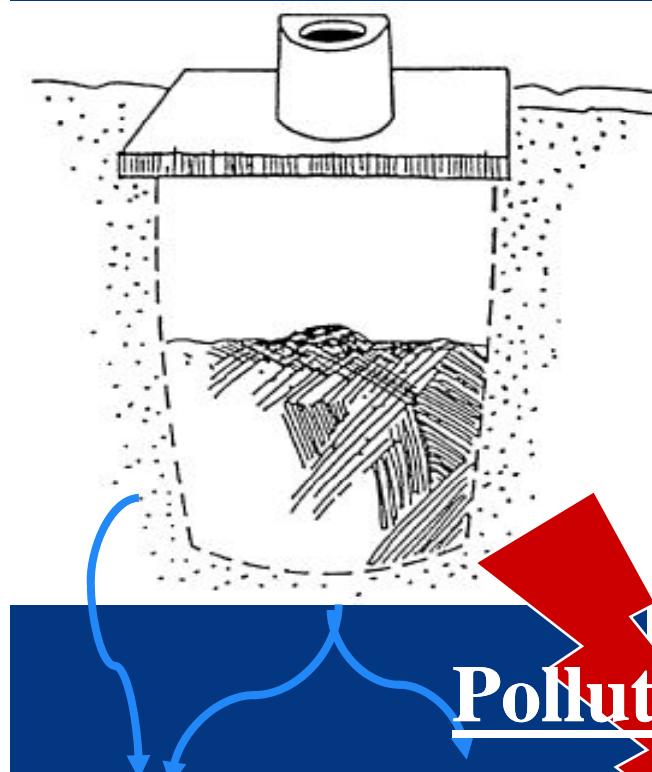
(Drinking) water pollution



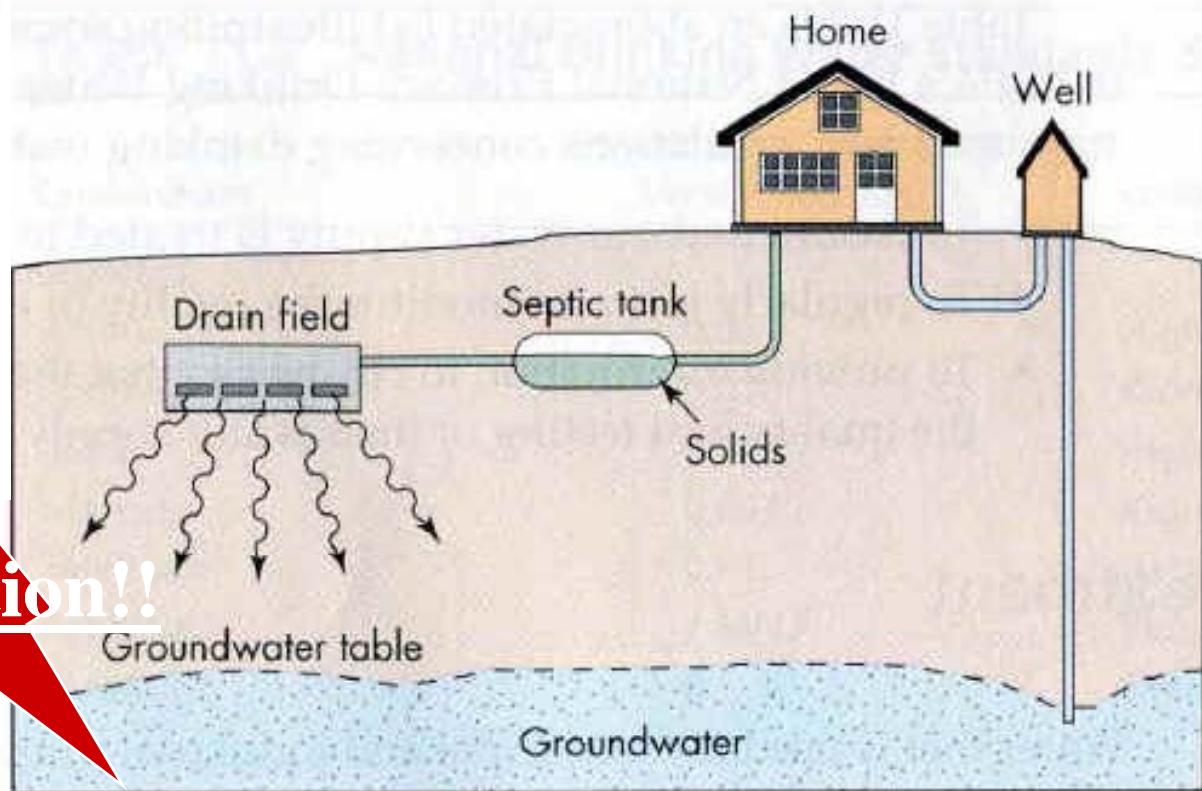
Danger for health
and environment

Conventional decentralised/onsite systems

Pit latrines



Septic tanks



How to make wastewater collection and treatment in rural areas successful and sustainable?

- Robust and reliable technology
- Easy to maintain and operate
