



Fig. 1: Project location

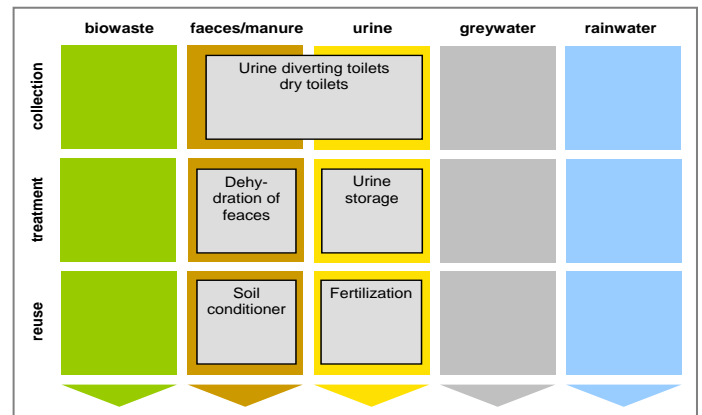


Fig. 2: Applied sanitation components in this project

1 General data

Type of project:

Rural upgrading of a peasant settlement

Project period:

Start of planning: January 2000

Start of construction: December 2000

Start of operation: January 2001

End of project: ??

Project scale:

46 inhabitants

Total investment: 6000 EUR

Address of project location:

Canton Chordeleg, communities of Celed, and sectors of the cantonal centre of Cahalao, Ramos and Las Cuadras

Planning institution:

CARE Ecuador

Executing institution:

CARE Ecuador

Supporting agency:

Municipality of Chordeleg

2 Objectives and motivation of the project

The ecological sanitation programme was part of a broader project in the Canton Chordeleg, which included the decentralisation of health services, local government empowerment, community participation and social health, water and sanitation services supply. **Name of this project?**

The general objective was to contribute to the improvement of living standard in the Chordeleg communities through the implementation of sustainable programs of sanitation, water supply and environmental health systems.

Two specific objectives were pursued:

- Promote habit changes in terms of sanitation, water management and environmental health to the residents of the zone
- Provide **life security** to the population through ecological sanitation practices.

3 Location and conditions

The Canton Chordeleg is located east of the city of Cuenca. Its estimated population **in the year 1995 was 12.200 inhabitants**. The canton includes 27 communities. The main economic activities and income sources in the rural region of the canton are diverse handicrafts of toquilla straw, wool and agriculture, in the urban areas gold, silver and ceramic handicrafts.



Fig. 1: Project region (photo: Xavier Zapata)

Weather conditions of Chordeleg are: cold climate with an average temperature of 12-14°C. The canton has a mountainous topography with clayey soils, middle copious vegetation and big pastures. The lower part of the terrain is used for agriculture and livestock.

The communities' populations vary from 500 to 1200 inhabitants. In each dwelling normally live 5 to 6 people. The population density reaches from 3 to 12 persons per hectare and the dwelling density is between 0,63 and 2,4 houses per hectare. The socioeconomic standard of the communities has been decreasing in the last years when? due to a vicious circle of general national economical problems, reduced crop yield and a high migration rate, which concerned especially the low income families.



Fig 2: Map of Canton Chordeleg (photo: Map Ecuador) Please

4 Project history

The project began after attending the International Meeting of Ecological Sanitation organized by the Network of Ecological Sanitation in Mexico with the support of UNDP which year?. It started thanks to CARE Ecuador with the promotion and knowledge of similar experiences on a national level.

The planning phase and design of the toilets was done together with the local stakeholders. When? The first concepts were updated considering current information of technological innovations. This was possible, because international experience was shared with the support of municipality personnel and community members.

Ecological sanitation was integrated as one of the possible sanitation solutions. Promotion of ecosan targeted an implementation in a bigger scale, but the desired covering was not achieved for several reasons (see lessons learned). When??

5 Technologies applied

The ecological sanitation units implemented in Chordeleg when? are decentralized solutions without flushing. Each unit has a urine-diverting toilet, a washbasin and a shower.



Fig. 3: Urine-diverting toilet (photo: Xavier Zapata)

The faeces are stabilized by storage in two ventilated dehydrating chambers beneath the toilet, used alternating from six months to one year. Supplementary drying material such as earth, ash from artisan ovens, carpentries shavings, sometimes lime (costly) are added after using the toilet. The urine flows to an infiltration well or is in some cases collected and stored in containers to be used as fertilizer. (Please more details what is meant by infiltration well? Maybe fotos?)

Greywater is disposed directly on the orchards. This type of solution has been implemented in the dwellings of 11 families in the vicinity to the centre of Chordeleg.



