PILOT ECOSAN PROJECT,
BULGARIA

Demonstration ecological sanitation
systems for decentralized
management of wastewater and
organic wastes

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Development of a model for water and waste management for rural Bulgaria

- **Areas of implementation:**
  - Stara Zagora Municipality – Sulitsa and Stara Zagora Spa; Varna Municipality - Topoli.

- **Partners:**
  - Bulgaria – Earth Forever, IEM;
  - The Netherlands – WECF, WASTE, IRC;
  - Germany – TUHH.
Brief Characteristics

- **Geographic background**
  - Climate – Semi-arid transit continental;
  - Soils – Chromic cambisols, sub-types Rhodic;
  - Surface water – Banska River, lake;
  - Ground water – Banska River terrace, thermal mineralized.

- **Settled population**
  - 8,000 years copper mining and processing;
**СЕЛО СУЛИЦА**

- Mountainous – 75% country territory;
- 1 of 50 villages in the Municipality;
- Small – like 47 of 50 villages in the Municipality;
- Centralized water supply like the other villages from the Municipality and 96% of the villages in the country;
- No sewer, no working mechanism for wastewater management like 98% of the villages in the country.
Brief Characteristics

Sulitsa

- **Population**
  - 180 permanent villagers (300); 120 households;
  - Aging population;
  - Ethnic structure.

- **Occupation**
  - Agriculture – vegetation growing, animal breeding;
  - Lime and stone production, woodcutting etc.
Water Sulitsa

- Drinking water
  - Water source
  - Water supply system
- Boreholes and wells
Concentration of nitrate in drinking water, Sulitsa (2001-2005)

Monitoring of nitrate concentrations
Maximum allowed concentration of nitrate

Date of sampling

mg/l

Ma
Sanitary zones:

• Belt I: 50 days, at least 50m /15 m in settlements; 1.4 m fence;

• Belt II: 400 days;

• Belt III: 25 years.
Sanitation Sulitsa

- **Wastewater**
  - Blackwater;
  - Greywater – soakaways, gardens;

- **Sanitary conditions**
  - Dry pit latrines;
  - Flush inside toilet with limited usage

- **Sanitary practices**
  - Usage of lime;
  - Summer bath.
Management of human wastes
Analysis of wastewater flows - Sulitsa

- Kitchen wastewater
- Soakaway
- Truck
- On the street
- In the garden
- In the gully
- Overflows in neighbor's garden
- Soaks in soil
- In the river
Analysis of wastewater flows - Sulitsa

Faeces and blackwater

- Pit latrine
  - Store in soil
  - In the garden
  - Overflows in neighbor’s garden

- Soakaway
  - Soaks in soil

- Truck
  - In the river
Analysis of wastewater flows - Sulitsa

- Wastewater from the rakya plant
- In the gully
- Forms a small lake
Management of wastewater / greywater

- Very few households produce wastewater – only greywater;
- Soakaways for waste / greywater;
- Emptying of the soakways;
- Discharge in the garden;
- Discharge in the neighbor’s garden;
- Discharge along the street;
- Discharge in the nearby gully.
Замърсяването причинено от отпадните води на почвата, улиците, водите е причина за повишен риск от заболявания

Няма оперативна концепция за управление на отпадните води

Сухи клозети

Септични ями

Изградени с цел да попиват в почвата

Няма нужда да се изпразват

Септичните ями не функционират

Скъпо струва изпразването на септичните ями

Преливащи септични ями

Увеличено потребление на вода (toaletни казанчета, автоматични перални)

Няма местна фирма за изпомпване на септичните ями

Ниска информираност за съдържанието на полезни вещества

Липсват знания относно механизмите за замърсяване на средата

Безразличие

Ниски изисквания от живота

Недостатъчно информация, нисък интерес на медиите към проблема

Липсват уроци в училище

Големи семейства

Частна собственост

Ниски доходи на домакинствата

Малки и зле построени септични ями
Management of Biological Waste

Traditional practices:
• ‘wild’ composting of animal excreta;
• usage of composted animal excreta to improve soil fertility;
• drying and burning the vegetable wastes;
• dry pit latrines - 99% of households.

AND

• Lack of measures to protect ground water;
• No info about possible pollution due to overuse of animal compost;
• No awareness about the associated health risk.
Brief Characteristics

Stara Zagora Spa

- **Settling**
  - Ancient spa, renovation of the traditions, after 1965;
  - Infrastructure: 32 company rest houses, sanatoria, hotel; school, kindergarten, orphanage; policlinic, pharmacy; maternity ward...

- **Population**
  - 250 permanent residents (370);
  - Age structure.

