

Engineers Without Borders UK

Ruth Manning

13th November 2009

Background to Engineers Without Borders (EWB) UK

My involvement with the organisation

Summer Placement

Research Project

Engineers Without Borders Cardiff

Education

Placements

Outreach

Bursaries



Training

Research

EWB Branches



Aberdeen Bath Birmingham Brighton Bristol

Cambridge Cardiff City University Coventry Cranfield

Durham Edinburgh Exeter Glasgow Heriot Watt

Imperial Kings College London Leeds Liverpool

Manchester Napier Nottingham Oxford Plymouth

Sheffield South Bank Southampton Strathclyde

Sussex Swansea University College London Warwick

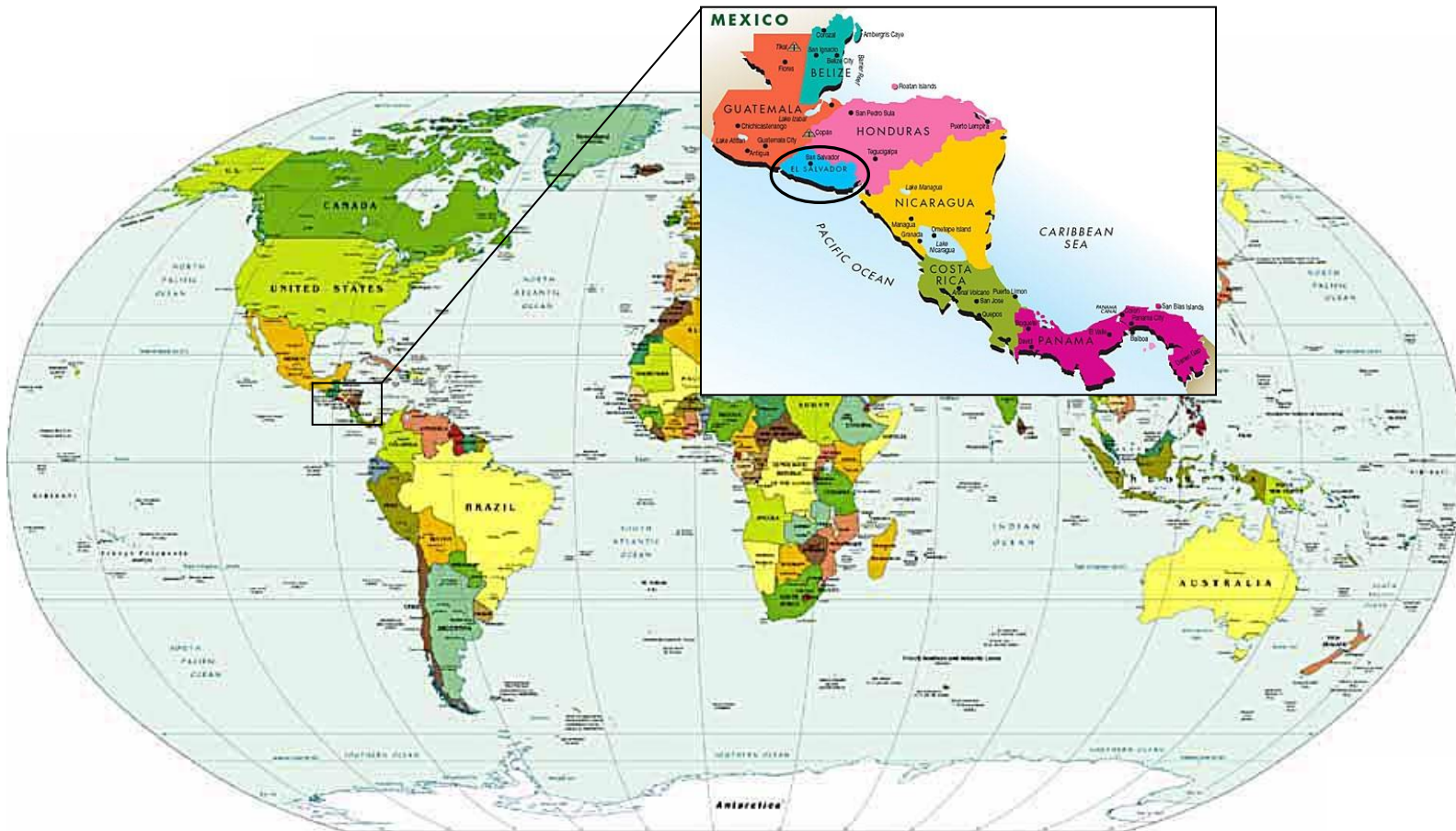
My Involvement with EWB



A Sanitation Project in El Salvador

June – September 2007

