



The World Bank

Demand Creation and Supply Chain Development
for Scaling Up Rural Sanitation
in Hoa Binh Province

Assessment Report

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List of abbreviations and acronyms

BCC	Behavior Change Communication
CLTS	Community-Led Total Sanitation
CHS	Commune Health Station
CPM	Center for Preventive Medicine
DARD	Department of Agriculture and Rural Development
DHC	District Health Center
DoF	Department of Finance
DOLISA	Department of Labor Invalids and Social Affairs
DoH	Department of Health
DPI	Department of Planning and Investment
EMG	Ethnic Minority Group
FGD	Focus Group Discussion
IDI	In-depth Interview
IEC	Information, Education and Communication
INGO	International Non-Governmental Organization
JMP	Joint Monitoring Program (WHO, UNICEF)
KAP	Knowledge, Attitude and Practices
KII	Key Informant Interview
MARD	Ministry of Agriculture and Rural Development
MoH	Ministry of Health
M&E	Monitoring and Evaluation
PCERWASS	Provincial Center for Rural Water Supply and Environmental Sanitation
NTP	National Target Program
OAM	Opportunity, Ability and Motivation
OD	Open defecation
OSS	One stop shop
PC	People's Committee
RWSS	Rural Water Supply and Sanitation
SaniFOAM	Sanitation-Focus, Opportunity, Ability, Motivation
SME	Small and Medium Enterprise
SPSS	Statistical Package for Social Studies
SNV	Netherlands Development Organization
TA	Technical Assistance
ToR	Terms of Reference
USD	United States Dollars
VSPB	Vietnam Social Policy Bank
VND	Vietnamese Dong
WASH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization
WSP	Water and Sanitation Program (World Bank)
WTP	Willingness to Pay
WU	Women's Union
VIHEMA	Vietnam Health and Environment Management Agency

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Executive summary

1 INTRODUCTION

The National Target Program in Rural Water Supply and Sanitation (RWSS-NTP3) is the main government program to improve rural water supply and sanitation in Vietnam. The Water and Sanitation Program (WSP), World Bank provides technical assistance to the government (The Vietnam Health Environmental Agency [VIHEMA] – Ministry of Health), to reach sanitation targets and create more opportunity for the poor to access improved sanitation. The strategy is built on four elements: i) improving the enabling environment for service delivery, ii) strengthening rural sanitation supply chains, iii) generating demand for improved sanitation and iv) improving service delivery models through knowledge and learning.

In parallel with the technical assistance at the national level, WSP and VIHEMA supports a technical assistance model in Hoa Binh province, Kim Boi and Mai Chau districts in particular, with the aim of informing improvements to the governments National Target Program 3 (NTP3) implementation in other similarly challenging provinces with low sanitation access and remote villages with ethnic minorities. As part of this, WSP has contracted a consulting team to support the Department of Health (DOH) and the Center of Preventive Medicine (CPM) of Hoa Binh province to i) develop an evidence-based behavior change communication strategy and plan to generate demand for improved sanitation among rural, poor households of different ethnic origins; and ii) develop a supply chain strengthening strategy and implementation plan to meet these demands. To obtain key data and information to fulfill the aforementioned assignments, a consulting team carried out formative research in two selected districts of Kim Boi and Mai Chau as a means to provide evidence-based recommendations. This initial activity is part of the assignment “Rural sanitation demand creation and supply chain development for Hoa Binh Province”.

The main objectives of the formative research were i) to understand barriers and motivations of rural men and women to acquire in hygienic sanitation; ii) to define the supply chain ‘actors’ for both materials and services in the selected districts, as well as existing and potential business models for sanitation delivery; and iii) to assess the policy, regulatory, and institutional environment influencing rural sanitation in Hoa Binh.

2 METHODS

The formative research was conducted during February and March 2014, across 9 communes in the two districts of Kim Boi and Mai Chau in Hoa Binh province.

A desk review of existing sanitation documents was undertaken. In addition, quantitative and qualitative research methods were utilized to provide demand and supply side information. Household questionnaires with observation checklists, in-depth interviews and focus group discussions (FGDs) were conducted with household heads or representatives to understand barriers and drivers of hygienic latrine acquisition. Supply side data were collected using FGD and IDIs with key representatives of the supply chain.

For the household survey, multi-stage sampling was used to select households. In total, 801 respondents were included, from 341 households in Mai Chau and 460 households in Kim Boi. The in-depth interviews were conducted with 78 respondents from 12 target groups. They included representatives of households, sanitation service providers, sanitation supply-chain product providers, village health workers, leaders of CPM, District Health Center (DHCs), Commune Health Centers, commune Peoples Committee (PC), and representatives of the Women's Unions (WU) at district level. A total of 30 FGDs sessions engaging approximately 300 people were conducted, representing 4 target groups (adopters, non-adopters, masons and village representatives [e.g. commune health workers, village leaders]).

To present data on the demand side, the SaniFOAM¹ framework was used as a means to organize and present findings. It was also used as the conceptual framework to guide the qualitative data analysis. For the supply chain, data were presented and analyzed according the marketing mix: price, product, promotion and place.

Quantitative data was cleaned and managed using SPSS (V 17.0) to produce descriptive statistical analysis. Qualitative interviews were tape recorded and fully transcribed into Vietnamese. A transcript based analysis was used to identify major themes. Key quotes were translated into English.

3 KEY FINDINGS

Social profile of survey households

Respondents were on average 45 years old (ranging from 18-60 years). Households had an average of four members per household. Fifty two percent were female. Household heads accounted for 85% of the total respondents. Nearly half of the total surveyed households had children aged 5-14 years (47%). The study population was ethnically diverse: Muong (56% of total sample), Thai (24%), Kinh (15%) and Dao (5%) with differences between districts. The majority (92%) had completed primary to high school education with 48% completing secondary level (Grade 6-9). Illiteracy rates were low at 2%. The majority of respondent were farmers (81%). Of the total households surveyed, poor households² accounted for 30.3% and near poor 17%.

Household sanitation context and facilities

A total of 27.7% households own hygienic latrine facilities (23.8% in Mai Chau and 30.7% in Kim Boi), and the majority of these were septic tanks, found in 17.4% of households, followed by double vault latrines and soakage pits. Septic tank ownership is more common among 'better off' households (24.4%) as compared to 'poor' households (7.8%).

More than half of households (55.9%) own unhygienic latrine facilities (such as such as bucket, bridge or hanging latrines, unimproved pit latrines and single vault latrines). The most common type of latrine

¹ Introducing SaniFOAM: A Framework to Analyze Sanitation Behaviors to Design Effective Sanitation Programs, Devine, J., October 2009

² A rural poor household is a household with each member earning an average income of up to VND 400,000 per month. A near poor rural household is a household with each member earning an average income of between VND 401,000 and VND 520,000 per month. Households with each member earning an average income higher than 520.000VND per month are considered better off.

is a hanging bucket or bridge latrine (25.1%), followed by a single vault latrine (24.2%). Rates of unhygienic types of latrines were similar between economic groups.

