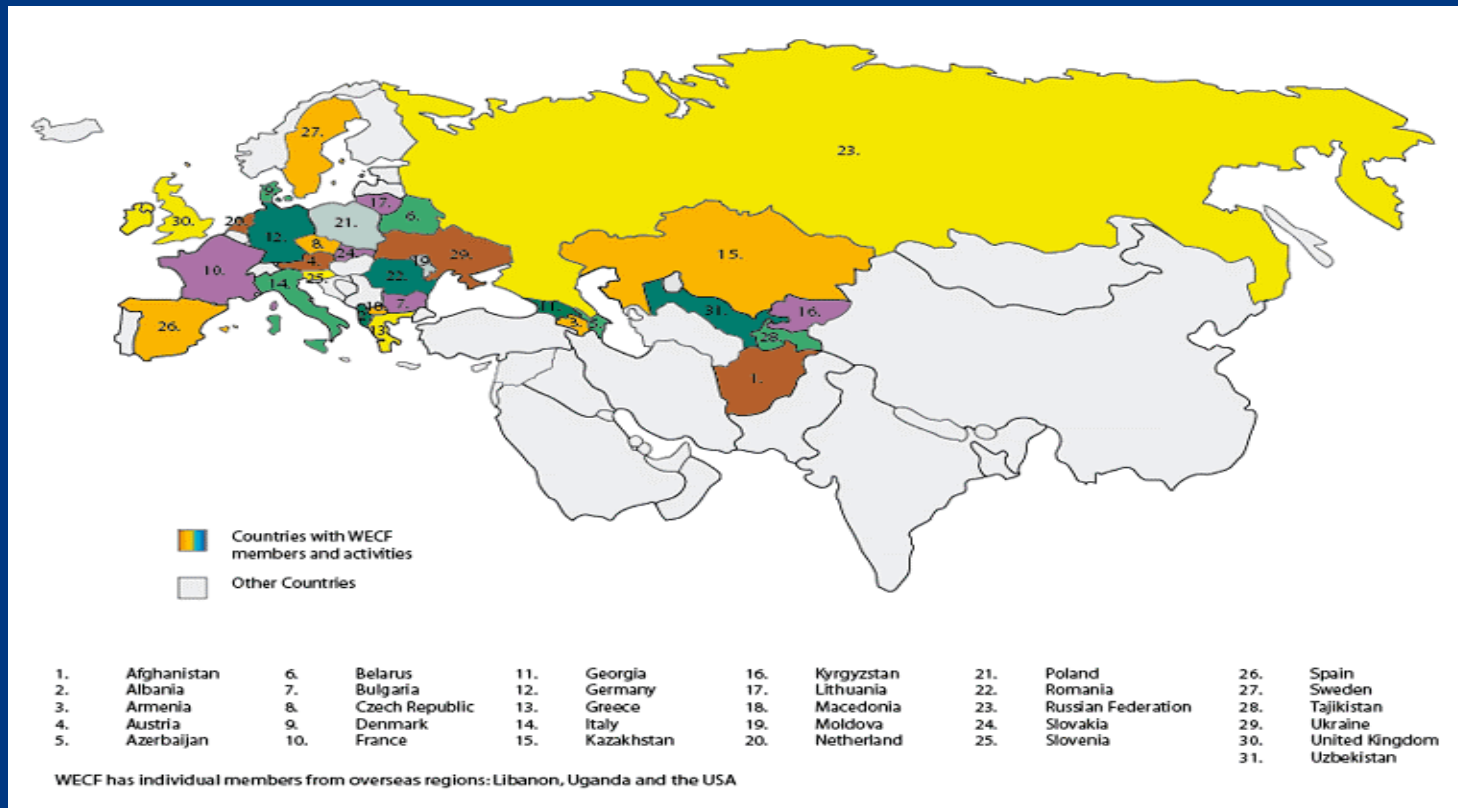


Introduction

Gero Fedtke

WECF



WECF is a network of more than 80 Environmental and Women's NGOs in 31 countries

WECF works in Eastern Europe and the EECCA-countries

Mission

Moving People for a World in Balance

WECF strives for a **Healthy Environment for All**. We use women's potential in balancing environment, health and economy. WECF's activities are based on its partners individual visions and needs. Following this, WECF implements solutions locally and influences policy internationally.

