



ZER0-M

Sustainable Concepts Towards A Zero Outflow Municipality

www.zer0-m.org

A project under the
EURO-MEDITERRANEAN PARTNERSHIP

Euro-Mediterranean Regional Programme For Local Water Management

Zer0-M aims at concepts and technologies to achieve optimised close-loop usage of all water flows in small municipalities or settlements (e.g. tourism facilities) not connected to a central wastewater treatment - the Zero Outflow Municipality (Zer0-M).

Open letter to Johannesburg Summit

February 2002 Division for Sustainable Development, United Nations

Presented for the PREPCOM 2, 28 January - 8 February 2002, New York, USA

By Fax to: 1-917-367 2341 and to all delegates, observers, NGOs and journalists *(please distribute further to support this initiative)*

Sustainable Sanitation is a key to Sustainable Development!

Sustainable sanitation is designed for low water consumption (demand side management) and aims for full reuse of water and fertiliser

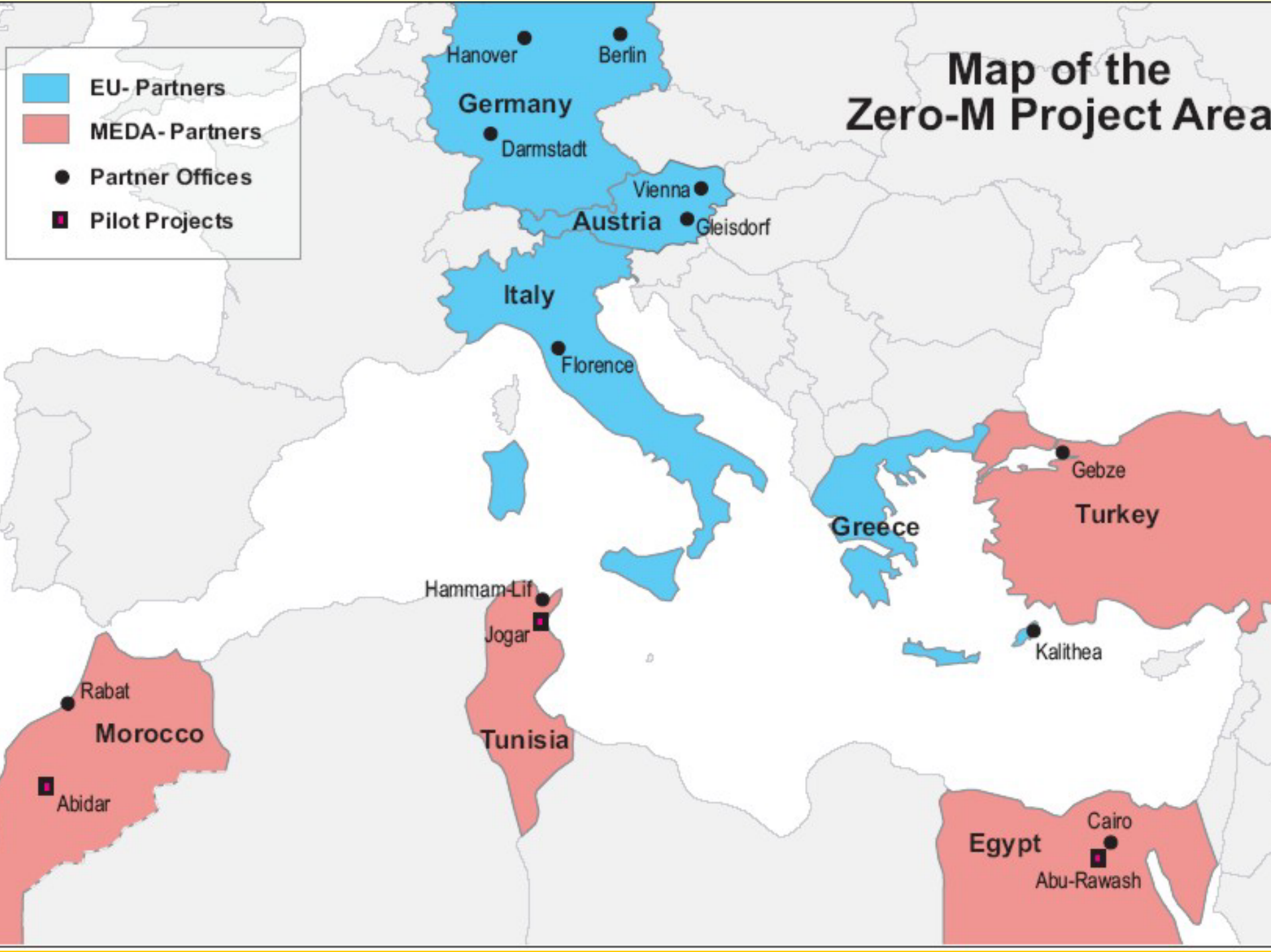
Sustainable sanitation is often based on source control of faecal matter **to secure highest hygienic standards** and keep it apart from freshwater