- Financially sustainable
- Environmentally and climate sound
- Considered within a regional planning process

Advantages of constructed wetlands (planted soil filter)

- Good efficiency (COD, nutrient and pathogen 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

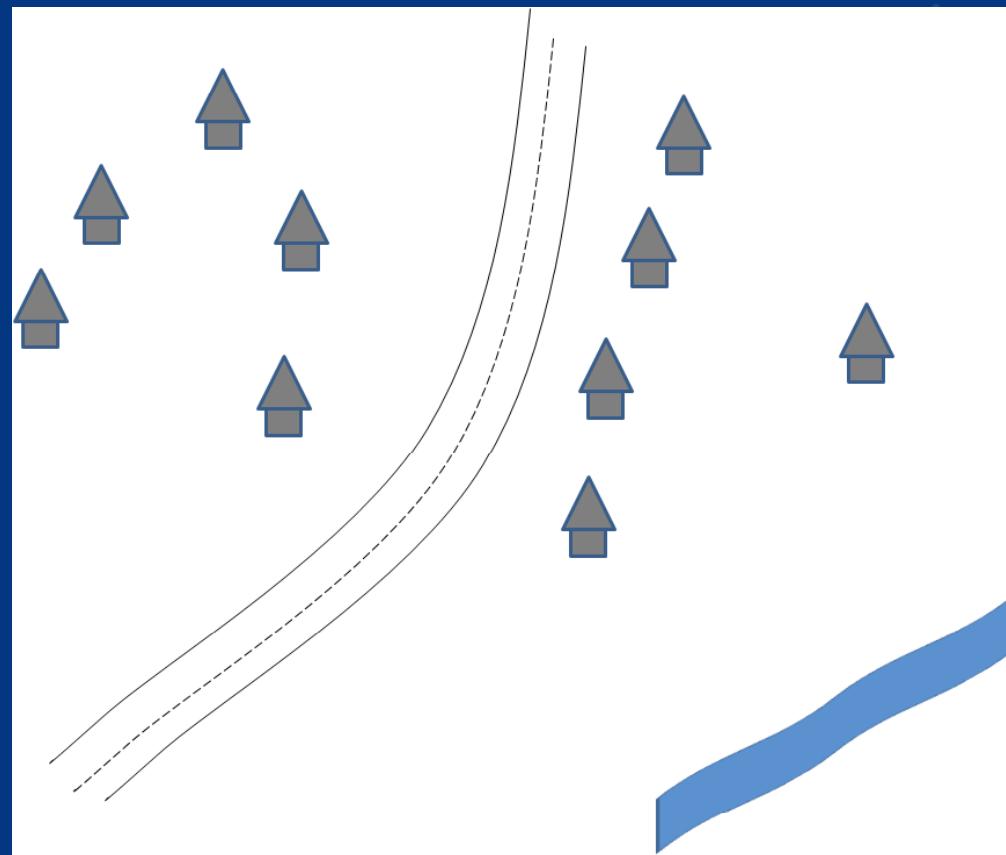
Selection of the best wastewater treatment and collection system