WECF Ecosan projects

Where & since when

- Romania - since 2002
- Ukraine - since 2003
- Bulgaria - since 2005
- Armenia, Uzbekistan- since 2005
- Kyrgyzstan - since 2006
- 2007: Moldova, Belarus, Georgia
Kazakhstan, Tajikistan

Project

- A decentralized sustainable wastewater management for Kyrgyzstan
 - Urine Diverting Dry Toilets
 - and Soil Filters
- Donor: German Ministry of the Environment



Bundesministerium
für Umwelt, Naturschutz
und Reaktorsicherheit

Goal of project: Demonstration of possible ways of Sustainable Sanitation Introducing





Project beginning



Myrzabay Dooranov

ULGU



Problems of Agriculture in Kyrgyzstan :

- Lack of farmer knowledge
- Low harvest of agricultural products
- Poor soil conditions
- Low financial viability of farms
- Poor household planning
- Remoteness of farmers' markets
- Low level of soil fertility
- Environmental pollution caused by farmers' inadequate householding and agricultural practices
- Lack and high cost of chemical fertilizers
- Framers' ignorance and lack of skills in waste treatment



Construction



Indira Aseyin

Habitat for Humanity Kyrgyzstan

UDDT Types

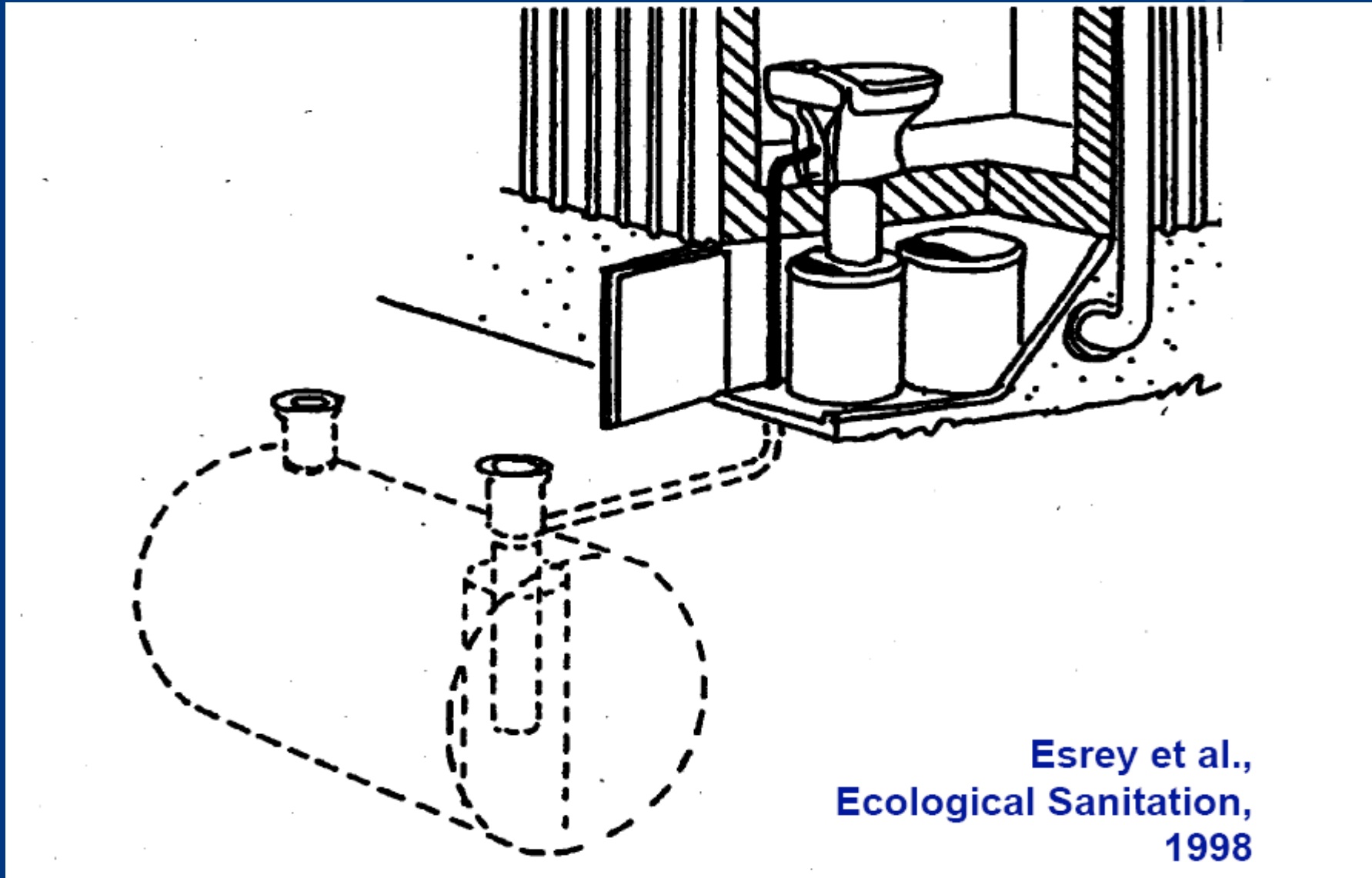


- ❖ *For all house holds*
- ❖ *For urban and rural areas*
- ❖ *Indoors*
- ❖ *Outdoors*
- ❖ *With different toilet seats*
- ❖ *All types require ventilation*



Espacio de Salud
Cuernavaca, Morelos

UDDT Mechanism

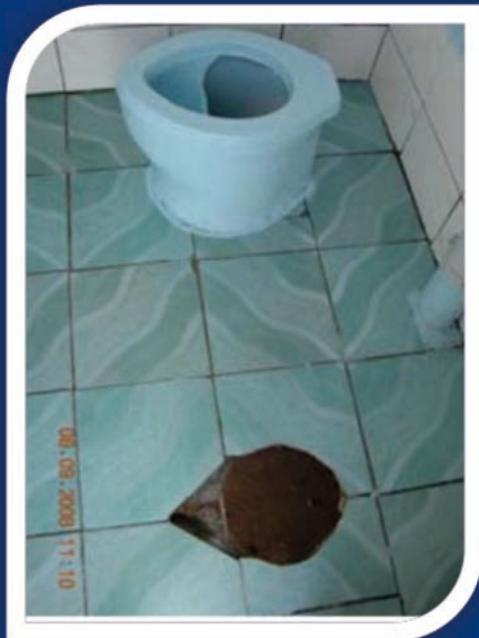


Double-Vault UDDT



Double-Vault UDDT

- * Feces composting*
- * Second composting might be required*
- * More space needed*
- * Toilet seats might be needed to be changed*
- * More expensive*