Sustainable sanitation is adaptable to the socio-economic conditions through the use of high- to low-tech technologies

Sustainable sanitation **allows economic water reuse** by separate collection and treatment of greywater, the fraction of wastewater not polluted with faecal matter

Sustainable sanitation is often decentralised and is capable to **provide high performance at low costs** – user involvement and proper maintenance is a key to success

Map of the Zero-M Project Area



1. Tübitak-Marmara Research Center (MRC-ESERI)
2. Water Research & Pollution Control Department, National Research Centre, Dokki, Cairo, Egypt (NRC)
3. Institut National de Recherche Scientifique et Technique, Laboratoire Eau et Environnement (LEE)
4. Institut Agronomique et Vétérinaire Hassan II, Wastewater Treatment and Reuse Unit (WTRU)

1. Arbeitsgemeinschaft ERNEUERBARE ENERGIE, Institute for Sustainable Technologies (AEE INTEC)
2. Associazione Ambiente e Lavoro Toscana – O.N.L.U.S. (ALT)
3. "Kallithea - Rhodes Sustainability" Municipal non profit Co. (Rhodes)
4. Department of Geography and Regional Research, University of Vienna (IGR)
5. TU Berlin, Zentraleinrichtung Kooperation and Fakultät III, Fachgebiet Verfahrenstechnik I (TUB)
6. Universität Hannover, Zentrale Einrichtung für Weiterbildung (weiterBILDUNG)
7. Fachvereinigung Betriebs- und Regenwassernutzung e.V. (fbr)

- Know-how exchange – Conferences, website, journal
- Know-how transfer – training of water experts in sustainable sanitation
- Demonstration – implementation of small scale and real scale examples, what we call TDCs and pilot plants
- Virtual studies – development of advanced examples of sustainable sanitation based on the pilot plants leading to a planning tool
- Awareness – production of a DVD on sustainable sanitation

Demonstration plant realization at 4 TDCs
Operation and monitoring
Real scale plant realization in 3 settlements

Ahmet Baban
TUBITAK - MRC

Demonstration plants realisation

4 SWM Demonstration plants in MCP

- **Municipality of Zenein, South Cairo, near to NRC (Cairo/Egypt),**
- **IAV (Rabat/Morocco)**
- **INRST (Hammam Lif/Tunisia),**
- **MRC (Gebze/Turkey)**

of TDCs is demonstration of new practices, the use in training, seminars and workshops, test public acceptance and,

- **replication (real scale implementation, case studies, economic assessments)**
- **extention (tourism, adaptation for Mediterranean cond., market for ww technologies)**
- **dissemination (publication, internet homepage, cooperation with bodies, health organizations)**

- **SWM examples cover a range of measures as wide as possible**
- **spanning from water saving to ww recycling**
- **not all examples realised at every TDC**
- **intended to design and implement most comprehensive sets for TDCs**

