

### Combining Technologically Appropriate WASH and Nutrition Interventions in Floating and Flood-Affected Communities

#### Context

On many lakes and waterways in Cambodia, entire “floating communities”— homes, schools, and other structures—are built on top of bamboo poles, sealed plastic barrels, or upturned concrete water jugs so that they can shift seasonally as water levels rise and fall. These highly vulnerable communities are typically overlooked by large-scale development programs.

Live and Learn Environmental Education, Cambodia, has been working in partnership with the Royal University of Agriculture and Engineers Without Borders, Australia, to investigate appropriate agricultural practices and sanitation technologies for such areas. From 2008–2013 they worked in five communes (about 14 villages) around the Tonle Sap Lake and in a wetland on the outskirts of Phnom Penh to introduce and demonstrate both WASH and nutrition innovations before larger scale up. Funding was provided by the Bill & Melinda Gates Foundation and AusAid through Assisi Aid.

#### Activities/Channels

The project took a holistic approach to the issues of waste management, energy, and agricultural production. Innovations were developed in a participatory way with the help of communities (including a small women’s forum) to ensure they were suited to the unique local needs. Development and testing began in 2008 and new technologies/practices were then introduced to families through workshops and focus groups, followed by capacity building of community volunteers and demonstration sites that integrated the new sanitation and food production components. Field facilitators and farmer collaborators helped disseminate practices. Schools (primary and secondary) also played important roles in this dissemination process.



Max Shapira

*A farmer and his floating bio-digester*

*Ecosan toilets.* Both homes and schools in floating communities typically dump their waste directly into the water. For families, the project developed a Urine Diversion Desiccation toilet (known as Ecosan) that is lightweight, low-cost, and can be manufactured using locally available materials and easily installed in the limited space in floating houses. Solid waste from an Ecosan toilet

is collected in a bucket and treated with ash. The project designed latrines for schools considering the needs of both girls and boys (including the need for privacy and for disposal of sanitary napkins).

The project also constructed Floating Community Waste Management Stations (or barges) in several floating communities for storing Ecosan buckets the six months or so needed for feces to be safe for composting. Waste management and fertilizer production committees were established to service and process the waste collected in the Ecosan toilets.

*Floating & resilient gardens.* The project investigated crops and improved techniques to extend the growing season for nutritious foods and allow for more resilient and varied agriculture. The project also worked with farmers collectives to create trial gardens and demonstration sites and to improve market access. Different solutions, such as floating, mobile, and raised gardens, were identified and developed for a range of circumstances—from floating houses to seasonally and occasionally flooded houses. This allowed improved access to vegetables and thus a more diverse and nutritious diet in fishing communities accustomed to buying fresh produce, as well as in flood-affected communities facing the “hungry season.” Integration of food production and sanitation activities was encouraged both to improve yields and provide an added incentive for collecting and managing waste.

*Bio-digesters.* Finally, the project developed a home bio-digester to treat both human and animal waste so it can be safely disposed of or used as fertilizer or even fish feed. The floating technology also produces gas for energy. It is smaller, cheaper, and more adaptable than existing bio-digesters; is capable of floating; and is suitable for households with fewer animals. One household with a couple of pigs can produce enough gas for cooking. A major benefit of the bio-digesters is better control of waste from the increasing number of floating pig farms, which has affected water quality in these areas. The waste of cows and buffalos can also be treated, as can the waste from fish processing.

## Results

Monitoring to date shows that the communities are embracing the new techniques and are actively using

them. They are seeing the benefits themselves and are also equipped to extend use further in their communities. Final evaluation results are pending.

## Lessons

Communities were receptive to introducing multiple technologies that provide a holistic approach to waste management. Attempts to introduce the Ecosan toilet as a stand-alone intervention met with less enthusiasm because families were used to dumping waste in their waterways and enduring the health consequences. With more support for compost and fertilizer production, and the simultaneous introduction of bio-digesters, families had an added incentive for capturing waste.

The project successfully based dissemination of new practices on the principle that “seeing is believing,” introducing technologies through demonstrations and model families. The early focus on schools provided several benefits in addition to the most important ones of improving sanitary conditions and motivating better attendance by girls in particular. Children learned about the new technologies from their teachers, had the opportunity to adopt them along with their peers, and became messengers and promoters of the new devices in their homes.

Incorporating menstruation systems within the sanitation design of both home and school latrines was new to some Cambodian and Australian practitioners. The project initially faced some reticence among its own staff to discuss and collect data on this subject and to include menstruation services as a key component.

## Resources

[Facebook updates](#)

[Floating Toilet Project](#)

[Floating Gardens](#)

[Case study: Designing Gender Sensitive Sanitation for Floating Villages](#)

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