A Sanitation Project in El Salvador



Salvadoran Foundation for
Reconstruction and Development





Existing Problems

Lack of toilet facilities

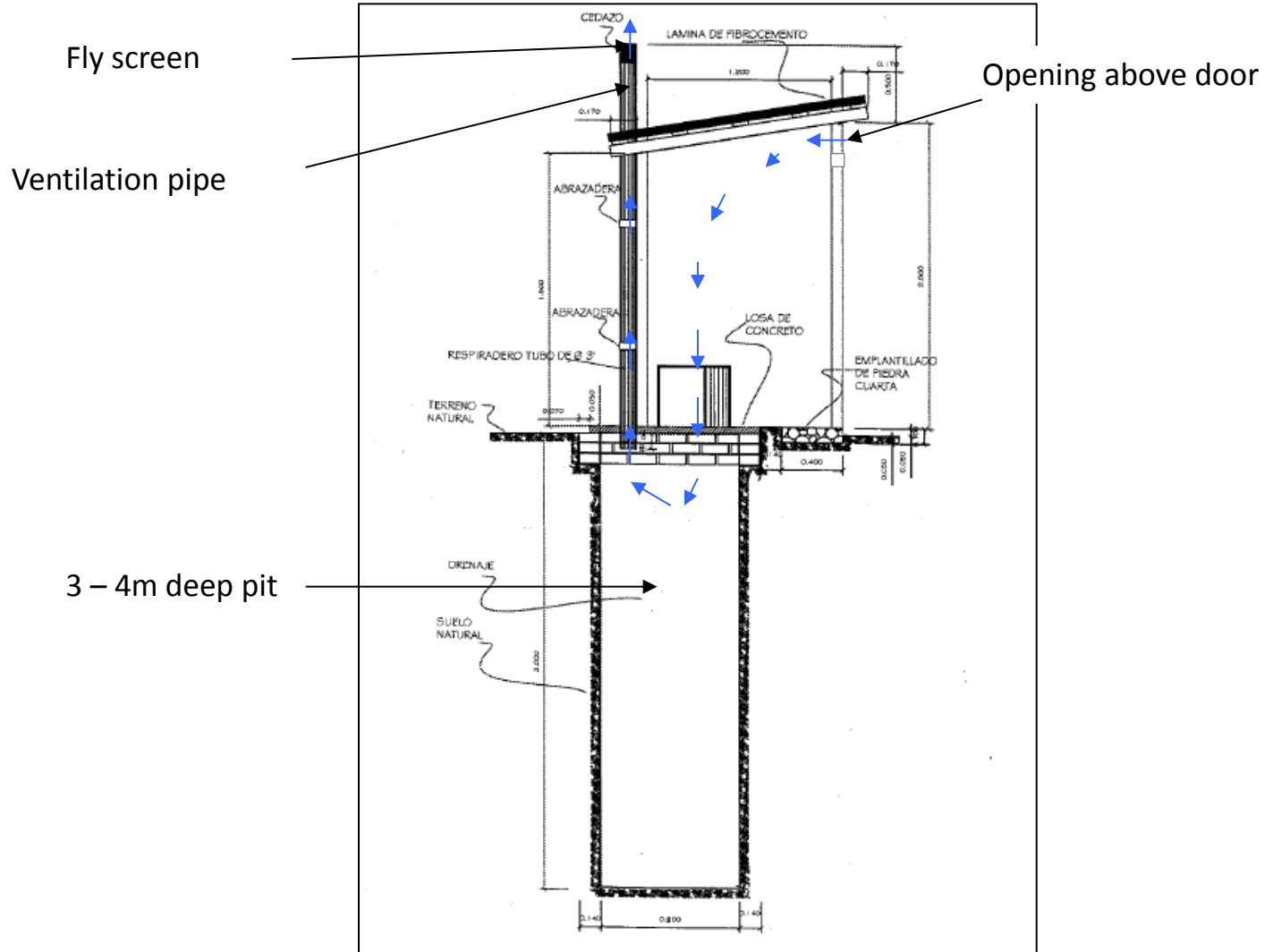


Grey water

- breeding ground for mosquitoes
- contaminates water course
- polluting crèche

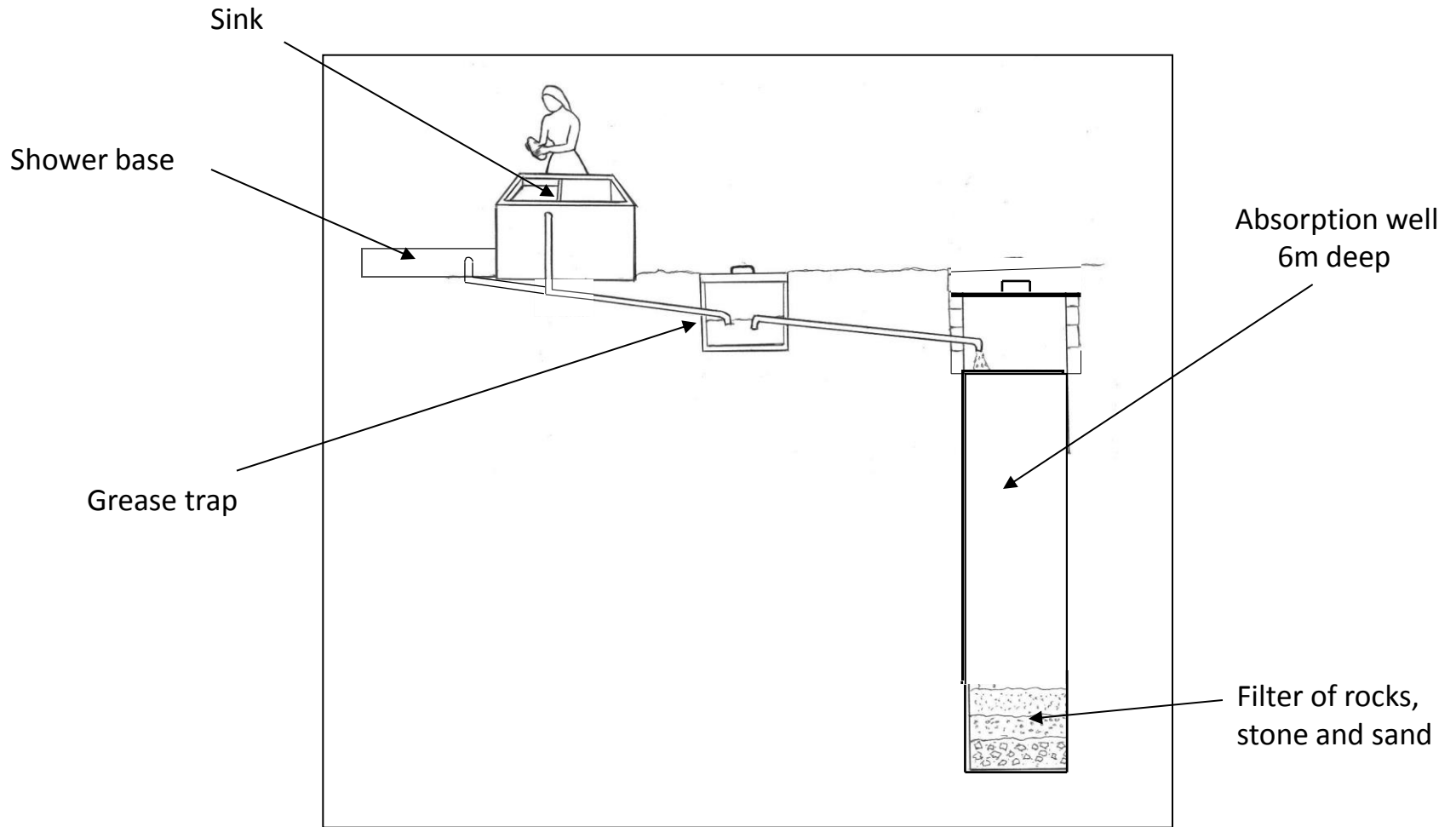


Ventilated Improved Pit (VIP) Latrine



(REDES)

