Strategies for Sustainable Communal Waste-water Management in the Baltic Sea Region SUWMAB

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Plan of presentation

1.Introduction – about Tretment Wetlands Technology,

2.SUWMAB proposal

- problem discription,
-needs and targets,
- partners,
- action plans,
- results

3. Our experience

Treatment wetland

it is an engineered marsh system

a variety of biochemical and physical processes are incorporated leading to effective removal of even persistent pollutants

Properties and Advantages of TWs

- **resistant to changing hydraulic and pollutant loads**
- competitive costs compared to traditional solutions
- natural look for easy incorporation into a rural landscape
- **not arise secondary sludge**
- effective removal of suspended solids and organic matter
the possibility of removal of nutrients and refractive
- **easy operation and maintenance**
- during the summer time transpiration of water
4-8 mm H_2O / d

Wetland method can be applied for surface water protection:

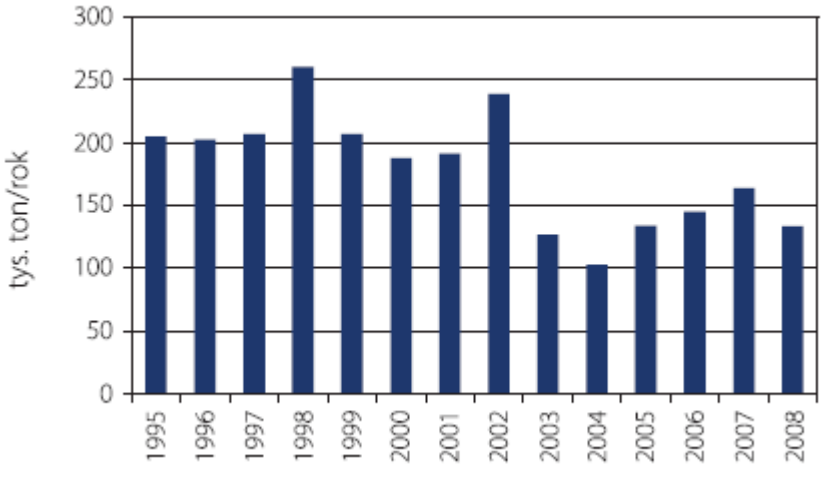
- wastewater treatment for settlements with less than 2000 pe and as single family TP
- polishing and restoration treatment of effluent form conventional WWTP
- storm water treatment
- landfill laeachet and liquor form digested sludge centrifugation in WWTP
- stabilization and dewatering of sewage sludge

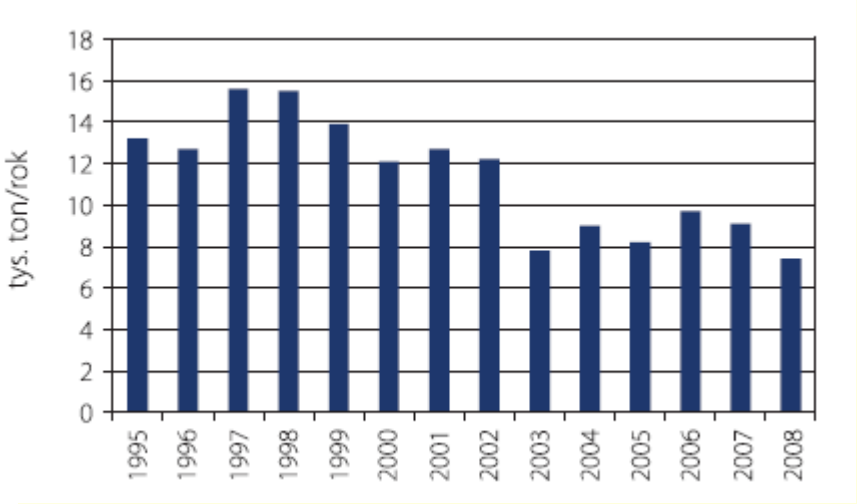
Problem identification and description

	Phosphorus (tonnes)	Nitrogen (tonnes)
Denmark	16	17,210
Estonia	220	900
Finland	150	1,200
Germany	240	5,620
Latvia	300	2,560
Lithuania	880	11,750
Poland	**8,760**	**62,400**
Russia	2,500	6,970
Sweden	290	20,780
Transboundary Common pool*	1,660	3,780

The action plan duly proposes provisional country-wise annual nutrient input reduction targets for both nitrogen and phosphorus

It is estimated that: 75% of N load and 95-99%% of P load is discharged to the Baltic Sea via rivers