Thirteen percent of household did not own a latrine, and this was most common among poor households (19.8%) as compared to the near-poor or better off households (~10%). This was also notably high among the Dao ethnic group (61.5%). In addition, 33% of households without a latrine reported having previously owned a latrine.

The interviewer observations indicated a number of deficiencies in latrine construction, use and maintenance, indicating that many of the hygienic types of latrines do not meet the VIHEMA's standards of hygienic criteria. When applying the VIHEMA standards, the percentage of households with a hygienic latrine is less than ten percent (7.5%).

Understanding the opportunities, barriers and motivations of rural men and women to invest in hygienic sanitation

The findings highlighted several key behavioral determinants in relation to the ownership of unhygienic latrines, the practice of open defecation and the hygienic ownership and maintenance of latrines. As open defecation rates are low, the priority demand for sanitation relates to improving access to and usage of hygienic latrines. These findings are arranged according to the SaniFOAM theoretical framework of opportunity, ability and motivation to perform the behaviors.

3.1 OPPORTUNITY

Access

There is a good perceived availability of construction materials, masons and sanitation products in the sampled communes with only some more remote areas reporting limited access. However, households do not have access to full latrine packages from one shop or retailer. Rather they would need to visit a number of retailers to purchase a full set of required sanitation products and construction materials. This complicates the purchasing process, and means there are a number of barriers with regards to information on the total cost of the different types of latrines. Also, sanitary ware and ceramic tiles were less accessible than other sanitation products, as suppliers of these products are more concentrated in shops located in district towns, suggesting that access to materials needed to construct hygienic latrines may be more difficult. It is also noteworthy that many latrines are still built with local, natural materials, which may explain the finding that while perceived availability of hardware was high, only 57% of adopters (latrine owners) had actually visited a sanitation shop or supplier.

Product attributes

Cleanliness and lack of odour are the key product attributes of a desired latrine. Other positive product attributes include: being easy to clean, solid and durable, and affordable. Latrines that 'avoid environmental contamination' are also a considered desirable attributes. Septic tanks and latrines with ceramic pans are most commonly associated as having these positive product attributes, as well as squat pans. However it is acknowledged that most respondents are unaware of other types of hygienic latrines (see Knowledge). In addition, having a superstructure is also considered to be a very important component of the latrine, and this may have particular relevance for men. Building the

entire latrine at once is preferred to building the latrine in stages. No relevant differences were identified among the different segments in terms of preferred product attributes. Finally, most respondents are dissatisfied with their latrine (see Motivation section of the main report), though hygienic latrine owners are notably more satisfied than unhygienic latrine owners.

Social norms

Open defecation is not socially acceptable. This may be in part due to government regulations in the past few years which have required all households to build a latrine, as part of efforts to promote a “Cultural and Healthy Village”. However, respondents acknowledge that open defecation does occur, but usually when people are farming remotely or among younger children. Sharing latrines, though less common, seems to be acceptable. Unhygienic types of latrines are considered socially acceptable and the norm in communities. Though it is recognized that unhygienic latrines are perceived as a dirty, unpleasant, and foul smelling these are also considered ‘normal’ attributes. Owning a hygienic latrine is perceived as something that is reserved for wealthier households.

Sanctions and Enforcement

In the two surveyed districts, a regulation requiring all households to have a latrine was implemented over the past few years, leading to a reported increase in household latrine construction. However, the current national regulation that requires households to have a hygienic latrine has not filtered through to lower government levels yet (i.e. at the commune and village). As such, village leaders still promote only the necessity of owning a latrine, or at most stress the need for concrete latrine floors, but do not enforce the need to acquire a hygienic latrine. There may be misconceptions or lack of understanding among village leaders regarding the specifications that are needed to meet hygienic latrine criteria. There is consensus among respondents and local authorities about the need to develop additional official decisions on the regulation on hygienic latrines. There are no sanctions or fines being in place for not complying with the regulation.

3.2 ABILITY

Knowledge

Knowledge of health causes/disease: Most respondents do not understand the relationship between the latrine construction, use and maintenance and its impact on health and disease. Likewise, most respondents are not aware of the risks of untreated human feces, and 35% of the respondents did not know of any disease caused by untreated human feces. Open defecation is commonly associated with the risk of environmental pollution rather than transmission of diseases (mentioned by less than half of the respondents) or contamination of water sources (13%).

Knowledge of different latrine types and cost: When asked about their awareness of different latrine types, most respondents are only aware of septic tanks, though awareness was somewhat higher among those from ‘better off’ households. Few respondents know about other hygienic latrine options such as soakage pits, biogas plants, or improved pit latrines.

Despite the finding that most respondents report having visited a sanitation shop, three quarters report a lack of knowledge regarding the price of latrines. When asked generally about the price of different sanitation products, over eighty per cent also report that did not know. In particular, most

respondents tend to overestimate of cost of hygienic latrines, as they associate these with septic tanks which are perceived as expensive (see Affordability).

Social support

The main source of advice for building a latrine comes from relatives, friends and neighbors (44.3%), followed by masons (18%). Very little information come from mass media or training. Support among members of the community is common in the selected communes through collaborative and group work, information and labor exchange and solidarity savings groups.

Affordability

Most households who purchased an unhygienic type of latrine spent less than 500,000 VND, while most hygienic types of latrines cost more than 5 million VND. Among respondents that were willing to build or make upgrades, many were prepared to spend a maximum of 6 million VND for their latrine, and up to 8 million VND for the desired septic tank facility. Supply chain data show that septic tanks typically cost between 5-6 million VND. This suggests that respondents over-estimate the cost of hygienic latrines. Qualitative data also confirmed that a key barrier to hygienic latrine acquisition includes perceptions of affordability: hygienic latrines are deemed expensive and unaffordable. This is further exacerbated by noted wealth differentials, where ‘better off’ households are willing to pay more for their latrines. In particular, the perception that septic tanks are expensive could also be influenced by a number of very expensive septic tanks built in some of the surveyed communes (which cost more than twelve million VND), creating an inaccurate assumption about the price of a latrine.

Money for latrine construction mainly comes from income and savings, with loans being rarely used to invest in latrines due to people’s reluctance, particularly the poor, to borrow money to invest in a latrine. However, there are already high levels of debt in the surveyed communes, with a high percentage of households with outstanding loans. Income is seasonal for most households, with higher affordability after harvesting time.

