

Annex 10 Bolivia Pilot Project evaluation report

EVALUATION OF PILOT PROJECTS, BOLIVIA

Agua Tuya pilot project in Cochabamba and Demonstration pilot at the Military Base of the Bolivian Navy in Copacabana

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1 Introduction

In addition to the evaluation of the Bolivia knowledge Node, the following pilot and demonstration projects were visited in the evaluation:

Agua Tuya, Cochabamba:

Ecological Sanitation in Challacaba: Focus group with seven participants.

Wash in Schools: Ecological Sanitation and composting “Escuela Sagrado Corazón”, interview with staff responsible for the Ecosan at the school.

Community based peri-urban ecological sanitation “Junta Vecinal 22 de Febrero”, visit to household and interview with users.

Waste water treatment (artificial wetlands) “Lomas del Pagador”, interview with the Chairman, Bernardo Huanba of the local “CBO” (Organización Territorial de Base – OTB), and with Chairman of the Local Water and Sanitation Committee (CAPYS), Leandro Mamani.

Recycling and Composting plant (MESPAL), Interview with the chairman of the microenterprise.

Bolivian Navy, Military Base at “Capitanía de Puerto Mayor de Copacabana”, Lake Titicaca:

Demonstration centre including Ecological sanitation module, re-use of urine as fertilizer in greenhouse. Focus group with 10 soldiers and interview with Captain responsible for the demonstration plant.

In addition, a visit was made to Sumaj Huasi’s pilot project of peri-urban ecological sanitation project in El Alto. This was not one of the pilots financed by the ESR2 programme, but was visited as a reference site as Sumaj Huasi has been closely involved in EcoSan and the development of the Node in Bolivia.

All the Bolivia Node’s pilot projects have been jointly financed by the ESR2 and counterpart funding including contribution by the local community involved in the projects.

2 Methodology and limitations

The evaluation of the pilot projects was carried out by a consultant from Bolivia. The evaluation included review of background and project documents, interviews with staff at the organizations that carried out the pilots and interviews and focus group meetings with stakeholders and beneficiaries.

The total time input for the evaluation of the Bolivia Node, The Central America Node, and key persons in Mexico, Brazil and Peru was eight person-days, out of which four

days were spent by the Bolivian consultant on assessment of the Bolivia Node and pilots (two days on visit to the pilots).

3 Brief description of objectives and outputs of the pilot projects

3.1 Agua Tuya: Saneamiento Ecológico in Challacaba

The pilot Project in Challacaba started as a response to the demand from the local community to find an alternative solution for sanitation. This as a traditional sewerage system was not an economical or technical feasible option in the area. The pilot project was implemented between June 2006 and December 2007. The total cost of the project was USD 89.000, which also included a counterpart fund from the beneficiaries.

The general objective was to implement and validate an ecological sanitation Project in a peri-urban setting in Cochabamba, Bolivia. The specific objectives were to:

- i) Construct 20 Ecotoilets in the Challacaba community;
- ii) Construct 30 Ecotoilets in other communities in Cochabamba;
- iii) Construct a demonstration pilot for re-cycle and re-use of excreta;
- iv) Construct a demonstration plant for grey water treatment.

The Pilot was based on a participatory approach with the involvement of the local user association: “La Asociación de Usuarios de Agua Potable de Challacaba”, the Foundation Agua Tuya as responsible for the implementation, and SEI and SNV as network partners for training and documentation of experiences.

The technical solutions were based on material and products manufactured locally in Cochabamba. The design of the ecotoilets was adapted to be attractive to users in a peri-urban setting including hand-basins and toilets of china and ceramic tiles flooring. The local community, the user association was involved in all stages of project development.

Results: The pilot project achieved its objectives: In total 50 ecotoilets were constructed (27 in Challacaba and 23 in other communities in the town). A demonstration plant for grey water treatment was constructed at a local school, and a re-cycling centre to demonstrate re-use in agriculture. Didactic training material was produced and training events (workshops, meetings) with user groups and stakeholders were held according to plan.

According to the focus groups and interviews the participants/ user groups, the pilot project has been successful. The design of the toilets (exterior as well as interior) is attractive and has the potential to be replicated in other peri-urban areas.

3.2 Agua Tuya: Wash in schools - Escuela Sagrado Corazón

An ecotoilet and demonstration plant for alternative treatment of greywater was constructed at a nursery school with approximately 200 infants. The grey water is treated in an artificial wetland. The pilot had the double purpose to solve the sanitation for the school and at the same the viability of the choice of technology in a peri-urban setting in Cochabamba.

Results: The use of artificial wetlands for greywater treatment is a technology that can well be replicated in peri-urban areas. Cochabamba has a dry climate and water resources are scarce. The aquifer, which is the main source of water supply in the town, is being overexploited and there is a clear need for recycling and re-use of water, for instance for irrigation in agriculture and recreational areas. Artificial wetland is a viable low cost option, both in terms of construction and operation and maintenance.

3.3 Agua Tuya: Eco toilets in a peri-urban áreas of Cochabamba: “Junta Vecinal 22 de Febrero”

The objective was to construct ecotoilets in an peri-urban area of the town using a similar participative approach to the one used in Challacaba.

Results: The objective was achieved. The previous experiences and lessons learned from Challacaba was used in the project to further increase local participation and improve the design of the ecotoilets.

3.4 Agua Tuya: Treatment of domestic effluents in artificial wetland - "Lomas del Pagador"

The objective was to treat the effluents from household (1.000 inhabitants) and recycle the treated water for irrigation and tree planting in green – recreational areas in Cochabamba.