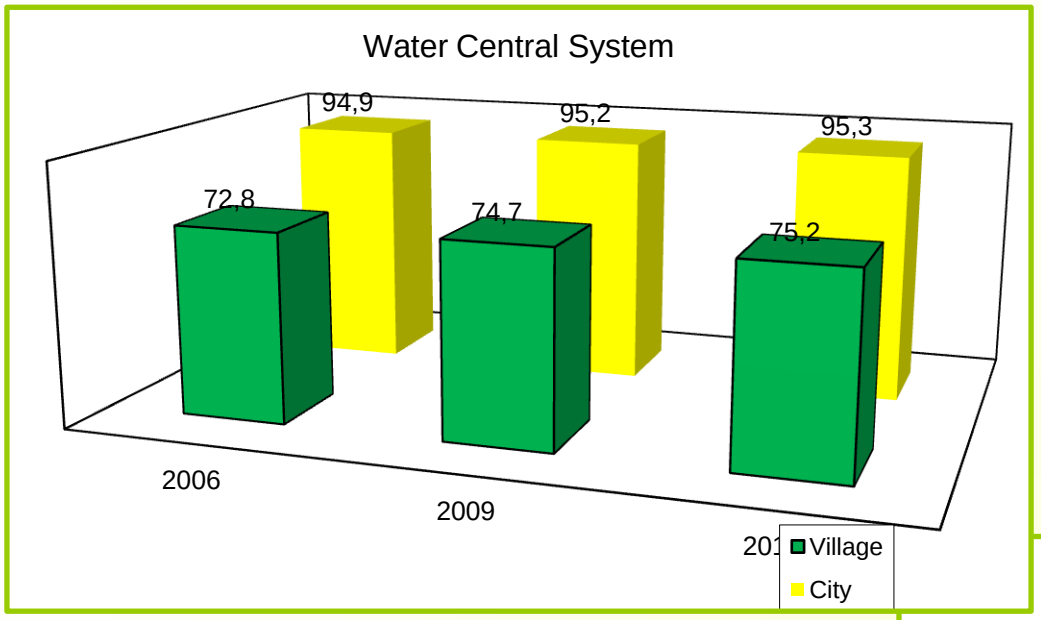


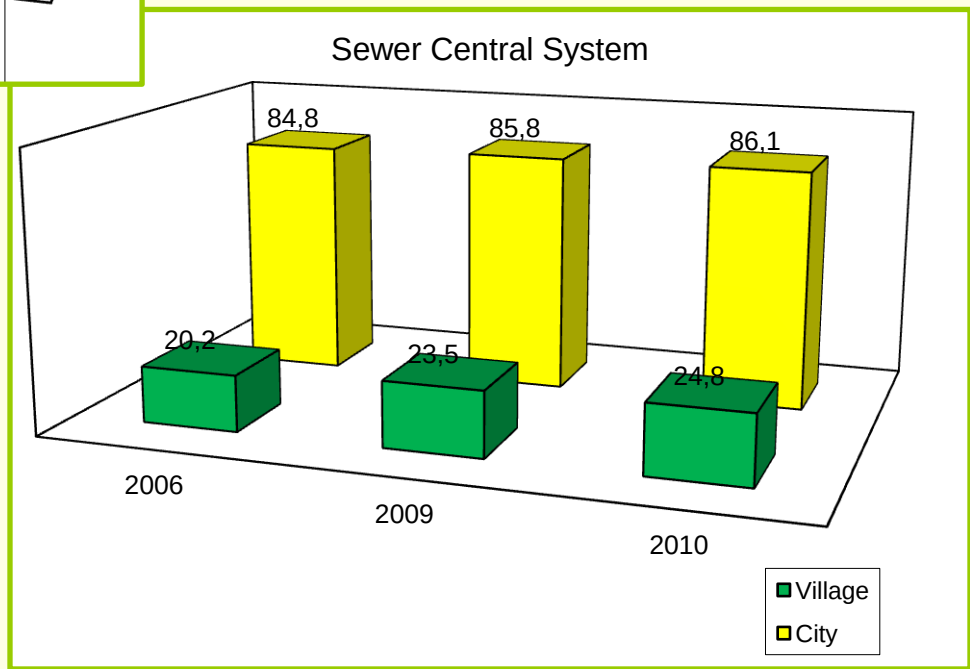


Loads of N and P discharged to Baltic Sea with rivers from Poland catchment's

Is still decreasing but …..

Problem with wastewater treatment in rural areas with scattered buildings





Threats

- Pollution of surface and groundwater with disordered wastewater management.
- Restrict access to clean water, which can cause epidemiological risks.
- Aggravated aesthetic and landscape areas attractive in terms of recreational and tourism to be reliable.

Is this problem important ?