Skills

While respondents have the skills to build basic, unhygienic latrines, the majority of respondents with hygienic latrines report using masons to build their latrines. Reliance on mason’s is higher when building hygienic latrines, and thus knowing where to find a mason, and ensuring sufficient financial resources to pay for their services, is deemed necessity for hygienic latrine construction. In addition, supplies and materials are purchased when constructing hygienic latrines and reliance on local materials (bamboo, wood, etc.) is minimal. In terms of maintenance, a high number of households with unhygienic types of latrines use untreated human feces as fertilizer in the paddy fields. Septic tank owners had had never emptied their tanks, and no sludge removal services were found in the surveyed communes.

3.3 MOTIVATION

Attitudes and Beliefs

There is a misconception regarding the harmfulness of human feces. Among some households that own latrines, respondents report using untreated feces for fertilizer, and report saving or keeping feces untreated for this very purpose.

Values

There is general agreement that owning a latrine will make a family more modern and developed, that it will create the illusion of a cleaner and more beautiful home, and add value to the property.

Not feeling ashamed by having an unhygienic latrine in front of relatives and neighbors is also valued by households. People feel respected by their neighbors and proud when they have a hygienic latrine, and they perceive this as helping them to build better social relationships. Complying with the regulations is also socially desirable and appreciated, as being an exemplary member of the community.

Emotional, physical and social drivers

Cleanliness and comfort, privacy and being considered a “cultural” or modern family are the main drivers for building a hygienic latrine. Securing the family’s health, obeying the authorities’ regulations and being good host to their guests are also strong drivers. Women are more motivated to have a hygienic latrine as a means to avoid bad smell, dirtiness and to be more comfortable. Family health and safety are also additional drivers for building hygienic latrines, and in particular, children are perceived as benefiting from this.

Among open defecators, motivators for latrine acquisition include the convenience of not having to go out in the dark or in the rain to defecate as well as avoiding dirtiness/contamination caused by open defecation.

Intentions

Intention to build or rebuild latrines is high among latrine owning households (75%), as well as households that do not own latrines (87%). Most unhygienic latrine owners intend to build a new latrine rather than upgrade their existing latrine; and households with hygienic latrines (namely septic tanks), cite an intention to make upgrades. However, given price perceptions regarding the affordability of latrines and upgrades, most believe they would need to save for a long time in order to make any changes. As such, while there is a willingness to build or rebuild facilities, most have no plans to do this in the short term.

3.4 COMMUNICATION CHANNELS

Regarding communication channels, the results of the assessment highlighted people’s preference for interpersonal and direct consumer contact activities. However, some weaknesses were identified in terms of the quality and depth of the information provided through those channels as well as the way the activities were conducted regarding the focus, the length and the dynamism of the facilitator. TV and printed materials like leaflets were the most preferred supporting communication channels and tools.

3.5 DEFINING THE SANITATION SUPPLY CHAIN

Product

Households can easily access construction materials, sanitation products and services in the district towns and communes although more remote communes have less access. Transportation services are widely available for large or small volumes, at all levels (village, commune, and district).

Beyond transport services, there is limited integration between main actors in the supply chain – masons, material producers and retailers. The supply chain is not currently providing standardized sanitation technologies at household level in the study area. The market is responding predominantly to the consumer needs and preferences for high end latrines such as septic tanks, which are the most common type of latrines built by masons and owned by households. Masons commonly work collectively but with limited technical knowledge that does not guarantee a correct latrine design and installation.

The purchasing process is complicated in that households must separately acquire construction materials and sanitation products and hire construction services for building a latrine. There are no supply chain providers who offer a full service for a latrine construction/installation either independently or linked to other actors in the supply chain beyond transport. The sanitation supply chain is integrated into the construction supply chain; there are no specialized sanitation providers for the household market. Most masons, particularly assistant masons, and sanitation retailers and material producers do not have the adequate technical knowledge to guarantee correct latrine design and installation, particularly for septic tanks.

Customers prefer latrines that are easy to clean and do not have bad smells. However, they have incomplete information on the market costs of hygienic latrines and associate these attributes mainly with septic tanks. This has implications for ensuring equity in access and causes delays in uptake as households save up for what is a significant investment whilst using unhygienic latrines or no latrines. There are no sludge removal services. There is also no demand for this service given the limited awareness among households about the need of emptying the septic tanks regularly and the recent introduction of this technology into the communes. Supply chain providers provide no information about this requirement to households. As such, the market is responding predominantly to the consumer needs and preferences for high end latrines such as septic tanks which are the most common type of latrines built by masons. Households also do not have access to technical information on how to build a latrine for those types of latrines that are most commonly self-built.

Price

Material producers and retailers bear most of the financial burden in the supply chain. Both require large amounts of working capital and they are not able to get inputs on credit from their providers. Bank credit for supply chain providers is widely available and without significant constraints. There was reportedly good access to financing in the supply chain with Agribank being the main lender providing credit lines.

Transaction costs involved in providing financing to households for latrine construction are higher than when provided by the supply chain. Credit fungibility could be reduced if financing is provided through the supply chain. However currently there are no coordination mechanisms between government

agencies in charge of sanitation promotion and the sanitation credit program by the Vietnam Social Policy Bank (VSPB). There is strong competition between actors in the supply chain at all levels (material producers, retailers, transportation service providers and masons). Margins are low and prices of construction materials and sanitation products (pans) are considered acceptable for households.

Place

There were not examples of integration between masons, material producers and retailers. Complete service provision for building a latrine could not be hired and nor could all materials and products required for building a latrine be found in a single location. More remote communes had less access to sanitation materials and product providers and higher transport costs, but in general there is an extensive network of materials and service providers. Respondents from the demand surveys state that they know of some sanitation and service providers and these are close to their village.

There were no coordination mechanisms between government agencies in charge of sanitation promotion and the sanitation credit program by VSPB. Transaction costs involved in providing financing to households by formal financial institutions for latrine construction are higher than when provided by the supply chain, because of more time consuming procedures for both provider and customer and higher requirements like collateral. Credit fungibility is also higher when financing is provided by financial institutions than by the supply chain.

Promotion

There are almost no incentives for supply chain actors to promote or invest in marketing activities of products and there is a perceived lack of sufficient demand.

There are no incentives for the supply chain actors to promote or invest in marketing activities, as a consequence of the lack of integrated sanitation products that could be branded, the perceived lack of sufficient demand and the preference for households to self-construct. Information on VSPB available credit programs for sanitation is not adequately reaching rural households. Many households still do not know about the program, other many think it is only for water projects.

3.6 POLICY, REGULATORY, AND INSTITUTIONAL ENVIRONMENT INFLUENCING RURAL SANITATION IN HOA BINH

The national goal on sanitation for 2015 included in NTP3 and in the National Socio-Economic Development Program (SEDP) has been revised by VIHEMA from 75% to 65% hygienic latrine coverage. The Provincial Goal on Sanitation is based on this National Goal and was included in the Annual Resolution of the Provincial and District/Commune People's Council. The National Strategy on Sanitation developed by the Ministry of Agriculture and Rural Development (MARD) for the period 2010-2020 for both water and sanitation focuses on reaching the poor through the provision of subsidies; raising awareness on sanitation through communication and promotion; improving the coordination among related agencies; and promoting appropriate technology application. The province often follows the national strategy with or without minor modifications (such as the technology applied or coordination schemes).