One-Vault UDDT



** A tank for feces required*

*** Cheaper*

**** Little space needed*

***** No need to change seats*

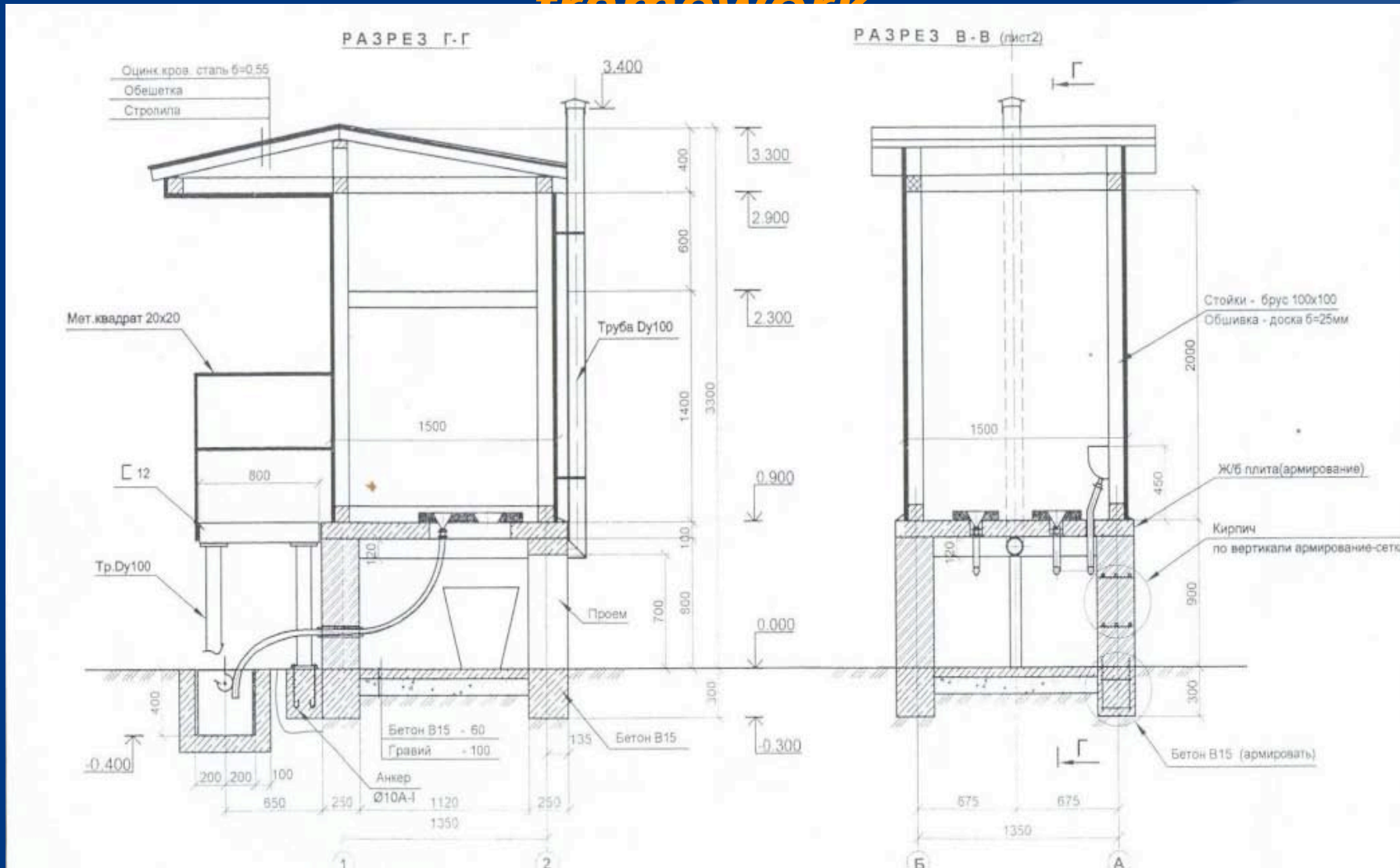
****** Fresh feces treatment*



Toilet Production Using Local Resources



Construction design of toilet built in project framework



UDDT Ready for Use



UDDT Built into Household





Revolving Fund Principles

Место строительства	Ф.И.О. семьи-партнера	№ договора и Дата заключения договора	Срок ссуды (лет)	Ежемесячная сумма возврата ссуды (сом)
Сару, Иссыккульская область.	Бердикожоев Саку	№ 6 от 06.07.2007	3	364
Сару, Иссыккульская область.	Маданбеков Саламат	№ 1 от 01.07.2007	2	541
Каражыгач Чуйская область	Майчинов Салмоорбек	№ 5 от 04.07.2007	3	356
ТОГО:				1261 сом = 25 EURO

To ensure sustainability of safe sanitation programs, a new model of financing poor families was developed:

- 1. Loan contract from 1 to 3 years*
- 2. No interest rates*
- 3. No deposit*
- 4. Loan of 5000 -15000 som depending on UDDT's cost*



Sanitization



Mikhail Yakovlev

EM BIOM

Urine and Feces as High Quality Fertilizer

Urine contains

- Nitrogen
- Phosphorus
- Potassium

Feces contain

- Phosphorus
- Potassium
- Organic substances
- Pathogenic microorganisms

Special feces treatment required before use

1 gram of feces may contain
10,000,000 viruses
1,000,000 bacteria
1,000 parasite cysts
100 parasite eggs

Sanitization Objectives

1. Elimination of pathogenic organisms
2. Prevention of environmental pollution
3. Recycling of nutrients and water

WHO's Mandate on Urine and Faeces Treatment

Urine

- Household urine for self-use:
Immediate utilization or short-term storage
- Public toilet urine:
One-to-six-month storage before use for all types of crops

