

DEVELOPMENT AND MARKETING OF AFFORDABLE TECHNOLOGY OPTIONS FOR SANITATION IN LAO PDR



FINAL REPORT 20 FEBRUARY 2012

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The findings, interpretations, and conclusions expressed in this report are entirely those of the authors and should not be attributed to the World Bank or its affiliated organizations.

List of Acronyms

CLTS	Community Led Total Sanitation
DHO	District Health Office
iDE	International Development Enterprises
IEC	Information Education and Communication
Lao PDR	Lao People's Democratic Republic
Nam Saat	National Centre for Environmental Health and Water Supply
NGO	Non Governmental Organization
OD	Open Defecation
ODF	Open Defecation Free
RWSSH	Rural Water Supply, Sanitation and Hygiene
WSP	World Bank Water and Sanitation Program

Executive Summary

The 'Development and Marketing of Affordable Sanitation Options in Lao PDR' Project is a World Bank Water and Sanitation Program (WSP) project conceived as a response to the low levels of sanitation coverage and limited range of toilet designs in Lao PDR. WSP engaged International Development Enterprises (iDE) to lead efforts to identify potential suitable technology options and develop an operational model for marketing these sanitation products on a pilot basis in Lao PDR.

The overall objective of the Project is to identify potentially suitable sanitation technology options and marketing models for Lao PDR. The specific objectives are:

- 1) To investigate the current demand for, and supply of, rural sanitation technology options and hardware in two selected locations of Lao PDR.
- 2) To review lessons from past and current rural sanitation technology initiatives in Lao PDR, Cambodia, Vietnam and Indonesia.
- 3) To develop and test potentially marketable sanitation options.
- 4) To propose an operational model for marketing tested options to rural customers in the project areas.

The 9-month Project commenced in mid-May 2011. The project scope and study area was confined to 2 districts in southern Lao PDR where WSP is currently working: Tatheng District in Sekong Province and Bachiang District in Champasak Province. However, it is envisaged that technology options, business and marketing models will include elements that can be adapted to other districts and provinces in the country.

The project involved research into household demand and supply chains; an iterative process of 'Human Centered Design' to identify low-cost and desirable sanitation technology options; development and trialing of business and marketing models; and canvassing of potential operational models for a large scale sanitation marketing program. The main outputs and results from the field research included:

- **Vit Bor Sai Nam (Waterless Toilet) and Vit Sai Nam (Pour-flush Toilet):** A new sanitation product line including an upgradable waterless toilet (100,000-160,000 LAK/13-20 USD) and a tiled pour-flush toilet (LAK 375,000-425,000/47-53 USD) with simple 'Do-It-Yourself' instructions for self-installation.
- **'Proof of Concept' for a market-based approach to sanitation:** Two enterprises currently producing and selling the new affordable, desirable products in the target area, and at least three more enterprises eager to begin production.
- **Field-tested marketing strategies and messages:** A set of draft marketing messages and materials, as well as strategies and tactics for direct village-level sales and retail sales promotions.
- **Recommendations for program and operational models:** A set of strategic recommendations for the design and implementation of the pilot Sanitation Marketing component of the WSP's Scaling Up Rural Sanitation Project.

This Final Report presents the final recommended product offering, business model and approach to sales promotion based on findings from field research work. The Final Report also provides a set of strategic recommendations on programmatic and operational issues,

which will inform the development and implementation of a full-scale sanitation marketing program in Lao PDR. This report should be read alongside the Field Research Report, a companion document detailing the field research process and key findings.

1. Background

The 'Development and Marketing of Affordable Sanitation Options in Lao PDR' Project is a World Bank Water and Sanitation Program (WSP) project conceived as a response to the low levels of sanitation coverage and limited range of toilet designs in Lao PDR. Lao PDR has one of the lowest sanitation coverage rates in South East Asia, with just 53% of Laotians accessing improved sanitation in 2008 (WHO/UNICEF 2008). There is roughly 39% sanitation coverage in rural areas with road access, and 15.8% sanitation coverage in rural areas without road access (Ministry of Planning and Investment et al., 2008).

There are few toilet designs in use in Lao PDR, and a high prevalence of and preference for expensive pour-flush designs that are out of reach for most rural consumers (Ryan 2009). In the absence of affordable sanitation products and services, donor-funded sanitation projects have made extensive use of hardware subsidies without significant results. Programs offering individual latrine hardware subsidy often suppress demand, discourage private sector interest and create community expectations of external support.

WSP is assisting the government of Lao PDR in developing, testing and scaling up effective approaches to sanitation promotion that will help accelerate progress towards national goals and reduce dependence on subsidies. Since 2008 it has supported Nam Saat, the National Centre for Environmental Health and Water Supply in the Ministry of Health, in the piloting of Community-Led Total Sanitation (CLTS) in Champasak and Sekong Provinces. CLTS facilitates collective action by communities to end open defecation completely and, being focused on behavior change rather than toilet construction, does not depend on the use of hardware subsidies.

In the absence of generous subsidies, it is important that communities have access to latrine products and services that are affordable, desirable, accessible and technically viable in the local context. Sanitation marketing is an approach that has been demonstrated to rapidly increase access to sanitation at scale by connecting consumers with products they want and can afford. Coupled with CLTS, there is strong potential for the sanitation marketing approach to help catalyze the market for sanitation in rural Lao PDR.

1.1 Project Scope and Objectives

Through the 'Development and Marketing of Affordable Sanitation Options in Lao PDR' Project (hereafter, the Project), WSP engaged International Development Enterprises (iDE) to lead efforts to identify potential suitable technology options and develop an operational model for marketing these sanitation products on a pilot basis in Lao PDR.

The overall objective of the Project was to identify potentially suitable sanitation technology options and marketing models for Lao PDR. The specific objectives are:

- 1) To investigate the current demand for, and supply of, rural sanitation technology options and hardware in two selected locations of Lao PDR.
- 2) To review lessons from past and current rural sanitation technology initiatives in Lao PDR, Cambodia, Vietnam and Indonesia.
- 3) To develop and test potentially marketable sanitation options.
- 4) To propose an operational model for marketing tested options to rural customers in the project areas.

The 9-month Project commenced in mid-May 2011. The project scope and study area was confined to 2 districts in southern Lao PDR where WSP is currently working: Tatheng District in Sekong Province and Bachieng District in Champasak Province. However, it is envisaged that technology options, business and marketing models will include elements that can be adapted to other districts and provinces in the country.

1.2 Final Report Scope and Objectives

This Final Report presents a set of guidelines and recommendations on sanitation technology options and marketing models developed under the Project. The objectives of the Final Report are:

- To provide details on final recommended product offering, business/supply chain models, and sales and promotional tools and tactics.
- To provide a set of strategic and programmatic recommendations outlining necessary steps for the development and implementation of a full-scale sanitation marketing program in Lao PDR.

It is anticipated that the recommendations outlined in this Final Report will inform the design of a sanitation marketing project component of the 'WSP Scaling Up Rural Sanitation in Lao PDR' program.

This report should be read alongside the Field Research Report, a companion document detailing the field research process; key characteristics of the target area; findings from demand, supply and product development research; and outcomes of market strategy field trials. Those sections covered in the Field Research Report are not discussed in detail in the Final Report.

2. Product Offering

The recommended product offering includes **three packaged toilet options** that target widely across market segments. The products range in cost and sophistication while retaining key design features that make each model a viable and desirable sanitation solution. A reduced number of product options helps to simplify the purchase and decision process for the consumer and can thereby increase willingness to purchase.

Product design principles were derived from a deep investigation into users, supply chain actors, and other stakeholders. Iterations of prototyping, focus groups and manufacturing trials informed final design specifications and manufacturing techniques (see Field Research Report for details on the research process).

2.1 Key Features and Design Specifications

The three toilet models are designed to meet consumer desires, manufacturing efficiencies, and retail price targets. Each of the final recommended models follows the same basic design, thus reducing the need for new investment in molds and training for businesses.

2.1.1 Vit Bor Sai Nam: Standard and Featured Upgradable Waterless Toilet

The Vit Bor Sai Nam (literally, 'Toilet not using Water') or Waterless Toilet is designed to meet extreme affordability goals and to address the needs of water scarce areas. Waterless Toilet models have the following key features and attributes:

- **Modern durable concrete slab:** The Waterless Toilet is the first manufactured dry toilet available on the market. It features a large (1m x 1m x 4cm) durable square pre-cast concrete slab. Currently, all other available dry toilet slab options are built from collected materials such as wood or stone. The Waterless Toilet is thus a new and modern alternative to the traditional dry pit latrine.
- **Upgradable to a pour-flush latrine:** Both Waterless latrine models are designed to accommodate simple upgrading to a pour-flush latrine. Customers need not wait until they have enough money for an 'ideal' pour-flush toilet. They can enjoy the benefits of toilet ownership straight away for minimal cost and build on their initial investment in the base slab unit when ready. The Waterless Toilet includes an access tile or cap that allows users to access the pit to empty the contents if and when they have upgraded to the pour-flush model.
- **Pit contents hidden from view and suitable for children's use:** All Waterless Toilets come with a pre-fabricated zinc-steel 'dry pan', designed to block pit contents from view during use. The dry pan provides a barrier to prevent children from falling or slipping into the pit, addressing a key concern of adult users. The defecation hole is designed to accommodate upgrading to all available ceramic pan models and does not need to be removed: the ceramic pan is simply inserted over the dry pan and sealed (see below).
- **Lid to reduce flies and smell:** All Waterless Toilets have an attractive, easy to clean zinc-steel lid with handle and locators, to prevent flies from entering the pit when it is not in use. User instructions recommend the regular application of ash to the pit to further reduce smell and flies.
- **Available in 'Standard' or 'Featured' models:** The Standard model features a smooth concrete surface. The Featured model incorporates ceramic tiles for a more easily cleanable surface for an additional cost.

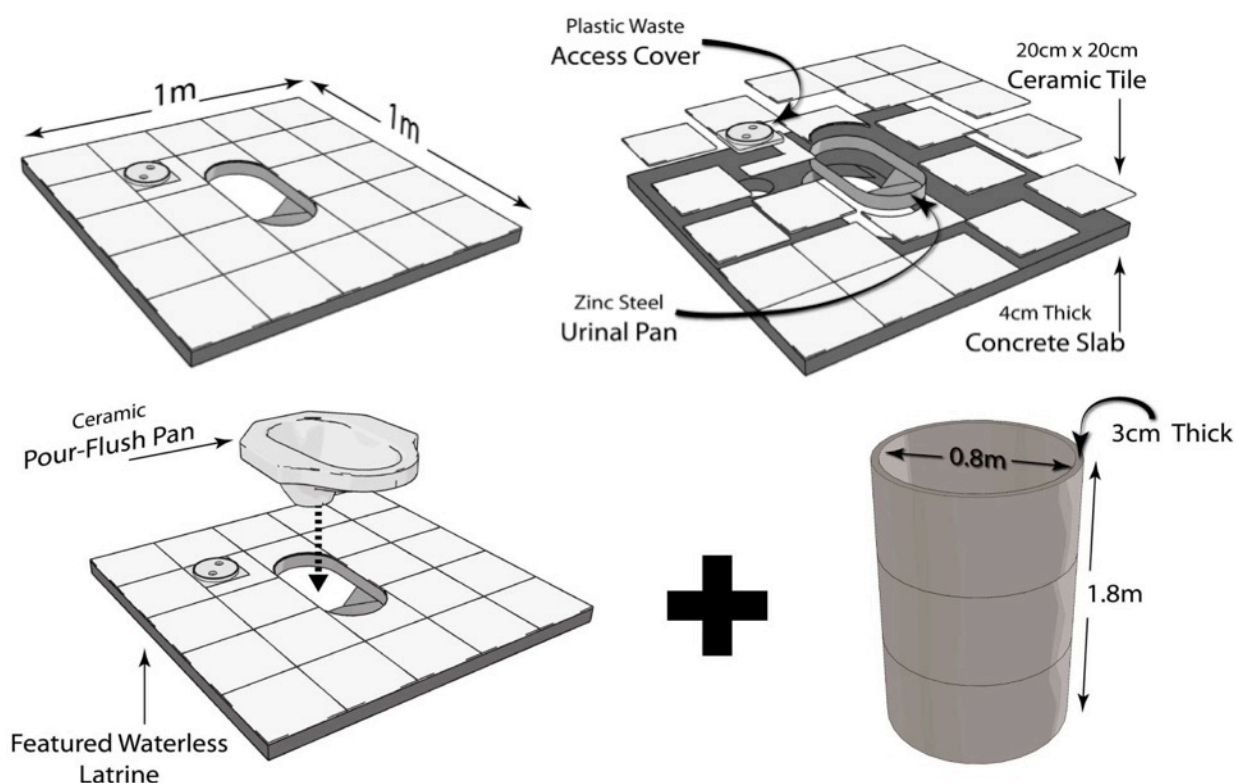
Figure 1: Vit Bor Sai Nam: Upgradable Waterless Toilet (with pit emptying access)



Vit Bor Sai Nam Standard Waterless Toilet



Vit Bor Sai Nam Featured Waterless Toilet



Upgrade to Pour-Flush Latrine

Design Specifications	<ul style="list-style-type: none"> • 1m x 1m x 4cm thick square slab • Pre-fabricated zinc-steel 'dry pan' • Zinc-steel lid with handle and locators • Pit emptying access hole • OPTIONAL: 24 count 20cm x 20cm ceramic tiles
Suggested Retail Price	
Standard Waterless	100,000 LAK [USD 12.50]
Featured Waterless	155,000 LAK [USD 19.38] – 165,000 [USD 20.63]

2.1.2 Vit Sai Nam: Featured Pour-flush Toilet

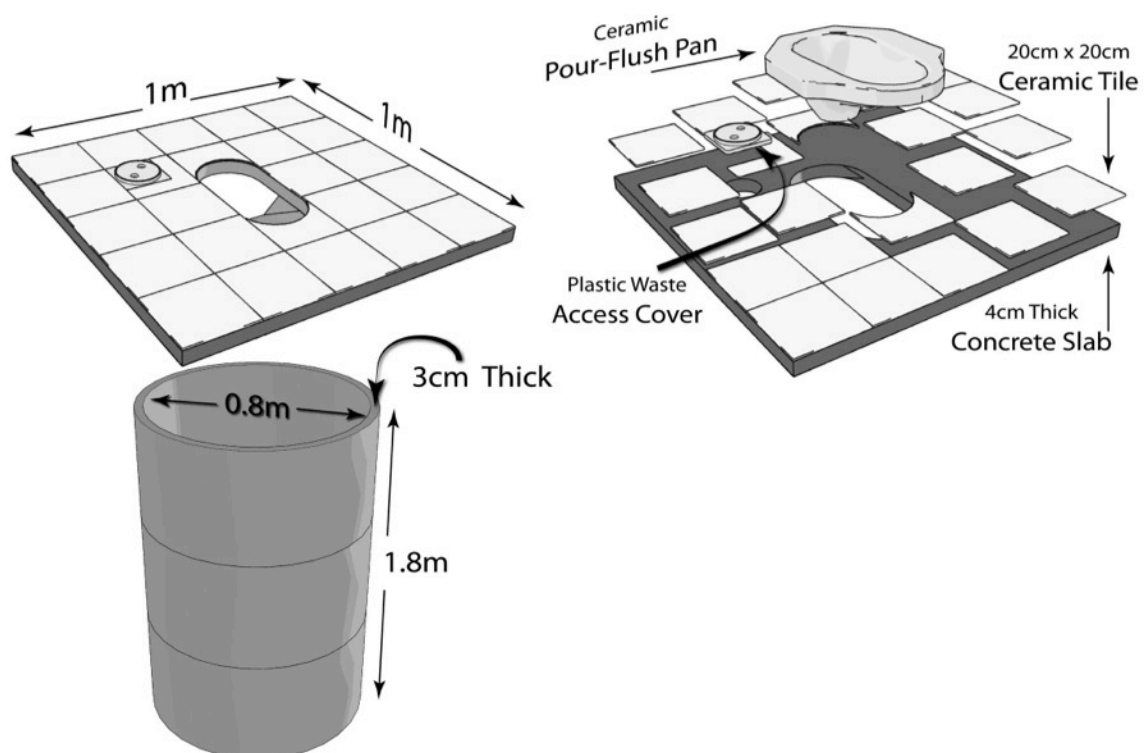
While the Waterless latrine offers a level of affordability and desirability previously unavailable in the Laotian sanitation marketplace, a majority of consumers prefer to use a toilet with water and are unwilling to settle for less. The Vit Sai Nam (literally, Toilet using Water) or Featured Pour-flush Toilet is a highly desirable pour-flush latrine with the following key features:

- **Durable large-size tiled concrete slab with integrated ceramic pan:** Unlike other available pre-cast concrete slabs, which are a standard 80cm diameter round design, the Vit Sai Nam Pour-flush Toilet features a large (1m x 1m x 4cm) durable square concrete slab. The integrated raised ceramic slab comes as a set, eliminating the previous need to go to two separate shops for slab and pan and to purchase cement to seal the pan.
- **Easy to clean tiled surface:** The Featured Pour-flush Toilet features a modern ceramic tiled surface. Tiles come in a variety of colors and styles and can be custom-ordered to suit customer tastes.
- **Pit accessible for emptying:** The Pour-flush Toilet includes an access tile or cap that allows users to access the pit to empty the contents when full.
- **Packaged set of three concrete rings:** The Toilet with Water integrated slab-pan is packaged together with three standard (80cm x 50cm) concrete rings for a 1.5m concrete-lined pit.

Figure 2: Vit Sai Nam: Featured Pour-flush Toilet (with pit emptying access)



Vit Sai Nam Featured Pour-flush Toilet



Design Specifications	<ul style="list-style-type: none"> • 1m x 1m x 4cm thick square slab • 24 count 20cm x 20cm ceramic tiles • Pre-cast ceramic pour-flush squatting pan • Pit emptying access hole • 3 standard 80cm x 50cm concrete rings
Suggested Retail Price	375,000 LAK [USD 46.87] – 425,000 [USD 53.13]

2.1.3 Shelter Options

The three packaged toilet products do not include shelter materials. The construction of a suitable shelter is at the discretion of the consumer, and will vary based on their desires, income and available materials.

The vast majority of households in both Champasak and Sekong use bamboo or wood for the walls and zinc or grass for the roof of their primary private household dwelling. According to the LECS 4, in Champasak, nearly 87% of primary dwellings have bamboo or wood walls, while over 93% have roofs of zinc or grass. In Sekong, over 94% of dwellings are made bamboo or wood walls, and 92% have zinc or grass roof (MoPI 2009). These data, alongside findings from household demand research and mini-pilots (see Field Research Report), point to the high likelihood that households will construct bamboo or

wood toilet shelters at low or no cost. More complex concrete and brick shelters may also be built. A range of shelter options, starting with the lowest-cost, can be presented alongside the packaged toilet options to give consumers an idea of their options and costs.

2.2 Manufacturing Process

Both the Waterless Toilet and the Pour-flush Toilet slab designs follow a very similar manufacturing process, which is relatively simple and aligns well with current manufacturing practices in the study region. The major difference between the two slab types is that the tiled models use slightly different tile cut patterns. Ease of manufacture is a critical design feature when considering adoption by potential latrine businesses in a full-scale sanitation marketing program.