All provinces (including Hoa Binh) have developed their own annual and longer term (2012-2015) Plans on Sanitation, with technical support from VIHEMA and the Mobile Team. The sanitation planning

process in Hoa Binh has received support (technical, political and financial) from VIHEMA, the Mobile Team and the WSP/WB. Hoa Binh DOH/CPM has advocated and worked closely with Provincial People's Committee (PPC), Department of Planning and Investment (DPI), Department of Finance (DoF) and Department of Agriculture and Rural Development (DARD) in getting more NTP fund allocated to sanitation, and specifically for communication. The Hoa Binh Provincial Sanitation Plan has been seen as one of the best plans. Recognizing the limitations of the subsidy policy for sanitation, efforts have been made by VIHEMA and Hoa Binh in minimizing the amount of funds allocated but with limited success.

In most cases, Provincial CPM acts as the focal point for sanitation. In Hoa Binh, the Community Health section the 3 available staffs have been trained on sanitation planning, sanitation technology and some communication activities and are capable of provide trainings to district CPM and commune health workers. However, given few staff, the Provincial CPM mainly reaches district level. Hoa Binh does have a Provincial Center for Health Propaganda and Communication but its cooperation and contribution to sanitation is limited. Sanitation marketing and supply chain is a totally new concept to the health sector at all levels. Further training is therefore needed. CPM staff at both provincial and district levels have been trained on sanitation techniques. They all reported that they have capacity to train staff at the grassroots level. Refresher courses are needed for health staff, particularly in non-NTP districts. At commune and village levels, there is a lack of knowledge on sanitation techniques and hygienic options among health workers and village leaders, again especially in non NTP3 communes.

Most of the national policies on sanitation reached the province (and the commune to a limited extent) either through the PPC or the Provincial line departments, including DOH, DARD, DPI and DOF. Hoa Binh is one of a few provinces that have a strong political commitment on sanitation. Guidelines and instructions often go through the line agencies rather than the administration system (DPC/CPC). District/Commune authorities and health officials are not fully aware of the latest development of the sanitation sector (Circular 04, Decision 366, Decision 1808 etc.). Sanitation policy is often "integrated" in directions for other sectors (water supply, health, culture etc.) without specific instructions on sanitation. Authorities at grassroots level need written instructions from higher levels as a reference in directing and implementing sanitation activities.

4 CONCLUSIONS AND RECOMMENDATIONS

The findings will be used to develop a province-wide behavior change and market development strategy for Hoa Binh province and develop sanitation implementation plans for 2014-2016 for Kim Boi and Mai Chau districts.

In terms of generating demand for sanitation and behavior the priority sanitation and hygiene related behaviors include i) improving access to hygienic latrines; and ii) correct use and maintenance of latrines by all members of the household. Eliminating open defecation practices is included within the first behavior. The findings highlighted several key behavioral determinants to address as part of the behavior change communication strategy in order to create demand for sanitation in the planned communications strategy including *Attitudes and Beliefs, Knowledge, Affordability and Sanctions/Enforcements and Physical and Social Drivers*.

A key conclusion in analyzing the supply chain is the need to simplify the purchase process for households and improve access to information on market costs for consumers that meet a range of needs and preferences, beyond septic tanks. A focus on improving “product” availability and eliminating purchase complexity may contribute to uptake. There are a number of market barriers that could be addressed, such that households had:

- Greater price awareness about hygienic latrine options
- A simplified buying process eliminating the need to visit several retailers
- Improved access to technical information about hygienic latrine options in terms of how to self-build and maintain.

All of these elements would contribute to improved household opportunity, ability and motivation to access the latrine they want and a price they can afford, which is suited to their needs and preferences. Learning from programs in the region shows that the product-packaging concept could be introduced to simplify the latrine purchase process for households with existing retailers. Other options include simple design innovations to reduce the costs, and the testing of business model options including the one-stop shops and concrete ring production. It is noted that the current supply chain is not responding to the potential issue of service provisions for septic tank management and desludging.

The set goals/targets (MDG/NTP and People’s Council) provide a “tool” for advocacy for higher political commitment in alignment with development partners. Options to maximize the involvement of local authorities in sanitation by planning and defining the activities include issuing provincial/district resolutions on sanitation; dissemination meetings at commune (Party, CPC, Related Agencies, Village Heads) and developing commune action plans that include targets, classification of target groups, communications, appropriate technology options and technical support.

Tailored technical support to CMP required would include i) Behavior Change Communication (BCC) strategy design (communication objectives), BCC planning (including communication channels), and tools related to the key behavioral determinants and ii) market strengthening with introduction of appropriate latrine options and coordination mechanisms with supply chain providers. Further, hygienic latrines could be made a compulsory criteria (not the “soft” one as it’s currently seen as) and new procedures for monitoring and supervising progress and achievements could be developed and linked with development recognitions and award provided by different government programs like the New Rural Development Program, the National Health Support Project or the WU’s Program.

Existing and potential business models for sanitation delivery

Based on the above analysis of the supply chain, the following potential business models are recommended as options to test. These build on existing options:

One stop shop (OSS) model (providing all latrine components and materials and information, with/without masonry service)

Working with existing local retailers, the model would seek to improve the offer of standardized designs and technologies at different prices with supporting materials. The OSS could offer associated services including transport/home delivery to reduce purchase and transport costs and difficulty, installation services, and other services (consulting on hygienic latrine types, product choice, use and maintenance, warranty).

Medium Scale Off-Site Concrete ring production and installation by producers

In this model, the local producer buys materials, fabricates concrete rings at a workshop, transports the concrete rings to the customer's household, and potentially installs the latrine. The producer could provide (i) both the concrete ring and installation service or (ii) just the concrete rings, and then the customers could hire the mason to install the concrete rings together with constructing other parts of the latrine. As there are now local producers of concrete rings for water projects, this model could be adopted more easily. The local producer could be offered some technical instructions on latrine concrete ring construction. Promotion of this new service would be needed for customer buy-in.

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Chapter 1 - Introduction

1 BACKGROUND

1.1 BACKGROUND OF THE RAPID ASSESSMENT

The National Target Program on Rural Water Supply and Sanitation (RWSS-NTP3) is the main government program to improve rural water supply and sanitation in Vietnam. The Water and Sanitation Program (WSP) of World Bank provides technical assistance to the government of Vietnam (represented by the Vietnam Health Environmental Agency [VIHEMA] at the Ministry of Health), to reach sanitation targets and create more opportunity for the poor to access improved sanitation. The strategy is built on four elements: i) improving the enabling environment for service delivery, ii) strengthening rural sanitation supply chains, iii) generating demand for improved sanitation and iv) improving service delivery models through knowledge and learning.