Faeces

Feces special treatment before use is mandatory:

- Alkaline treatment
- Composting
- Storage
- Incineration

WHO's Faeces Treatment

Treatment	Criteria	Note
Alkaline ash or lime	pH > 9 > 6 months	Temperature > 35 °C Humidity <25% If others, prolong storage time
Composting	Temperature 50 °C For > 1 week	Minimal requirements If others, prolong storage time
Storage Temperature 2-20 °C	1,5 – 2 years	Eliminates pathogenic organisms; decreases the number of viruses and protozoa; regrow if rewet
Storage Temperature >20-35 °C	> 1 year	Significant inactivation of viruses, protozoa, bacteria and eggs
Incineration	Full incineration	< 10% oxygen in ashes

Results of Urine Nutrients Test

TOC mg/l	TC mg/l	TN mg/l	N-NH4 mg/l	TP mg/l	pH	EC mS/cm
2360	5640	6820	5350	401	9,10	43,0
1960	5110	7520	6390	330	9,22	44,2
1420	4030	5350	2860		8,94	37,9



Reuse of Nutrients



Myrzabay Dooranov

ULGU

What do plants feed?



Carbon
50%

Mineral substances
22%

Hydrogen
8%

Oxygen
20%



Nitrogen
15%

16 mineral macro- and microelements
15%

In the plants food minerals make up only 22%. Mainly, plants nourish themselves with carbon.

How much do plants need?

- Urine can be used as a regular fertilizer
 - Depending on a crop, the maximum amount can reach 120 kg (N)/ha
 - If the nitrogen level in urine is unknown, use 1-2 l urine per square meter (= 5 - 7 g N/l)
 - One farmer is able to fertilize 200-500 square meters annually
 - Utilization – diluted or undiluted – dosed

How and when apply urine?



- For vegetation field, urine should be 3-10 times diluted with water
- Before planting or seeding, urine can be used undiluted
- One-time utilization: preferably, during seeding or planting
- Two-time utilization: the second time after about 1/4 of period in-between planting and harvesting
- Urine should be spread closely to soil and let it be thoroughly absorbed
- Not recommended to spread on foliage.



Experimenting with urine...