Production of both toilets slabs involves installing the pan (zinc dry pan or ceramic pour-flush pan) after concrete slab fabrication. This will allow businesses to mass manufacture and stock standard slabs that can be finished based on orders or forecasted demand. Finishing with pan installation (rather than casting pans inside the concrete) also allows the business to choose when and where to install the pans. In the case of a large bulk order, a business may decide to install the pans on-site to enable easier transport (see Section 5.4 for further discussion on transport).

Annex A includes step-by-step Manufacturing Guidelines for all products and components.

2.3 Material Inputs and Costing Estimates

Tables 1 and 2 provide details on material inputs, costs and suggested retail prices for each of the new toilet products. Input costs will vary by location. Indicative costs and prices for Champasak Province are provided below, and assume costs for the 'business specialization' model in which finished concrete rings are an input (see Section 3 below).

It should be noted that although tiles contribute to a significant increase in product cost, this surface is highly desirable and will likely help to drive sales and uptake. The Field Research Report discusses design decisions, including the balance of affordability and desirability, in greater depth. While tiles were found to be most desirable, businesses may wish to experiment with untiled surfaces to further reduce the cost.

Suggested retail prices factored non-material costs including:

- Construction labor costs
- Overheads (including non-construction labor costs and operational costs) and wastage, calculated as an estimated 10% of cost
- Sales commission per toilet
- Profit

Costs of mold amortization and other asset depreciation were not included. In practice, concrete businesses often have great difficulty calculating overheads or indirect costs.

In a full-scale sanitation marketing program, each new business can be supported to make reasonable estimates of their costs (using the costing template below) to arrive at suitable prices. Actual profit margins will vary. Retail prices will fluctuate based on changing input costs, accessibility of labor and competition within the marketplace. Government officials and programs ***should not attempt to fix retail prices.***

Table 1: Waterless Toilet Materials, Costs and Prices (Champasak)

Material	Qty.	Cost (LAK)	Sold Unit	Total (LAK)
Cement (bucket)	1	38,000	50Kg Bag	11,875
Sand (bucket)	2	55,000	1 m ³	4,321
Gravel (bucket)	3	85,000	1 m ³	10,684
6mm Reinforcing Metal	9.84	11,000	8 m	13,530
Wire		500	1 m	500
Metal Sheet Pan	1	10,000	1 part	10,000
Metal Lid	1	15,000	1 part	15,000
Handle		1,000	1 part	1,000
Tile (20cm x 20cm)	24	42,000	25/Box	40,320
Silicone (White)		500	1 tube	500
Adhesive				
<hr/>				
Standard Waterless Latrine	INPUT Cost:			67,410 LAK
		Construction Labor*:		4,000
		Sales Commission:		10,000
		Overhead and Wastage (10%)^:		6,741
		Profit (≈12% margin):		11,849
	SUGGESTED RETAIL Price:			100,000 LAK
				\$12.53 USD
<hr/>				
Featured Waterless Latrine	TOTAL Input Cost:			107,730 LAK
		Construction Labor*:		6,667
		Sales Commission:		10,000
		Overhead and Wastage (10%)^:		10,773
		Profit (≈13% margin):		19,830
	SUGGESTED RETAIL Price:			155,000 LAK
				\$19.42 USD

* Assumes construction labor daily rate at 20,000 LAK/day, average production per laborer per day = 3 featured (tiled) slabs or 5 standard (smooth) slabs.

^ Estimate covers overheads (non-construction personnel, electricity, water, miscellaneous tools and supplies, property and other taxes, administrative and other indirect costs) and wastage (product breakage and excess unusable material).

Table 2: Pour-flush Toilet Materials, Costs and Prices (Champasak)

Material	Qty	Cost (LAK)	Sold Unit	Total (LAK)
Cement (bucket)	1	38,000	50Kg Bag	11,875
Sand (bucket)	2	55,000	1 m ³	4,321
Gravel (bucket)	3	85,000	1 m ³	10,684
6mm Reinforcing Metal	9.84	11,000	8 m	13,530
Wire		500	1 m	500
Ceramic Pan	1	50,000	1 part	50,000
Tile	24	42,000	25/Box	40,320
Silicone (White) Adhesive		500	1 tube	500
Pre-Cast Concrete Rings	3	60,000	1 Ring	180,000
Featured Pour-flush Latrine Kit (w/ 3 rings) TOTAL Input Cost:				311,730 LAK
Construction Labor*:				6,667
Sales Commission:				10,000
Overhead and Wastage (10%)^:				13,173
Profit (≈9% margin):				33,430
SUGGESTED RETAIL Price:				375,000 LAK
				\$46.99 USD

* Assumes construction labor daily rate at 20,000 LAK/day, average production per laborer per day = 3 featured (tiled) slabs or 5 standard (smooth) slabs.

^ Estimate covers overheads (non-construction personnel, electricity, water, space rental, miscellaneous tools and supplies, property and other taxes, administrative and other indirect costs) and wastage (product breakage and excess unusable material).

2.4 Environmental Suitability

The Waterless Toilet is most suitable for areas where the maximum ground water level is at least 1 meter below the slab level in the rainy season and 2 meters below the slab level in the dry season. This allows the pit contents to infiltrate more completely into the surrounding soils and allow the sludge to dry out and decompose. The Waterless Toilet option is not recommended for areas where soil composition is high in sand content or experiences regular flooding. The Pour-flush Toilet is suitable for areas with high water tables and occasional flooding if the slab is raised above ground level. The Pour-flush Toilet is also suitable for loose or sandy soil types as it includes a concrete pit lining.

2.5 Installation and Maintenance

The following sections provide an overview of key installation and maintenance considerations. Installation and maintenance user instructions are included in Annex G and discussed in more detail in Section 6.5 below.

2.5.1 Finding an appropriate site

As a general rule, the toilet should be located 20m or more from water sources (wells, surface water). It should be convenient to access and not too far from the house. The site should be on stable ground and have a low likelihood of being flooded during heavy rainfall, so households should consider local drainage on their property. The toilet should be downwind (if there is a prevailing wind) from the house.

2.5.2 Installing and Maintaining the Waterless Toilet

The Waterless Toilet can be built with either an unreinforced pit or a pit reinforced with local materials. The pits will have a limited lifespan (1 to 1.5 years depending on soil conditions and pit depth). Consumers who select this option should be clear that the pit will fill up and they will need to be rebuilt or upgraded over time.

A round 80cm pit should be dug to a depth of about 1 meter. While the pit can be unreinforced, it is recommended that it be lined with bamboo, wood or other material for added reinforcement. The rim of the pit can be lined with stones to reinforce it and prevent premature collapse. The rim should be built up to elevate the slab above the surrounding ground by at least 10cm. The soil excavated from the hole should be used to build a pad for the slab to rest on. This pad should be at the same elevated (10cm) height. The soil pad should be compacted so that it does not settle. The Waterless Toilet slab can then be placed on top of the pad, centered on the pit. The slab should be placed so the squatting hole is at the back (and the zinc-steel pan piece is towards the front). A shelter of the consumer's choice can then be constructed around the slab.

To keep a well-maintained Waterless Toilet, the user should:

- Keep the pit as dry as possible. Do not pour water inside the pit or use the toilet for bathing or washing.
- Keep a small bucket of ash inside the toilet room. Apply a small amount of ash to the pit after defecation to keep the pit contents dry and avoid smells.
- Clean the Waterless Toilet regularly with a wet sponge. Do not use a lot of water for cleaning.

- Keep soap and water for hand washing nearby. Always wash your hands with soap after defecation.

When the pit is full, the user can dig a new pit. The new pit may be used for another Waterless Toilet or for an 'upgrade' to a Pour-flush (see below). The new pit should be at least 2 meters away from the existing pit.

The filled pit should be backfilled and topped off with soil excavated from the new pit. The soil should be compacted to ensure integrity of the backfilled area. A tree can be planted in the location of the old pit to take advantage of the nutrients now present in the soil. If a second pit is built, the original pit needs to be left untouched for two years, at which point the contents can be safely handled and used for fertilizer or otherwise disposed of without risk of contamination.

2.5.3 Installing and Maintaining the Pour-flush Toilet

The Pour-flush Toilet should be built with a reinforced pit. The Toilet includes three concrete rings to be used for the pit lining. The rings should not be rolled on their side at any time. Prior to installation, the integrated slab/pan should not be placed face up on the ground, as this will put pressure on the ceramic pan.

A round 1m pit should be dug to a depth of about 1.5 meters. The rings should be lowered into the pit one by one and stacked one on top of the other. They should not be sealed or grouted together, as liquid from the pit should be able to seep out into the surrounding soil. The top ring should be about 10cm above the surround ground. The soil excavated from the hole should be used to backfill the remaining spaces around the rings in the hole and build a pad for the slab to rest on. This pad should be at the same elevated (10cm) height. The soil pad should be compacted around the top of the top ring so that it does not settle. A small amount of cement and water should be mixed to make a grout mix. This is spread around the top of the top ring to grout (permanently seal) the Pour-flush Toilet slab to the top ring. The Waterless Toilet slab can then be placed on top of the top ring, centered on the pit. The slab should be placed so the squatting hole is at the back. A shelter of the consumer's choice can then be constructed around the slab.

To keep a well-maintained Pour-flush Toilet, the user should:

- Do not throw sticks, rocks, menstruation fabric or other large items into the toilet.
- Clean the Pour-flush Toilet regularly with soapy water and a sponge.
- Keep soap and water for hand washing nearby. Always wash your hands with soap after defecation.

Approximately every two or three years, the pit will fill up. The exact time frame will depend on the soil conditions, number of latrine users, the diet of the users and what material they use for anal cleansing. Once filled, the pit will need to be emptied. To access the pit contents, remove the pit access cover (or lift the pit access tile) and remove contents using a hose and pump. The contents of the pit are contaminated and should be handled with care. They should be trucked away for further treatment or deposited into a secondary hole and backfilled (see Installation and Maintenance of a Waterless Toilet for more information).

2.5.4 Upgrading from Waterless to Pour-flush

To upgrade the Waterless Toilet to a Pour-flush Toilet, the user will need to purchase a ceramic pan and concrete rings. It is recommended that Pour-flush Toilet always be used with a reinforced pit (preferably concrete-lined) to ensure the integrity of the pit. The user should dig a new hole at least 2 meters away from the existing pit. Follow the instructions for Pour-flush pit construction above.

When the concrete-lined pit is ready, place the Waterless Toilet slab on top of the pit using a small amount of grouting mix (cement, sand, water) to seal the slab to the top ring. Insert the ceramic pan into the squatting hole, using a grouting mix to seal the pan into place. Follow the instructions for Pour-flush maintenance and pit emptying above.

The filled pit should be backfilled and topped off with soil excavated from the new pit. The soil should be compacted to ensure integrity of the backfilled area. A tree can be planted in the location of the old pit to take advantage of the nutrients now present in the soil. If a second pit is built, the original pit needs to be left untouched for two years, at which point the contents can be safely handled and used for fertilizer or otherwise disposed of without risk of contamination.

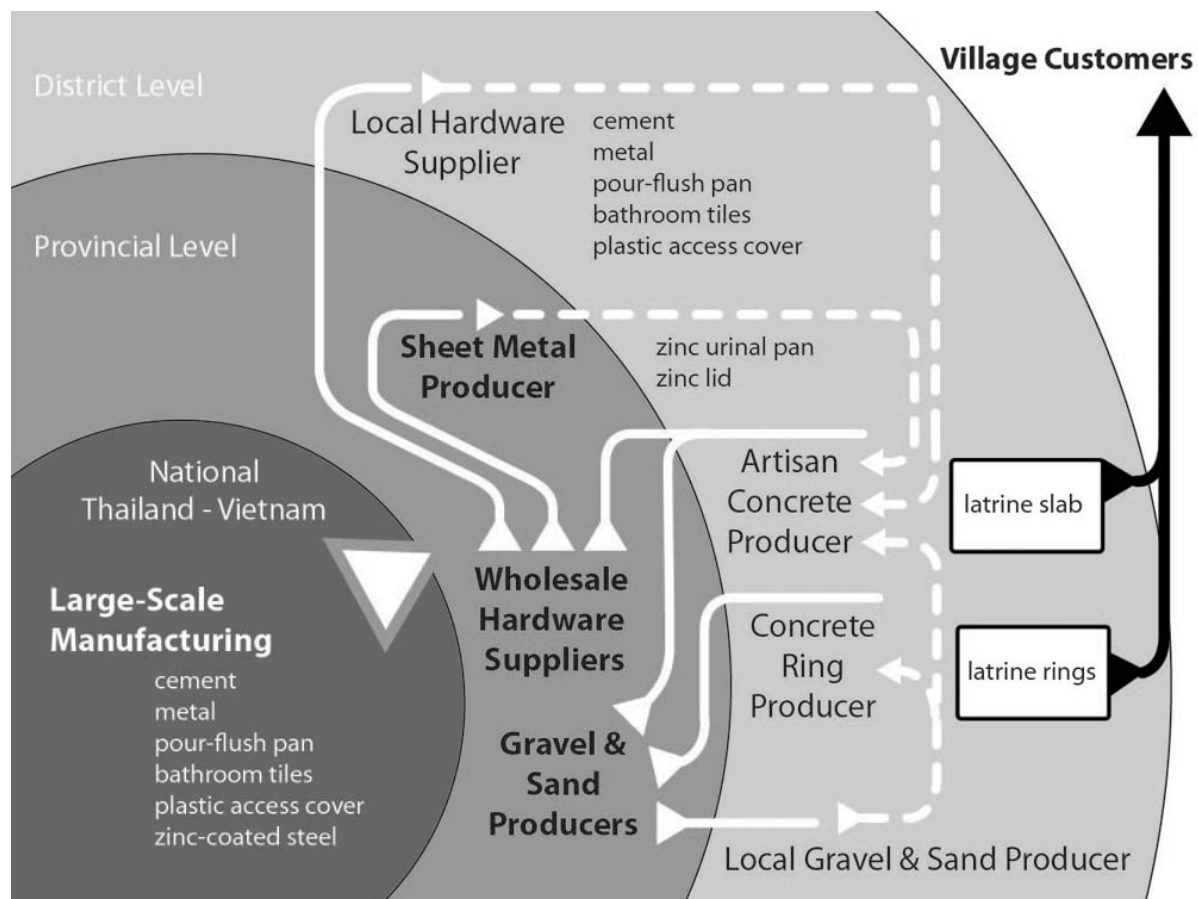
3. Business and Supply Chain Models

As noted in the Field Research Report, a new supply chain model was developed and tested to address key challenges within the supply chain for toilet products, most notably:

- **Purchase and construction complexity:** No single business could supply a household with everything it needed to construct a toilet. Businesses sold toilet materials and components, but no business offered a fully packaged 'toilet product'. Purchasing and constructing a toilet was time consuming and confusing for consumers.
- **Supply chain fragmentation and lack of interest:** Businesses selling toilet components and materials were not working together to offer consumers an easier purchase pathway, mainly because toilets were not considered a significant business opportunity.

The tested supply chain model (illustrated in the diagram below) targets pre-cast concrete producers as 'focal businesses' that can purchase all material inputs, manufacture finished products and sell packaged sanitation solutions directly to consumers. It is recommended that this model be retained in the development of a full-scale sanitation marketing program.

Figure 3: Proposed Supply Chain Model



3.1 Focal Businesses

The proposed model targets two key types of **existing businesses**, which can work together to offer complete toilet products to end consumers:

- **Artisan Concrete Producers** currently make items such as decorative pots, tiled tables and benches, stupas, and other 'decorative' concrete items as well as cement bricks and posts for household use. These producers focus on households as their core customer base. With their skills and comparative advantage in quality concrete production, artisan concrete producers are targeted to manufacture the new concrete slab/pan integrated sets.
- **Concrete Ring Producers** currently manufacture pre-cast concrete products for the construction industry, often specializing in concrete rings for drainage, irrigation channels, large concrete posts for electricity and other items. These producers are targeted for mass-production of standardized concrete rings, which can be sold to the Artisan Concrete Producers at bulk discount rates.

For the new waterless upgradeable latrine slab, a third business is also required:

- **Zinc Sheet Metal Producers:** These metal shops produce the additional 'dry pan' made of zinc sheet for the upgradeable Vit Bor Sai Nam. Zinc sheet metal producers usually operate at provincial level, and can easily mass-produce and distribute the zinc 'dry pans' to sanitation businesses at provincial and district levels.

In the proposed model, input suppliers of sand and gravel and hardware wholesalers are not primary 'focal businesses.' It is assumed that concrete producers will continue to source their inputs from existing channels. However, in a full-scale program it may be possible to target up-stream suppliers to arrange bulk discounts on inputs (see Section 8.3).

Similarly, in the proposed model, the focus is on pre-casting of manufactured products that can be purchased as a single package and self-installed by a household. Builders and masons are not targeted as 'focal businesses' and it is not envisaged that large-scale identification or training of masons will be required. However, as these businesses get to know their market, they can be encouraged to link up with village-level masons in their area to offer additional services, such as shelter construction or pit digging. Further research is also required to explore alternative business models, including those involving on-site casting (see Section 8.3).

4. Recommended Production Model

During field trials, the Project tested two different business models:

- **The ‘one shop’ manufacturing model:** A single concrete business manufactures both integrated slab/pans and concrete rings and sells this directly to consumers as a single package.
- **Production ‘specialization’:** An Artisan concrete producer focusing on manufacture of integrated slab/pans and a Concrete Ring producer focusing on manufacture of concrete rings, working together. In this model, the ring producer would sell the rings to the slab producer (or vice versa), who would then sell both items directly to consumers as a single package.

While both tested models showed promise, the Project Team recommends **encouraging production specialization** where possible. Artisan concrete producers and ring producers have slightly different capacities and strengths, particularly in terms of skilled and unskilled labor. By encouraging business partnerships, sanitation marketing programs can help each type of business do what it does best. Business specialization can result in production efficiencies, lower costs, and less time and effort spent in training or recruiting new labor and lower up-front investment in new equipment. It is important to note that while production specialization is recommended, *the final product should be sold as a single package*. Sale of slabs by one producer and rings by another is not recommended.

Although specialization is recommended, in practice, ‘artisan’ products and concrete rings are sometimes produced by the same business, particularly at district level. It is likely that in a full-scale program both models will be operational, depending on existing businesses in a given area.

4.1 Production Start-up Costs and Return on Investment

In order to attract existing businesses to the relatively unproven consumer market for sanitation, the new product line was designed to keep initial capital investment requirements low. Using existing input supply channels, tools and equipment and with minimum up-front investment, focal businesses can enter into production of the new product line. As indicated in Table 3, estimated start-up capital and stock investment requirements are minimal. Keeping these up-front costs low minimizes financial risk and will hopefully enable wider uptake of the new technology designs on the supply side, since the toilet products can be a low-risk add on to existing product offerings.

It is recommended that businesses that are serious about the toilet business opportunity start with a minimum of two slab molds. Table 4 indicates maximum daily and monthly production rates for a single mold. As businesses grow more confident and begin responding to the demand generated by sales and promotional activities, they will invest in the additional molds, equipment and labor they need to increase production.