No solution fits all

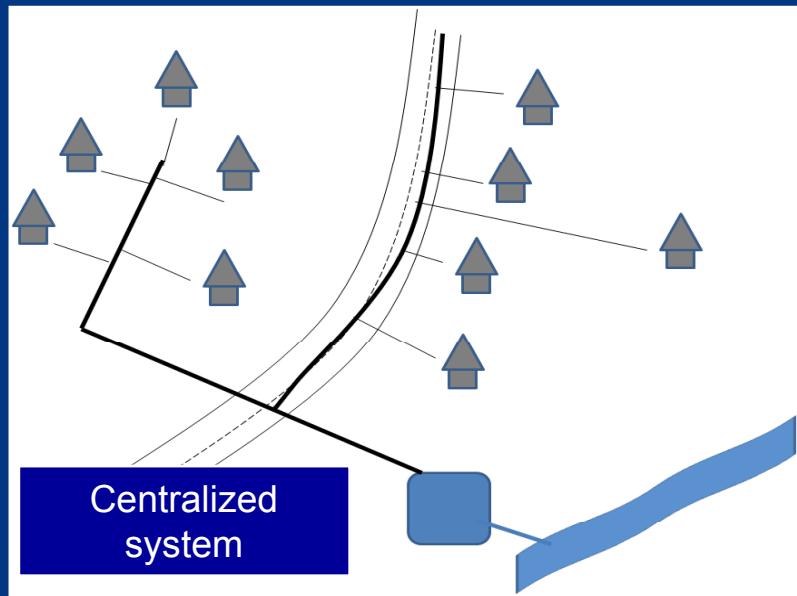
Depends on the site characteristics

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

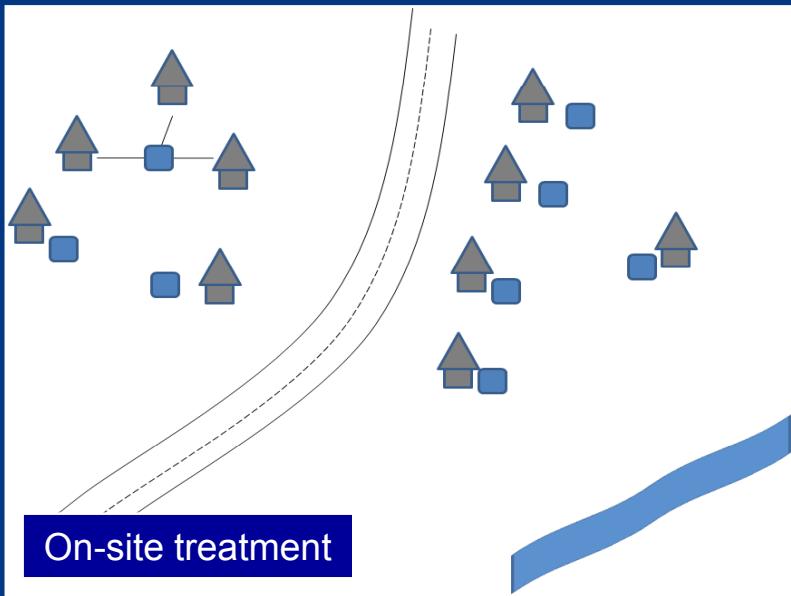
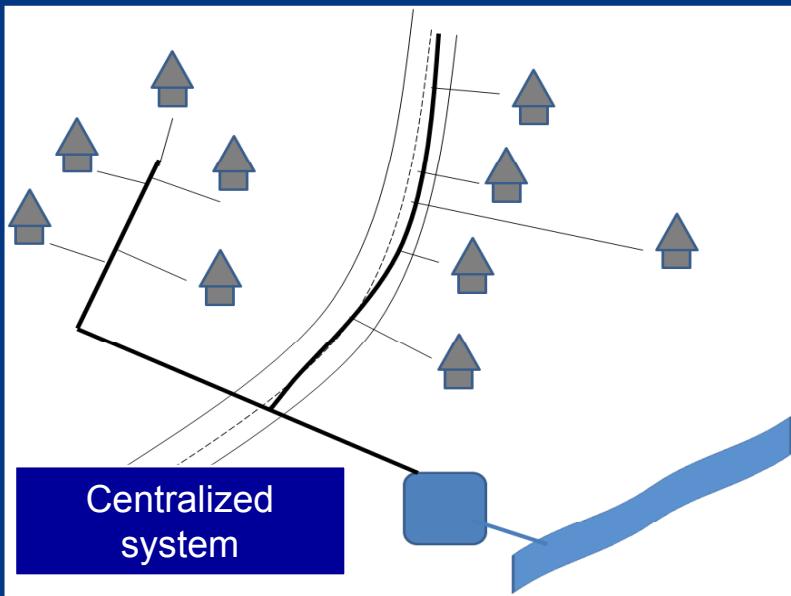
Which wastewater system is the best?