Population (38 mln)	14,9 mln (30% populacji – 2010)
Farms	2278 tys. (2010)
Volume of wastwater	1,0 km^3/rok
Small WWTP*	**1,25 mln inhabitants. (. 8,4% of rural areas populations)**
Single family treatment plants	sum 51943
Forecast for 2015 year	**4 mln populations. (30% ludności wsi)**

* below 2000 pe

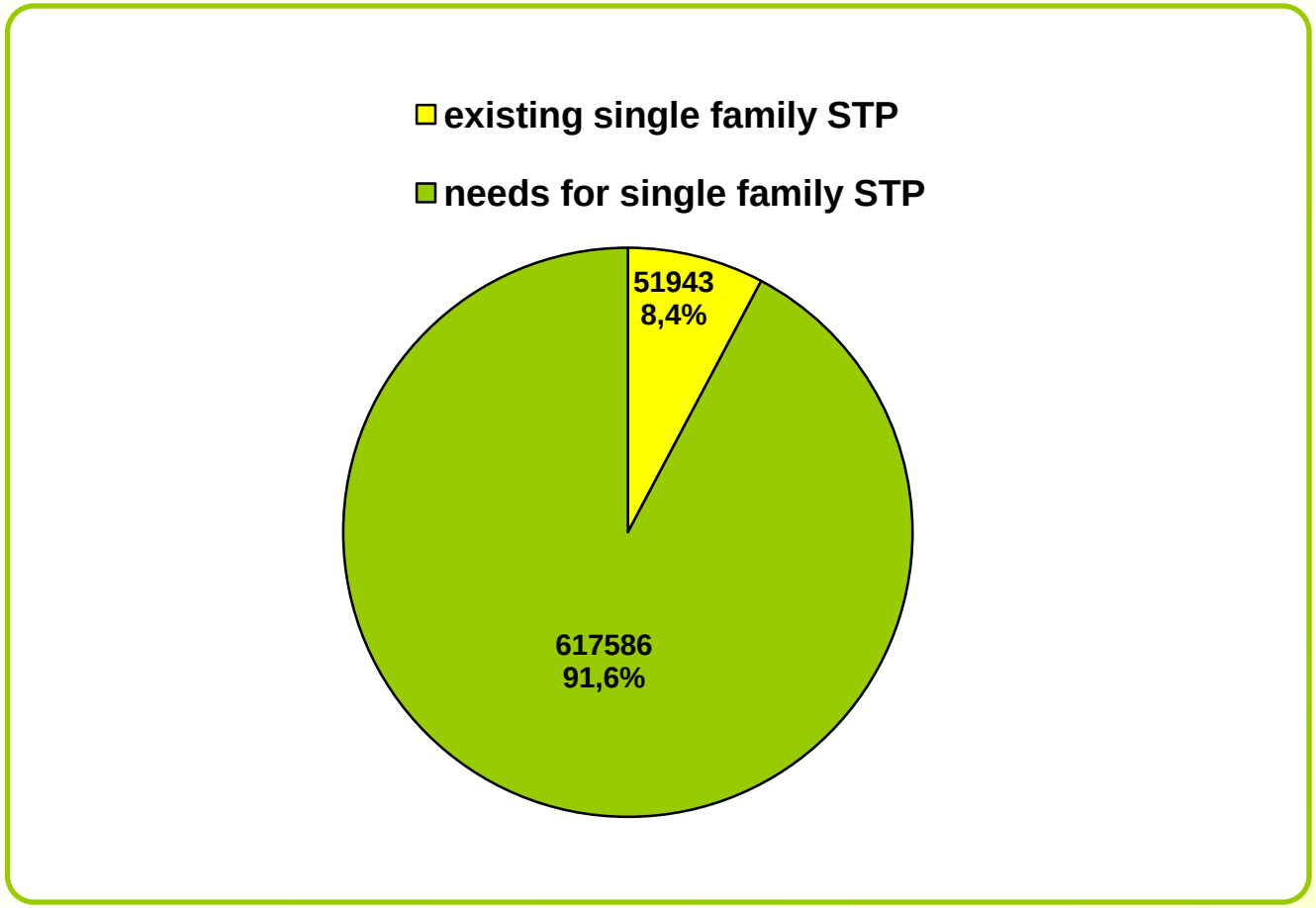
National Program for Municipal Wastewater Treatment does not apply to agglomerations with less than 2000 inhabitants. However, according to the data contained therein:

- 5.0 million people in our country use the vacuume truck,
- 3.85 million people have no access to any wastewater services,
- 5.5 million inhabitants is located outside of any Program

Currently household receiving funding from the EU under agri-environment programmes have to demonstrate the solved problem of wastewater management.

In many places, the only solution acceptable economically and environmentally safe is the use of single family treatment plants (SFTP).

There is an urgent need to build single family treatment plants



Achieving the correct quality of surface and groundwater in accordance with the requirements of the WFD 2000/60/EC will not be possible without the development of an integrated wastewater management in the areas of **scattered builddings**.

