BGR-Symposium “Coupling Sustainable Sanitation and Groundwater Protection”

Sustainable and safe application of sludge and wastewater in Short-Rotation-Plantation
Situation in developing countries

- Lack of energy sources (mainly electricity, fuel and firewood)
- Huge amount of untreated wastewater available
- Extreme poverty of suburban and rural population and lack of income sources
- High health risks (polluted surface waters, contaminated groundwater)
- Deforestation (firewood) and resulting floods and losses of fertile soils
Targeted Needs

- Low-cost and efficient wastewater treatment systems with additional positive aspects (e.g. biomass production)
- New sources of income and jobs e.g. as energy farmer (especially in rural areas)
- Production of local renewable energy sources
- Substitution of chemical fertilizers with organic matters
- Clear legislation and standards for a environmental protection (health risks)
SHORT-ROTATION-PLANTATIONS

From Waste to Energy
SHORT-ROTATION-PLANTATIONS
**Main principles**

1. Use of fast growing and local available tree species (e.g. willows & poplars) with high potential
2. High density of plants and harvesting cycle of 2-3 years (up to 7 rotation cycles)
3. Reusing wastewater and sewage sludge for irrigation and fertilisation of trees
4. Treatment of wastewater in the root zone and direct reuse of nutrients by the plants (biofilter)
5. Enables an efficiency increase in Short-Rotation-Plantation (SRP) biomass production up to 3 times
6. Production of CO2-neutral wooden biomass in SRPs as a renewable raw material for different technical purposes (firewood, paper industry)
SHORT-ROTATION-PLANTATIONS

WACOSYS: Monitoring Control System for Wastewater irrigated Energy Plantations

Source: TTZ 2005
Applications
Applications
Applications
Applications
Applications
Applications
Applications
Benefits for farmers

1. New source of income opportunity (energy farmer)
2. New source of income from wastewater/sludge recycling
3. Alternative fertilization and irrigation method at low cost
4. Flexible use with urine, wastewater, effluents (anaerobic treatment)
5. Increased income from improved biomass yields due to irrigation and fertilization
6. Increase in soil organic matter content and soil fertility
Benefits for local communities & society

1. Opportunities to reduce costs for conventional wastewater treatment (investment, operation, disposal)
2. Opportunities to produce renewable biomass for local heat and power generation
3. Supporting local economy by establishing local biomass supply chains
4. Recycling of local water and nutrient sources
5. Supporting sustainable rural development by reducing dependency upon fossil fuels
Example: INAWAB

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Integrated Approach for sustainable water management in Bangladesh

Goal: Performance of a feasibility study for wastewater treatment in SPRs for water recovery and firewood production in Bangladesh

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Thank you for your attention!