WSP's support at the national level and in selected provinces (including Hoa Binh) will serve as "learning labs" to generate new knowledge and evidence on reaching the poor with affordable and desirable sanitation products and services. In parallel with the technical assistance at national level, WSP and VIHEMA are supporting a technical assistance model in Hoa Binh province (selected pilot districts are Kim Boi and Mai Chau), with the aim of informing improvements to RWSS-NTP3 program implementation in other similarly challenging provinces with low sanitation access and remote villages with ethnic minorities.

Under this framework, WSP contracted a team of consultants for the assignment "Rural sanitation demand creation and supply chain development for Hoa Binh province". Under this assignment, the consulting team was expected to support the DoH and the CPM of Hoa Binh province to:

1. develop an evidence-based behavior change communication (BCC) strategy, which includes a strategic plan to generate demand for improved sanitation among rural, poor households, with diverse ethnic groups;
2. develop a supply chain strengthening strategy, which includes a strategic plan to meet these demands.

1.2 OBJECTIVES OF THE RAPID ASSESSMENT

To meet these objectives, the consulting team carried out a Rapid Assessment (RA) in Hoa Binh province, among two selected districts: Kim Boi and Mai Chau. The main objectives of this rapid assessment are:

1. To understand barriers and motivations of rural men and women to invest in hygienic sanitation;
2. To define the supply chain 'actors' that provide both materials and services in the selected districts, and to determine existing and potential business models for sanitation delivery.
3. To assess the policy, regulatory, and institutional environment influencing rural sanitation.

1.3 REPORT STRUCTURE

The report is structured as follows: methods and research findings from the sanitation supply and demand side studies are presented, according to the type of survey that was implemented. Drawing on these key research findings, recommendations as to how to generate behavior change and demand for improved sanitation among rural, poor households of different ethnic origins, etc. are discussed. Recommendations on a strategy for supply chain strengthening and an implementation strategy and plan to meet those demands are thereafter proposed.

1.4 SANIFOAM FRAMEWORK: FOSTERING EVIDENCE-BASED DECISION MAKING

WSP utilizes a conceptual framework, called SaniFOAM, to help program managers and implementers analyze sanitation behavior to inform effective sanitation programs (see Figure 1). The SaniFOAM framework has also been applied to design formative surveys aimed at understanding barriers and driving forces for improved sanitation, and to monitor progress of the effectiveness of behavior change programs (Devine & Kullmann, 2012). This framework was used to guide the presentation of results and conclusions presented in this report.

Figure 1: SaniFOAM Framework



2 ASSESSMENT METHODOLOGY

2.1 STUDY SITES

The RA was conducted in 9 of the 51 communes located across the two districts (Kim Boi: 27 communes and 1 district town; Mai Chau: 22 communes and 1 district town). The selected communes include Binh Son, Nam Thuong, Sao Bay, Thuong Bi and Vinh Tien in Kim Boi and Bao La, Chieng Chau, Dong Bang and Tan Mai in Mai Chau.

Figure 2 Map of Hoa Binh Province



2.2 METHODS OF DATA COLLECTION

The RA commenced in early November 2013. Data collection was carried out between February to March 2014. For the RA, a mix of quantitative and qualitative research methods was applied, including (i) a desk study, (ii) a household survey, (iii) in-depth interviews (IDIs), and (iv) focus group discussions (FGDs). The following sub-chapters describe the four applied methods in detail.

2.2.1 Desk Study

A comprehensive review of existing documents and statistical data provided by the Hoa Binh CPM, was undertaken. The review included proposed rural sanitation demand creation approaches, national capacity building assessments and strategy developments, existing policy and institutional frameworks under the NTP-3, and supply chain business models. Existing sanitation formative research was also included in the review, which provided information on demand and supply side in Vietnam, as well as existing BCC communication materials. A systematic assessment of rural sanitation and hygiene programmatic approaches implemented in Vietnam was also conducted.

2.2.2 Household Survey

Target population

Household heads or representatives were included in the survey.

Sample size

A Slovin sampling formula³ was used to estimate a sample size for each district surveyed. Based on the total population of each district and with a desirable error margin of 5% and a 95% level of confidence, the selected sample size is 801 households (341 in Mai Chau and 460 in Kim Boi). The sample size was inflated by 10% to account for non-response and refusal.

Sampling strategies and procedures

The household survey was conducted in nine communes, of which five communes were in Kim Boi and four communes were in Mai Chau. Stratified random sampling was employed to select communes and villages. Across the communes, rates of hygienic latrine coverage (<30%, 30-50%, 50-65%, >65%) and levels of village economic status (poor, near poor and better-off households) was also considered in the sampling strategy. These classifications were used to organize sampling frames and selection of households. Table one illustrates the number of villages and households selected. Household heads or representatives were identified to complete the survey instrument, once informed consent was provided.

Table 1: Summary of sampling method and sample size

District	Selected Commune	Total No. of HH	No. of Selected Villages	Sample Size
Mai Chau	Chieng Chau	867	3	92
	Dong Bang	360	3	81
	Bao La	559	4	88
	Tan Mai	337	3	80
	<i>Subtotal</i>		<i>13</i>	<i>341</i>
Kim Boi	Binh Son	624	3	90
	Sao Bay	930	4	92
	Nam Thuong	1,098	4	94
	Thuong Bi	537	3	87
	Vinh Tien	1,575	4	97
	<i>Subtotal</i>		<i>18</i>	<i>460</i>
	Total	6,350	31	801

Sample and Survey Instrument

The survey instrument collected information from household heads or representatives. Questions addressed latrine ownership, use and type of latrine, latrine purchasing, installation and cost, as well as intention to make up-grades. Information was also collected on reasons for open defecation, and intention to build latrines, among respondents that did not have latrine facilities. Perceptions regarding the availability of sanitation services, price of latrines, knowledge of diseases, sources of information and communication channels was also assessed. Question using Likert scales were also included to address specific components of the SaniFOAM determinants, where respondents were asked to strongly agree, agree, disagree, or strongly disagree to various statements. Demographic information was also obtained regarding household assets and respondent characteristics.

³ Slovin formula: $n = N / [N * (e)^2 + 1]$ with n =sample size, N =number of total survey population, e = desired margin of error ($e=1$ -degree of confidence). The Slovin sampling formula was also employed to estimate the sample size for each selected commune with a confidence level of above 90% and a margin of error below 0.1 (10%).

An observational checklist was also employed. The observational checklist included an assessment of the actual type of latrine facility, latrine structure, latrine construction, whether the latrine appeared to be functioning and in use. Survey instruments were pilot tested prior to data collection.