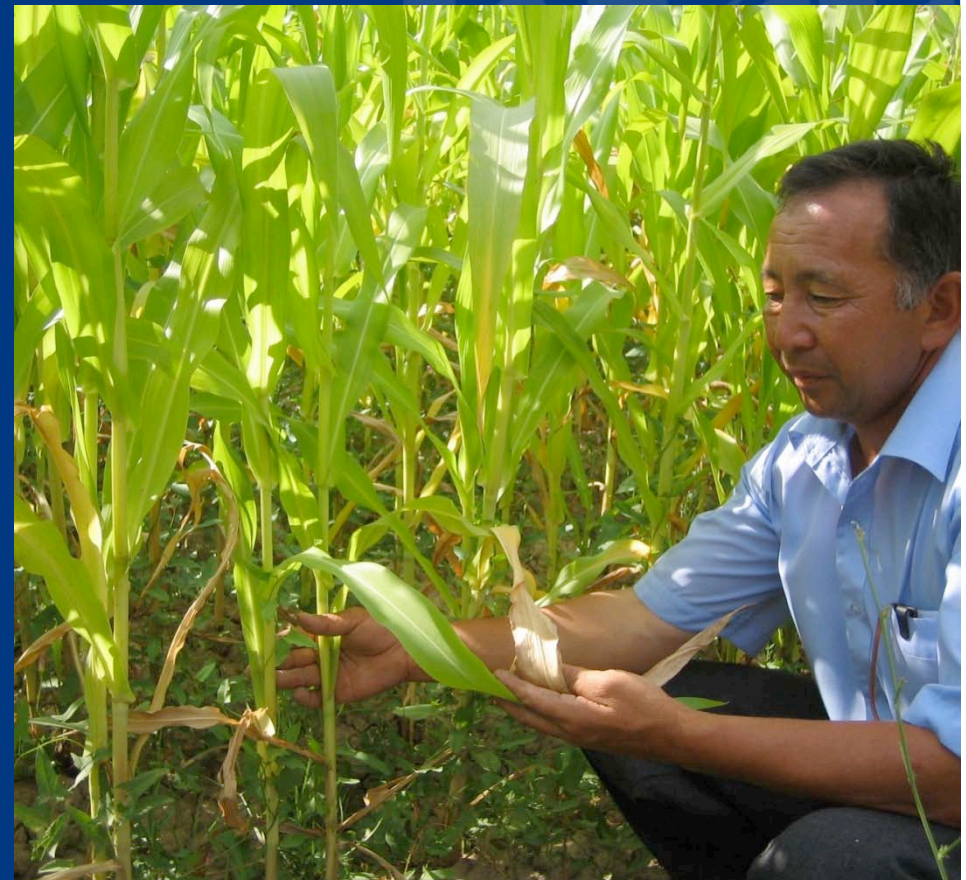


**...growing urine
fertilized corn**

Control field



Pilot field

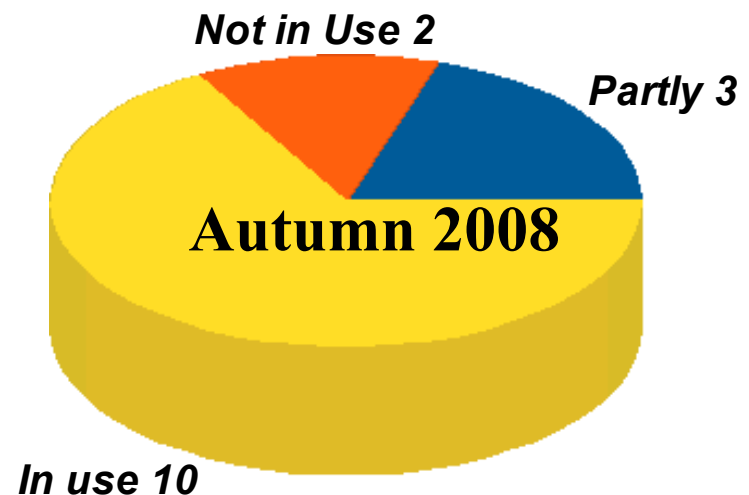
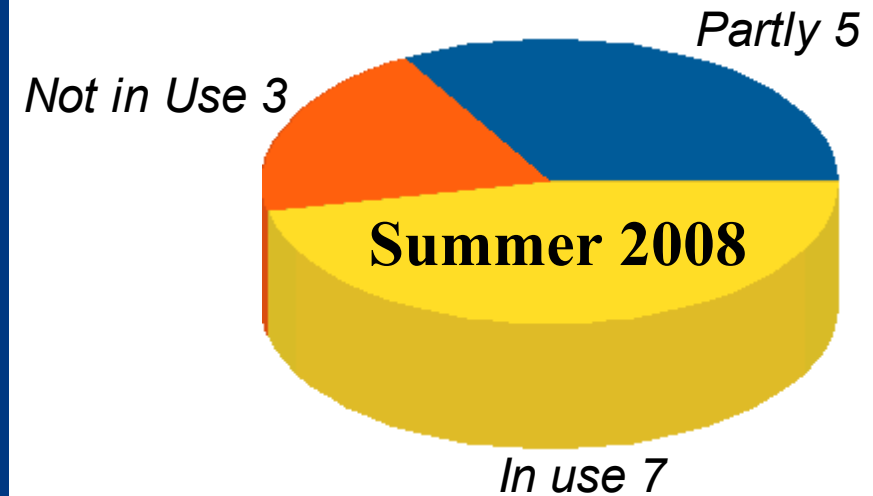