Table 3: Start-up Investment Requirements

	Cost (LAK)
Capital Investment (New molds and equipment)	
Two slab molds	600,000
Angle grinder w/ tile cutting blade (medium grade)	410,000
Misc. tools and supplies (buckets, shovels, etc.)	100,000
Minimum Capital Investment	1,110,000 [139 USD]
Other (non-essential) Equipment	
Welder	1,000,000
Concrete Vibrator (medium grade)	1,540,000
Optional ring mold set (inner, outer)*	2,043,000
Investment - Initial Stock Inputs	
10 Standard Waterless	674,100
10 Featured Waterless	1,077,300
10 Featured Pour-flush	3,117,300
Initial Stock Investment	4,868,700 [609 USD]
Total Start-up Investment	5,978,700 [747 USD]

* Assumes existing businesses will be targeted. Concrete ring producers will utilize existing ring molds and conventional ring production techniques. For Artisan Producers in 'specialization' model, finished concrete rings will be purchased as an input.

Table 4: Single Mold Production Rates

	Max Daily Production	Max Monthly Production
Slab mold (dry/wet)	3	90
Ring mold	2	60

The businesses will launch a new product line with three new products, each with different profit potential. Break-even point will therefore vary based on consumer preferences for each of the products. Consumer research and preliminary sales trials indicate that the Featured Pour-flush will likely be the most popular and bestselling of the three product options. Tables 5 and 6 below illustrate potential profit for different sales scenarios. In Scenario 1, capital investment costs will be recovered after the sale of 43 units, assuming a mix of Waterless and Pour-flush Toilet sales. In Scenario 2, it is assumed that no Waterless Toilets are sold. In this case, capital costs are recovered after the sale of 34 units.

Although profit margins are lower for the Featured Pour-flush Toilet (9% compared to the 12-13% margin on Waterless Toilet options), net profit is higher for the Pour-flush units. Businesses may therefore have an incentive to more heavily promote Pour-flush options. Sanitation marketing program staff will need to discuss this issue with businesses and encourage them to stock and promote all products in the line. Additional support in terms of positioning the Waterless Toilet as a desirable consumer item and helping businesses to reach the target market for this product (e.g. by targeting recently triggered CLTS villages in their area) will be essential.

Table 5: Breakeven Point Scenario 1

	Profit per Unit (LAK)	Units Sold	Total Profit (LAK)
Standard Waterless	11,849	5	59,245
Featured Waterless	19,830	15	297,455
Featured Pour-flush	33,430	23	768,898
	Total Profit		1,125,598 [141 USD]
	Minimum Capital Investment		1,110,000 [139 USD]

* See Tables 1 and 2 above for calculations of estimated profit.

Table 6: Breakeven Point Scenario 2

	Profit per Unit*	Units Sold	Total Profit (LAK)
Standard Waterless	11,849	0	0
Featured Waterless	19,830	0	0
Featured Pour-flush	33,430	33	1,103,190
	Total Profit		1,103,190 [138 USD]
	Minimum Capital Investment		1,110,000 [139 USD]

* See Tables 1 and 2 above for calculations of estimated profit.

5. Recommended Distribution and Sales Models

5.1 Village-level Direct Sales

The core recommended product distribution strategy is for businesses to sell products directly to consumers in villages, using a network of commissioned sales agents. Given the limited access to transportation, markets, and market information in the target area (and throughout rural Lao PDR), village-level direct sales create an opportunity to bring products to the consumer, thus overcoming some of the major identified barriers to access. Village level sales events and ‘door-to-door’ sales at village level are likely to result in the highest uptake, since they create new product exposure and purchase opportunities and leverage

person-to-person communication channels. Direct sales, as opposed to sales through intermediaries, also reduce added margins and thus final retail prices.

In the village-level direct sales model, a network of commissioned sales agents is recruited and managed by a business to sell within their target area through group meeting sales events and/or door-to-door.

5.1.1 Village-level Sales Activities

The Project developed and tested a simple 8-step process for conducting a village sales event, utilizing a range of sales and promotional tools and tactics. The ‘Selling Steps’ were inspired by and based on the WaterSHED/Lien Aid WASH Marketing Project village sales event steps in Cambodia. The event is designed to be fun and interactive, combining messages about good sanitation behaviors with promotion of the new product line (see Section 6 for discusses of promotional messages). A key goal is to keep the event short and simple: it is designed to last no more than 1.5 hours. Annex B: Steps for Conducting a Village Sales Event is a simple guidance sheet outlining sales event steps so they are easy for sales agents to remember and conduct. Marketing/advertising firms working on the design of a full-scale sanitation marketing program may wish to revise these steps and activities. However, it is recommended that any village-level sales event includes the following components:

- Broad-based sanitation behavior change communications messages, including benefits of toilet ownership and use (and disadvantages of open defecation).
- Thorough description of each product, including physical features and attributes, prices and payment options, and purchase/delivery methods.
- Opportunity to take orders and arrange deliveries with consumers.

In addition to sales events, Sales Agents can be encouraged to go door-to-door to promote the products to individual households.

5.1.2 Sales Agent Selection Criteria and Recruitment Strategies

Village chiefs, members of the village committee, and other trusted leaders should be consulted to identify and recruit suitable sales agents. Sanitation marketing program staff can assist business in connecting with village chiefs and requesting interested volunteers to come forward. The following recommended selection criteria can be used to identify the most suitable candidates:

- **Cluster- or village-level ‘influencers’:** Given the target area’s low population density, dispersed settlement patterns and high proportion of ethnic minority villages, it is recommended that sales agents are recruited from *within the cluster or village community*. During sales trials, the Project tested the use of the Village Health Volunteers (VHV) network. VHVs exist in every rural village, and are generally tasked with providing health information to their community. They already have some basic knowledge about hygiene and sanitation and existing links to Nam Saat District officials. VHVs are volunteers from the community, and are not officials (although in practice some VHVs may also hold official village posts). The VHV network presents a ready sales network opportunity; however, other trusted, influential people at village level will also work well. Wherever groups of villages have been amalgamated into clusters, it is

recommended that only one cluster-level sales agent is selected (to limit the overall number of sales agents that a business must manage).

- **Toilet ownership:** To be able to credibly influence people to purchase a toilet, sales agents must be able to speak from experience. All sales agents should own and use their own household toilet. If a sales agent does not have a toilet, he or she should agree to build or buy a toilet within the first month of recruitment. Sanitation Marketing program staff should encourage businesses to give their sales agents a toilet on credit or installment if needed.
- **Basic literacy and numeracy:** Sales agents will need to be capable of filling in sales order forms and doing basic calculations.
- **Confidence, enthusiasm and communication skills:** The best sales agents will be those with good communication and public speaking skills. They should be confident, hardworking, respectful and capable of speaking about an 'embarrassing' topic.
- **Desire to help their community:** Although it is recommended that sales agents receive a commission on each sale, the monetary incentive alone will not be enough to motivate them. The best sales agents will be driven by a desire to support positive change in their village.
- **Access to mobile phone preferred:** Sales agents will need to be in regular contact with their producers and customers. In areas with mobile phone reception, communications will be easiest by phone.

5.1.3 Sales Agent Role Description, Commission and Management

Sales agents will be expected to undertake the following roles and responsibilities:

- Attend sales agent training and any refresher training.
- Attend planning meetings with producers.
- Keep ready supply of sales brochures and maintain other sales tools. Bring all sales tools and materials to sales events.
- Make all pre-event arrangements and conduct village events and door-to-door sales as agreed in sales plans.
- Keep regular contact with producers to confirm product is delivered on time and that there is sufficient stock available.
- Collect money and communicate the most up-to-date retail prices to consumers.
- Provide product information and after-sales advice on installation and maintenance to customers.
- Keep clear and organized sales records.
- Work in good cooperation with local officials.

It is recommended that businesses incentivize their sales agents by giving them a commission on each sale. The commission should be the same for both wet and dry latrine options so that sales agents are equally motivated to sell both options. In discussions with businesses, pilot sales agents and local officials, a commission of LAK 10,000 (1.25 USD) was agreed as a suitable commission per sale.

Businesses are responsible for keeping in regular contact with their sales agents to motivate and encourage them and help them to solve problems that may arise. Businesses should meet with their sales agents at least once a month to review sales data, set monthly sales targets, discuss key questions and provide refresher training and sales tips.

Producers may wish to formalize their agreements with sales agents by signing a contract outlining these roles and specifying the agreed commission paid per sale.

5.2 Retail Sales

Retail sales at the concrete business's shop are recommended as a secondary product distribution and sales strategy. Most existing concrete businesses have a shop-front and already engage in retail sales of other products. Businesses should be encouraged to prominently display toilet banners and physical toilet product displays in clear view of walk-in customers and roadside passers-by. Staff at the shop should be trained on sales tactics for walk-in customers and shops should have a ready supply of sales tools and materials (for example, product brochures) at the point of sale. Businesses should be encouraged to keep all toilet models in stock for immediate retail sale.

5.3 Order Processing and Management

Businesses and their sales agents will need an efficient and simple system for processing orders and making payments. The Project tested elements of a sales order management system during sales trials. It is recommended that the core tools are retained in a full-scale sanitation marketing program:

- **Sales Order Form**, with customer details, units ordered, material and transport costs and delivery date. The form should be completed by promotional agents and signed by customers and village chiefs during the sales event. Sales order forms can be printed on carbon paper, so that a copy can be given to the business. An example used during sales trials is include in Annex C.
- **Sales Record Book**, tracking each sale by customer name, location, order date and delivery date. This book should be used by the businesses to help manage stock, orders and deliveries. An example used during sales trials is include in Annex D.
- **Sales Receipt**, with customer details, purchased units and final delivery date. Businesses should be encouraged to use their existing receipt books.

A critical component of a sales order processing system will be timely and regular communication between businesses and their sales agents. Businesses will rely on this system for stock management, order tracking and delivery timing. Additional tools, such as monthly sales plans, may also be useful. The simpler and less onerous the system, the more likely businesses will be to use it. Sanitation marketing teams should bear in mind that not all businesses will adopt the project-designed systems: In the end, it will be the responsibility of each businesses to manage its processes.

The sales order management system should link to sanitation marketing program monitoring (e.g. to track program performance across all businesses, as measured by sales and other program indicators). Thus, sanitation marketing teams should take care to streamline their M&E frameworks with business-level order processing systems.

5.4 Order Transport and Delivery

As noted in the Field Research Report, transportation costs are a key bottleneck for rural distribution in Lao PDR. Managing transportation costs will be a key issue for businesses that deliver the new products. A related issue will be ensuring optimal packing of delivery trucks to minimize breakage in transport.

In Lao PDR, transportation costs are based on the truckload. As a ‘rule of thumb’ in the target area, transport costs are usually in the order of 10,000-20,000 LAK per kilometer depending on the size of the truck and other factors. Table 7 below presents shipment estimates for common delivery trucks. It is most common for medium-size concrete producers to own a Hyundai 4x2 truck.

Table 7: Product Shipment Capacity by Truck Type

Truck Type	Bed Size	Shipment Capacity	Packing Method
Hyundai 4x2	1.63m (w) x 2.77m (l) x .35m (h)	<ul style="list-style-type: none"> • 6 rings, 2 slabs • 6 slabs (no rings) 	Stack slabs directly on top of rings using cardboard or rubber
Hyundai 6x4	Varies	<ul style="list-style-type: none"> • 12 rings, 4 slabs • 24 rings only • 8+ slabs only 	Stack slabs directly on top of rings using cardboard or rubber



In general, the Project recommends taking a flexible approach to product delivery, allowing businesses and consumers to negotiate transport arrangements rather than offering fixed per unit transport charges. The following core strategies are recommended:

- **Businesses should offer delivery as an add-on service:** Since transport costs will vary, delivery charges should not be included in the retail price of the product, but offered for an additional transport service charge. Although it is expected that many villagers will prefer home delivery, some rural consumers will want to pick up their order from the business’s shop, using informal transport networks already in place.
- **Sales agents should encourage bulk village sales:** The final transport charge per order will be calculated by dividing the truckload transport charge by the total number of orders. Therefore the more orders per truckload delivery, the cheaper the transport charge for the individual consumer. Sales agents can use tactics such as presenting bulk purchase as an opportunity for transportation ‘discount.’ Businesses might consider offering promotions to drive bulk purchase. For example, during field

trials one pilot business offered one free toilet to any village purchasing ten or more sets at once.

- **Delivery should be used as an opportunity for additional sales:** When making a village delivery, businesses should load as much extra product as can fit on the truck and attempt to sell extra units when they arrive in the village.

Transport negotiations will require regular communications between sales agents and businesses. Where possible, businesses should communicate truckload transport costs to sales agents in advance. For example, they may be able to give an estimate of 100,000 LAK per truckload for all villages within a 10km radius from their shop.

6. Marketing and Promotional Strategy Design

The development of a full sanitation communications and marketing strategy or campaign was outside the scope of this technology options project. Using insights from the qualitative consumer demand assessment, (see Field Research Report), the Project team developed elements of a promotional model for the new products, including designing and testing draft sales tools and promotional materials.

It is recommended that the Project's consumer demand research, drafted promotional materials and feedback from sales trials feed into the development a large-scale marketing and communication campaign strategy within the planned sanitation marketing program. This strategy should be designed by a marketing or advertising firm that has experience with the rural Lao consumer market. The following sections present recommendations, directions and insights that can help inform marketing strategy design.

6.1 Market Scope and Segmentation

The Project was confined to a study area encompassing just two districts in Champasak and Sekong provinces. Available provincial data provide an indication of the overall potential household market demand for sanitation in the two target provinces. Table 8 indicated that the number of households without sanitation is over 56,000 in Champasak and nearly 8,000 in Sekong. As nearly 80% of the population in both provinces is in rural areas (and urban sanitation coverage is consistently much higher than rural sanitation in Lao PDR), it can be assumed that the majority of the 'toiletless' market is in the rural areas. This total 'household toilet requirement' can be taken as a proxy for potential demand for sanitation products and services. Estimates for new toilets do not include the households with unimproved sanitation facilities that can be targeted for 'upgrades' to hygienic toilets.

Table 8: Estimated Potential Market Demand for Sanitation, Champasak & Sekong

	Champasak	Sekong
Number of Households, 2008	108,568	15,200
Rural Population	79.5%	78.7%
Sanitation Coverage	52.11%	30.34%
Potential Market Demand (expressed as # of households without access to sanitation)	56,755	7,921

Sources: Laos PDR Ministry of Planning and Development and UNDP *Employment and Livelihoods: Human Development Report 2009*; Unpublished 2010 sanitation coverage data from Provincial Departments of Health.

To estimate the affordability of the products in the new product line, the cost of each item was calculated as a percentage of average annual non-food household consumption. Table 9 indicates that in both provinces, the Waterless Toilet options are 0.5-1.5% of annual non-food household consumption. The Featured Pour-flush is about 2% of annual non-food consumption in Champasak and 3.7% of non-food consumption in Sekong. This data would indicate that on average, the products meet affordability criteria. However, average consumption figures mask differences between households. It is recommended that planned national formative research into household demand include a high-level market segmentation exercise to better understand the needs and purchasing power of lower-income segments.

Table 9: Toilet Products as a Percentage of Annual Non-food Consumption

	Champasak	Sekong
Consumption per month per household (LAK)	2,299,500	1,518,700
Food consumption per month per household (LAK)	712,845	561,919
Non-food household consumption per month per household (LAK)	1,586,655	956,781
Annual non-food HH consumption per household (LAK)	19,039,860	11,481,372
Standard Waterless Toilet Retail Price (LAK)	100000	100000
Cost as % of annual non-food HH consumption	0.53%	0.87%
Featured Waterless Retail Price (LAK)	155000	165000
Cost as % of annual non-food HH consumption	0.81%	1.44%
Featured Pour-flush Retail Price (LAK)	375,000	425,000
Cost as % of annual non-food HH consumption	1.97%	3.70%

Source: Calculations based on 2007-08 provincial consumption data, Laos PDR Ministry of Planning and Development *Lao Expenditure and Consumption Survey in 2007/2008* (LECS 4).

Qualitative research conducted under this Project suggests that beyond latrine ownership, the market might be segmented based on other key variables:

- **Latrine Usage:** A good deal of previously subsidized toilet infrastructure currently uninstalled and/or unused in the target area. Those households with existing but unused sanitation facilities represent a sub-segment of latrine owners in which the target behavior is not buying or building a toilet, but installing, refurbishing and consistently using the facilities they already own.
- **Access to roads:** The market might be segmented geographically, with separate activities and messages (and possibly products and production techniques) based on road access. More research in areas without road access will be required to understand consumers and supply chains in these areas. All villages in the target study districts have full year-round road access.
- **Income levels:** The market for particular toilet products can be segmented by household income level, with products at different price points (and with different financing options) pitched to different income groups. For those with very low income and ability to pay, lower-cost (or no-cost) hygienic toilets can be promoted as the first step on the pathway to the 'ideal' toilet.

6.2 Product Promotions: Messages and Themes

The creative concept for a marketing campaign can draw on the research insights and draft marketing tools developed under the Project. The following core recommendations are offered in terms of creative concept design:

Product/Positioning

- **Encourage businesses to promote a single 'wet and dry' product line: 'Beautiful, Clean Toilets.'** Key product features for all products (wet and dry) are modernity, cleanliness, lack of smell and durability. Dry options are as beautiful and clean as wet options.
- **Reposition the dry pit as an upgradeable and aspirational consumer item.** A core focus of product promotions should be to change the perception of the simple dry pit toilet and promote it as a desirable consumer item that is a first step towards an 'ideal' toilet. Sales messages should focus on the upgradability of the dry option. In trial sales materials, the dry pit ('vit heng') was renamed a 'Waterless Toilet' (Vit Bor Sai Nam). Marketing teams can consider retaining this name, or otherwise differentiating the Waterless Toilet from its traditional dry pit 'competitor.'
- **Sell complete toilet sets, but with optional shelters:** Promote the simplicity of a full toilet package that can be self-installed. Visually depict how the toilet sets can be used with any type of shelter and that shelters can be upgrade over time.

Communications/Promotion

- **Emphasize aspirational aspects of toilet ownership and focused on positive images and messages.** Focus on the toilet as a 'status symbol' and emphasize modernity and convenience. Use images portraying happy and healthy families. Market products as 'affordable', good quality and good value for money, but not 'cheap'. In sales trials, the rhyming slogan "Use toilet, no worries, relax" and the accompanying

toilet song/dance about the inconvenience of open defecation proved very popular with villagers and was easy to remember and repeat.

- **Use images of real people, not cartoons.** Advertisements for popular items such as Beer Lao, hair and beauty products and other fast-moving consumer goods use real people in real situations. These images, which already have deep reach into rural villages, are seen as fresh and modern. Toilet advertisements should promote the concept of 'modernity' and avoid cartoons and drawings.

6.3 Product Sales and Promotional Tools

The draft sales tools designed and tested during the Project included a product display, a simple brochure, and a large banner (see Annex E). It is recommended that all three of these simple sales tools are retained and developed further:

- **Product displays – bring the product to the consumer.** Consumers want to see, touch and experience the products. This is a very large investment and so they want to be confident of the product quality. Physical product displays will be very important, particularly in the early stages of product promotion. Product displays and demo models should be a core tool in both direct and retail sales models.
- **Simple brochure and banner - provide basic product information, key features, prices and business details.** The brochure should be easy for businesses to print and distribute en masse. The brochure should leave blank spaces for individual businesses to fill in current prices and contact information. The banner should not include retail prices (as these may change over time).