Data collection team

Surveyors from the Center for Application, Research and Transfer of Science Technology were trained to administer the survey instrument. Two field coordinators were responsible for field supervision and logistics.

2.2.3 In-depth Interviews

Target Population

Respondents included household representatives, sanitation service providers (including formal and informal masons, Small and Medium Enterprise [SME] owners, and credit suppliers), sanitation supply chain product providers, village health workers, leaders of CPM, District Health Centers (DHC), commune Health Centers and commune People's Committee (PC), and representatives of Women's Unions (WU) at district level.

Sample size

A total of 78 IDIs were conducted for the 12 different interview segments (see Table 2). Six of the 78 interviews were conducted with representatives of Hoa Binh province.

Sampling strategies and procedures

A non-probability, purposive sample of the target population was recruited from two communes in each of the two districts. The two selected communes for qualitative assessment were selected based on the hygienic latrine coverage criteria (one of the communes with the lowest rates from the selected communes and one with an average rate). The in-depth interviewees were selected on the basis of their roles, functions and responsibilities with regard to sanitation and hygiene issues as shown in Table 2.

Snowball sampling and preliminary lists of potential interviewees, collected with the support of CPM staff at provincial, district and commune level, were used to identify respondents. The 78 IDIs were held alongside the 30 FGD sessions over the course of several weeks in January 2014. All discussions were held in private and tape recorded for accuracy. Additionally, notes on each key topic were taken by each researcher to provide summaries of each interview in English or Vietnamese. Illustrative quotes were translated into English for the report.

Table 2: In-depth Interviews: target and sample size

#	Targeted Interviewees for IDI	Hoa Binh	Kim Boi	Mai Chau	Total
1	Provincial CPM director	1	0	0	1
2	District CPM directors	0	1	1	2
3	Vice-chairman of commune PC	0	1	1	2
4	Commune PC (Vice) Chairman	0	1	1	2
5	District WU representatives	0	1	1	2
6	Commune health workers	0	2	2	4
7	Sanitation supply chain product providers ⁴	2	12	12	26
8	Sanitation supply chain service providers ⁵	0	6	6	12
9	Households without latrine	0	4	4	8
10	Households with latrine ⁶	0	8	8	16
11	VIHEMA representative	1	0	0	1
12	INGO ⁷ representatives	2	0	0	2
	Total	6	36	36	78

2.2.4 Focus Group Discussions

Target population

The target participants of FGDs included management and technical officials from CPM and DHCs; commune and village health workers, masons, and household representatives. The FGD were organized according to ethnicity, gender (including mixed, male-only and female-only groups) and economic status (poor, near-poor and better-off).

Sampling strategies and procedures

A total of 30 FGDs sessions were facilitated representing 4 target groups. Each FGD consisted of 10 participants, totaling 300 participants. Participants were from the same selected communes as the IDI participants. Participants were selected on the basis of their roles, functions and responsibilities with regard to sanitation and hygiene issues and gender as shown in Table 3.

Table 3: Sample size of FGD

#	Target Groups for FGD	Kim Boi	Mai Chau	Total
1	Village and commune health workers, village leaders and WU representatives at commune and village level	2	2	4
2	Representatives from households <u>with latrine</u> belonging to the majority ethnic groups in the district	9	9	18
3	Representatives from households <u>without latrine</u> belonging to the majority ethnic groups in the district	2	2	4
4	Sanitation service providers (masons)	2	2	4
	Total	15	15	30

Sample and Survey Instrument

⁴ The groups were comprised of wholesalers or retailers of construction materials and sanitary equipment (both at district and provincial level), distributors, agents and retailers, or producers of materials.

⁵ The FGD comprised exclusively of masons, transportation service providers and mobile vendors, or credit service providers.

⁶ In half of the FGD, respondents were hygienic latrine owners, and respondents were exclusively male or female. Efforts were also made to organize and separate groups according to their income status.

⁷ International Non-governmental Organizations

The IDI and FGD guidelines included open ended questions. These varied according to the main target groups. Qualitative guidelines used to collect information from household heads or representatives followed similar topics presented in the quantitative questionnaire, but collected information from household heads or representatives. Other guides included questions to address the research objectives associated with the different target groups.

2.3 DATA PROCESSING AND ANALYSIS

Data were entered and cleaned in Epidata and transferred into SPSS (version 17). Additional mining was conducted to identify any errors prior to commencing analysis. Descriptive statistical analysis with measures of central tendency and valid percentages are presented.

Qualitative data collected from FGDs and IDIs were transcribed from digital records into Vietnamese. A transcript based analysis was used to identify common themes and those that were idiosyncratic or unique. Findings were verified and validated with in-country staff to ensure accurate representation of the data, and cross checked with quantitative findings. Coding of themes was based on the SaniFOAM determinants to address demand side determinants. Coding for the supply chain was based on the marketing mix (product, price, place and promotion). Summaries of the key findings and relevant quotes were translated into English and are presented in the report.

3 DESK REVIEW

3.1 SOCIO-ECONOMIC AND SANITATION BACKGROUND

Secondary data was collected primarily from VIHEMA and the Hoa Binh province CPM. The documentation included historic data of coverage, socio-economic information and other relevant documents regarding rural sanitation activities in the province. The following is a summary of the available information.

3.1.1 Socio-Economic and Sanitation Context of Hoa Binh Province and Selected Districts

Socio-economic status and sanitation coverage in Hoa Binh province

Latrine coverage rates and measures of poverty across the districts of Hoa Binh province is presented in Table 4. Latrine coverage is relatively high in the province according to the official statistics. However, hygienic latrine coverage is lower, with five out of the eleven districts presenting rates below 30% of hygienic coverage.

Rates of latrine coverage in Mai Chau and Kim Boi are high (92% and 98.7% respectively), but hygienic latrine coverage is much lower (22.6% and 35.6% respectively). Around one in four of the households Mai Chau and Kim Boi are considered 'poor' (25.8% and 28.3% respectively). Most households have access to clean sources of water, though access is lower in Kim Boi (60.2%) as compared to Mai Chau (75%).

Regarding hygienic latrine coverage in schools and health centers in Hoa Binh province, 52.4% of schools and 57.1% of health centers have access to both hygienic latrines and clean water⁸. This highlights the insufficient sanitation infrastructure in both types of public buildings.