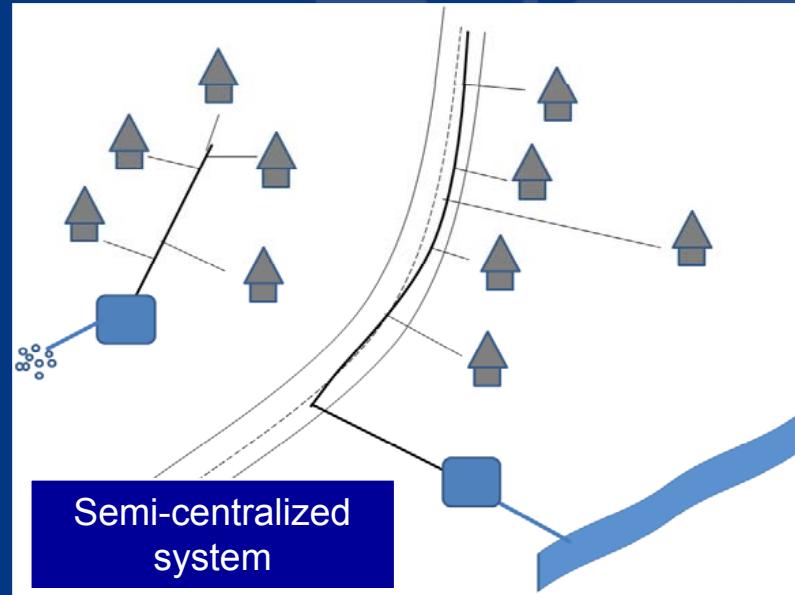
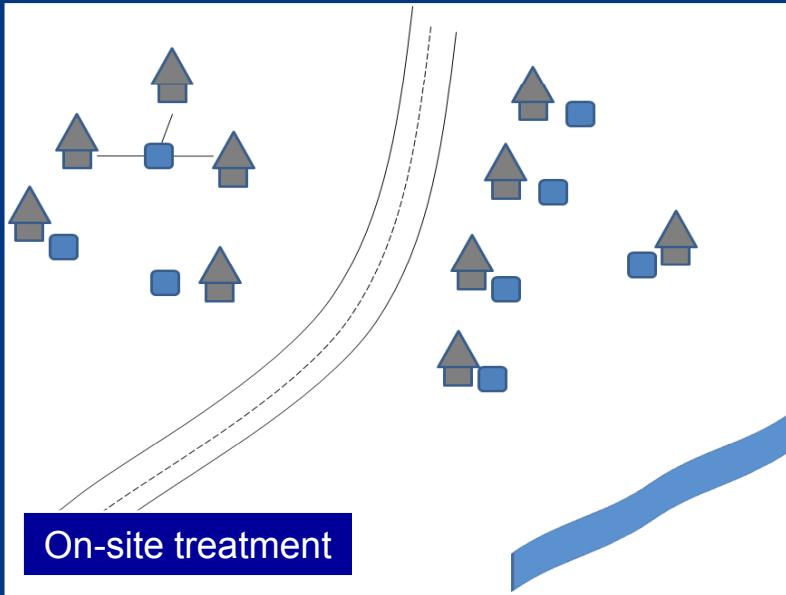
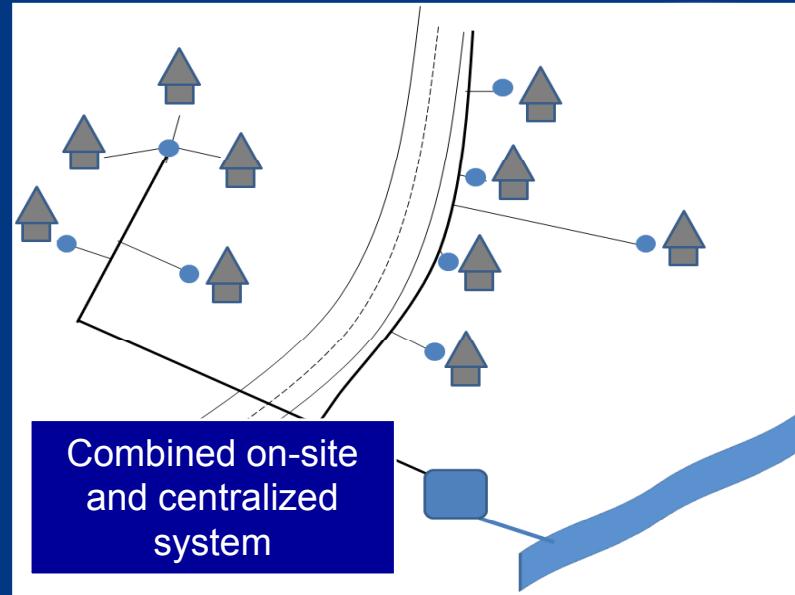
