

COMPARISON BETWEEN TWO CONSTRUCTED WETLAND MODELS : GERMANY VS MEXICO

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INTRODUCTION

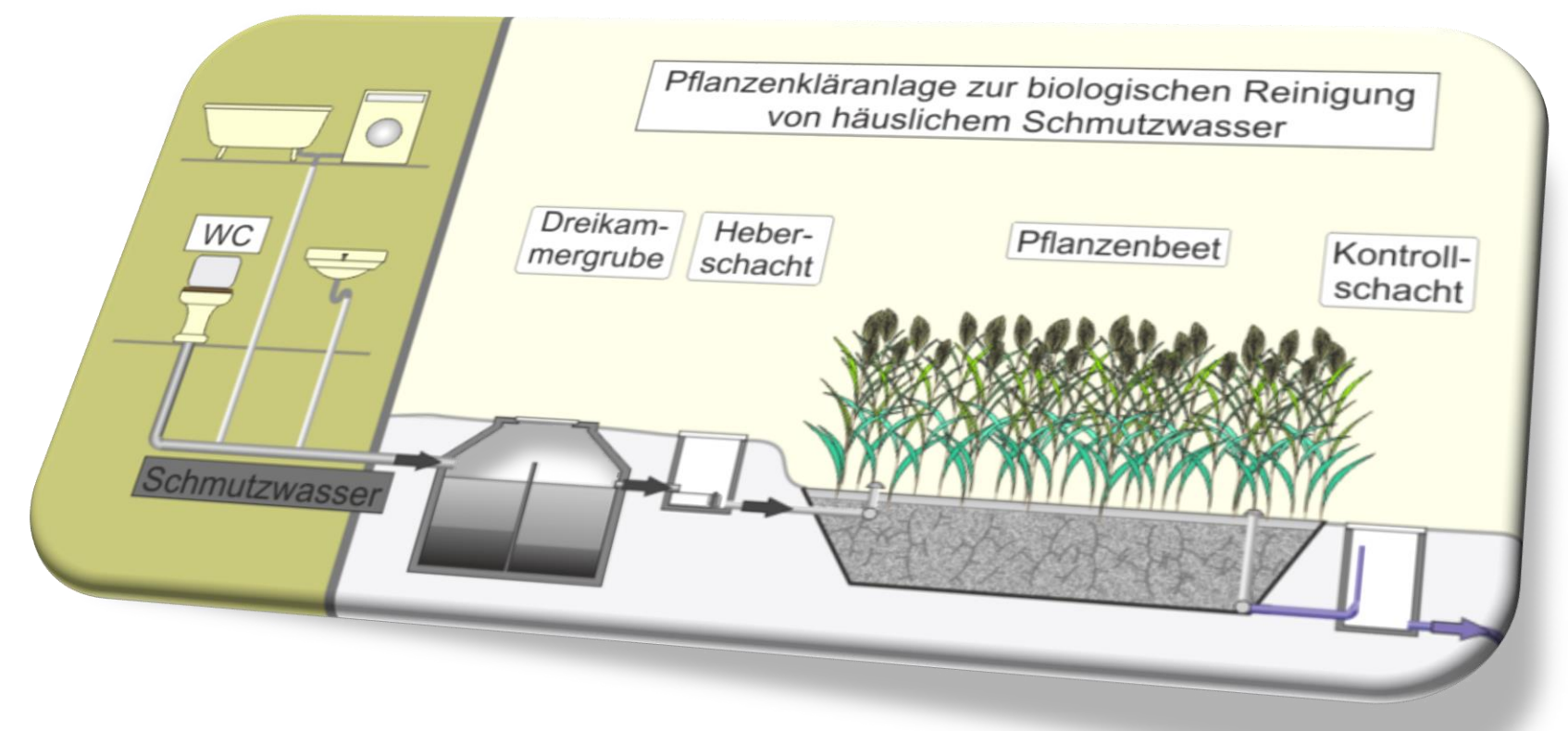
Constructed wetlands are engineered wetlands that mimic the simultaneous physical, chemical, and biological processes occurring in natural wetlands for wastewater treatment purposes using vegetation, soils, and their associated microbial assemblages.

Worms' constructed wetland in Germany

A constructed wetland was built in the Worms park in order to pre-treat domestic wastewater before transferring it to the wastewater treatment plant.

The system is a horizontal subsurface flow where wastewater get stored first on a multi-chamber pit then pumped beneath a bed of media (gravel, soil & sand) where emergent plants are planted, the wastewater is then flowing through the roots and rhizomes of the plants where different reaction occurs leading to a treated water.

Some on site analysis have been carried out at the inlet and outlet of the wetland, the results showed that the quality of water has been improved mainly turbidity has decreased from 190 NTU to 70 NTU only, Dissolved oxygen increased from 0,24 mg/l to 0,4 mg/l due to the oxygen release from the plants during photosynthesis. The plants use nitrogen for their growth as nutrient leading to a Nitrate decrease from 1,16 mg/l to 1 mg/l



Constructed wetlands worms														
Locations	Temp (C°)	pH	Conductivity (µS/cm)	DO (mg/l)	TDS (ppm)	Turbidity (NTU)	Hardness (mg/l)	Alkalinity (mg/l)	Chromium (mg/l)	Free Chloride (mg/l)	Nitrate (mg/l)	Sulphate (mg/l)	Chromium (mg/l)	Lead (mg/l)
inlet of the constructed wetland	26,6	7,8	240	0,24	1,7	190	125	120	10	3	1,16	127	0,044	0,23
outlet of the constructed wetland	24,2	7,2	240	0,4	1,8	70	250	40	BDL	0,5	1	110	0,018	out of range

Atequizayan's constructed wetland in Guadalajara Mexico

A small wastewater treatment plant for an estimated 800 inhabitant has implemented an artificial wetland as a tertiary treatment phase after sedimentation and anaerobic digestion stages. The media of the wetland is formed from "Tezontle" volcanic rocks that serve as natural filters and also soil for the "Canan indica" plants that work as absorbers of phosphorus, nitrogen and heavy metals in the water.

The results of the analysis shows that the water quality has improved with a significant decrease in conductivity from 1068 µS/cm, which is considered very high as a consequence of the industrial effluent discharge, to 987 µS/cm due to the removal of dissolved salts and solids shown also as Total dissolved solids that decreased from 544 ppm to 534 ppm

Constructed wetlands Mexico							
Locations	Temp (C°)	pH	Conductivity (µS/cm)	DO (mg/l)	TDS (ppm)	Hardness (mg/l)	Alkalinity (mg/l)
inlet of the constructed wetland	22,5	6,87	1068	0,24	544	125	120
outlet of the constructed wetland	22	7,39	987	0,4	534	50	120



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