



WHAT

Closing water loop in a student house

The global concept around the TDC/SWM-House (Technical Demonstration Center / Sustainable Water Management House) is local water management with the integration of unconventional water as resource and multi-use adapted solutions for zero discharge. The TDC scheme is divided into three lines of treatment relating to grey water, black water and rain water and three objectives of re-use for toilet flushing, landscaping and showering, respectively. Technologies to be established are membrane bioreactor (MBR), sequencing batch reactor (SBR) and Constructed Wetlands. Research studies are conducted by ZerO-M partners to optimise and evaluate the performances of these technologies with respect to grey or black water.

DOMESTIC/URBAN FIELD

SAVE WATER TREAT WATER
GREY WATER BLACK WATER
CLOSING WATER LOOP
RAIN WATER IRRIGATION
ZERO DISCHARGE REUSE MULTI-USE



HOW

Grey Water: the grey water is first introduced from a manhole to a tank serving as storage and homogenising unit. Coarse and fine particles are removed by screens placed in the manhole and the holding tank. Two technologies of treatment are selected, MBR and SBR.

The principle of the SBR is a biological treatment in a compact reactor with different sequences (example: aerobic/anoxic/settlement)

media link



more info



project

of which the order, the number and the duration are variable and have to be optimised according to the nature of the effluent. The disinfection of treated water is ensured by UV lamps.

Black water: the black water is introduced to a storage tank and then 1m³/day is treated in three septic chamber tanks followed by horizontal subsurface flow (HSSF) and vertical subsurface flow (VSSF) constructed wetlands. The treated water is stored in a tank for green area irrigation.

Rain water: the rainwater is collected from the roof of the student house building in a storage tank (14 m³) after screening. The outflow of the storage tank discharges into the sand bed for rainwater infiltration. The pumped water is filtered with a sand filter and heated using solar energy before being recycled to supply one shower. Sludge produced by the TDC is treated in a planted composting bed.