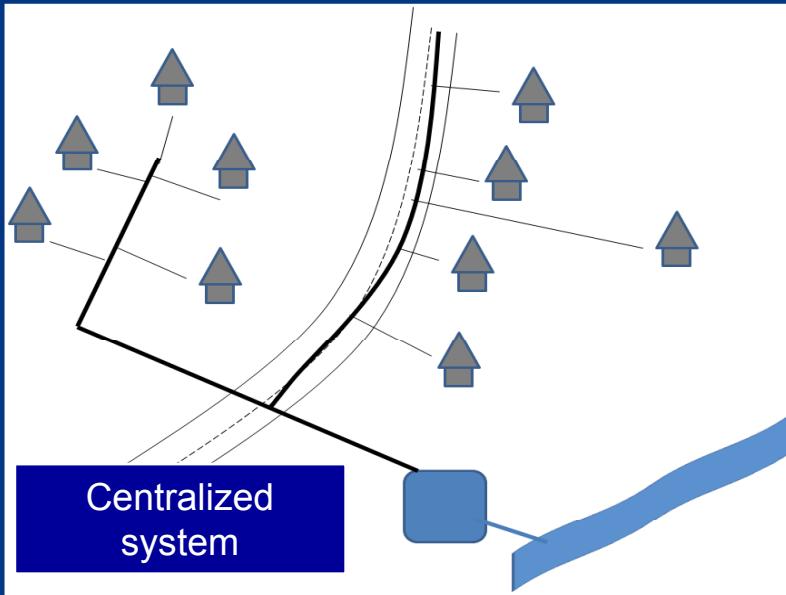
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Which wastewater system is the best?