Table 4: Demographic, Poverty and Sanitation Data of Hoa Binh Province⁹

District	Population	Poor Households	Ethnic Minorities	HH with latrine	HH with hygienic latrine	HH with no latrine	HH w access to clean water
	N	%	%	%	%	%	%
Mai Chau	51,897	25.8	88.0	92.0	22.6	8.0	75.0
Kim Boi	105,289	28.3	90.7	89.7	35.6	10.3	60.2
Yen Thuy	59,690	20.4	69.2	100	26.5	0.0	72.7
Lac Thuy	49,152	16.3	36.3	98.4	51.9	1.6	72.3
Tan Lac	78,665	26.9	84.7	83.8	27.1	16.2	75.6
Luong Son	63,484	7.6	63.9	91.3	41.4	8.7	78.3
Lac Son	132,337	35.7	91.2	88.9	23.9	11.1	80.7
Ky Son	32,828	6.3	95.1	93.7	45.7	6.3	82.9
Da Bac	53,128	42.5	89.1	91.3	27.3	8.7	70.1
Cao Phong	40,949	21.9	73.9	87.4	40.6	12.6	80.1
Hoa Binh city	83,080	1.8	30.2	98.8	88.6	1.2	91.3
Total	750,499	21.6	74.9	92.2	40.0	7.8	76.0

3.1.2 Socio-economic and sanitation context of Mai Chau and Kim Boi districts and selected communes

Kim Boi

Kim Boi district is located in the East part of Hoa Binh province and has an area of 551.03 km² and has an estimated 25,217 households¹⁰ and a population size of 142,079¹¹. The district has 27 communes and one district capital. The main ethnic group in Kim Boi is Muong, and other ethnic groups include Kinh (the main ethnic group in Vietnam), Dao and Thai. The five selected communes for the household survey show varying rates of hygienic latrine ownership ranging from 5% in Thuong Bi to 72% in Nam Thuong (see Table 5), with an overall coverage rate of 36%.

Mai Chau

Mai Chau district is located in the West part of Hoa Binh province and has an area of 564.54 km² and has an estimated population size of 55,663, and 12,588 households. The district has 22 communes and 1 district capital. The main ethnic group is Thai, and other ethnic groups include Kinh, Dao and H'Mong. Rates of hygienic latrine ownership are lower than in Kim Boi and range from 8.4% in Tan Mai to 35.0% in Dong Bang, with an overall coverage rate of 23%.

Table 5: Demographic, Poverty and Sanitation Data of Kim Boi District¹²

⁹ Data provided by Provincial Center for Rural Water Supply and Sanitation (CERWASS) and Department of Labor, Invalids and Social Affairs (DoLISA) of Hoa Binh Province (2012).

¹² Data from Center for Preventive Medicine, Hoa Binh Province 2013.

Commune by district	Population	Poor Households	Ethnic Minorities	HH with latrine	HH with hygienic latrine	HH with no latrine	HH w access to clean water
	N	%	%	%	%	%	%
<i>Kim Boi</i>							
Vinh Tien	6,119	34.5	65.6	100	52.8	0.0	99.4
Binh Son	2470	48.9	94.1	100	11.2	0.0	10.9
Thuong Bi	2,597	26.8	98.7	86.3	4.5	13.7	34.7
Nam Thuong	4,871	19.3	82.0	90.1	72.0	9.9	100
Sao Bay	3,926	24.4	95.9	93.8	37.9	6.0	42.7
Total	105,289	28.4	90.7	89.7	35.6	10.3	61.3
<i>Mai Chau</i>							
Bao La	2,302	29.7	91.1	100.0	11.4	0.0	79.0
Dong Bang	1,353	12.2	78.0	100.0	35.0	0.0	88.0
Tan Mai	1,564	45.7	95.5	91.3	8.4	8.7	79.0
Chieng Chau	3,432	11.6	89.2	100.0	23.4	0.0	92.0
Total	51,897	26.1	84.0	92.0	23.0	8.0	76.0

Key findings:

- Ownership of any latrine is high (92%), being the percentage of households without a latrine very low in both selected districts (8.0% Mai Chau and 10.3% in Kim Boi).
- Considerable variation is observed regarding hygienic latrine coverage rates, both at district and commune levels. At the district level, rates range from 22.6% to 51.9% in rural districts, with Mai Chau district having the lowest rate, where as in Kim Boi around one in three households have hygienic latrines (35.6% hygienic latrine coverage).
- Poverty rates vary at the district level and range (in rural areas) from 6.3% of 'poor' households to 42.7%.
- Around one in four of the households Mai Chau and Kim Boi are considered 'poor' (25.8% and 28.3% respectively), though again there is considerable commune variation (e.g. in Chieng Chau 11.6% of households are 'poor' where as this is higher in Tan Mai [45.7%]).
- Most households have access to clean water, 76.0% and 61.3% respectively.
- Only around half of the schools and health centers have clean water and hygienic latrines.

¹⁰ According to the official information provided by DARD Kim Boi district, 2012

¹¹ 2009 Population Census

¹² Data from Center for Preventive Medicine, Hoa Binh Province 2013.

Chapter 2 – Demand Assessment results

Findings from both quantitative and qualitative assessment are presented in this chapter. Key data on the socio-economic profile of surveyed households is first presented to frame the context of the surveyed communes. Subsequently, information is presented on the demand-side analysis. Finally, a section on the findings from the supply chain mapping and analysis is presented.

1 HOUSEHOLD BACKGROUND CHARACTERISTICS

1.1 SOCIO-DEMOGRAPHIC PROFILE OF RESPONDENTS

A total of 801 respondents were interviewed, and around half were male (48.6%), with an average age of 45. Table 6 shows that 1.6% of respondents are illiterate or only know how to read or write, 26.9% have completed only primary school, 47.9% have completed secondary school, 16.9% finished high school, and 6.9% have higher than secondary education. With regards to ethnicity, there are notable differences between districts. In Kim Boi, most respondents are from the Muong group (84.3%), whereas in Mai Chau, most respondents are Thai (56.9%). The Dao minority was concentrated in only two of the surveyed communes, usually in those further away from the district town.

Table 6: Socio-demographic information by district

	Mai Chau N=341	Kim Boi N=460	Total N=801
Respondents age	Mean 44	Mean 45	Mean 45
Gender (male)	% 46.6	% 50	% 48.6
Ethnicity	%	%	%
Kinh	18.2	12.4	14.9%
Muong	16.7	84.3	55.6%
Thai	56.9	0.4	24.5%
Dao	7.6	2.8	4.9%
Others (H'Mong, Tho)	0.6	0.0	0.2%
Education	%	%	%
Illiterate	1.2	0.4	0.8
Only know how to read, write	0.3	1.1	0.8
Completed primary (1-5)	28.7	25.5	26.9
Completed secondary (6-9)	40.8	53.2	47.9
High school (10-12)	18.2	15.9	16.9
Above high school	10.9	3.9	6.9
Don't know/don't remember	0.0	0.2	0.1
Number of members per household	Mean 4	Mean 5	Mean 4
Total number of people in surveyed households	N 1,404	N 2,106	N 3,510

1.2 ECONOMIC PROFILE OF SURVEYED HOUSEHOLDS: HOUSEHOLD POSSESSIONS AND CHARACTERISTICS

The availability of durable consumer goods is an indicator of a household's welfare status. Table 7 shows that 95% percent of households have televisions and mobile phones, and more than half (53.9%) own CD or DVD players. Only 10% own computers. More than 95% of the households possess a motorcycle as a means of transport. Twelve percent of households have a tractor, and this is more common in Kim Boi (17.9%) than Mai Chau (4.7%). Few differences were observed across the different segments, and notably there were few differences by economic status.

