

Report 10/2008

School Gardens and Ecological Sanitation Component in Selected Philippine Schools in Northern Mindanao

1.1 School Garden and Ecological Sanitation Component

In order to address the malnutrition and poor water and sanitation situation in many schools, pilot projects on school gardening and ecological sanitation were implemented in five public schools of Cagayan de Oro City and the neighboring Municipality of Manolo Fortich (both in Northern Mindanao) to explore further venues of school health programs. This project was carried out by the Periurban Vegetable Project (PUVeP) of Xavier University. The locations are as

- Balubal National High School, located in barangayⁱ Balubal, Cagayan de Oro City with a student population of 305
- Baluarte Elementary School, located in barangay Lumbia, Cagayan de Oro City with a student population of 167
- Lapasan National High School, located in barangay Lapasan, Cagayan de Oro City, with a student population of 2,299
- Bagalangit Elementary School¹, located in barangay Kalugman-an, Manolo Fortich, Bukidnon, with a student population of 85
- Dalirig, Elementary School, Dalirig, Manolo Fortich, Bukidnon (120 students)

These pilot sites were selected based on the diversity of their socio-cultural environment.

ⁱ Barangay = smallest administrative unit in the Philippines corresponding to a city or municipal district

Lapasan National High School is the only site that is located within the buzzing urban center of Cagayan de Oro, while Balubal and Baluarte Elementary Schools are located in the periurban and rural outskirts of the city about 25 km from the city center.



This old toilet is for 305 students of Balubal National High School

Manolo Fortich is a neighboring municipality of Cagayan de Oro. The Dalirig Elementary school is located along the national highway that connects Cagayan de Oro with Malaybalay, the capital city of the province of Bukidnon. The Bagalangit Elementary School is located at an elevation of about 1,200 m above sea level at the foot of Mt. Kitanglad, which is the 2nd highest mountain of the Philippines. Aside of being an important biodiversity hotspot, the Mt. Kitanglad range serves also as the watershed for Manolo Fortich and Cagayan de Oro. The village of Bagalangit itself is populated by an indigenous community belonging to the Higaonon tribe.

1.1.1 Preparations made

All schools and corresponding local government units (LGUs) have been partners of PUVeP in earlier and ongoing projects, respectively.ⁱⁱ

The activities under the ICCH Project, hence, represent a strengthening and expansion of already existing and ongoing activities and relationships.

They also set the testing ground on the expansion of the EHCP to High Schools as well as to introduce additional components to address food security as well as water and sanitation issues.

1.2 Project Implementation

1.2.1 School gardens

School-based allotment gardens

School-based allotment garden had been successfully implemented by PUVeP in the elementary schools of Balulang² and FS Catanico³, Cagayan de Oro as an earlier joint project with the office of Dr. Bella Monse with financial assistance of the German Embassy Manila.

The same concept was also introduced to the schools Bagalangit, Balubal and Dalirig since all sites avail of sufficient land area with good soil properties. Each allotment garden has a size of 1200 m² which is further subdivided in 4 parcels of a size of 300 m². The parcels are managed by the PCTA as well as students under the supervision of their respective teachers.



Parents together with PUVeP staff plant seeds in the school garden of Bagalangit Elementary School

In each school a rainwater catchment (5 m³) was established which collects rainwater from the rooftop of the school building. The rainwater collected is used for irrigation purposes as well as hand washing in case of water shortages.



A rainwater catchment in Balubal National High School with the Ecosan toilet in the background

School-based container gardens

In the schools of Lapasan and Baluarte, so-called “container gardens” were established a) due to the lack of sufficient available space for an allotment garden in Lapasan and b) due to the unsuitable soil conditions in Baluarte where the soil is very rocky with limited top soil.

ⁱⁱ See Table 1 in the Appendices

A container garden is defined as “A *micro model of farming where a family unit or household is producing fruits and vegetables in special containers for personal consumption to help improve the income, health and well-being of its family members*”. Special three dimensional structures increase the available area for crop production. Any empty container can be used to grow crops, however, in this project empty water bottles (5 l) were used due to availability, costs and esthetic purposes.



Steps in container gardening



Students constructing the container garden structure



Students of Lapasan National High School filling containers with soil

The substrate used for container garden is vermicompost, a special compost produced by earthworms. Vermicomposting facilities were also provided for all schools, not only to produce a good medium for seedling production but also to process biodegradable school waste in an environmentally friendly manner.

1.2.2 Ecosan UDD toilets

In addition to the school garden, rainwater catchment and vermicomposting facilities, two Ecosan urine-diverting dehydration toiletsⁱⁱⁱ were established in all schools. While the costs for the materials were shouldered by the project, the labor cost for constructing the facilities was provided by the community, either the PCTA or through financial support of the local government unit.

ⁱⁱⁱ Except for Lapasan where only one UDDT could be established due to budgetary constraints. Since the toilet is attached to a school building where it replaces an old, not functional water-sealed toilet, it had to be redesigned which resulted in higher material costs. In addition, costs for construction materials had gone up very high as compared to the start of the project in January 20008

A technical drawing of an Ecosan UDDT in Lapasan National High School

The segregated urine can be used as a liquid fertilizer for different crops after a period of 1 month storage in a sealed container. It can also be used as an activator for composting since its high nitrogen content will hasten the decomposition process. It will also contribute to achieve temperatures of 60°C above in the compost heap which is a prerequisite.