Which wastewater system is the best?

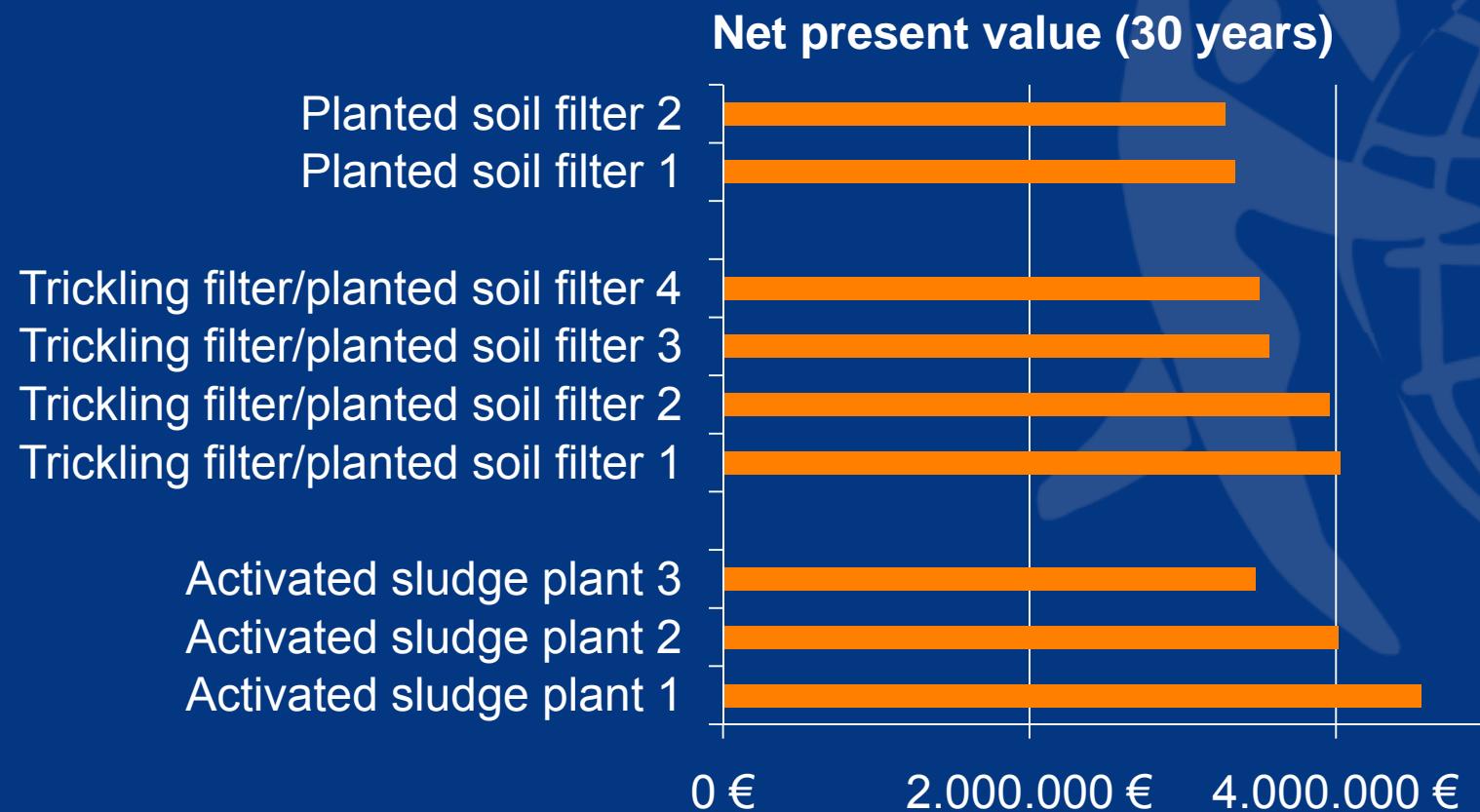


Tool for selection

- 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)