Our Target is

The aim of this SEED – SUWMAB project is to initiate a process by capacity building and knowledge transfer between a selected but diverse set of partners towards development of an integrated wastewater management to reduce the load of biogenic componds dischargerd from the Baltic Sea Chachment

PARTNERS

- **Gdańsk University of Technology**
- **Oulu University of Applied Sciences, School of Engineering, Finland**
- **Halmstad University, Wetland Center, Sweden**

Potential Partners:

•Institute of Oceanography Polish Academy of Science (IOPAS), Sopot, Poland.

•Coastal Research and Planning Institute, University of Kleipeda (CORPI), Lithuania;

•University of Tartu, Estonia,

SUWMAB Work Plan and Output

1. **State of play in the field addressed by the project including an overview of complementary projects**

   State of the art and Participation at branch events

   to gain knowledge and contact, new partners

2. **Plan for the main stage project containing Work plan, Composition of the partnership and Budget plan**

3. **Report on funding possibilities and steps to be taken after the seed money project is finalised**

4. **Pre-feasibility study- Pre-feasibilty study will be carried out in Poland in order to determine the costs, profits and other implications of pilot investments planned in the main project (communal eco-engineering measures)**

Outcomes of main project

- ready-to-implement eco-engineering solutions (turn-key engineering),
- established co-operation between experts and local authorities/municipalities,
- preparation of local waste-water strategies, management plans in the participating municipalities
- policy recommendations for national waste water treatment strategies (including EU BSR implementation strategies)
- raised awareness on the problems of water management in rural and suburban areas

Single Family Treatment Plant (SFTP)

natural methods

(high demand of area)

- ✓ drain system
- ✓ sand filter
- ✓ treatment wetland

intensive methods

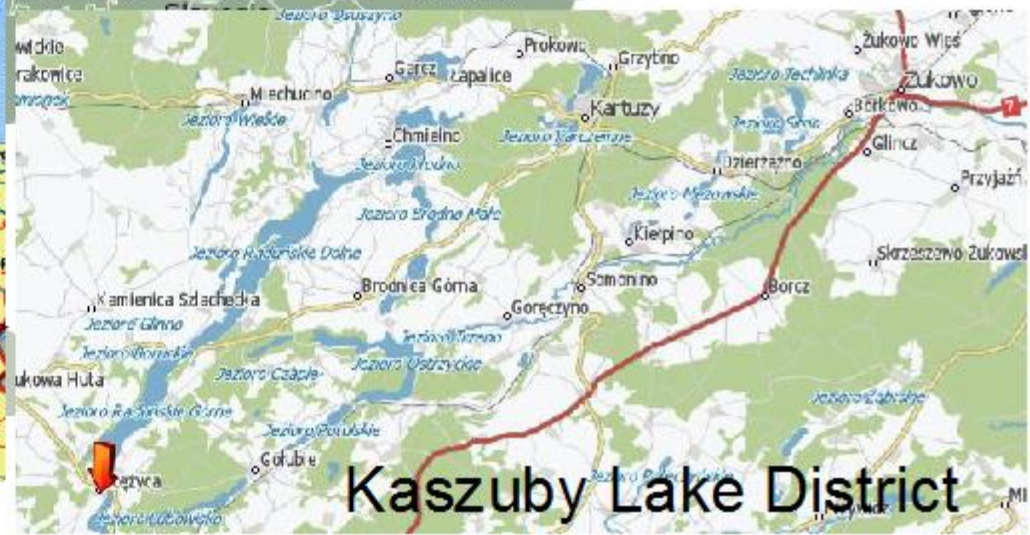
(low area demand)

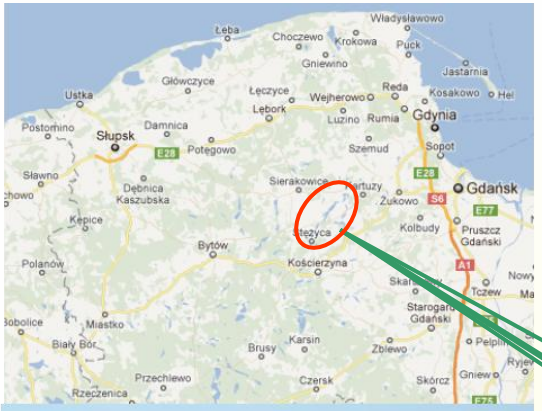
- ✓ bio filter
- ✓ activated sludge

Why we?