In determining other appropriate sales tools, emphasis should be placed on keeping costs down and urging businesses to invest their own resources to promote their products.

6.3.1 Revisions to Draft Sales Tools

Should the sanitation marketing program choose to retain or build on the draft sales tools, it is recommended that these are further tested and revised based on feedback from consumers. Preliminary feedback on draft brochure and banner design (Annex E) indicated a number of areas where further revisions would be necessary:

- **Changes to wording based on language and literacy:** The target provinces of Champasak and Sekong are home to ethnic minority communities speaking a range of indigenous languages. Fluency in Lao language may be limited, particularly among women. Literacy levels vary across the provinces. In Champasak, 90% of men and 74% of women over the age of 15 years old are literate; in Sekong, these figures are 76% and 48% respectively (MoPD and UNDP, 2009). Further testing will be required to determine whether further revisions are needed to limit or change words that prove difficult to understand.
- **Changes to 'happy family' front cover image:** Although people liked the image of the happy family, they were a bit unclear on the meaning. The image should be revised to be more straight-forward, perhaps including an photo of a family standing next to a newly-purchased toilet.
- **Changes to drawings of 'snakes, pigs and flies':** Feedback indicates that the message around the inconvenience and uncomfortable aspects of defecating due to the presence of animals and insects was difficult to understand. Suggested changes

included using more realistic photos of a man in an ‘uncomfortable’ open defecation situation, possibly with real animals nearby.

6.3.2 Indicative costs – print materials for sales tool ‘starter’ kit

It is recommended that businesses be encouraged to invest their own resources in sales and promotional materials. In practice, it can be difficult at first to encourage businesses that are not used to doing any form of advertising to make this kind of investment. As an early incentive, the sanitation marketing program may wish to enter a cost-sharing arrangement with each business, or subsidize the first ‘set’ of marketing materials outright. Table 4 presents indicative printing costs for one sales tool ‘starter kit’ as developed by the Project.

Table 10 Indicative Costs: Print Materials for Sales Tool ‘Starter Kit’

	Cost per Piece (LAK)	Number of Pieces	Total Cost (LAK)
Product Brochure (color)	5,000	300	150,000
Product Banner (color)	150,000	1	150,000
Laminated Flip Chart Story with Ring Binder (color)	134,500	1	134,500
Total Cost – Sales Tool Starter Kit			434,500 [54.31 USD]

6.4 Broad-based Communication of Good Sanitation Behaviors

While the project utilized communications tools and tactics focused on the benefits of toilet ownership, these tools were developed in the context of a village-level sales and promotional event. More broad-based communications related to good sanitation and hygiene were not developed in any depth. However, qualitative demand research (see Field Research Report) suggests that such messages should place strong emphasis on non-health benefits of toilet ownership and use, including convenience, status and safety.

The Project did not explore opportunities for communications channels such as radio, television, drama, road show, billboards and the like. It is recommended that all such options are investigated during the design of a full-scale communications campaign.

The key ‘social marketing’ tool used during the sales event was a flip chart story (Annex F) adapted from the WaterSHED/Lien Aid WASH Marketing Project in Cambodia. The story was originally developed as part of the Cambodia National ‘Stop the Diarrhea Campaign’¹ and has been in use within the WaterSHED project for over two years. The story uses the vehicle of two different men (in Laos, Samboun and Samnout) to discuss key messages including:

- The benefits of toilet ownership and the importance of constructing a basic dry pit toilet as a starting point.
- Ways to save money and slowly upgrade to a pour-flush toilet.

¹ The open-source ‘Stop the Diarrhea Campaign’ was developed under the guidance of the Cambodian Ministry of Rural Development by the WaterSHED and Lien Aid WASH Marketing Program with the social marketing firm 17 Triggers.

- Disadvantages of open defecation, including wasting money on medicine when you get diarrhea.
- Problems with waiting until you have enough money to buy an 'ideal' pour-flush toilet and prioritizing other things (like a mobile phone) above toilet purchase.

The story was adapted to the Lao context with minimal changes to some of the images. During field trials in Lao PDR, it proved to be a powerful communications tool. However, more pre-testing and research is needed to determine how and if the story can be incorporated into the final marketing campaign. In addition to the story, it may be possible to adapt other 'Stop the Diarrhea Campaign' tools to the Lao context. Those developing the campaign may wish to review the tools in the open source campaign to determine if they might be suitable.²

6.5 Product Installation and Maintenance Instructions

The Project developed a draft set of Instructions for installation and maintenance (Annex G). In a full-scale program, it is recommended that such a communications tool be retained for further development. However, the instructions should be further tested and revised based much more detailed feedback. Ideally, the communications team can observe the installation of the toilet and hold more detailed discussions with existing consumers who have installed their toilets to understand what aspects of the instructions are unclear. Preliminary feedback on the draft instructions indicated a number of areas where revisions would be necessary:

- **Provide separate instruction sheets for the Waterless Toilet and the Pour-flush Toilet:** The draft single installation instruction sheet may be confusing for consumers. Having separate instructions may help clarify the steps and will also allow for more detail to be added if necessary.
- **Use some minimal text to explain installation steps:** Some written text may be useful to describe installation steps. If text is used, consideration should be given to language and literacy issues (as discussed in Section 4.4.1 above).
- **Include more key messages on maintenance:** For the Waterless Toilets, this might include strict instructions on keeping the pit dry; how and when to add ash; and how to safely cover a filled pit. For Pour-flush Toilets, this might include the importance of not rolling concrete rings; how to know when your pit is full; strict instructions on keeping the access cover sealed; and information on where to access pit emptying services (as these become available).

Preliminary feedback from consumers indicated that many prefer to receive verbal instructions and support. In addition to paper-based instructions, the sanitation marketing program should include training to businesses, sales agents and District Nam Saat staff on how to instruct and advise households on product installation and use.

² The full toolbox of WASH social marketing campaign materials is available at <http://www.watershedasia.org/wash-social-marketing-campaign/>.

7. Program Design Considerations

The Project demonstrated ‘proof of concept’ for the retail sale of a new line of low-cost aspirational toilet designs to rural consumers in the target study area. The next stage will be to develop a sanitation market development program to effectively stimulate the market for rural sanitation on a broad scale. The following strategic and programmatic recommendations outline necessary steps for the development and implementation of a full-scale sanitation marketing program in Lao PDR.

7.1 Overarching Program Principles

It is recommended that the Lao PDR sanitation marketing program team consider two core principles or criteria by which to measure the suitability of any planned program intervention:

- **Sustainability:** Are marketing activities private-sector driven? Will sanitation marketing activities continue after the program ceases to operate in a given area? Can private sector actors grow their businesses in the future without on-going support?
- **Scalability:** Are interventions cost effective and time efficient? Can they be replicated on a larger (e.g. national) scale with minimal program resources? Do program activities effectively leverage private sector and household investment?

By using the ‘sustainability and scalability’ test, program staff will be guided towards market catalyzing and facilitating roles, rather than hands-on ‘program implementation’ roles.

7.2 Program Management Resources

Recruit a core team with small business development, marketing and sales experience. The core program management team and all field-level program staff will need to be able to ‘think like a business’ and will be expected to negotiate with and support small businesses and their sales agents. Field staff and managers will need to speak in the language of business, and be able to clearly articulate investment costs, risks and potential profits for businesses. They will need to understand, design and teach effective sales tactics for village-level promotions.

Bring in external resources where needed and think beyond ‘WASH’. Not all sanitation marketing activities need to be (or can be) managed ‘in-house’ by the core team. For example, marketing and advertising firms specializing in *rural Lao PDR markets* are best placed to design a full-scale marketing and communications campaign. Training might be best developed (and delivered) by external training or business development service providers with specialist skills in training small businesses and sales forces. To find these firms, the program team will need to look beyond WASH networks, to groups, firms and organizations working in other sectors (particularly rural market development).

Separate sanitation marketing teams from teams conducting CLTS triggering and follow-up, but ensure that they coordinate closely. Although sanitation marketing programs should link closely to CLTS and other behavior change efforts, the two approaches require very different skill sets and activities. Groups or individuals that specialize in community development, public health or engineering may not have all the required skills to work directly and intensively with local small businesses and sales agents.

7.3 Geographic Scope

Cover a wide geographical area. Sanitation marketing is not a village-by-village approach. One of the main benefits of sanitation market development programs is that they can and do work *at scale*. Marketing messages (particularly if mass media is utilized) target a wide swathe of the population and businesses seek to expand their customer base – they will not be confined to village boundaries. It is strongly recommended that the initial sanitation marketing program target *at least* two provinces.

Focus initially on areas with a minimal level of existing market and road access. As the focus was on two districts with full road access, the business model developed under the Project, which involved pre-cast concrete and delivery by truck, was designed for areas with road access. Sanitation market development has the best change for success in areas with a minimal amount of exposure and access to markets and where populations have some cash income. Target these areas first.

Target areas without road access for trialing of new business models. More remote areas without road access should be targeted separately for trials and testing of appropriate models. This will likely include on-site concrete casting, alternative technology designs and more targeted support to those without cash income. The aim should be to get ‘proof of concept’ before launching of full-scale of activities in these areas.

Do not limit businesses geographically. Businesses cannot be bound to program-delineated boundaries. They will seek out markets where they can profitably sell their products. In just a few months of operations, the pilot businesses are already moving into do not expect that businesses will market only in CLTS villages. In the target area, there will be only 40 triggered villages across the two provinces in 2012: this is not a big enough market to support a supply-side market.

7.4 Timeframe and Duration

Plan for at least two sales seasons for real market penetration. The sanitation marketing pilot should allow for at least two ‘peak income’ seasons. Sales will increase over time as people gain exposure to the new products and as marketing messages reach and penetrate the consumer market. In the first two critical years, the program will need to provide extras support as businesses gain confidence and build trust with their new market. Since most households in the target market have seasonal income, the program should think and plan in terms of a peak ‘sales season’ from January to March. Irrespective of official program start date, the new program should include at least two of these January-March sales seasons to really see program impacts.

Target resources towards seasonal sales ‘push’. Sanitation marketing programs should target resources to ramp up marketing efforts just before and during the January-March Sales and promotion activities will be most effective during the times of year that are the best opportunity to capture as much demand as possible. Develop detailed program work plans and marketing campaigns that coincide with peak sales seasons. Consider timing of CLTS efforts such that triggering takes place around November-December, to prime the market for sales efforts.

Allow for at least six months of preparation work before full-scale launch. The new program will need time to recruit resources and prepare program work plans; design monitoring systems and tools; develop the marketing and communications strategy; design and print sales tools; identify and recruit businesses and sales agents; and design and deliver training curriculums. To undertake these and other activities, the program will need an intensive period of preparation before it is ready to launch into sales promotions.

7.5 Business Engagement Approach

7.5.1 Business Engagement Principles

Scale through replication and encourage innovation and competition. Actually demonstrating the market opportunity by getting early businesses up and running is the best way to get other businesses interested and involved. The Project has already worked intensively with two pilot businesses that are showing strong promise and beginning to take their own initiative. These businesses have successfully demonstrated the potential of the products and promotional approach and can be used as models in the full-scale sanitation marketing program. Businesses should be encouraged to innovate to drive sales and differentiate their product and service offering from others.

Encourage business-to-business exchange and business-government networking. Use exposure tours and a ‘seeing is believing’ approach to replicate the early successful businesses and advertise the ‘toilet business opportunity’ to other potential businesses. Bring businesses together periodically to discuss common issues and problems. Use program resources to support ‘business forums’ that bring together businesses and local government officials to talk about key issues such as quality standards, training opportunities, and government sanitation goals.

Take a ‘hands off’ approach to businesses. Real entrepreneurs will be motivated by potential profit and will take business risks and make monetary investments. Businesses that are serious about the toilet business opportunity will need to see that they can make enough money selling toilets not just to cover their costs, but to continue selling toilets to more consumers over time. They will also need to know that failure is an option. When negotiating with businesses, program staff should approach with a clear business proposition and as a service provider and supporter – not as a project looking for a contractor. The sanitation marketing program is offering to help their business, not the other way around.

7.5.2 Existing Businesses in the Target Area

During the supply chain assessment and throughout the study period, the Project Team built up a database of key existing supply chain businesses in the target area, their location, business type and contact details. Summary data of all businesses, including concrete producers, hardware shops and input suppliers was compiled into a Supply Chain Map available at:

<http://maps.google.com/maps/ms?msid=204249198474696923068.0004b3c3e19e39bf2dbb8&msa=0>

The Supply Chain Map is not an exhaustive list of all supply chain businesses in the target area (the Project study area was limited to one district per province); however, the map may be a good starting point and resource to future sanitation marketing teams. Tables 3 and 4 below provide a rough estimate of potential focal businesses in the target provinces (only focal businesses, and not all supply chain actors, are given). It is not envisaged that all of these actors will be engaged in a full-scale program.

Table 11: Estimated Potential Focal Businesses, Champasak Province

		Businesses per District/Town	Total Number of Businesses
Provincial Town (Pakse)	Artisan Producers	4-6	4-6
	Ring Producers	6-8	6-8
	Zinc Producers	4-6	4-6
District Level (10 Districts)	Ring/artisan Producers	1-2 per district	9-18

Table 12: Estimated Potential Focal Businesses, Sekong Province

		Businesses per District/Town	Total Number of Businesses
Provincial Town (Sekong)	Artisan Producers	2-3	2-3
	Ring Producers	3-5	3-5
	Zinc Producers	1-3	1-3
District Level (4 Districts)	Ring/artisan Producers	1-2 per district	3-6

7.5.3 Identifying High-Potential Businesses

Given the limited size of the market and limitations in geographic reach of the focal businesses, the optimal number of businesses supplying any one area should be considered. Although the toilet opportunity can be open to all potential businesses, sanitation marketing teams may want to be selective in which businesses they target for training and support initially. A great many of the potential businesses in the target area will likely be uninterested in the toilet business opportunity, especially at the beginning. In opening up a new market, sanitation marketing programs should try to identify 'quick wins' and early successful businesses that can then be used as models. A number of general criteria are recommended to assess and select initial businesses that have a high likelihood of success:

- **Existing business with diversified product line:** Sanitation marketing programs should target existing businesses and should not attempt to set up 'new' sanitation businesses. Businesses engaging in toilet sales will not be 'sanitation businesses' per se: Toilet sales will complement an overall business, but there will simply not be enough demand or enough profit to sustain a business through toilet sales alone. Businesses should ideally sell a range of products and have existing staff, resources, networks, management skills and business acumen.

- **Willingness to make up-front investment:** Successful businesses will ‘self-select’ by committing their own financial and human resources. Project experience with two pilot businesses indicates that additional financial incentives, ‘seed funding’ or subsidization of molds and equipment will not be necessary. Sanitation marketing programs should seek out entrepreneurial businesses willing to take on all the financial risks involved in the launch of a new product line.
- **Willingness to engage in retail and direct sales to rural consumers:** Active sales and promotions, particularly direct sales in villages, will be a very new concept for most businesses. Moreover, rural consumers will make up a fraction of their client base. High-potential businesses should be willing to take the risk on sales to rural consumers. Many of the existing concrete producers in the target area, particularly in Sekong, have experience with contract sales to NGOs and agencies providing subsidized materials to the rural areas – they will need to be willing to shift away from bulk NGO contracts and must be clear that this is a retail sales opportunity.
- **Capacity to sustain and grow:** Successful businesses need not be the largest market players, and indeed the very large players may be uninterested in the toilet business opportunity. However, high-potential businesses must have the capacity to produce and deliver high quality products on time. They will therefore need sufficient resources (including means of transport or financial resources for up-front vehicle hire) and cash flow. Successful businesses will be willing to invest profit or take on debt to grow.
- **Geographic dispersion:** Sanitation marketing program teams will need to map the target market to understand where to look for potential businesses. As a ‘rule of thumb,’ with the size, weight and bulk of the products, businesses will not likely be able to profitably service an area outside of a roughly 30km range from their production site. However, creative distribution models may be able to overcome this constraint.
- **Not directly affiliated with Nam Saat:** To avoid conflict of interest, it is recommended that initial businesses are not on the staff of Nam Saat. Since businesses have a vested interest in profiting from toilet sales, those that are also charged with promoting sanitation have a clear incentive to undermine competitors and/or create a monopoly situation in their area.

By taking a ‘scale through replication’ approach, sanitation marketing program can nurture and grow the number of active businesses over time. In fact if conditions are right, other business will respond to demand and early success of their competitors, and will replicate the technologies and promotional approaches on their own.

7.6 Training Approaches

7.6.1 Business Training Guidelines

In the design of suitable training programs for businesses, the sanitation marketing program should consider the following:

Mode of delivery and training approach: ‘One-off’ training courses that bring together groups of businesses may be useful to communicate certain types of knowledge, but just attending a short course is usually not enough to equip a small business with all the skills it

needs to run effectively. The program should consider training modes such as one-on-one hands-on business support and business-to-business mentoring. These trainings might be conducted over a period of weeks or months, not days. Such 'on-the-job' training, conducting at the place of business, can be a very effective learning strategy.

Regardless of the mode of delivery, business trainings should be practical and skills-based. They should emphasize 'learning by doing' and avoid too much theory. Trainings should have clear outcomes measured by the competencies of the trainees. For example, if the training is on manufacturing a slab, the trainee should demonstrate that he or she can actually manufacture a slab to specification without assistance (not describe how to manufacture a slab). If the training is on keeping a sales record, the trainee should demonstrate that he or she has maintained a correct sales record for one week (not described how to do it on paper). If certification is given, it should be awarded based on successful demonstration of specific skills and competencies (and not just on attending or completing the training).

Training content: The business training curriculum or tool-kit should include modules in the following broad content areas:

- **General sanitation and hygiene and products functions and features:** Businesses selling toilet products should understand the core benefits of good sanitation and hygiene. They should know how the toilet technologies function and the importance of each technical feature. This includes understanding clearly about use and maintenance issues.
- **Technical manufacturing of the new product line** (see Annex A): Setting up the production site; manufacturing materials, steps and techniques; curing times; handling the product and loading delivery truck; installation and maintenance advice.
- **Business management and finances:** Sales projections; stock control; sales order records; on-time delivery; managing construction labor and sales agents; calculating a balance sheet; cash flow issues; consumer credit/installment payment plan records.
- **Sales and promotions:** Sales skills; conducting village meetings; sales during deliveries; sales agent recruitment and coordination; sales agent commission and incentives; brochure and banner distribution.

Training providers: The program should consider appropriate training providers to develop curriculum and deliver business training. Training providers with previous experience in business development services and training in the Lao context may be best placed to undertake this work. If training is done 'in-house' by the program team, specialist training providers may be able to advise the program or provide 'training of trainer' services.

7.6.2 Sales Agent Training Guidelines

In the design of suitable training programs for sales agents, the sanitation marketing program should consider the following:

Mode of delivery and training approach: At the start of their engagement, sales agents can be given an intensive training course on all the core aspects of their work. This training course will probably need to be program-supported in the first instance. Considering the

number of sales agents that will be trained, a training course format is probably the most cost and time efficient way to train sales staff. Sales agent training should be very practical and skills-based. It should include role-plays, practical exercises and a field-based practice component. At the training, sales agents should spend time with their businesses and should see and touch the sanitation products.