Inside an Ecosan UDD Toilet, 5 gallon plastic bottles are innovatively transformed into urinals

The segregated faeces can be reused for agricultural production after a storage period of 6-12 months and undergoing secondary treatment such as vermicomposting and aerobic composting.

Further recommendations on the reuse of treated Ecosan products in agriculture under Philippine conditions are described by Holmer & Itchon (2008)⁴.

1.3 School Gardens

In all schools, vegetables are being produced successfully. About 2/3 of the produce is sold to outside customers such as neighbors and the parents of the school children who are very pleased to avail of fresh and cheap vegetables. In most cases (except Lapasan since it is urban), vegetables are hardly accessible in the remote areas of Bagalangit, Balubal, Baluarte and Dalirig, especially the different varieties introduced to the school gardens such as sweet corn, cucumber, tomatoes and lettuce. The rest of the produce goes to the school feeding program.



A school garden with sweet corn, okra and cucumbers in Balubal National High School

From the sales of the vegetables, the schools were able to sustain and expand the program. Balubal, for example, has already more than doubled the original area of 1200 m². It was invited by DepEd to submit its school garden program to a competition initiated by UNICEF entitled “Earn while you learn”.

Additionally, the Xavier University College of Agriculture has tied up with the Lapasan and Balubal schools for a special research program for high school students⁵.

1.4 Ecosan Component

The UDD toilets in all schools are well accepted by the students and teachers. Xavier University has tied up with the schools to conduct joint researches as regards the health and reuse aspects.^{iv}

In addition, a workshop on monitoring and evaluation of ecological sanitation projects was conducted from September 9 to 10, 2008 in Manolo Fortich, Bukidnon, and from September 11-12, 2008 in Cagayan de Oro City. Ms. Imelda Balbuena, Community Organizer of the GTZ Water & Sanitation Program, facilitated the workshops together with staff from PUVeP, and the local government units of Manolo Fortich and Cagayan de Oro.

The workshop was attended by representatives of the different Ecosan pilot projects implemented in Northern Mindanao, namely the technical working groups of Cagayan de Oro and Manolo Fortich, the teachers-in-charge for Ecosan at the pilot schools, barangay officials, and gardeners. The objective was for the participants to become knowledgeable on the monitoring concept in general, becoming familiar with the monitoring tool and its use in particular, and to acquire additional skills, techniques and strategies in the actual conduct of monitoring Ecosan projects. During the workshop sessions, the participants were asked to identify the

problems encountered during the implementation of the Ecosan project and what the counter-measures taken⁶.



PUVeP Staff with the staff of Balubal National High School

^{iv} Except for Lapasan where only one UDDT could be established due to budgetary constraints. Since the toilet is attached to a school building where it replaces an old, not functional water-sealed toilet, it had to be redesigned which resulted in higher material costs. In addition, costs for construction materials had gone up very high as compared to the start of the project in January 2008

APPENDICES

Table 1. Earlier Activities in Target Areas

Location	Earlier activities
Balubal	Several UDD toilets were established in the barangay as part of another project funded by the German Embassy. In course of said project, the school requested for the possibility of having a school garden and Ecosan facilities. Capacity building of local officials in ecological sanitation had been done in these earlier projects.
Baluarte	One UDDT was established earlier for the community in another project funded by the Japan Children Fund. In the course of the project implementation ⁷ , the need for UDD toilets within the school premises as well as a school garden was expressed
Lapasan	There has been an established cooperation with barangay Lapasan through a nearby allotment garden with Ecosan toilet ⁸ which had been established earlier. One of the allotment gardeners is serving as a teacher in the Lapasan National High School, who has approached PUVeP earlier for assistance in establishing a school garden and Ecosan program.
Manolo Fortich	PUVeP has an established cooperation with the LGU of Manolo Fortich through an Ecosan program funded by the German Embassy that also had a capacity building component ⁹ for school and LGU representatives. During this training, the need for school gardens and school Ecosan UDDT was expressed and formulated.

BIBLIOGRAPHY

- ¹ <http://www.deped.gov.ph/public/public.asp?sec=&action=edit&iID=25256&type=public>
- ² <http://puvep.xu.edu.ph/ag/balulang.htm>
- ³ <http://puvep.xu.edu.ph/ag/fscatanico.htm>
- ⁴ Robert J. Holmer, Gina S. Itchon, 2008. Reuse of Ecological Sanitation Products in Urban Agriculture: Experiences from the Philippines. Urban Agriculture Magazine, 20, 44-46, RUAF, Leusden, Netherlands (http://puvep.xu.edu.ph/publications/UAM20_44-46.pdf)
- ⁵ http://aggies.xu.edu.ph/index.php?option=com_content&task=view&id=187&Itemid=1
- ⁶ More information on the workshop and its results are posted at http://puvep.xu.edu.ph/snews/ecological_sanitation/ecosan_monitoring_workshop/
- ⁷ See http://puvep.xu.edu.ph/snews/ecological_sanitation/ecosan_lumbia2/
- ⁸ <http://puvep.xu.edu.ph/ag/lapasan.htm>
- ⁹ http://puvep.xu.edu.ph/snews/ecological_sanitation/2007_ecosan_training/