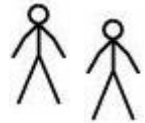
Grey Water System



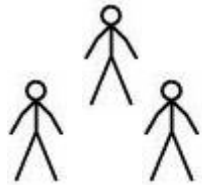
Beneficiary Selection



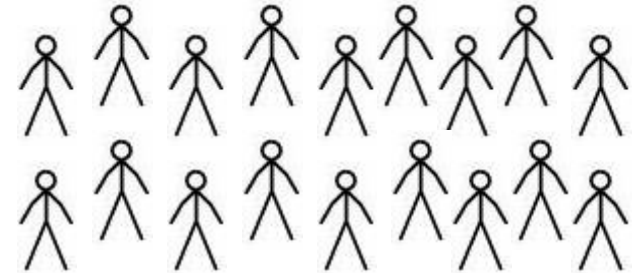
Stakeholders



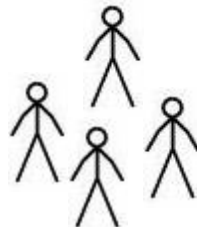
REDES Staff



EWB Volunteers



Beneficiaries



Local Builders





PLAN DE ACCIÓN BASURA

- FELLENO
- ORDENAR EL ENTORNO Y LIMPIAR
- RECLUTAR
- TENDR DE MORA
- EDUCACIÓN (ESCALAR)
- REDUCIR CANTIDAD
- ORGANIZARSE GRUPO DE COMARCAS
- PROMOVER
- BRINDAR EL SERVICIO DE TENDR DE MORA
- SER MUYO CERCADO A LOS GRUPOS DE COMARCAS

Más que 1.000.000 Años

12-40 Años

10-20 Años

Nunca

2-4 Semanas

45 Años







EWB Research Project

June 2008 – March 2009



Wetlands for Wastewater Treatment in the Altiplano, Bolivia

www.ewb-uk.org/programmes/research





WETLANDS FOR WASTEWATER TREATMENT IN BOLIVIA

Ruth Manning



Project Brief

To write a design code for the design, construction, operation and maintenance of a sub-surface flow constructed wetland suitable for the Altiplano region of Bolivia.

Requirements:

- Low cost of construction, operation and maintenance
- Simple to construct, operate and maintain

The Altiplano

Landscape: The Altiplano is a flat region high in the Andes with a barren and windswept landscape

Altitude: 3800m above sea level

Climate: Average of -6°C in winter, 17°C in summer

Wastewater Treatment in Bolivia

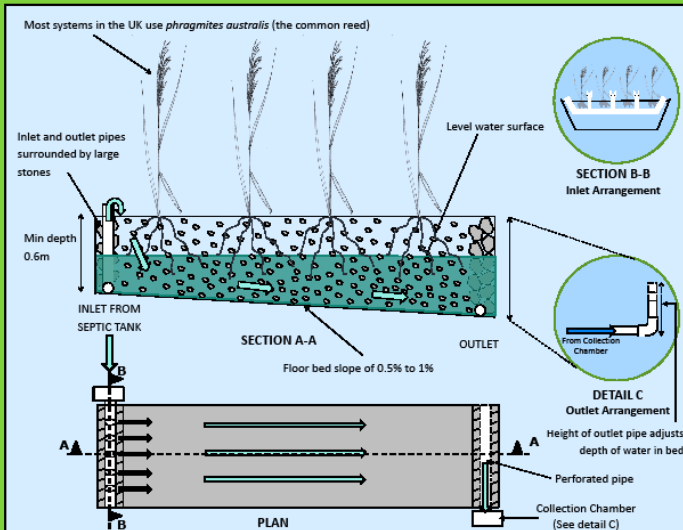
Current situation: Wastewater treatment is virtually non-existent on the Altiplano.

Standards: Treatment in Bolivia is at an infant stage with the current focus on the removal of organic matter rather than ammonia or phosphorus removal.

Potential solutions: Waste Stabilisation Ponds (WSP) are a good low cost, simple form of wastewater treatment where wastewater is treated entirely by natural processes involving algae and bacteria. However, WSP are not well suited to the harsh climatic conditions of the Altiplano. This project aims to determine the suitability of sub-surface constructed wetlands as a wastewater treatment option for the area.