After the initial training course, it should be the responsibility of each business to monitor and manage its own sales agents. Sales agents should meet with their business regularly. Businesses should be encouraged to bring their sales agents together on a monthly basis to discuss sales tips and tactics with each other.

Training content: The sales agent training course should include the following areas:

- Core benefits of good sanitation and hygiene, and basic hygienic practices.
- Product features and benefits, including design features, price and comparison to other products
- Guidelines and steps for conducting a Village Sales Event (Annex B)
- How to use each of the promotional materials and tools
- How to use the sales order form
- Follow-up steps with the business after the sales event
- Providing advice to consumers on latrine installation and maintenance

Annex H: Sales Training Agenda and Trainer's Notes provide an overview of the brief one-day training designed and conducted as part of the Project sales trials. In a full-scale program, a Sales Agent Training would probably need to be 3-4 days in length, including at least one day of field-based practice conducting an actual event.

Training providers: As with the business training, Training providers with previous experience in sales force training may be best placed to design and deliver curriculum, or to provide 'training of trainer' services to in-house sales agent trainers.

7.7 Enabling Environment Institutional Arrangements

Government agencies and officials have critical roles to play in stimulating, promoting and regulating sanitation markets. However, unlike CLTS, the private commercial market for sanitation products and services essentially involves a transaction between a business and a consumer. At the level of individual sales transactions, provincial and district government do not need to play a direct role. These officials should continue to serve the public interest and take care to avoid conflict of interest situations. Table 13 outlines potential roles for government and agency stakeholder institutions.

Table 13: Potential Enabling Roles for Key Stakeholder Institutions

Institution	Roles and Functions
Nam Sat Central	<ul style="list-style-type: none"> Clearly articulate the role of private markets in national sanitation policies and strategies Set quality standards for sanitation technologies Support national-level research and knowledge exchange on sanitation marketing and its links to CLTS Support and attend provincial-level stakeholder meetings
Provincial Nam Saat	<ul style="list-style-type: none"> Provide overall monitoring and oversight of provincial sanitation marketing programs Play an active role in designing and conducting the communications and promotions campaign Continue CLTS efforts, linking these to commercial purchase opportunities Facilitate and attend Business Forums and other events and support the formation of business associations Monitor businesses to ensure compliance with quality standards Provide consumer protection against predatory businesses Contribute to research and knowledge exchange on sanitation marketing and its links to CLTS
District Health Office	<ul style="list-style-type: none"> Offer technical support to consumers on installation and safe usage. Play an active role in communications and promotions campaign Continue CLTS efforts, linking these to commercial purchase opportunities Provide equal access to information and equally opportunity for businesses to promote their products Provide consumer protection against predatory businesses Do not accept sales commissions or other payments from businesses. Do not directly engage in sales or payment collection
Village Chief/Village Committees	<ul style="list-style-type: none"> Help arrange and conduct village-level sales events Help broker and arrange bulk village purchase Act as a 'guarantor' on sales and installment payment arrangements Provide equal access to information and equally opportunity for businesses to promote their products Follow-up with sales agent and/or business as needed
WSP and External Support Agencies	<ul style="list-style-type: none"> Design and coordinate all market development activities Lead the design of marketing and communications campaign Identify and recruit businesses and their sales agents Provide training and support to new businesses and their sales agents Facilitate meetings, exchanges and forums that link businesses to each other and to local governments. Monitor sales and other program data

7.8 Linkages with CLTS efforts

CLTS and sanitation marketing are highly compatible approaches, but as noted above they do require different skill sets and activities. It is generally recommended that sanitation marketing and CLTS programs teams are managed separately. Other recommendations include:

Help businesses to coordinate sales after CLTS triggering. Sanitation businesses can be given a list of villages and their planned CLTS triggering schedules, so that they know where and when to go to a village. Clear sales opportunities exist for businesses in villages where CLTS has occurred, particularly in terms of promotion of the Waterless options. In terms of timing of sales events with CLTS triggering, it seems that sales will be best after CLTS triggering.

Do not limit businesses to sales in CLTS villages. The sanitation marketing program can develop marketing strategies that leverage CLTS without relying solely on it. Successful marketing approaches should help generate new demand with or without CLTS (and after CLTS activities cease). Businesses will not be able to survive on CLTS-generated demand alone.

Recognize the difference between creating demand for a behavior and creating demand for a product. Commercial marketing does not replace broad-based communications targeting changes in sanitation and hygiene practice. The goal of CLTS is for the entire community to reach ODF. The goal of a business is to sell as many toilets as possible. While these goals are different, they are not incompatible. CLTS will work best when people have better access to desirable and affordable products and services.

Use CLTS follow-up to encourage immediate installation and use of purchased products. Where CLTS programs are active, follow-up teams can help encourage the installation and use of purchased products.

Encourage ‘healthy competition’ between villages and districts. Within a CLTS framework, provincial authorities can help drive change by creating non-monetary rewards and incentives for districts and villages. In this framework, toilet sales through private market channels will be seen as a way for district and village officials to reach ODF faster and to sustain ODF over time.

7.9 Program Targets and Monitoring

Plan for sales to start modestly and grow over time. The sanitation marketing program should be aware that the first season of sales will be the weakest. The program should set realistic sales targets that plan for incremental (and more likely, exponential) growth in sales. These should be based on overall demand data (e.g. toilet requirement) within the given target area.

Plan for a time lag between purchase and installation. New consumers of the sanitation products may not install them straight away for various reasons. The program should plan for some delay between purchase, installation and use and should develop monitoring systems to track conversion rates over time.

Keep program monitoring and reporting frameworks simple and streamlined. Where possible, the program should keep monitoring to a minimum and should attempt to use data that is already being collected by businesses and sales agents for other purposes. To track sales and business growth indicators, the Program should take the business as the unit of analysis. To track overall coverage and use, village surveys and spot checks may be required. Monitoring plans should include a strong consumer survey component, as it is feedback from consumers that can drive program, product and business improvements.

8. Further Research Needs

8.1 Product Offering

Within the timeframe of the study, the Project Team was not able to fully explore technology design options that would require longer design lead times, significant R&D budget, new production centers or large-scale importation of components or tooling. The Project also focused on designs that were highly desirable to a target market within a limited geographical area. The following sections present recommendations for further research into other potential technologies.

8.1.1 Offset-Pit Integration

Some areas outside of the study region might prefer offset-pit latrines. In areas where this is a key purchase driver the current designs can be modified to meet this requirement. The current Featured Pour-Flush slab could easily be modified to remove the pit-access hole from the slab casting process. In addition a catchment box and pit lid would need to be added to the latrine kit. Both the Cambodia and SNV catchment box designs (see Field Research Report) could be used in Lao PDR, but more research and prototyping should be completed around cost savings and manufacturing/mold efficiency. The Offset-Pit option adds considerable cost (roughly and additional 130,000 LAK or 35% of total cost). It should be user-tested in different regions depending on relative affluence and desires.

8.1.2 Alternative Pit Lining Materials/Technology

There are many opportunities to investigate new pit lining technologies and materials. During the Project, consumer feedback and perceptions of a new/foreign approach to the familiar concrete ring was not very positive. Any new designs of molds that produce a similar ring with less raw material, for example using cut-aways, is worth pursuing and possibly marketing, provided that the molds can be easily purchased (sourcing molds was a bottleneck in the target area). Other materials such as plastics can also be investigated further, using manufacturing techniques such as rotational molding. Such technologies would most likely involve importing parts or starting new production facilities within Lao PDR and importing raw material.

8.1.3 Fiberglass or Plastic Concrete Latrine Slab Molds

It may be possible to use new molds to produce higher quality concrete toilet slabs at a lower cost. Fiberglass and vacuum-formed plastic are two fairly 'low-tech' options that are available in the neighboring countries of Vietnam and Thailand. These materials can create very smooth surfaces with little effort at a relatively low cost. It might be possible to utilize

fiberglass or plastic molds to generate one-piece slabs and eliminate the need for expensive ceramic tiles and possibly even the ceramic pour-flush pan. A common complaint about concrete casted pour-flush pans (tested in Lao and elsewhere) is the inability to clean easily or effectively. However, a cleanable concrete-casted might be possible with an ultra-smooth mold and possibly the addition of a hydrophobic protective coating. These mold types also allow the casting of unique and complex shapes that might produce a more desirable product.

8.1.4 Plastic Pan and Plastic Slab Technology

Plastic pans and plastic dry slabs should be considered for further research because of the potential cost savings and ease of transport to more remote areas. Plastic pans and plastic slabs are currently available in neighboring countries and are worth testing among different consumer demographics for desirability. There are a number of plastics manufacturers in Lao, but currently lack the manufacturing capacity (specifically injection molding technology) to produce plastic latrine pans. Refer to Annex I for a list of plastics manufacturers and their respective product categories.

8.1.5 Large Scale Production of Concrete Rings

On a field research trip to the Ubon region of Thailand, the Project encountered a concrete ring production facility utilizing a unique manufacturing technique to produce a range of different sized concrete rings through a high-speed compression process. The machinery to do this was fairly large and was most certainly a significant investment for the business. However, the technology allowed him to produce a very large quantity of rings per day without the use of metal reinforcement. This kind of technology and production method might be considered for the Lao context on a provincial level to achieve lower costs and great production rates. This kind of technology might also be possible to alter in order to create a pit lining technology that is easier to transport.

8.2 Services and Service Delivery Models

Much more research in Lao PDR will be needed to explore effective service offerings for pit emptying, treatment and possibly reuse. The proposed Pour-flush Toilet is an improvement on the current direct-pit toilet designs common in the area, as it includes some way to access the pit once it is full. Although the product was designed with a means of pit emptying, the single pit design is still a weakness of the product. The Project team found very few pit emptying services in the study area, and these serviced the urban and peri-urban areas of provincial towns. Either as part of the sanitation marketing program or as a separate stand-alone project, further research will be required to develop or adapt technologies and business models for rural pit emptying, treatment and reuse. Such research should draw on global and regional learning and experience in this area and should also take a clear consumer focus.

8.3 Business Models

8.3.1 On-site Concrete Casting

As noted above, further research is needed into appropriate technologies and business models in remote areas without roads or with poor road access. In these areas, on-site concrete casting may be the most efficient way to produce desirable and durable designs.

In an on-site casting model, bags of cement, molds and other materials would need to be transported to village sites. A trained laborer would then cast the products at the village. On-site casting options may be the only viable option for concrete production in areas without road access. It should be noted however that on-site casting options are not necessarily more cost effective or efficient. Careful research into the relative cost efficiency of pre-casting vs. on-site casting options and discussions with businesses on profitability of these models is required. To be attractive as a business opportunity, on-site casting in villages would most likely need to be for bulk orders. In addition to trialing options in remote areas without road access, the sanitation marketing program might also be able to test on-site casting with one of the pilot businesses to work out time and costs (provided that a minimum number of orders could be secured in a village).

8.3.2 Indirect Retail Sales

A number of 'mobile shops' travel from village to village, selling fast moving consumer goods such as drinks, snacks, seasoning powder, cigarettes, noodles, beer, soap and other toiletries. These mobile shops are generally small trucks with a set route to villages that they will frequent again and again. They sell directly to village consumers and also supply village-level retail kiosks. These kiosks generally have a very small amount of space, stocking low-margin fast moving goods. Where mobile shops exist, they could offer a potential opportunity to sanitation business, particularly as sales agents distributing leaflets, advertising products or taking orders. Similarly, where retail kiosks exist, there may be an opportunity to engage them as sales agents promoting new toilet products, possibly stocking 'display units' at their shop and making a commission on each sale.

8.3.3 Business Associations

In a full-scale program it may be possible to target up-stream suppliers, for example to help concrete businesses arrange bulk discounts on inputs. Sanitation marketing programs can consider targeting ceramic pan wholesalers and importers for preferential prices. As a full-scale sanitation marketing program gains momentum, it may also be possible to help small-scale sanitation businesses form an association that could aggregate input orders and thus obtain 'economies of scale' in purchasing inputs. Further research and testing of such options would probably come at later stages of the sanitation marketing program.

8.4 Financing Options

The sanitation marketing program should include a specific research component on financing options and opportunities. On the consumer side, early sales trials conducted under the Project revealed a clear consumer preference for and interest in installment payment plans. Consumers are already use installment payments to pay for other major purchases (e.g. furniture, farm equipment). At the time of writing, the Sekong pilot business was trialing installment payment options in one village. It is recommended that the sanitation marketing program follow up to learn more about this experience. Consumers seem less interested in loan repayments (e.g. with interest). However, it is worth exploring options for consumer microfinance. On the demand side, microfinance may be required for business expansion and trade credit (particularly if businesses are extending consumer credit to installment payment options). Many businesses may already be microfinance clients. It is strongly recommended that these aspects of the program are designed and

tested by specialists with experience in Lao PDR microfinance and small business development.

8.5 Linkages with CLTS and subsidy programs

Further research and experience will help to understand the optimal linkages between CLTS and sanitation marketing in the Lao PDR context. This might include research into consumer uptake and sustained toilet usage with/without CLTS; phasing and sequencing of triggering and sales; and appropriate roles for local government and other stakeholder. As both CLTS and sanitation marketing are fairly new in the country, the Project recommends taking a pragmatic approach, testing what works and then replicating the best models. Conventional subsidy programs as implemented in the target area have tended to distort the consumer market for sanitation products. In terms of linkages to subsidy programs, it may be possible to develop and test 'smart subsidy' options (e.g. a voucher system) for the poorest, but these would need very careful targeting and in practice may take significant resources and time to design and implement properly.

9. Next Steps and Conclusions

In the longer term, it is hoped that the products and models developed under the Project and outlined in this report can be used as the basis for a large-scale sanitation marketing program. In the interim program design period, the following steps have been recommended to build on the momentum created through the Project:

- **Capitalize on and continue to support the two pilot businesses.** The Project supported two pilot businesses that are ready and able to capture seasonal sales (Dec-Mar) in 2012 and to continue to sell after this period. Interim resources can be used to support the two existing pilot businesses to gain confidence and expand opportunistically, using their own networks. Pilot businesses would benefit from some minimal support and periodic check-in. They should be encouraged to continue monitoring their sales over the interim period.
- **Conduct one additional 'interim' training for sales agents in villages within a 20km radius of pilot businesses.** Using the one-day draft sales agent training format (see Annex G), additional resources could be used to conduct an interim training for identified sales agents from the villages nearby the two pilot businesses. These agents can be encouraged to conduct sales events on their own in their villages, using the draft materials and systems developed by the Project during the interim stage.
- **Link planned CLTS work with pilot selling.** CLTS scale-up to 40 villages in the target provinces will begin in early 2012. Interim resources can be used to inform implementing agencies about pilot businesses and their interim sales plans. Sales agents from the 40 CLTS villages can be invited to attend the interim training. If possible, lists of the CLTS villages, including the dates of CLTS triggering in each village, should be given to the pilot businesses. They can then be encouraged to conduct village sales events after CLTS triggering has occurred.
- **Send a clear message to all stakeholders that pilot/small scale activities should continue as the full-scale program is put into place.** Use interim resources to hold provincial-level meetings with relevant DHO staff to explain the project and the activities. *District Nam Sat staff do not need to be present at sales events.* However, they should

be informed and asked to support activities by continuing to provide sanitation advice to households and monitoring progress on their regular trips to the villages.

- **Begin discussions to put institutional arrangements in place for full-scale program.** During the program design stage, WSP and senior Nam Saat officials can begin to meet, discuss and agree on appropriate institutional roles and arrangements, particularly at the local level. Although this might include discussions with other agencies in other parts of the country, establishing working relationships within the new program target areas should be given first priority.

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Annex A: Manufacturing Guidelines

A.1: General Concrete Fabrication Techniques

A.2: Manufacturing of Base Slab for All Latrine Models

A.3: Next Steps of Manufacturing the Standard Waterless Latrine

A.4: Next Steps of Manufacturing the Featured Waterless Latrine

A.5: Next Steps of Manufacturing the Featured Pour-Flush Latrine

A.6: Manufacturing of Alternative Pit-Access Construction

A.7: Manufacturing of Zinc Urinal Pan & Lid

A.8: Manufacturing of Concrete Ring Pit Lining

A.9: Manufacturing Guides and Patterns

A.1: Concrete Fabrication Methodology

A.1.1. Mixing of concrete

1. *Inspect your material*

Always inspect your materials (water, sand, aggregate or river gravel) to make sure they are clean for concrete making (i.e. not mixed with mud, debris or organic matters)

2. *Ensure Consistency of quantities*

Always measure your cement and sand quantities using identical measuring devices such as handmade bins, bucket or any other containers.

3. *Keep your mix free of contamination*

Whenever mixing by hand, take the time to make a mixing pad (as per drawing below) to prevent the water from escaping and keep the concrete free of contaminants. The same applies to the areas where you keep your material; ensure your raw material are kept on a concrete slab to prevent transferring natural ground debris when you load the material into the measuring bins.



Figure 1: Concrete mixing pad (made from concrete)

4. *Ensure you mix thoroughly*

Whenever possible invest in a concrete mixer to ensure your mix is properly mixed each time. If you must mix by hand, take the time to ensure your concrete is mixed thoroughly so that the cement & water are equally spread through your mix.

5. *Keep the water cement ratio reasonable*

As mentioned earlier, the amount of water you add to your concrete should be in a 0.5 ratio with your cement (i.e. if you use 10kg of cement you should use no more than 5 liters of water). Always reduce this amount slightly (10-20%) if the gravel was recently exposed to rain or was delivered wet.

A.1.2. Placing of concrete

1. *Compact your concrete*

While placing the concrete ensure you compact it by creating vibration (using a vibrating needle if available or otherwise by tapping on the mold, tapping the top of the concrete with a trowel or a shovel, shaking the mold, etc.). The vibration will liquefy your mix making it easier to place and also will expel air bubbles trapped in the concrete making your concrete denser and therefore stronger

2. *Never let your concrete go off*
Always place your concrete within 30 to 45 minutes from mixing it. Adding water or keeping it under the shade does not stop the concrete from reacting and therefore using “old concrete” (concrete which has started reacting before being in place) is likely to lead to excessive cracking
3. *Never allow Cold joints*
A cold joint is when fresh concrete is added to concrete already in place and reacting (basically in place since more than 30 minutes). A cold joint is a guaranteed crack. Never leave a concrete job unfinished to go for lunch.
4. *Never let the steel be exposed*
When placing the concrete you must ensure that the reinforcing steel is properly encased by the concrete to protect the steel from rusting. The recommended minimum cover on steel is 50mm but as we build products much thinner than that we have to settle for no less than 12mm. [A Guide to the Development of On-Site Sanitation, WHO, 1992]
5. *Work your concrete until it is dry*
The concrete finishing process is an iterative process requiring to do the same work several times. When concrete finishing, you must return to your work every 20 minutes until the concrete has totally gone off. This will improve your concrete strength (by not letting the surface dry out) and give you a great finish. This will save you money by not needing to cement paint the slab the following day.