- **As part of the project "Innovative solution for wastewater management in rural areas" NORWET (co-financed by the Ministry of Science and Higher Education No. E033/P01/2008/02 and the EEA Financial Mechanism and the Norwegian Financial Mechanism No. PL0271) team of Department of Water and Wastewater Technology and the Department of Sanitary Engineering Gdansk University of Technology has developed a concept and implemented a model of waste water and sludge for the individual household in the community Stężyca. Stężyca municipality is located in the central part of Pomerania, in the district of Carthusian, it is home to nine thousand. people.**

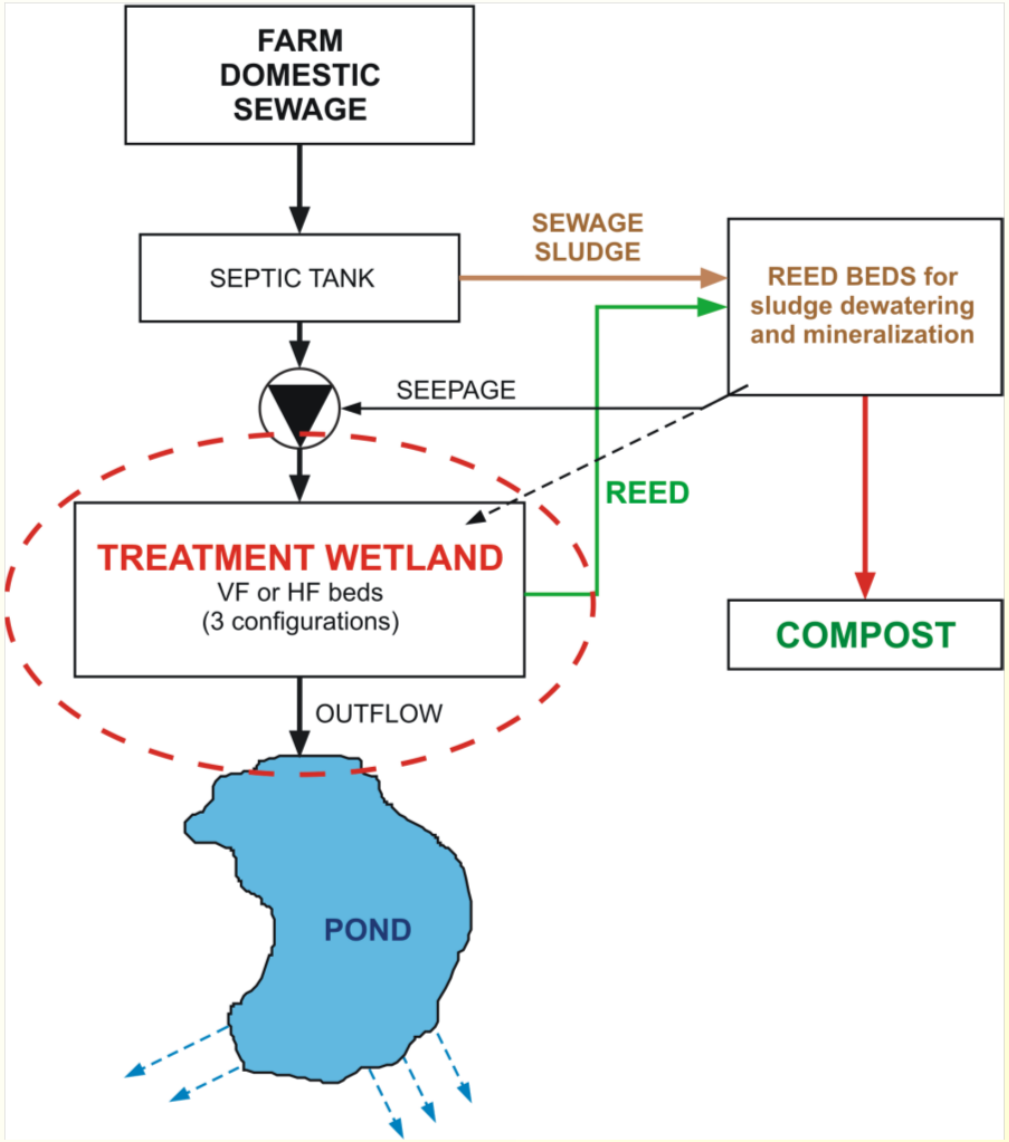
LOCALIZATION





Localization of SF TW in community Stężyca

Conception of the complete sewage-sludge management system for an individual farm



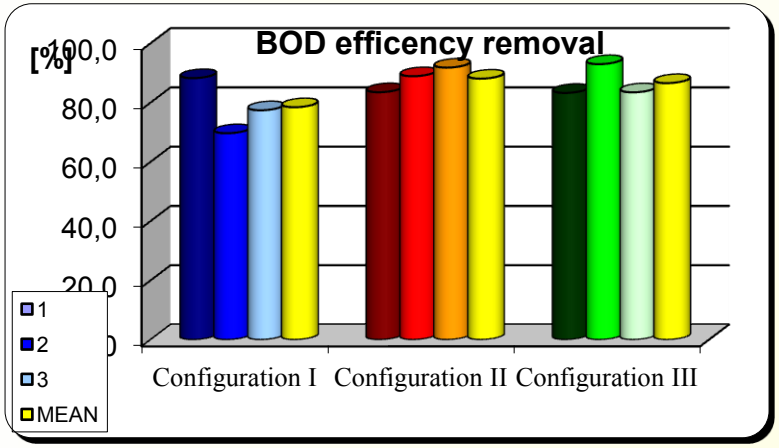
Proposed conception:

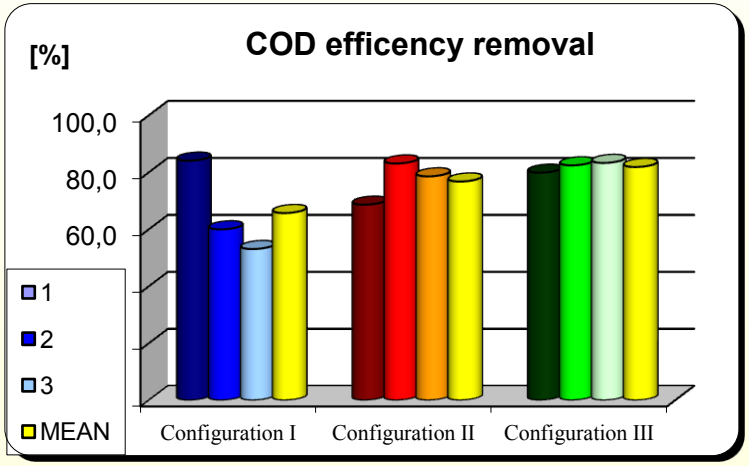
i. Do not need special permission due to the quantity of sewage is less than $5m^3$ /day (declaration in the district administration)

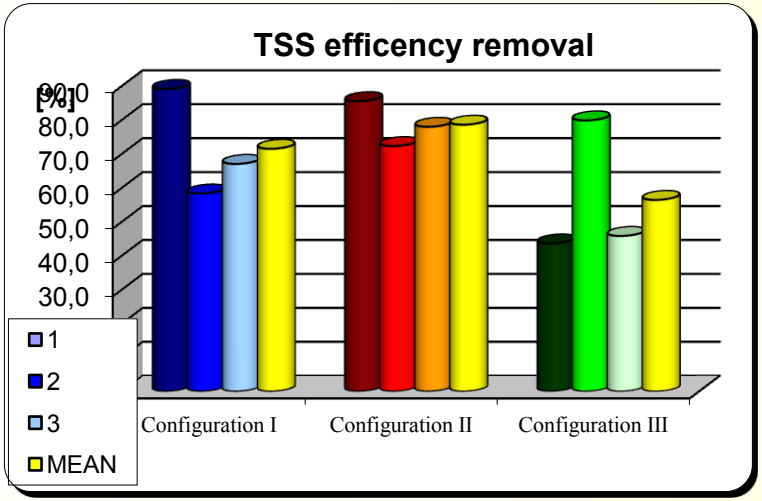
ii. Is well agreed with Polish Low – (pos 42) to protect the water body advice reuse of treated wastewater

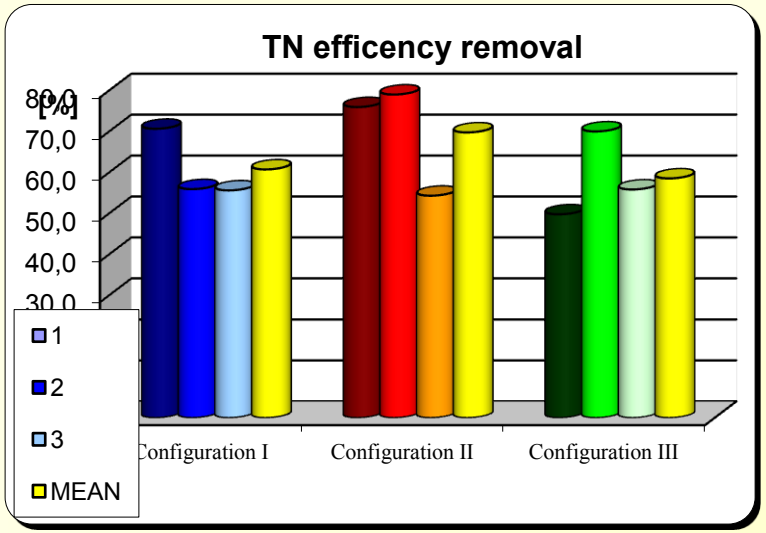
iii. Ensure close the cycle of organic substances and water in single household – catchment area