Fig. 4: Storage chambers for faeces and urine storage container (photo: Xavier Zapata)

Ecological Sanitation pilot project in Chordeleg Azuay province, Ecuador (draft)

6 Design information

In the first design, the chambers volume was calculated in terms of the family members and the expected amount of discharged material, which was 1,1 m³. The estimated period of time to fill each chamber was six months. A toilet in a sitting platform was constructed. Urinals for men and women were also built.

A second design included a urine-diverting toilet. The volume of the chambers decreased to 0,85 m³. Design parameters based on experience values.



Fig. 5: Platform toilet and drying material (photo: Xavier Zapata)



Fig. 6: Urinal for women and men (photo: Xavier Zapata)

The dimension of the sanitary unit was 3,36m² (2,40m by 1,40m) including space for the shower and washbasin.

The storage chambers were built of waterproof concrete. The floor slab was made of reinforced concrete. The walls were made of cement bricks with a steal door and were plastered inside and outside. The roof consists of a wooden structure and asbestos sheets.

7 Type of reuse

The obtained faecal material is used as soil conditioner in the gardens and orchards of each family, especially for fruit trees and ornamental plants.

Some peasants use urine as fertilizer after its fermentation (after four months of storage) in their orchards, others let it flow directly to infiltration wells.

The materials are reused at household level. ???

8 Further project components

To be updated

9 Costs and economics

The costs for training, promotion, and experience interchange were about 6.700 EUR.

The investment costs per unit for the constructions were 200 EUR in materials, 70 EUR in qualified human labour and 50 EUR in nonqualified human labour. The costs were provided fifty percent by the community and fifty by the donor institutions. In some cases the municipality donated gravel and stones.

The operation and maintenance costs are totally paid by the families and are about 7 EUR per month. They mainly consist of costs for the extraction, transport and preparation of the additional drying material for the faeces.

10 Operation and maintenance

Each family was trained and received an operation and maintenance booklet. After that, a monitoring of the operation and maintenance activities was done during 3 to 6 months. No bigger difficulties occurred.

11 Practical experience and lessons learnt

All the ecological sanitation units are working without inconvenience. The beneficiaries accept that this solution requires more steady maintenance than a WC with a septic tank because of its longterm benefits.

With the primary promotion of ecosan an acceptance of 4 of 15 families requiring sanitation in the Las Cuadras sector was obtained. People having more space available, no running water or being used to buy artificial fertilizers for agriculture were the most enthusiastic with the idea.

When the promotion was done in the other communities of the Canton the acceptance was only 8 of 60 families when?? And acceptance now??. This rate was a consequence of social and economical factors. The main social factors affecting the decision to implement a dry toilet were:

Ecological Sanitation pilot project in Chordeleg Azuay province, Ecuador (draft)

- Migration, lack of decision power of women: In families, whose male head of the household has migrated to another place for work, it was not possible to implement ecological sanitation solutions. Even when wife and children liked the technology, no decision could be made, because the husband was not present.
- Age of the family head: Older people easier accepted the technology, since they had experience in reuse practices.

The economical factor was:

- The bigger payment required for an ecological toilet compared to a WC with a septic tank.

Families already having a platform toilet wanted to have a urine-diverting toilet because of its easy operation and maintenance. The use of the urinal for women in the toilets having a toilet platform is not really practicable.

Flies and odours are absent of toilets having a urine-diverting basinet. Depending on dry materials used, spiders and moths are present in the storage chambers.

A good acceptance to the reuse of faeces and urine is seen.

12 Sustainability of the system components

Qualitative assessment regarding the sustainability of the system components (collection and transport, treatment, transport and reuse) after its implementation.

For this, please make crosses in the respective fields of the following table depending on whether you consider the system component to have a strong (+), average (o) or weak (-) sustainability.

A basic assessment (Table 1) was carried out to indicate in which of the five sustainability criteria for sanitation (according to the SuSanA Vision Document 1) this project has its strengths and which aspects were not emphasised (weaknesses).

Table 1: Relative sustainability of system components (update)

Sustainability criteria:	collection and transport			treatment			transport and reuse		
	+	o	-	+	o	-	+	o	-
• health and hygiene									
• environmental and natural resources									
• technology and operation									
• finance and economics									
• sociocultural and institutional									

With regards to long-term impacts of the project, the main expected impact of the project is ??? any assessment or data on measurable impact??

13 Available documents and references

Biannual reports of the project, operation and maintenance manual and design of the sanitarian units are available in the office of CARE – Ecuador.

Some Internet sources??
Relevant literature??

For more details write to: fsolis@care.org.ec

14 Institutions, organisations and contact persons

Design, planning and implementation of the project:

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Case study of SuSanA projects

Ecological Sanitation pilot project in Chordeleg, Ecuador

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