The treatment plant includes the following steps: sedimentation, separation of fat, primary treatment in anaerobic chambers and secondary treatment in artificial wetland. “Lomas del Pagador” is located in a peri-urban area, “District 14” of Cochabamba. It has a strong community organization, which managed to get potable water installed in the area. The construction of a water treatment plant was also based on an initiative from the local community. The treatment plant serves 151 households with a total capacity of serving 220 households. It has been co-financed by the Municipality of Cochabamba, UN-Habitat and Sida in coordination with the Vice Ministry of Basic Water and Sanitation Services (VAPSB).

Results: The treatment plant, which is operated by the local Water Committee, is working according to plan. The construction of the plant was accompanied by a series of training events for the households about the treatment plant and on basic hygiene practices. The local water committee received training in maintenance and operation of the plant. The operation and maintenance of the treatment plan is fairly simple and the Local Water Committee has been able to run the plant adequately which shows that the technology is well suited for locally operated small scale peri-urban schemes.

3.5 Demonstration Project (Capitanía de Puerto mayor de Copacabana en el Lago Titicaca – La Paz)

As part of the initiative to “close the loop in sanitation” the Bolivia Node established a strategic Alliance with the Bolivian Navy and the NGO Sumaj Huasi to establish a demonstration project at the Military Camp at Copacabana at Lake Titicaca. The objective of the project was to construct a facility to train the conscripts in the use of ecosanitation and re-use of urine in vegetable production. Once the conscripts complete the military services they were expected to be able to replicate the system in their local communities.

Results: The objective has been accomplished. The installation of ecotoilets and the re-use of urine in vegetable production in simple green houses are being used and the conscripts receive training in how to apply the technology. (No study has yet been made on how many of the conscripts trained have actually applied their new knowledge in their community).

4 Links between the pilots and the Bolivia Node

According to the interviews there have been strong links between the pilot projects and the Node. This is due to the fact that the organizations responsible for the implementation of the pilots are actively involved in the development of the Node as such. The fact that also the VAPSB has showed a strong interest in the Node and the pilot projects have been an important factor in disseminating experience and creating a strong network relationship between the various stakeholders: the public sector, NGOs and the private foundations as Agua Tuya.

5 Effects and impact of the pilot projects

Local impact:

The experiences from the implementation of the pilot projects have been disseminated and shared with the network of stakeholders in the country. This has paved the way for several new initiatives to promote EcoSan as a viable alternative in sanitation:

- The Faculty of Architecture at the San Simón University and the Municipality of Cochabamba has worked with a community on design of ecotoilets that are adapted to local needs. The design models will be used by the Municipality in a peri-urban development project.
- The pilot in Challacaba was the first pilot project (implemented in collaboration between a private foundation and the Municipality), was the first experiences for the Municipality in alternative sanitation solutions. As the pilot was successful it has paved the way at the Municipality to continue work with alternatives to traditional waste water systems.
- Several NGOs that previously only worked with ecosan in rural areas have, after the experience from the pilot projects, started to work with ecological sanitation in peri-urban settings. For instance, Water for People, ProHabitat foundation, and SODIS.
- The national guidelines for alternative sanitation solutions adopted by the VAPSB (*Guía técnica de diseño y ejecución de proyectos de agua y saneamiento con tecnologías alternativas (Ministerio de Medio Ambiente y Agua -2010)*) includes several sections that are directly based on the experiences from the pilots, such as:
 - Ecological dry latrines
 - Techniques for treatment of domestic wastewater.
- The treatment plant constructed by the pilot, continues to operate and is currently serving about 1.500 inhabitants in per-urban Cochabamba
- A local enterprise (Sanitarios Gandi Ltd) manufactures an urine separating toilet made of ceramic of good quality. This means that there is a small but functioning market locally in Cochabamba with a potential to grow according to customer demand.
- A local micro enterprise (MESPAL) is operating and taking care of the collection, composting and recycle of the waste from the ecotoilets.

6 Lessons learned

1. The concept of ECOSAN should not be seen only as a matter of introducing dry toilets, but rather a holistic system approach to alternative sustainable sanitation solutions that closes the loop of water use as well as the use of nutrients. In this respect, Agua Tuya are working both with dry ecotoilets and with the introduction of decentralized treatment of wastewater. It is important to continue develop several alternative solutions, to meet the needs and demands in different context and settings.
2. “Health and hygiene promotion and awareness raising” is not necessarily the most effective option to reach impact in urban areas. This, as there are several other incitements for urban household then strictly health related issues, for instance the level of comfort and status of particular sanitation technology option.

3. Networking, engaging public sector institution is key in able to quickly disseminate lessons learned and to introduce new approaches in national technical guidelines.
4. There is an inherent risk when translating new technologies into national guidelines, that this may limit further technological innovation development. Therefore the guidelines should be more process oriented and less compulsory on for instance choice of materials etc.

To summarize:

The pilot projects, in particular the EcoSanRes – Agua Tuya pilots, have been characterized by an innovative process oriented approach throughout implementation. Agua Tuya and Sumaj Huasi have been the first to introduce ecosan in per-urban settings in Bolivia, both in terms of dry ecotoilets and artificial wetlands for wastewater treatment.

In a relative short time span (three years) considerable achievements have been made: From construction of pilot ecotoilets to contribute to the preparation of national guidelines published by the Ministry of Water and Environment.

This has been achieved thanks to the multisectoral approach adopted, including the involvement of: private sector (local enterprise), public sector (municipalities and ministry) and the local community.

Another contributing factor have been that the staff at SEI/EcosSanRes has adopted a flexible approach adjusting details during the implementation and at the same time maintaining focus on the main objectives.