- **water metering,**
- **water saving taps with aerators, flow regulators and long life tap seals,**
- **shower heads with flow regulators and flow control discs,**
- **toilet cisterns: dual flush and stop button toilet cisterns,**
- **hydraulically optimised toilet seats (availability of optimised squatting seats yet to be checked),**
- **compost toilets, other water saving appliances**

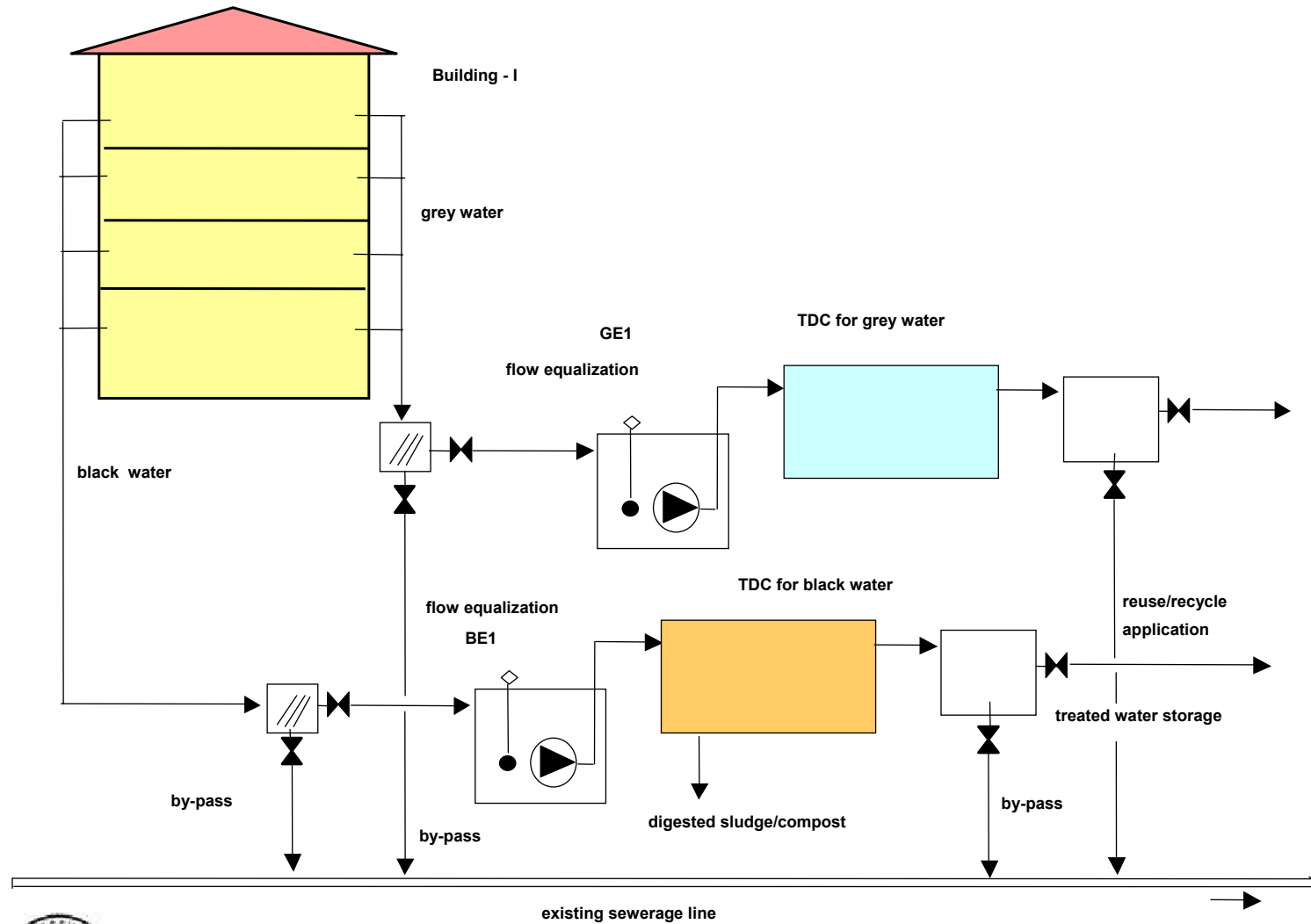
into components

- **grey water**
- **black water or**
- **dry night soil and**
- **urine**

with treatment processes, including low cost technologies, e.g.

- **constructed wetlands,**
- **anaerobic digestion**
- **biomembrane treatment**
- **SBR type biological reactors**
- **waste stabilisation ponds**
- **composting of sludge and night soil**

- **reuse of treated wastewater for minor domestic purposes as flushing, garden watering but also crop irrigation, landscaping**
- **reuse of nutrients in agriculture and gardening**
- **in addition to that, rain water harvesting and reuse options will be tried in TDCs**



- **enhance institutional capacity of MPCs by innovative technologies**
- **public acceptance for reuse/recycle concept**
- **involvement of the media accelerate environmental awareness and acceptance**
- **as accepted helps reduce water usage, cost of water / treatment, economic benefit**
- **positive effect on agriculture, landscape irrigation**
- **protection/conservation of natural resources**
- **economically and environmentally sound achievements for tourist areas resulting sustainability for MPC**

- **exchange of information / knowhow, transfer of technology**
- **problems for full scale detected and solved in TDCs**
- **technological developments or modifications to adapt local Mediterranean conditions**
- **training and optimum design results in risk reduction, maintenance of hygienic conditions**
- **integrated management attained by using results**

3 real scale pilot plants