TREATMENT EFFIENCY 2009- 2013







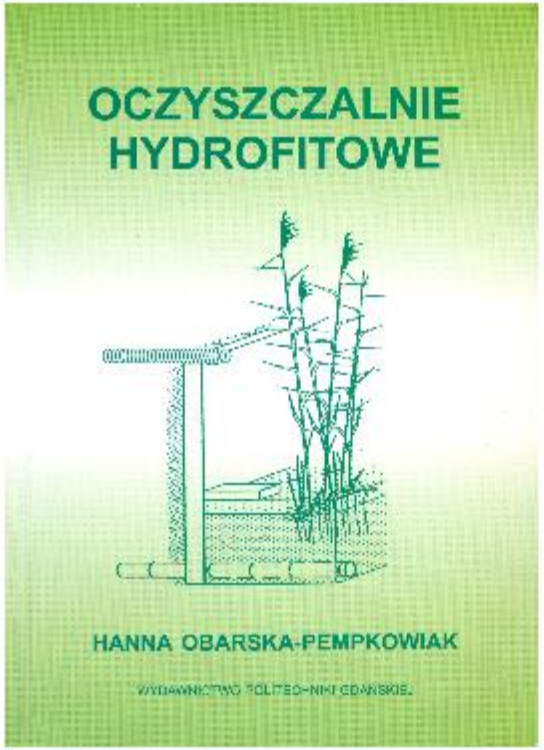


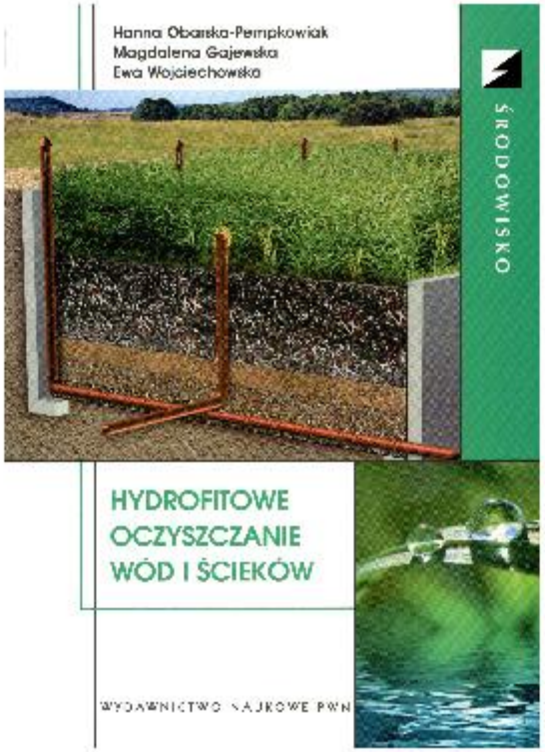
PROJECTS

8 projects financed by Polish State Committee for Scientific Research:

Norwegian Financial Mechanism and EEA Poland
"Innovative solution for wastewater management in rural areas (NORWET)"
and
"**New Methods of emission reduction of selected pollutants and application of by-products from sewage treatment plants“.**

research grant co-financed by EU Structural Funds in Poland - **„Innovative recourses and effective methods of safety improvement and durability of buildings and transport infrastructure in the sustainable development**” financed by the European Union from the European Fund of Regional Development based on the Operational Program of the Innovative Economy – still running up to 2013.


OCZYSZCZALNIE
HYDROFITOWE
HANNA OBARSKA-PEMPKOWIAK
WYDAWNICTWO POLITECHNIKI GDAŃSKIEJ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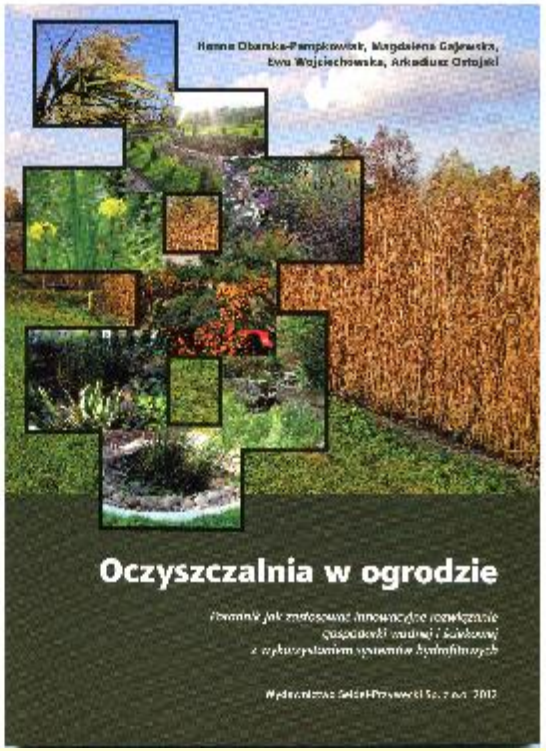
WYDAWNICTWO NAUKOWE PWN