A.1.3. Curing of concrete

1. *Always try to work under a shaded area*
Water is critical to the quality of your concrete. When working with concrete always try to reduce water evaporation; the sun will evaporate the water while you are working or while the concrete is curing. Too much water evaporation will lead to surface cracking. Whenever possible choose a shaded work area to minimize the effect of the sun on your concrete; the workers’ production may increase too.
2. *Cover your concrete with plastic*
As soon as your concrete has hardened (normally around 2 and a half to 3 hours), cover your concrete with plastic so that it retains all its moisture while curing. By doing so you will prevent the top layer from drying out and therefore will limit surface cracking and improve your concrete strength.
3. *Add water regularly*
Water should be spread regularly over the concrete for the first 3 days.

A.1.4. Steel fixing

1. *Protect your steel*

Always ensure that the reinforcing steel is encased by a layer of concrete (ideally 5cm but no less than 12 mm) so that it is never exposed to water and never comes into contact with the ground. If this is not done properly the steel will start to rust and rusted reinforcement is like no reinforcement. Before pouring concrete make sure your steel does not touch the formwork and is lifted from the ground (use stones, small concrete blocks, or mixed concrete piles if needed).

2. *Joining bars*

In order to create a strong link between two reinforcing bars, the steel must overlap over at least 30 times the bar's diameter (i.e. a 6mm bar must overlap over minimum 180mm to be considered continuous). [US Navy Training Modules, NAVEDTRA No: 14251, Ch.7, 1996]

3. *Respect the spacing*

When fixing the bars together ensure that you place them at the distance prescribed by the design. You should never exceed the distance by more than 10% (i.e. if 150mm distance is prescribed your bars should be no more than 165mm apart)

4. *Respect the number of bars*

Never try to reduce the number of bars by increasing the spacing a little everywhere. This is very dangerous as some of your product may break and someone may fall into a pit.

A.2: Manufacturing of Base Slab for All Latrine Models

1. *Prepare the molding area and mold:*

Be sure to clean all debris from the molding areas before beginning the casting process. It is best to use a flat and solid area for this work (a smooth concrete slab is best). To assemble the mold simply lock the two right angle steel pieces together on the ground. It is also advisable to treat the steel mold with oil. This acts as a releasing agent and can increase the life of the mold.

2. *Locate and place the void formers:*

It is advisable, but not necessary, to oil the two void formers before placement. Use a tape measure to center the hole mold or "void former" in the middle of the mold. Place the void former equidistant from each side of the steel mold. The void former is more narrow on one side than the other, this narrower side faces the front of the latrine slab. Once in place use sand to fill the void former to keep it stationary throughout the casting process (see: Figure 1). Next you should place the pit-access void former. It is easiest to use a standard sized 10cm PVC pipe fitting for this. Locate the pit-access void former by utilizing a standard 20x20cm tile to judge the distance from the rear-left corner of the latrine slab. The PVC should be located approximately 5mm away from the tile on both the left and rear sides (see Figures 2 and 3).



Figure 2



Figure 3

3. Prepare reinforcing steel:

Reinforcing steel is constant throughout the three latrine slab models. There are only three different sizes of steel required so it is easy to pre-cut these pieces in bulk for efficiency. Follow the table below for steel length guidelines:

**Reinforcing
Steel Cut Guide**

Qty	Length (cm)	Total Length (cm)
8	98	784
4	36	144
2	28	56
		984

4. Placing the reinforcing steel:

If available, use a welding machine to pre assemble the reinforcing steel grid according

to a guide. Otherwise, use wire ties to assemble the steel grid in place. Be careful to arrange the steel lengths so that they do not connect with the center void form or the pit-access void form. Use stones or piles of concrete mix to support the grid once assembly/location is complete. The metal should rest about 15-20mm from the ground (see Figure 4).

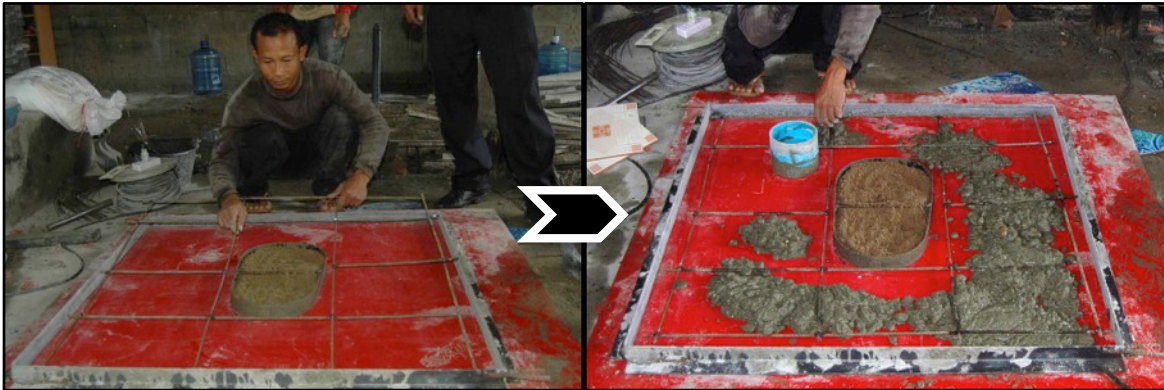


Figure 4

5. Prepare and place concrete mix:

Prepare your concrete and place it into the mold making sure that the steel is covered everywhere and is not in contact with the mold or the ground. Vibrate the concrete by using a mechanized vibrator or by simply tapping it with your shovel or trowel (see Figure 5).



Figure 5

6. Finish Concrete:

Use a trowel to smooth the surface of the concrete. For optimal surfacing for the Standard Waterless Latrine repeatedly re-smooth the surface every 30 minutes for about three hours, or until the concrete has “gone off.” For the production of the Standard Waterless Latrine you should be especially careful to create a smooth surface because this will greatly impact user satisfaction. (see Figure 6).

If you are producing the Standard Waterless Latrine continue with manufacturing

instruction in section A.3. If you are producing the Featured Waterless Latrine continue with manufacturing instructions in section A.4. If you are producing the Featured Pour-Flush Latrine continue with manufacturing instructions in section A.5.



Figure 6

A.3: Next Steps of Manufacturing the Standard Waterless Latrine

1. *Install the pit-access cover:*

After letting the concrete cure for at least 30 min you can remove the pit-access and center void former. With this void former removed locate the plastic access cover the access hole and tap it into the surface of the slab. This sets the access cap and you can continue to smooth the surface over the course of about 3 hours.

2. *Curing the concrete & removing the mold:*

The concrete should optimally cure for at least 2 days before moving the slab. After 3-4 hours you can remove the outer form. Use a hammer to tap lightly on the molds if they do not immediately release. Keep the slab covered with a plastic sheet or damp cloth over the next 2 days to reduce evaporation.

3. *Install the zinc urinal pan:*

After the Standard Waterless Latrine has cured for at least 2 days you can install the zinc urinal pan. The pan, once installed, is exposed below the under surface of the latrine slab. Using bricks, concrete blocks, or available rocks raise the slab to make room for the urinal pan to be installed. Place the urinal pan in the molded hole. Using an electric drill, pre-drill 6 holes evenly spaced around the circumference of the pan edge. Now you can screw the urinal pan into place. This completes the Standard Waterless Latrine (see Figure 7).

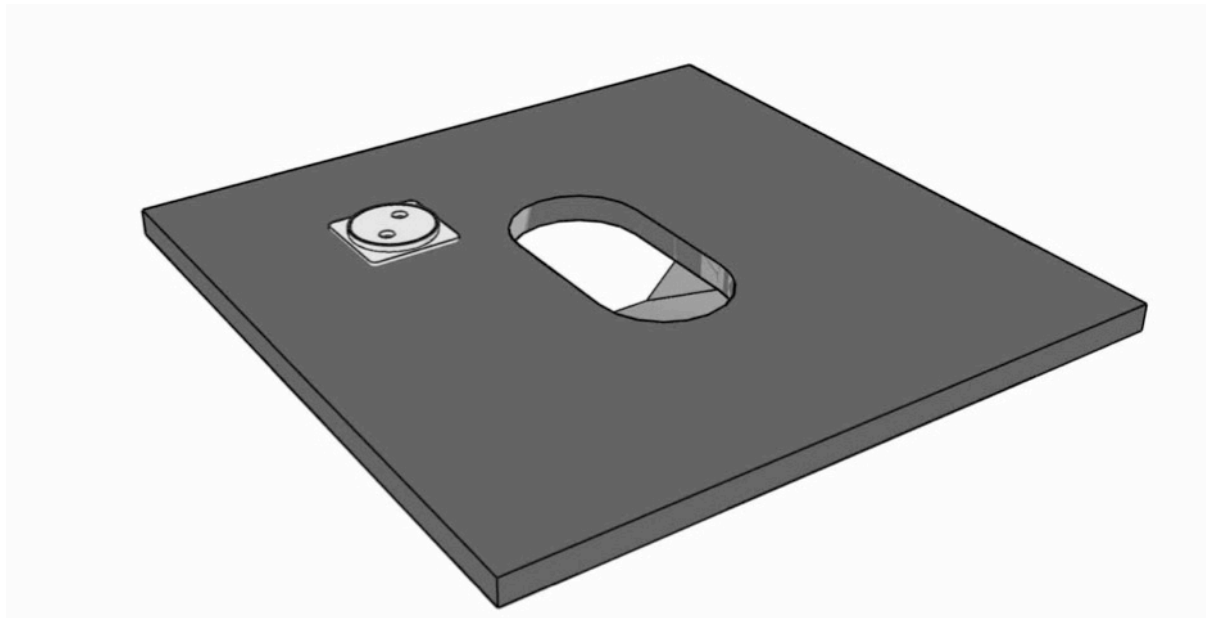


Figure 7 (with plastic access cover)

A.4: Next Steps of Manufacturing the Featured Waterless Latrine

1. Pre-cut tiles:

Using the center void former and the pit-access cover as a guides you can now mark and cut tiles to fit around the center hole and pit-access cover. Lay the tiles on the ground and place the void formers in their respective locations (refer to section A.2, Step 2). Mark around the outer circumference of the guides with a marker and cut these tiles. An angle grinder with a tile cutting blade works best for this. It is also recommended to mark and cut the tiles face-up as this will reduce the tendency for the tile surface to crack or chip.

2. Set tiles and pit-access cover:

In preparation for this step it is best to wet the bottom surfaces of all the tiles. This will increase their bond with the concrete surface. After letting the concrete cure for at least 30 min you can remove the pit-access and center void formers. With these void formers removed start placing the tiles around the perimeter of the latrine slab. Pay close attention and maintain an even surface as you go. Use a hammer or wooden block to gently tap the tiles into place. Locate the plastic access cover over the access hole and tap it into the surface of the slab making sure the cover lines up well with the surrounding tiles. Continue setting the tile around the center hole until finished. After initial setting (approximately 30 min) return to the slab and make adjustments to the surface if necessary. This is also a good time to clean any excess concrete/water from the tiled surface.

3. Curing the concrete & removing the mold:

The concrete should optimally cure for at least 2 days before moving the slab. After 3-4 hours you can remove the outer form. Use a hammer to tap lightly on the molds if they do not immediately release. Keep the slab covered with a plastic sheet or damp cloth over the next 2 days to reduce evaporation.

4. Install the zinc urinal pan:

After the Featured Waterless Latrine has cured for at least 2 days you are ready to install the zinc urinal pan. The pan, once installed, is exposed below the under surface of the latrine slab. Using bricks, concrete blocks, or available rocks raise the slab to make room for the urinal pan to be installed. Place the urinal pan in the molded hole. Using an electric drill, pre-drill 6 holes evenly spaced around the circumference of the pan edge. Now you can screw the urinal pan into place. This completes the Featured Waterless Latrine (see Figure 8).

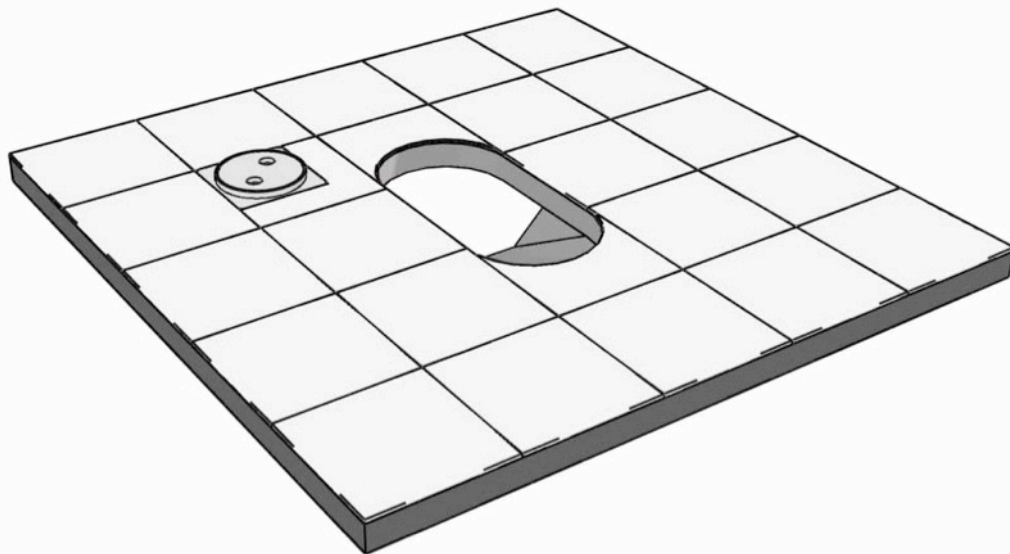


Figure 8 (with plastic access cover)

A.5: Next Steps of Manufacturing the Featured Pour-Flush Latrine

1. *Pre-cut tiles:*

Using the pit-access cover and the Ceramic Pour-Flush Pan Tile Cut Pattern (see Annex A.8) as guides you can mark and cut tiles to fit around the center hole and pit-access cover. The Pour-Flush Pan Tile Cut Pattern is specially designed to leave rough concrete exposed for the later installation of the Pan. It also simplifies cutting by using only straight cuts that are strategically located to eliminate hard corners.

Lay the tiles on the ground and place the guides in their respective locations. Mark around the outer circumferences with a marker and cut these tiles. An angle grinder with a tile cutting blade works best for this. It is also recommended to mark and cut the tiles face-up as this will reduce the tendency for the tile surface to crack or chip (see Figure 9).

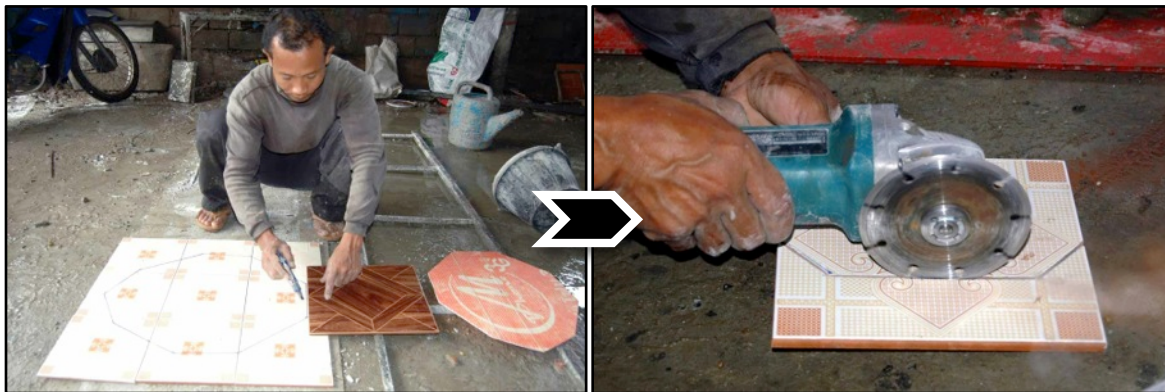


Figure 9

2. *Set tiles and pit-access cover:*

In preparation for this step it is best to wet the bottom surfaces of all the tiles. This will increase their bond with the concrete surface. After letting the concrete cure for at least 30 min you can remove the pit-access and center void formers. With these void formers removed start placing the tiles around the perimeter of the latrine slab. Pay close attention and maintain an even surface as you go. Use a hammer or wooden block to gently tap the tiles into place. Locate the plastic access cover over the access hole and tap it into the surface of the slab making sure the plastic cover lines up well with the surrounding tiles. Continue setting the tile around the center hole until finished (see Figure 10). After initial setting (approximately 30 min) return to the slab and make adjustments to the surface if necessary. This is also a good time to clean any excess concrete/water from the tiled surface.



Figure 10

3. *Curing the concrete & removing the mold:*
The concrete should optimally cure for at least 2 days before moving the slab. After 3-4 hours you can remove the outer form. Use a hammer to tap lightly on the molds if they do not immediately release. Keep the slab covered with a plastic sheet or damp cloth over the next 2 days to reduce evaporation.
4. *Set ceramic pour-flush pan:*
After the Featured Waterless Latrine has cured for at least 2 days you are ready to install the ceramic pour-flush pan. The pan, once installed, is exposed below the under surface of the latrine slab. Using bricks, concrete blocks, or available rocks raise the slab to make room for the ceramic pan to be installed.

Create a concrete pad upon which to set the ceramic pan. Be sure to sufficiently soak the exposed concrete around the perimeter of the hole before applying the new concrete mix. This will create a stronger bond between the ceramic pan and the latrine slab (see Figure 11).



Figure 11 (with alternative pit-access tile construction)

After creating an even pad about 40mm tall around the perimeter you are ready to set the ceramic pan. Before doing so you should also soak the under side of the pan to strengthen the bond. Set the ceramic pan by applying even and heavy downward pressure to the pan. To create the strongest bond tap the pan with your fist and work

the pan into place by twisting back and forth. Do this until the pan has been worked down to sitting relatively level with the slab surface. Lastly, wipe off the excess concrete from the surrounding tiles (see Figure 12). Let the pan sit for at least 1 day before moving and take special care not to rest the weight of the slab on the ceramic pan's trap that is exposed underneath the slab. This completes the Featured Pour-Flush Latrine construction (see Figure 13).



Figure 12 (with alternative pit-access tile construction)

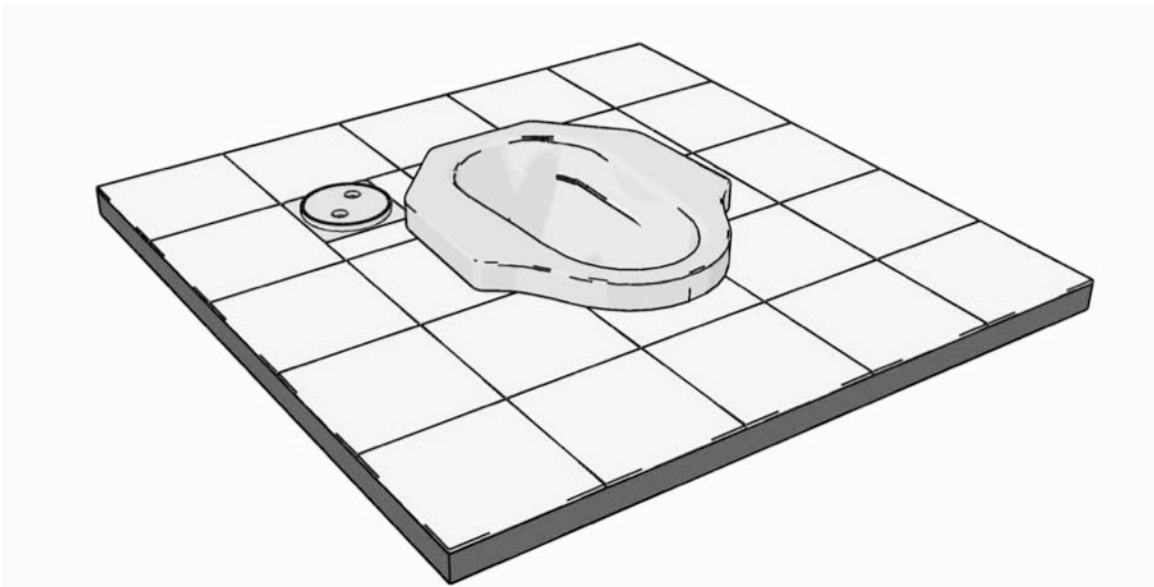


Figure 13 (with plastic pit-access cover)

Installing the pan after the initial slab casting allows the business to potentially transport the slab without the pan installed. This significantly decreases the likelihood of breakage in transport. This is especially beneficial if the business is making a bulk delivery.