- **Herghada, Suburb of Cairo, Egypt (tourism area, Red Sea coast, 300 m³/day, water saving & MBR is preferred because of land limitations)**
- **Jogar, Tunisia (110 house, 700 inhabitants rural town, raw ww currently discharged to land for irrigation)**
- **Abidar, Morocco (small peri-urban settlement, 3000 pe, no possibility for connection to sewerage system, high rate pond preferred)**

1st International Zer0-M Conference

Sustainable Concepts Towards a Zero Outflow Municipality

organized by
TUBITAK-Marmara Research Center

15-16 March 2005
Istanbul, TURKEY

SWM topics

- Water Efficiency And Reuse
- Rainwater Harvesting And Use
- Use Of Different Water Qualities In Buildings
- Low consumption Sanitary Facilities
- Grey Water Treatment
- Biological Grey Water Treatment,
- Membrane Bioreactors,
- Constructed Wetlands
- Life Cycle Assessment Of Environment And Health Aspects of SWM Components

Specifically designed for

- Municipalities,
- Tourism sector
- Environmental NGOs,
- Non-profit professional organisations
- Research Institutions
- Lawmakers, Regulators and Public Officials
- Educators and Academicians
- Water&Wastewater Treatment Technology Manufacturers

Rate of connection to sewer networks

70 % large cities

45 % in small centers

Wastewater disposal 750 Mm³ by 2015

Small communities (12.2 millions)

centers of 5,000 to 20,000 (18%)

centers of 200 to 5,000 (82%)

26 Mm³/year Wastewater

Drinking water provision in rural villages

14% (1994) to 39% in 2001.

4.35 billions Euro

1990 —————→ 2020

145 millions Euro /year

By comparison we spent for drinking water

1.82 billions Euro

1968 —————→ 1994

70 millions Euro /year

The Key elements are

the cost of the Project
the choice of the technology

On the sewerage side

On the treatment side

Cost of a treatment plant (WSP)

15 to 20.000 inhabitant
1.5 to 2.0 Million Euro

A loan of

30%
80%

0.5 Million
1.4 Million

Donors
FEC









THANK YOU