Comparative cost analysis based on discounted cash flow – Case study 1

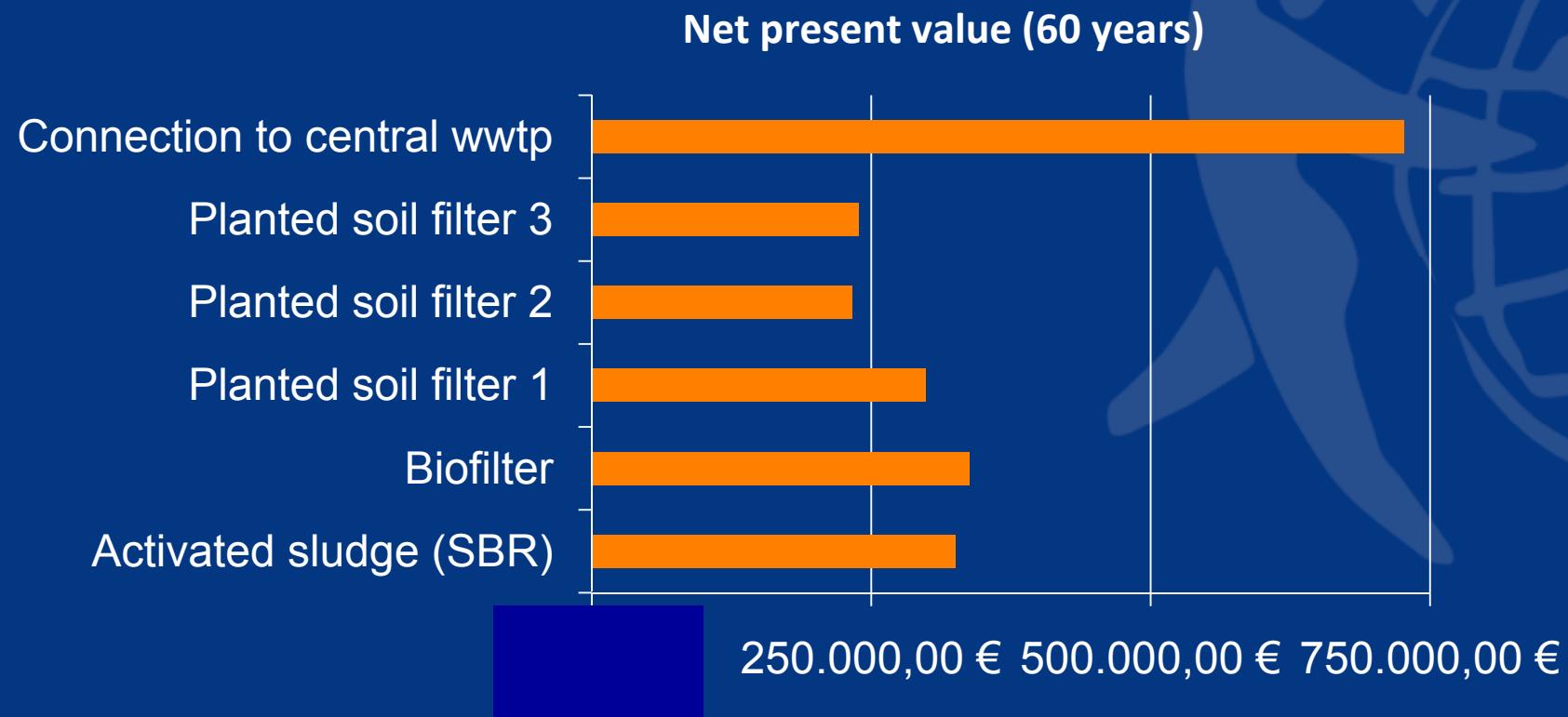
Renovation of an existing wastewater treatment plant for 4,150 PE
(Germany)



Source: Ebeling, B. 2006

Comparative cost analysis based on discounted cash flow – Case study 2

Small wastewater treatment plant (200 PE) versus sewerage connection to the next big treatment plant (Germany)



Barriers of implementing non-conventional wastewater systems

- 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)

Financial and economic barriers

Wastewater collection and treatment has not a priority in the national policies and the communities' budgets

No proper cost-benefit analysis is carried out comparing different scenarios for wastewater collection and treatment (decentralised versus centralised, technical versus natural systems)

Recommendations

- Awareness raising to set sanitation higher on the political agenda (multi stakeholder processes, education)
- Demonstration projects needed
- Full cost-benefit analysis to compare different scenarios
- National state of the art /regulations/incentives missing

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Изкуствени влажни зони

Устойчиво пречистване на отпадъчната вода в малки населени места и полу-градски райони в България



Пример от практиката

WECF

<http://wecf.eu/>

<http://wecf.eu/english/water-sanitation/publications.php>

Благодаря!