

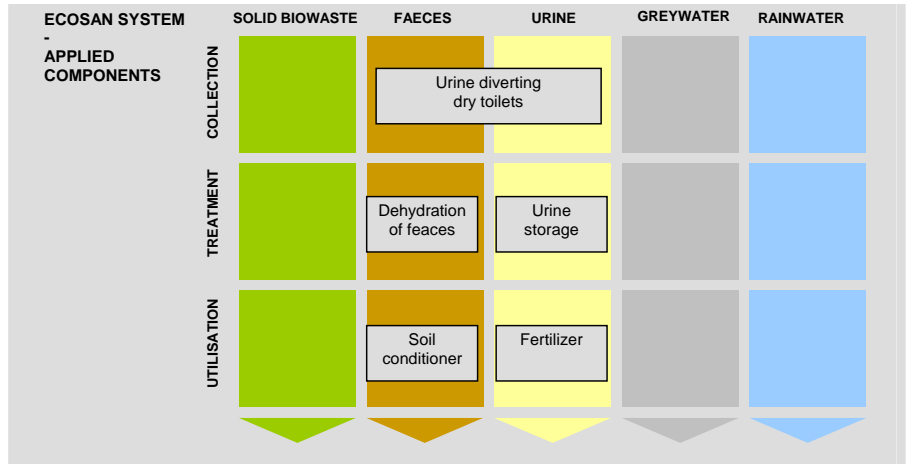


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Ecological sanitation pilot project in Chordeleg

Canton Chordeleg, Azuay province

Ecuador



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

Project Scale:

46 inhabitants
 Total investment: 9100 USD

Address:

Canton Chordeleg, communities of Celej, 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



Figure 1 :Project region (photo: Xavier Zapata)

2 Objective of the project

The ecological sanitation programme was a 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.

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

Two specific objectives were pursued:

- to promote habit changes in terms of sanitation, water management and environmental health to the residents of the zone

- to provide life security to the population through ecological sanitation practices.

3 Location and general 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 Chordeleg 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.

Weather conditions of Chordeleg are: a cold climate with an average temperature of 12 to 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

ecosan program
recycling oriented
wastewater management
and sanitation systems

commissioned by

Federal Ministry
for Economic Cooperation
and Development

persons per hectare and the dwelling



Figure 2: Map of Canton Chordeleg (photo: Map Ecuador)

density is between 0,63 and 2,4 houses per hectare. The socio-economic standard of the communities has been decreasing in the last years 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.

4 Technologies applied

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



Figure 3: Urine-diverting toilet (photo: Xavier Zapata)

The faeces are stabilized by storage in 2 ventilated dehydrating chambers beneath the toilet, used alternating from 6 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.

Urine flows to an infiltration well or is in some cases collected and stored in containers to be used as fertilizer.

Greywater is disposed directly on the orchards. This type of solution has been implemented in the dwellings of 11 fami-

lies in the vicinity to the centre of Chordeleg.



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

5 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 4 months of storage) in their orchards, others let it flow directly to infiltration wells.

The materials are reused at household level.

6 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. 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. 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).

7 Costs

The costs for training, promotion, and experience interchange were about 10.000 USD.

The investment costs per unit for the constructions were 300 USD in materials, 100 USD in qualified human labour and 80 USD in non-qualified 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 10 USD per month. They mainly consist of costs for the extraction, transport and preparation of the additional drying material for the faeces.

8 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.

9 Design information and technical specifications

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 6 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.



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



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

The dimension of the sanitary unit was 2,40 m by 1,40 m 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.

10 Practical experience and lessons learned, comments

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 long-term 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. This rate was a consequence of social and economical factors. The main social factors affecting the decision to implement a dry toilet were:

- 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 used dry materials spiders and moths are present in the storage chambers.

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

11 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.

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data sheets for ecosan projects

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