- **Occupation**
  - Services.
Water
Stara Zagora Spa

- **Drinking water**
  - City water supply system and water source from a nearby village Novo Selo;
  - Water supply network

- **No boreholes and wells**
Sanitation

Wastewater
Blackwater – sewer, soakaways;
Greywater – soakaways;
Sanitary conditions
Flush inside toilet;
Pit latrine.
Analysis of wastewater flows – Stara Zagora Spa

Wastewater

- soakaway
- truck
- Small ‘sewer’
- Sewer
- Sedimentation tank

-沿街
- Green area close to the park
- Overflows in neighbor’s garden
- In the river

водата от плажа
Problem Tree – Wastewater, Stara Zagora Spa

- Ne може да има връзка с ПСОВ на Стара Загора
- Няма третиране на отпадната вода
- Отпадната вода се влива директно в реката
- Децата се възпитават в занижен естетически изисквания
- Намаляват възможностите на местните хора за приходи

- Има опасност от бактериално замърсяване
- Септичните ями преливат
- Отпадните води навлизат в подпочвените води
- Няма работеща концепция за управление на отпадната вода

- Повишена заболеваемост
- Грозни гледки
- Вероятно замърсяване на водните ресурси
- Няма управление на ресурсите

- Няма информираност за разпространението на отпадните води
- Няма политика базирана на управлението на ресурсите

- Бедност
- Повишена заболяваност
- Повишен здравен риск
- Няма управление на ресурсите

- Отблъсква туристи
- Децата се възпитават в занижен естетически изисквания
- Намаляват възможностите на местните хора за приходи

- Няма информираност за разпространението на отпадните води
- Няма управление на ресурсите

- Няма политика базирана на управлението на ресурсите
- Повишена заболеваемост
- Грозни гледки
Drinking water quality

- Authorized institutions
- Protection of microbiological pollution
- Protection of chemical pollution
- Protection of the water source
  - Sanitary zone
MANAGEMENT OF WASTEWATER

SWOT analyses:

- strengths
- weaknesses
- opportunities
- treats
STRENGTHS

- There is some sewer in the Spa for the large buildings and some of the residential houses
- All households have toilets
- Most of the households have soakaways and are making efforts to manage their wastewater
- All households are connected to centralized drinking water supply
- No epidemics of waterborne diseases
- People have reasonable hygienic habits (handwashing, etc.)
WEAKNESSES

- Not all people drop the used toilet paper in the toilet (need to handle it again)
- No one maintains, controls, manages the sewer in the Spa
- Pit latrines are not hygienic enough, groundwater pollution
- The price of soakaway emptying is high
- Soakaways often overflow
- Wastewater soaks into the soil and pollutes it
- There is no political will to solve the problem with the sewer
- Lack of company offering reasonable price to empty soakaways
- No measures to enforce legislation on wastewater management
- The quality of wastewater may differ a lot, no one controls it
- Lack of information for innovative and alternative sanitation technologies
OPPORTUNITIES

- There is a demand for improved sanitation - easier acceptability for ecosan
- There are lots of informal communication channels in the community
- Tourist interest – pay more attention to clean environment
- Wastewater is not heavily polluted with chemicals
- In the great majority of households in Sulitsa, there is not mixture of black and greywater
- MATRA offers the opportunity for awareness raising in parallel with demo infrastructure
- People are used to dry toilets
- There is a governmental program to support construction of composting toilets
- Local government shows good will to support ecosan
Low soil infiltration capacity

The Municipality is obliged to build the public sanitation systems but no finances have been raised for this at the moment.

No one pays for using the sewer, i.e. no funds to maintain, operate, renovate it.

No demand for chemical fertilizers (extensive or no agriculture; relatively rich in N and Ph soils).

Ageing population with relatively limited financial potential.

Blindly following of the traditional ways.
How does the project work?
Dialogue among partners

- Villagers;
- Local authority;
- Regional authorities;
- National authorities;
- Special approach to elder youth and women.
Special approach to youth and elder women

- **Specific role:**
  - Youth – open for innovations, adaptable, communicative;
  - Elder women (‘Granies’) – determine the family rules for child care, health risk perception, hygiene practices, maintenance of the household, etc.
Special approach to youth and elder women

- **Tools of involvement:**
  - Ladies’ Club ‘White Rose’ – elder women activists train the other village women; participation in seminars, trainings, summer school, working groups, events and activities;
  - Summer school for children – lectures, experiments, games, homeworks, exam, certificates... and along with these lots of learning-by-doing and dissemination of information
Pilot ecological sanitation systems - Sulitsa

- EcoSan system – Cultural house Probuda:
  - UDD toilet (2 units);
  - Waterless urinal (2 units);
  - Vertical planted filter for greywater (1 unit);
  - Faecal composting with other organic waste;
  - Re-use of treated greywater and EcoSan products.

- ЕкоSan система – домакинства (2 бр.):
  - UDD toilet (1 unit per household);
  - Waterless urinal (1 unit per household
  - Mulch filter for greywater (1 unit);
  - Faecal composting with other organic waste;
  - Re-use of treated greywater and EcoSan products.
Construction of UDD toilet
The UDD toilet from inside
Composting
Launching / inauguration
Before
Now
Before
Now
In the closest future
View from inside
Thank you for your attention!