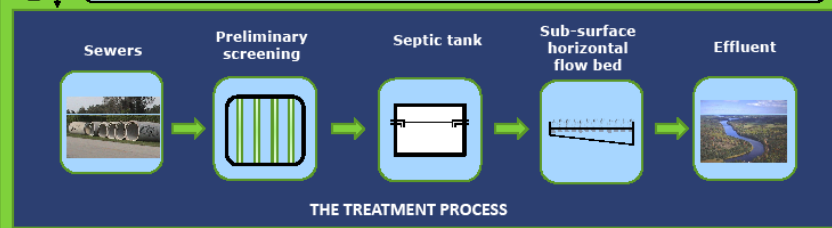
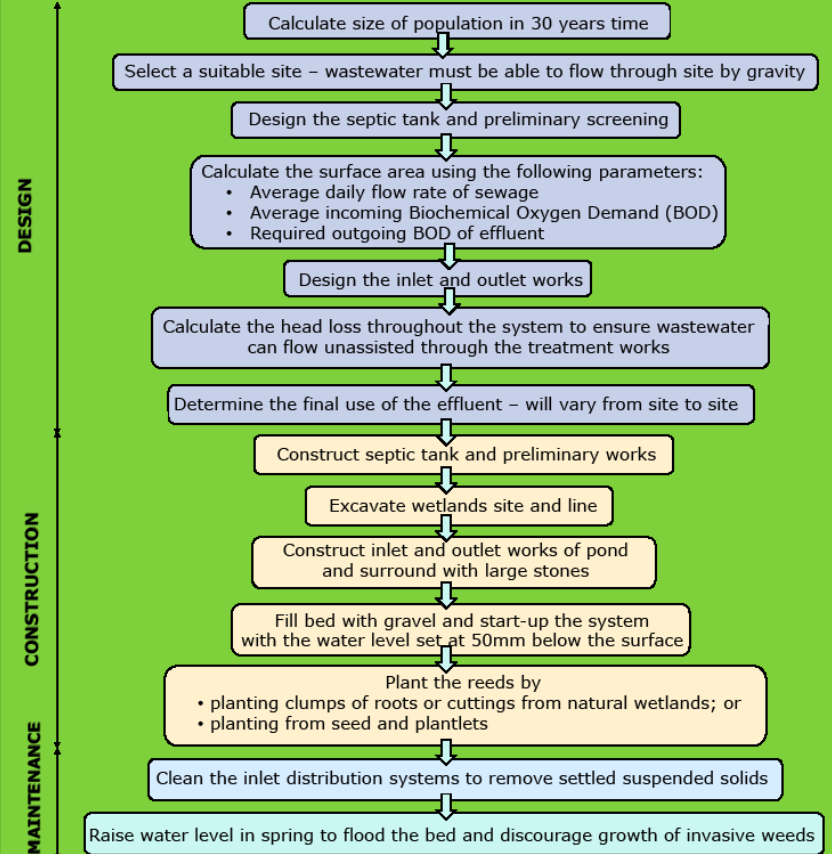
Sub-Surface Flow Horizontal-Flow (SSF-HF) Systems



How do Constructed Wetlands reduce the amount of organic matter and suspended solids in wastewater?

- Rhizomes (underground stems) grow vertically and horizontally which opens up the bed to provide hydraulic pathways.
- There are large populations of bacteria around the rhizomes which biologically treat the wastewater to reduce organic matter (BOD).
- The reeds pass oxygen down to the rhizome and out through the roots which provides pockets of air for aerobic reactions to take place around the roots.
- Anaerobic treatment takes place away from the roots.
- Suspended solids collect on the surface and are aerobically broken down.

An overview of the process



Questions that still need to be answered...

- Is there evidence that sub-surface flow wetlands work well in cold climates?
- Are they a low-tech solution?
- How much would a system for a small population cost?
- Up to what size populations can the systems serve?

EWB Cardiff

September 2009 – May 2010

Programme of Events

- So you think you could be a refugee?
- CAT trip
- RedR Essentials of Humanitarian Practice
- International Development Conference
- Branch Project: Pelton Wheel hydro turbine
- Outreach