Corn harvest results

- 30 % higher harvest
- 30 - 40 taller corn
- No nitrogen shortage detected

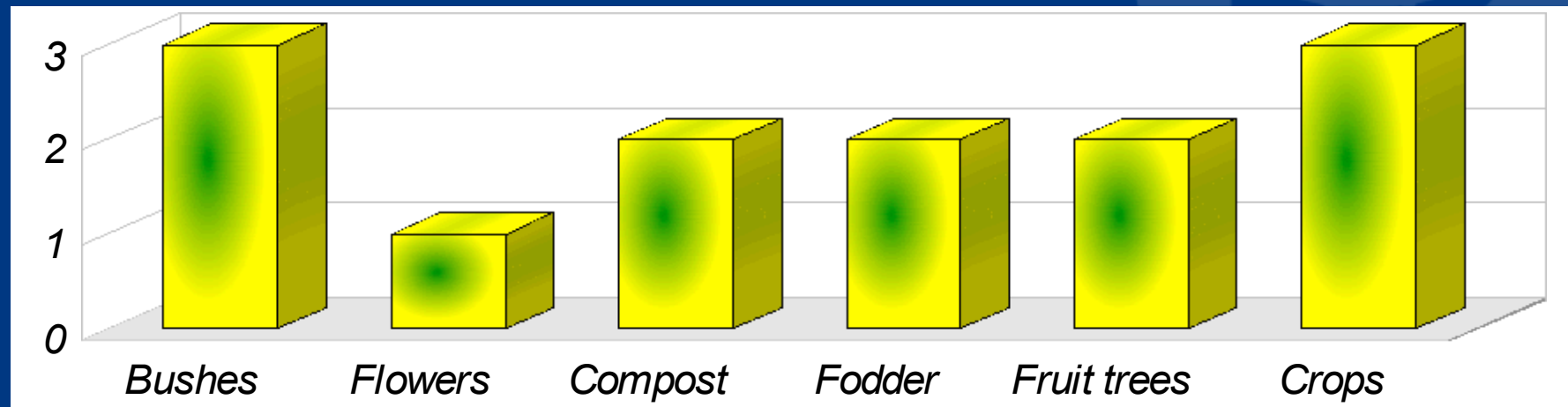
Monitoring results

- Proper smell prevention is crucial
- Women, men and constructors should be involved in trainings
- Informational and technical support of users
- Unpleasant smell and high groundwater level in pit latrines motivates people to build Ecosan



Urine application

- Farmer-orientated households were especially enthusiastic about urine application
- Irrigation systems and compost opportunity facilitate urine application
- Mentality change towards reuse of Ecosan products takes time



Показатель доверия безопасного использования

www.wecf.eu



Costs

- Costs for one toilet from 10.000 soms to 30.000 soms
- 6 of 15 toilets - 100% owners contribution
- Other UD toilet owners contributed 10-50% to the construction materials + labor
- Single-vaults toilets 2.000 soms cheaper than double-vaults