A.6: Manufacturing of Alternative Pit-Access Tile Construction

The pit-access tile is a technique used if the plastic pit-access cover is unavailable in the marketplace. Although the plastic cover is easier to install it might require special ordering in some regions. Implementing the tile pit-access requires that this tile be specially cut in the first step of sections A.4 or A.5 (Featured Waterless Latrine and Feature Pour-Flush Latrine respectively).

1. Prepare the pit-access tile and access hole area:

Be sure to thoroughly clean around the pit-access hole. Remove all dust, debris, and oils. It might be necessary to use a pointed tool (flat screwdriver, knife, nail, etc.) to remove solid concrete clumps from around the perimeter of the pit-access tiles. Also clean the pit-access tile of any foreign materials or oils.

2. Apply silicone adhesive and pit-access tile:

Use silicone adhesive sparingly and apply a 1cm bead around the perimeter of the pit-access tiles. Be sure to not leave any open gaps in the bead as this will lead to debris entering the gap later, or allowing unpleasant smells to escape the pit. Place the pre-cut access tile so it's seated well (see Figure 14). Clean up any excess silicone from the tiles with a clean rag. Be careful not to get the silicone dirty by using a dirty rag or dirty fingers. This will leave behind an ugly residue and customers might complain.

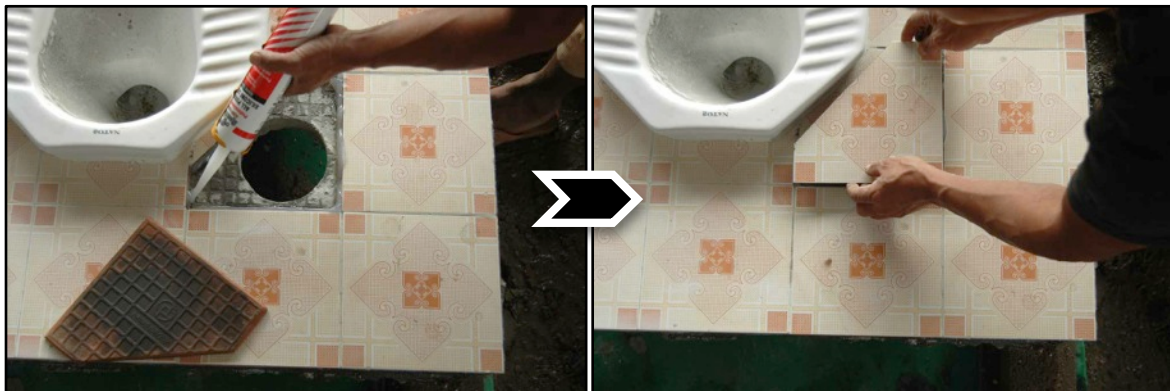


Figure 14

A.7: Manufacturing of Zinc Urinal Pan & Lid

A separate producer who specializes in sheet metal construction typically produces this part. These suppliers are readily available in the study region and typically make gutters, ice machine trays, large pots, and distillers. The zinc urinal pan & lid are designed to fit into the center void former. For this reason, it is a good idea to make an identical copy of the center void former for the sheet metal supplier to use as a guide for production. This will limit the potential failure of the part fitting the formed void.

1. *Cut zinc sheet to pattern:*

Use the zinc urinal pan patterns (see Annex A.8) and the center void former to cut the necessary pieces. These include the curved urinal pan tray, slab edging, lid, handle, and lid locator tabs (see Figure 15).

2. *Bend pan tray and slab edging and soldier together:*

Use the center void former to bend the slab edging. It is necessary to bend over the top and bottom edges and hammer along the fold. This will prevent sharp edges from being exposed. Secure this piece to the form temporarily (with clamps) and soldier at the seam where the two ends come together.

Pre-bend the urinal pan along the crease line to achieve the curved/slope surface required. Also fold the tabs 90 degrees upwards. At this point you can begin soldiering the pan tray to the slab edging being sure to keep any sharp edges towards the outside so that they will not be exposed once installed into the latrine slab (see Figure 15).

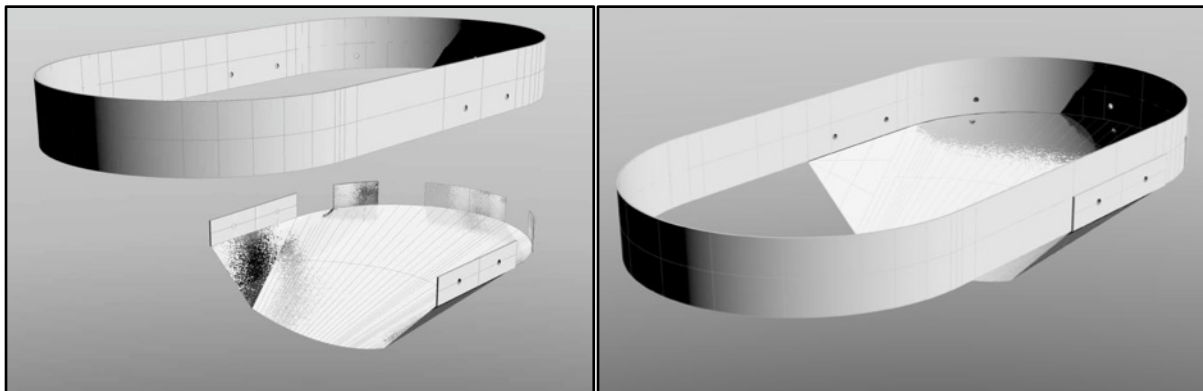


Figure 15

3. *Bend handle and locator tabs and soldier to lid:*

Bend the outside edges of the handle and lid inwards to avoid exposed edges. Bend locator tabs at 90 degrees. Use the previously soldiered pan tray/slab edging to locate the tabs and soldier onto the lid's underside. After bending the handle into its final shape you can soldier it in place.

A.7: Manufacturing of Concrete Ring Pit Lining

1. *Assemble Ring mold:*

Prepare the ring mold by simply locking the outer and inner molds together (see Figure 16). It is advisable to also oil these forms to aid releasing after curing. Set the mold on a level surface.



Figure 16

2. *Prepare metal reinforcement:*

Bend 2- 6mm steel reinforcement rods into round sections roughly 80cm in diameter. Use wire and wrap the overlapping ends to maintain the shape but allow for slight modification in the next step.

3. *Pour concrete:*

Pour pre-mixed concrete into the form up to 20-30mm deep. At this point lower one reinforcement ring into the mold. It is important that you take care to resize the ring if it is too big or small. The metal ring should not touch either the inner or outer form as this will lead to corrosion of the metal. Pour another 20-30mm deep and begin using a wooden or metal stick to agitate the concrete mixture. Continue to add concrete mix and agitate the mixture until you have filled up to 20-30mm from the top surface. At this point add the second reinforcement ring. Finish loading the mold while agitating the mixture (See Figure 17).

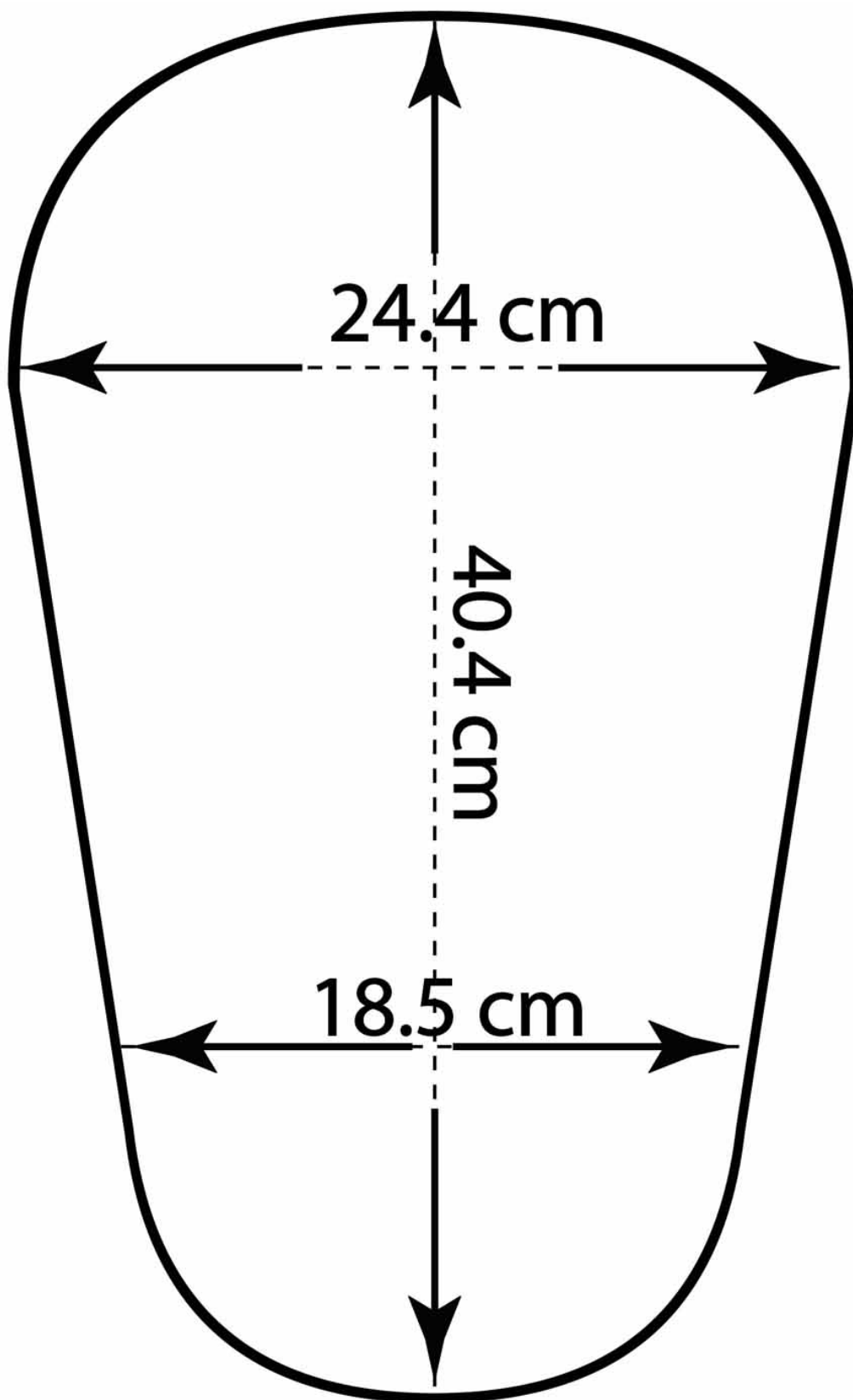


Figure 17

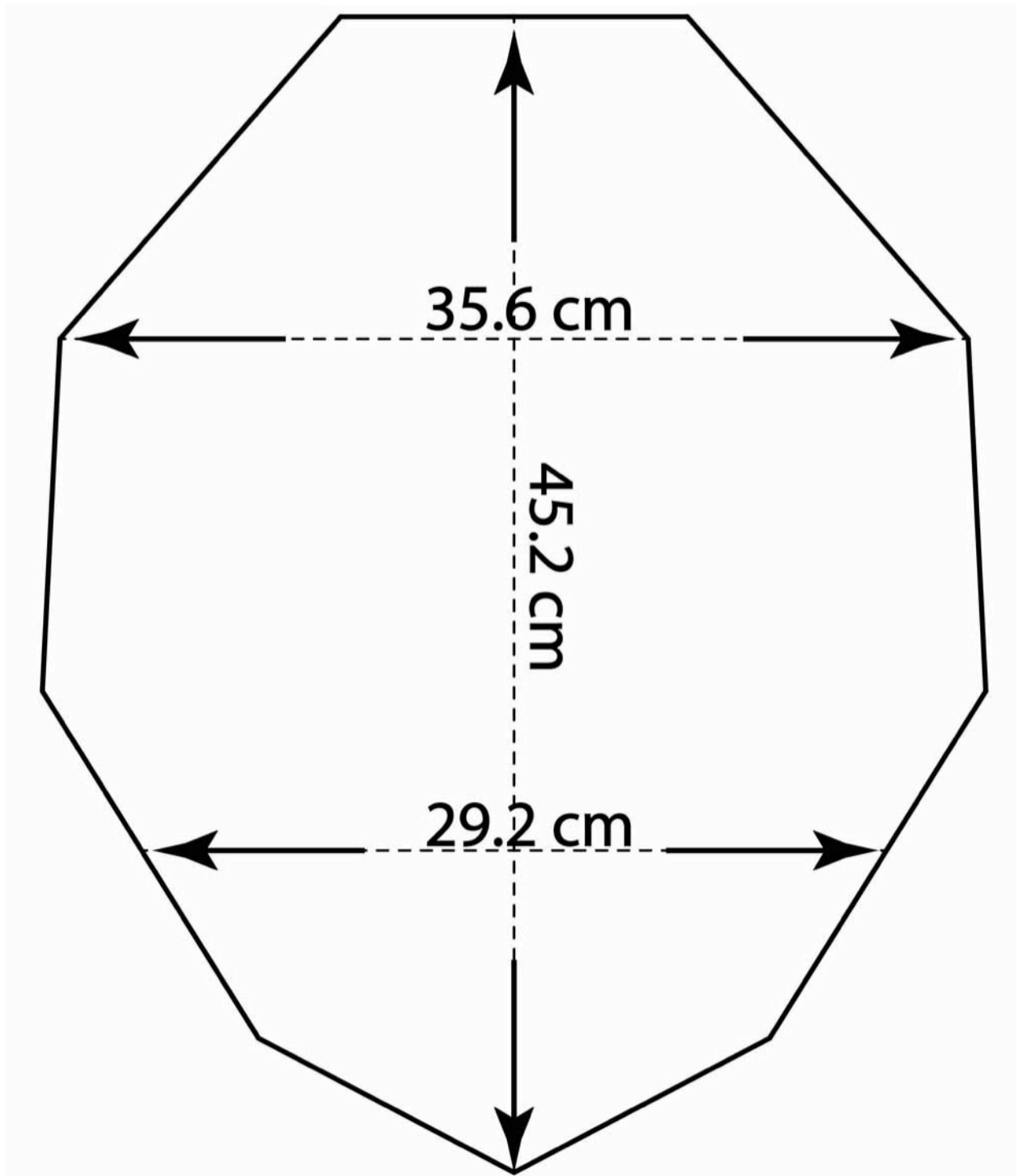
4. Curing the concrete & removing the mold:

After 5-6 hours you can remove the inner and outer molds (the inner mold can be released earlier should you be producing large quantities). Keep the ring covered or continuously water it over the next 3 days for optimum curing and strength. Do not move the ring prior to the 3 days and especially refrain from rolling the rings at any point.

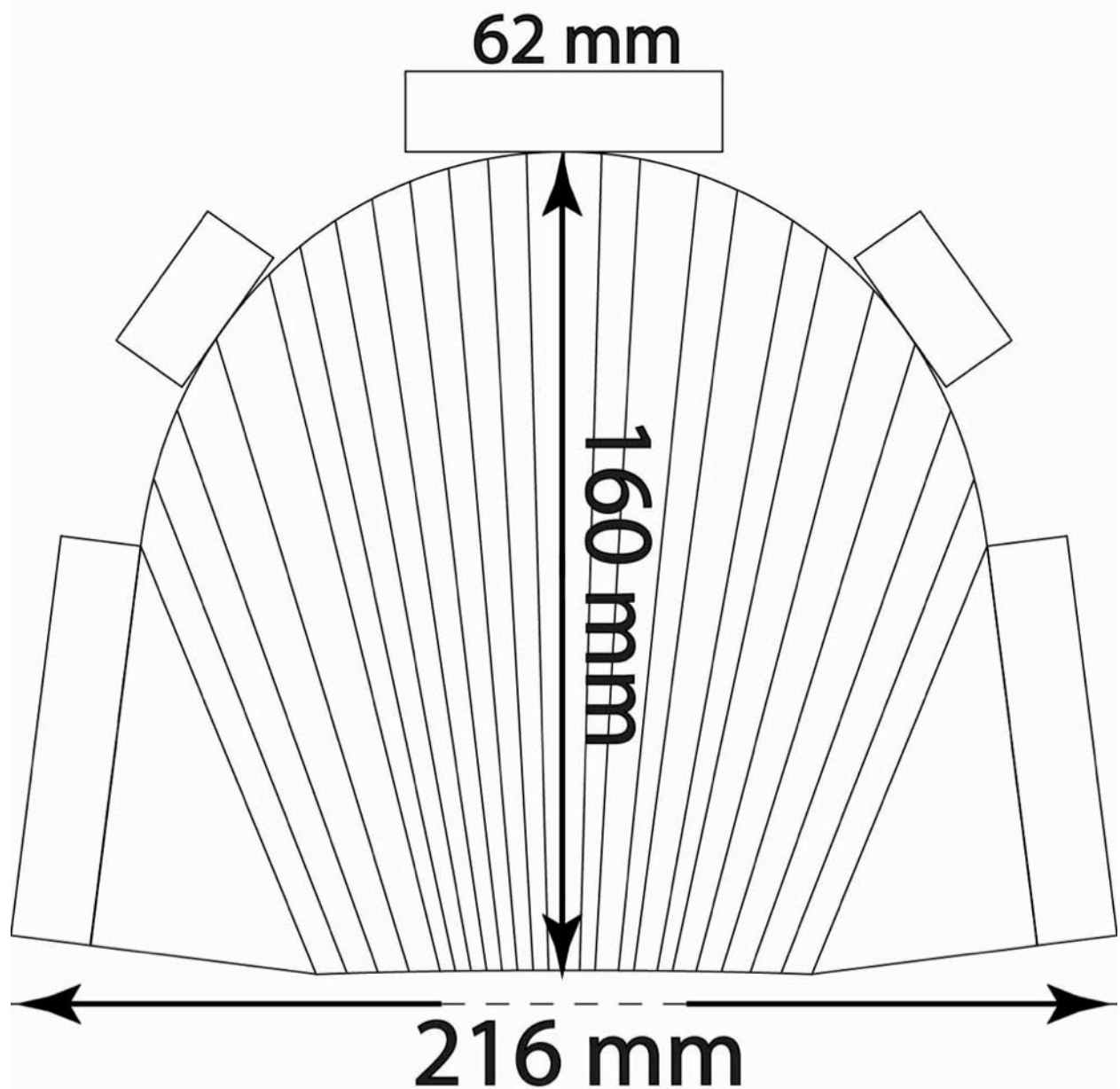
A.8: Manufacturing Guides and Patterns



Center Void Former Pattern (not to scale)



Ceramic Pour-Flush Pan Tile Cut Pattern (not to scale)



Zinc Urinal Pan Pattern (not to scale)

Annex B: Steps for Conducting a Village Sales Event

STEPS for SALES EVENT

STEP 1: Introduction (3 minutes)

- Introduce yourself. Village chief can say a few words to introduce.