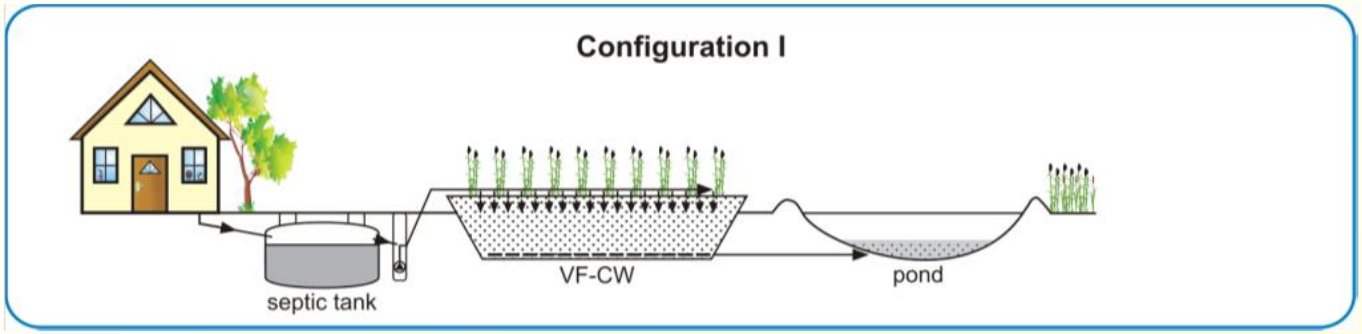

Hanna Obarska-Pempkowiak, Magdalena Gajewska,
Ewa Wojciechowska, Arkadiusz Ortajski
Oczyszczalnia w ogrodzie

Team distinction for development of an innovative technical solution entitled ’Implementation and Promotion of Ecological Engineering Basing on Sewage Treatment Plants’ In the competition for Master of Technology in academic year 2011/2012.

THANK YOU

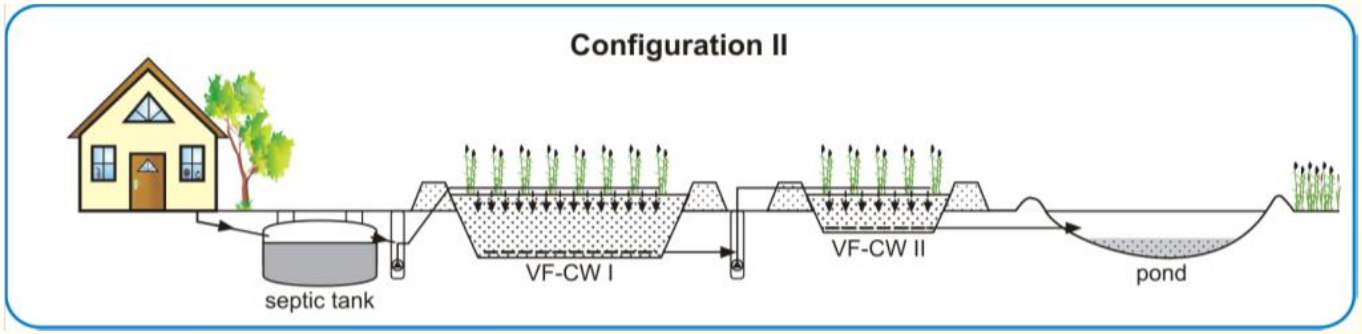
SEWAGE GARDEN Sokoły north-eastern Poland :

Przydomowe oczyszczalnie ścieków w gminie Stężyca



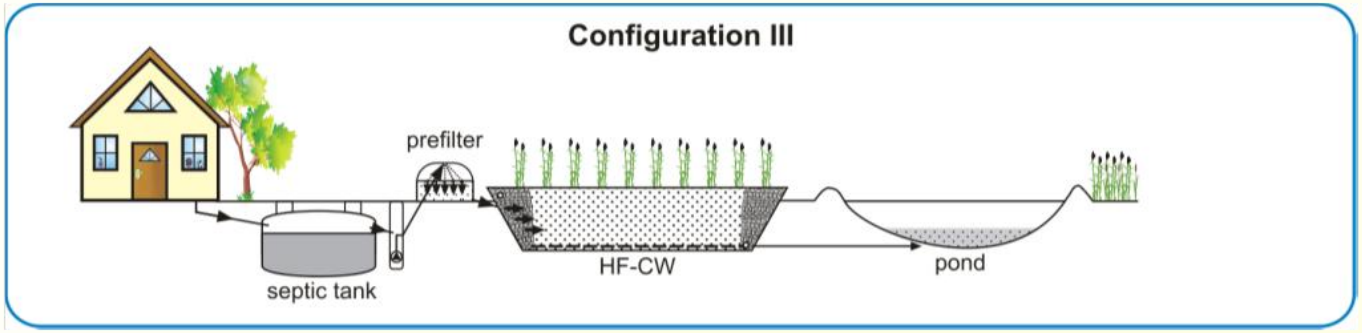
VF-CW

pond



VF-CW I and VF-CW II

pond



prefilter