Soil filter



Djanaeva Olga Nikolaevna

ALGA

Sources of Domestic Wastewater

Washing



Bathing



Kitchen



Toilet



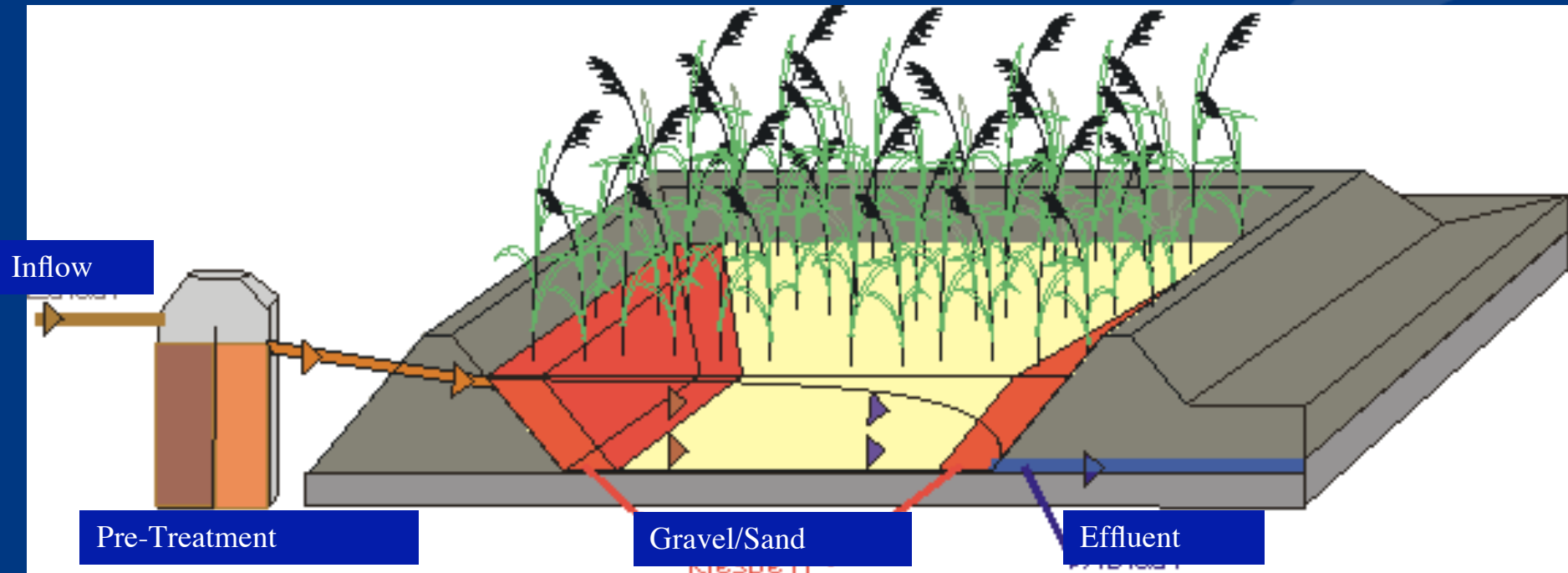
Greywater

Urine

Faeces

Blackwater

Horizontal Flow Soil Filter





**1st chamber of oil
and grease trap**

**Pump
sump**

Final discharge

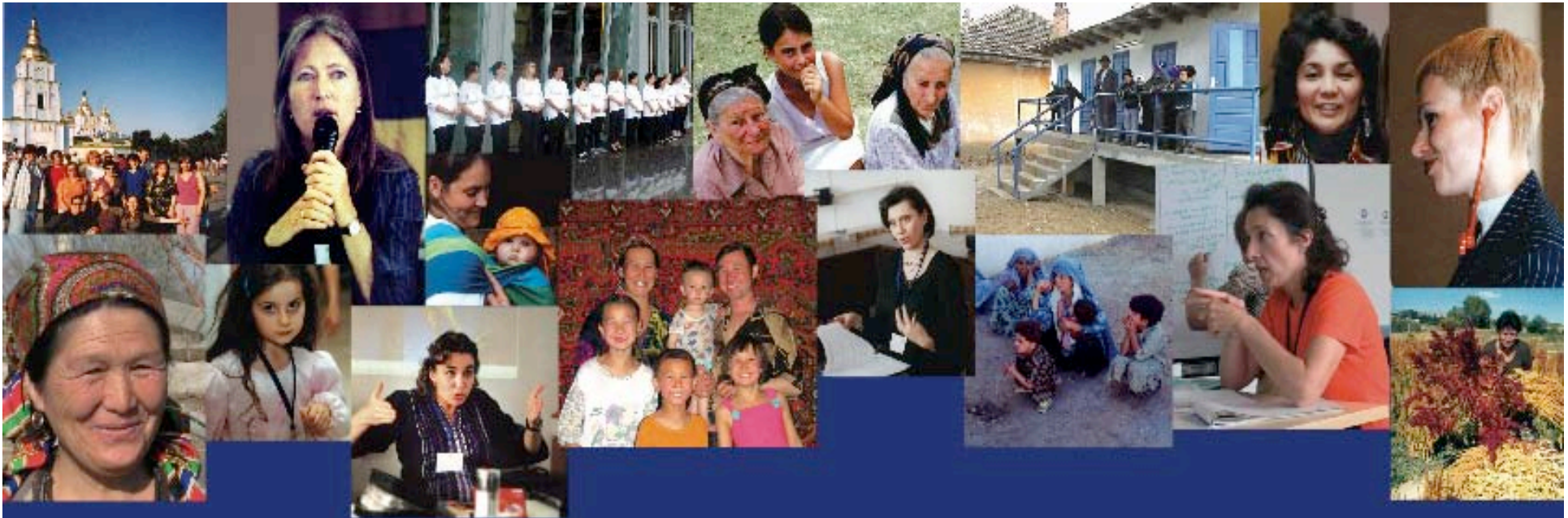
Photo: Y. Fevang

Team Work!



Soil Filter Ready





Thank you!