STEP 2: Toilet Song (3 minutes)

- Everyone get up and sing.

STEP 3: Tell the story (15 minutes)

- Use STORY FLIP CHART to tell story.

ASK: Questions

- What are the advantages of having a toilet for Somboun? What are the disadvantages of not having a toilet for Somnout?
- Why does Somnout get sick?
- How does Somboun save for a latrine? How much does it cost to buy medicine?
- What do you think about Somnout? About Somboun? Who is smarter?

STEP 4: Latrine local hero (5 minutes)

- Invite one toilet owner to stand up. (Give him/her a pen or a banana as microphone)

ASK: Why did you build a latrine?

ASK: What difference has having a latrine made?

ASK: How did you save for a latrine?

ASK: What advice do you have for your neighbors?

STEP 5: Introduce the Products and Prices (25 minutes)

- Use BANNER and BROCHURE to introduce each product.

REMEMBER:

- Use 'waterless toilet' and 'toilet with water' to describe products.
- Introduce each product one by one.
- Talk about the features: strong, durable, nice surface (smooth or tiled), slab is big and square, easy to clean.
- Show handles on waterless toilet for easy moving.
- Show access hole for easy emptying.
- Demonstrate how to upgrade (move slab and insert pan)

ASK: Does anyone have any questions about the products?

STEP 6: Steps to saving and buying a toilet (10 minutes)

ASK: Raise your hand if you want to have a toilet.

ASK: How did Somboun upgrade his toilet?

ASK: What is stopping you from buying a toilet (what are your challenges)?

Discuss steps to saving and buying:

1. Talk to your family.
2. Build a basic toilet.
3. Save your money every week. Don't spend it on cigarettes, phone credit, beer.
4. When you have money, buy and install a toilet.

STEP 7: Toilet ordering and register (10 minutes)

ASK: Who wants to order a new toilet now? (Stand up and form one group) – only 4 households can buy at this time.

ASK: Who wants to register to buy a toilet later? (Pass REGISTRATION FORM around)

STEP 8: Closing

- Thank everyone for coming and say goodbye.
- Take the ordering group to the side to fill in the ORDER FORM.

Total: 1 hour 10 minutes

KEY MESSAGES to REMEMBER

- No toilet = not convenient and not comfortable
- Difficulty during nighttime, raining, animal attack
- High quality and good price of your products
- New products have good features (Easy to buy, easy to install, strong, beautiful, easy to clean)
- All local authority encourage to buy – they have a goal for everyone to have latrine in future – target villages for development

Benefits of owning a latrine

1. Convenience – you won't waste time going far away to defecate, when you are sick you can defecate close to your home
2. Privacy – no one can see you when you go to the toilet
3. Clean – you will feel cleaner using a latrine
4. Safety – a latrine will protect your family (especially your daughters) from snakes, animals, rain. You don't have to be afraid to go defecate at night.
5. Pride – you can feel proud to be a person in your village with a latrine
6. Save money – when your family is healthy you won't spend money on medicine and the doctor
7. Health – open defecation spreads disease. Using a latrine will make your family healthier.

Disadvantages of open defecation (USE EXAMPLES)

1. Difficult life
2. Not clean, not easy, not relaxing
3. Uncomfortable in the rain and heat
4. Open defecation causes disease and death
5. Open defecation means you are eating your shit, your neighbors' shit, and all of the shit in the village
6. Getting sick from open defecation costs lots of money and prevents your family from achieving greater prosperity
7. Attacks from animals, snakes, and people
8. Wasting time
9. Embarrassment if someone sees you, no privacy

Benefits of the the NEW toilet products (USE EXAMPLES)

1. Reasonable price (compare to bags of rice, compare to mobile phone)
2. Easy to install yourself
3. Easy to buy in a package
4. Good quality
5. Can build with any shelter
6. Can upgrade easily from waterless to water toilet when you are ready
7. Access hole to empty pit when it fills up
8. Pick up or delivery possible

Annex C: Sales Order Form

ແບບຟອມສັງຊື້ - ຈາກການສາທິດການຂາຍ									
ບ້ານ:		ເມືອງ:		ແຂວງ:		ຊື່ຂອງຕົວແທນການຂາຍ:		ເບີໂທລະສັບ:	
ຊື່ຂອງລູກຄ້າ	ເບີຕິດຕໍ່	ວັນທີ ທີ່ ສັງຊື້	ຮູບແບບຜະລິດຕະພັນ			ລວມລາຄາ ທັງໝົດ	ຈຳນວນ ເງິນມັດຈຳ	ວັນທີ ທີ່ຈະ ຈັດສົ່ງ	ວັນທີ ທີ່ ຈະມາເອົາ
			ແບບບໍ່ໃຊ້ ນ້ຳ- ໜ້າກຽງດີ	ແບບບໍ່ໃຊ້ ນ້ຳ-ຕິດກາ ໂຮ	ແບບໃຊ້ນ້ຳ				
ຮູບແບບຂອງການຂົນສົ່ງ									
ໝາຍເຫດ									

Annex D: Sales Record Book

ປຶ້ມເກັບກຳຂໍ້ມູນການສັ່ງຊື້

ຊື່:

ທີ່ຢູ່:

ໂທລະສັບ:

ຊື່ລູກຄ້າ	ບ້ານ	ເມືອງ	ຊື່ຕົວແທນການຂາຍ	ວັນທີສັ່ງ	ປະເພດແຜ່ນ ປົກປິດ	ແຄ່ງປິດ	ຈຳນວນເງິນທັງໝົດ	ວັນທີນຳສົ່ງ/ຂົນ ເອົາເອງ

Annex E: Draft Product Brochure

Are you tired of
inconvenient shitting?

Invest in a toilet
for family convenience

Use Toilet, No Worries,
Relax



- Reasonable Price
- Complete Set
- Easy to Install
- Durable & Strong
- Pick-up / Home Delivery

Telephone :

Address :



Clean & Beautiful Toilets

Waterless Toilets

No Smell, No Flies, Just Add Ash
Durable/ Strong
Easy to Clean
Upgradeable to Use Water

Concrete Surface



Now Only

Tiled Surface



Now Only

Toilet with Water

Easy to Clean
Long Lasting
Hole for Emptying

Tiled Surface



Now Only

Annex F: Draft Flip-Chart Story Tool





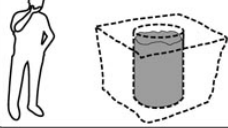


This tool was developed in Cambodia as part of 'Stop the Diarrhea Campaign' developed under the guidance of the Cambodian Ministry of Rural Development by the WaterSHED and Lien Aid WASH Marketing Program with the social marketing firm 17 Triggers. The full toolbox of WASH social marketing campaign materials is available at <http://www.watershedasia.org/wash-social-marketing-campaign/>.

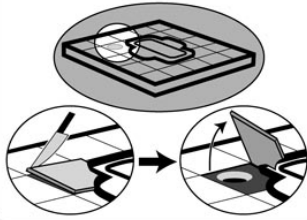
Annex G: Draft Installation and Maintenance Instructions

Long Lasting

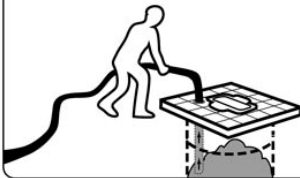
Is your latrine full?



Remove tile to access waste

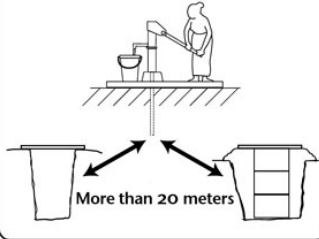


Remove waste and dispose of safely

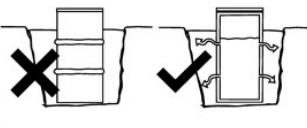


How you build your latrine is important!

Locate your latrine pit away from water sources

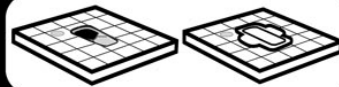


No need to mortar concrete rings together

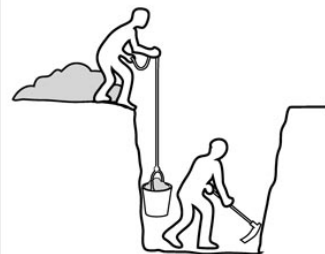


Have questions about installation?
Call your supplier:

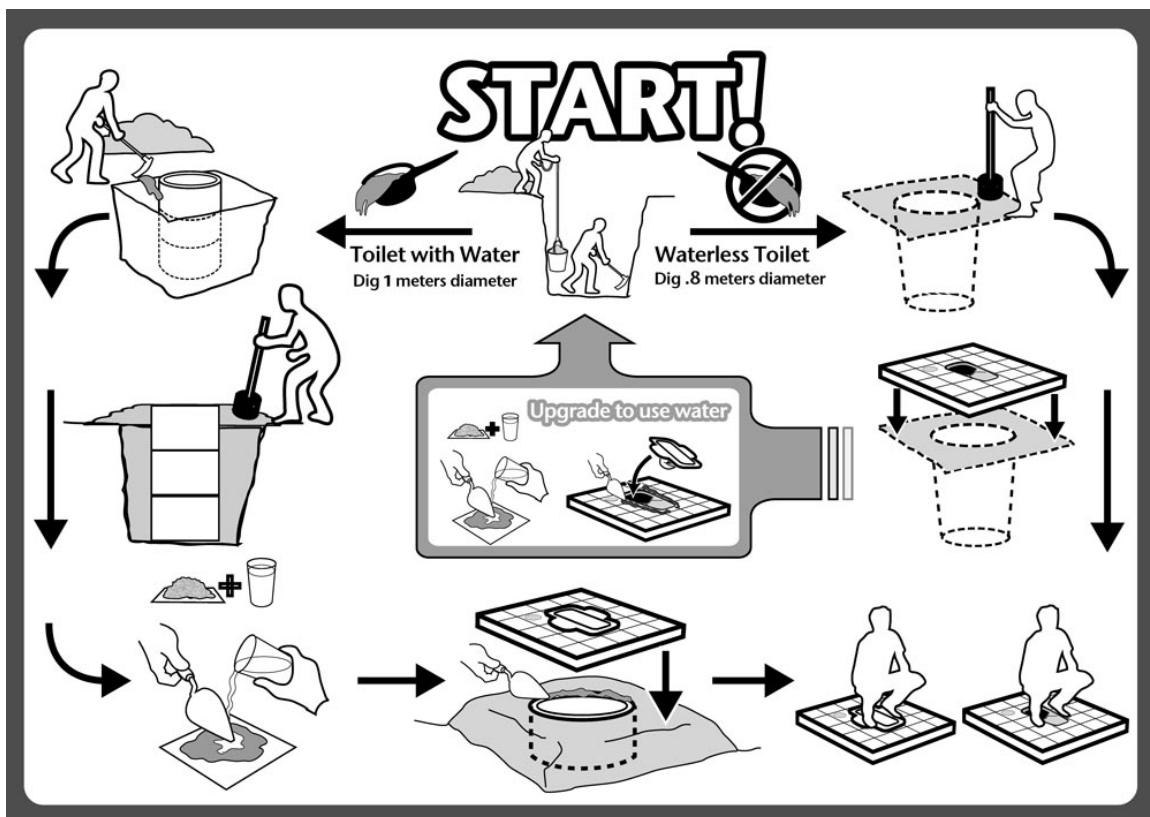
Have Latrine Change Your Life



Installation Guide



Please Follow These Instructions



Annex H: Draft Sales Agent Training Agenda and Trainer's Notes – Sales Trials

Development and Marketing of Affordable Technology Options for Sanitation in Lao PDR

Sales Demo Training

4 September 2011

AGENDA and NOTES FOR TRAINERS

TIME	TOPIC	Notes for Trainers
10.00-10.45	Sign-In Introduction to Selling: Basic Skills, Sales Event Steps and Materials	<ul style="list-style-type: none"> - Intro Danielle – objective, sales style and attitude - Introduce each step and show the sales tool that is used with it
10.45-11.00	Depart for Supplier's House	
11.00-12.00	View Demonstration Products Sales Step 6: Watch demo	<ul style="list-style-type: none"> - Conduct a 'demo sale' with product, price intro
12.00-13.00	<i>Lunch</i>	
13.00-13.10	Sales Steps 1 and 2: Demo and practice	<ul style="list-style-type: none"> - Explain - Demonstrate - Practice/role play - Questions
13.10-13.50	Sales Step 3: Demo and practice	<ul style="list-style-type: none"> - Explain - Demonstrate - Practice/role play - Questions
13.50-14.00	Sales Step 4: Demo	<ul style="list-style-type: none"> - Explain - Demonstrate - Questions
14.00-14.45	Sales Step 5: Demo and practice	Separate into Bachieng and Tatheng groups - discuss prices and supplier for each district <ul style="list-style-type: none"> - Review product information – clarify issues - Practice/ role play - Questions
14.45-15.15	Sales Step 6: Review and practice	<ul style="list-style-type: none"> - Explain - Demonstrate - Practice/role play Questions

15.15-15.30	Sales Step 7: Review and discuss	- Explain – only 2 wet and 2 dry can be sold now - Distribute sales form; demonstrate how to fill in - Distribute registration form; explain how to fill in
15.30	<i>Finish</i>	

Sales Demo Training – Trainer’s Notes

1. Introduce Objective: You will be sales agents for some new toilet products. Our goal for the sales events is for people to order the new toilets and install them in their home.

2. Selling is about ATTITUDE.

Tell participants that the most important thing is for them to be confident and positive. Mention some basic **SALES SKILLS**:

- Sales = Listening (90%) & Speaking (10%)
- Build customer confidence and trust by discussing issues honestly
- Do not make promises you are not 100% certain you can keep
- Don’t worry if people say ‘NO’
- Be confident – you can believe in this product and you can convince others!
- Think about who is in your audience – how can you interest and motivate them
- Be quick – try not to bore people
- Speak clearly, loudly and slowly
- Watch your audience: look at their faces to see if they are interested, confused or bored. Try to be flexible with your presentation to keep your audience interested

3. Introduction to Sales Steps. Introduce each step and the sales tools that come with it – Pass out the ‘Sales Steps’ Sheet. Tell them that today they will learn and practice how to do each step.

STEP 1: Introduction

STEP 2: Toilet Song

STEP 3: Story

- Use **STORY FLIP CHART**.

STEP 4: Latrine local hero

STEP 5: Steps to saving and buying a toilet

STEP 6: Introduce the Products and Prices

- **Use DEMO MODELS.** The demo models are the most important sales tool. Use the demos to talk about each product and explain the different product features.
- **Use BANNER** Make sure to hang the banner in a place where everyone can see it. Discuss the key messages and use the banner to talk about the different models.
- **Use BROCHURE** - Use this brochure like a name card – Give it to everyone at the sales event. They can take this home and use it to talk to their family and friends about toilets and have your contact information for when they decide to purchase.
 - Write prices for each latrine model
 - Write name and contact details of the supplier

The brochure has all the key messages you need – you can use it to remember the key sales messages.

STEP 7: Action plan and toilet ordering

- **Use SALES ORDER FORM**
- **USE REGISTRATION FORM**

4. Discuss the BASIC THINGS TO REMEMBER

Day Before the Sales Event

1. Meet with or call the Village Chief to explain what will happen during the sales event.
2. Ask the village chief to invite households without a latrine to the meeting. Ask the village chief which households have latrines and which do not. Ask the village chief to invite at least one household that DOES have a latrine.
3. Choose a comfortable place for the meeting. The place should: have shade, be comfortable for sitting, have enough space for Hyundai truck and product prototypes.

One Hour Before the Sales Event

1. Arrive early so people are not waiting for you and you are not in a hurry to set up
2. Make sure you have all of the sales tools. Make sure the names and phone numbers are written in them. The sales tools are:
 - Brochure
 - Story Flip Book
 - Sales Banner
 - Demo Models
 - Order Form
3. Walk around the village and ask people to come to the meeting.

At the Sales Event

Remember to:

- Thank people for coming to the meeting.
- Invite the village chief to open the event.
- Keep your presentation short so people do not get bored.
- Encourage people to ask many questions
- Give the brochure to everyone who attends the meeting.

After the Sales Event

- Follow up with each household who has ordered a latrine. Ask the village chief to support you.
- Follow up with the supplier to make sure the products will be delivered or ready for pick-up on time.

Installation Instructions

One of the big benefits of the toilet is that it is easy to install by yourself. These instructions make sure that people take care to install the toilets correctly – for good functionality and sanitation. If a customer has problems with installation or components breaking they have your number to call for help allowing you to provide good customer service.

If you tell people who are not certain about how easy it is to build, they will feel more confident to purchase.

REMEMBER TO TELL THEM

- Waterless toilet:
 - Dig the pit less than 1 meter in diameter.
 - Strongly recommend they line the pit to make it stronger. Pit lining ideas: bamboo, wood, old oil drum.
- Water Toilet
 - Do not seal the toilet rings together in the pit.

Maintenance

REMEMBER TO TELL THEM:

- The toilet pit should always be at least 20 meters away from any drinking water source.
- Waterless toilet: The waterless toilet pit **MUST** stay dry.
 - Use ASH to keep the pit contents dry and avoid smells.
 - Clean the dry pit with a wet sponge – Do not use a lot of water for cleaning.
 - When the pit fills up, remove the slab and cover it up. Dig another hole.
 - **DO NOT** empty the pit contents. **THEY ARE DANGEROUS TO YOUR HEALTH.**

- Water Toilet
 - When pit fills up, lift the loose tile to get to the access hole. Use a tube and pump to remove contents.
 - DO NOT empty the pit contents by hand. THEY ARE DANGEROUS TO YOUR HEALTH.

Annex I: List of Plastics Manufacturers

Lao PDR Plastics Manufacturers					
No.	Company name	Items Produced	Importation	Address	Phone number
1	J-Family Trading	Plastic bag	Thailand	nakhuay St, Somsanga village/xaysettha distirct.Vientiane.Cap.	021 470213 - 4
2	Phontong khoutphet	Bottle	Thailand	Phontong Village/ Chanthabuly District, Vientiane.CAP	021 560923
3	Laosamay Plastic	Bottle, Straw, Plastic bag	Thailand	Savang Village / Chanthabuly District, Vientiane.CAP	021 212821
4	Tien-Phong SMP Lao Plastic	PVC, HDPE , PRR	Thailand	Vientiane Capital	021 765021 - 2
5	PVC Lao Asia	Pvc.	Thailand	Khualuang neua Village/ Chanthabuly district, Vientiane Cap.	021 264233