Housing characteristics reflect the household's socioeconomic status in society. Around 60% of households are built with cement and brick, and one out of three is wooden or stilt house, though there are notable differences between districts. In Kim Boi houses are most commonly made of concrete (84%), and in Mai Chau houses are wooden¹³ (62%). Roofs are mainly made of fibro cement and concrete, suggesting a common use of construction materials.

Agriculture is the main economic activity in both districts (see Table 32 in Annex), although seasonal food shortage was reported by a high percentage of households (37.7%), which is somewhat higher than the official poverty rates (28.4% in Kim Boi and 26.1% in Mai Chau). Farming is the main source of income in all ethnic groups except for the Kinh (38.7%). Average agricultural land area is considerably higher among Dao people, which can be explained by being an ethnic group typically living in more remote and mountainous areas where land availability is higher.

The rate of better-off households in Mai Chau is considerably higher than in Kim Boi (65% and 44% respectively). Muong and Dao were the most disadvantaged ethnic groups in the surveyed areas, both in terms of the rate of poor households and food shortage, with Kinh being the most affluent.

Overall access to water throughout the year was reported to be high (82%, data not shown). For households without permanent access, the average reported period of being short of water was 3 months per year. More than half of households get their water from a well (56.8%), and near one third from gutter/gravity system (See Chart 1: Source of water by district). Less than 15% of households get it from a tap, while less than 1% was reported in each of the following sources: rain water container, rivers, ponds or springs, and bought water. There are some differences between districts, as dug wells are the most common source of water supply in Kim Boi (81.8%) while gravity systems/gutter are the most widely used means of water supply in Mai Chau (55.7%).

Table 7: Economic status by ethnic group

Ethnic groups	N	Poor (%)	Near poor (%)	Better off (%)	Total (%)
Kinh	119	17.6	10.9	71.4	14.9
Muong	445	35.5	22.7	41.8	55.6
Thai	196	23.5	9.2	67.3	24.5
Dao	39	43.6	10.3	46.2	4.9
Others	2	50	0.0	50	0.2
Total	801	30.3	16.9	52.7	100

¹³ Wooden stilt houses are the traditional way of Thai dwellings which explains the high prevalence of this type of housing in Mai Chau.

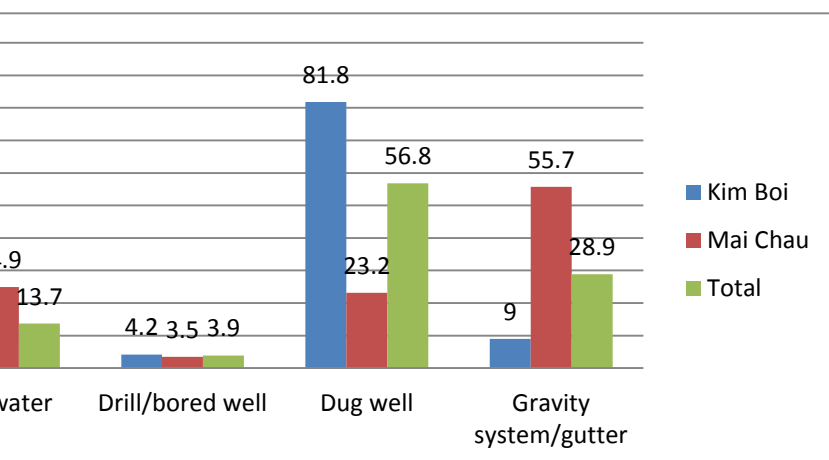
Table 8: Economic information: Household possessions

	Region			Economic status			Ethnic groups			Total N = 801
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	
	N=341	N=460	N=243	N=136	N=422	N=119	N=445	N=196	N=39	
	%	%	%	%	%	%	%	%	%	
TV	94.1	95.4	88.5	97.1	97.9	98.3	94.8	94.9	84.6	94.9
Mobile phone	96.8	96.1	94.7	97.1	97.2	95.8	96.4	97.4	92.3	96.4
Motorcycle	83.6	85.4	76.5	86.7	88.6	82.4	85.3	85.2	82.1	84.6
CD/DVD	56.0	52.4	43.6	54.4	59.7	55.5	54.4	56.1	30.8	53.9
Computer	12.6	8.5	4.5	5.1	15.2	30.3	6.7	8.2	0.0	10.2
Tractor	4.7	17.9	8.4	19.3	12.1	1.7	17.8	7.7	5.3	12.2

Table 9: Economic information: Household characteristics

	Region			Economic status			Ethnic groups			Total N=701
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	
	N=300	N=405	N=193	N=121	N=384	N=111	N=388	N=185	N=15	
	%	%	%	%	%	%	%	%	%	
Bamboo	0	1.7	1.0	3.3	0.3	0.9	2	0.0	0	1.0
Wooden/stilt house	60.7	4.4	30.1	19.0	31.0	14.4	14	67.0	27	28.6
1 story cement & brick	28.7	84.7	65.8	71.1	55.8	58.6	77	29.0	60	61.4
2 stories cement & brick	8.3	7.4	2.6	5.0	11.4	21.6	6	3.0	7	7.7
More than 2 stories cement & brick	2.0	0	0.5	0.0	1.1	2.7	0	1.0	0	1.0
Others	0.3	2	0.0	1.6	0.4	1.8	1	0.0	7	0.3

Chart 1: Source of water by district



2 DEMAND

2.1 QUANTITATIVE ASSESSMENT RESULTS

Findings from the household survey are presented in this section including information collected from the household questionnaire and the observation checklist.

2.1.1 Latrine types: descriptive insights and images

The following are photos and descriptions of the main types of latrines and their components, as observed in the surveyed areas. This sub-section provides illustrative detail and images to aide with the interpretation of the different types of latrines found in the two districts. The most common types of latrines that were owned are highlighted with a tick [✓].



[✓] **Bridge latrine:** a shallow hole in the ground, with two wooden or bamboo bars across the hole. Some of the bridge latrines surveyed were located under the shadow of a bush and as such were totally open, without superstructure. Others had plastic sheets to provide for a roof and walls. It is notable that many respondents do not consider this structure a 'latrine', and rather see this as 'a place for defecation' only. Most bridge latrines are located very far from the house.



Unimproved pit latrine: the pit is dug or built underground and sheltered temporally by leaves. If it is a dug pit, when it is full people will remove the upper parts and then fill or cover it with soil. If it is built in concrete, people will remove the slab, then take out the excreta.



[✓] **Single vault latrine:** Similar to a pit latrine but the pit is made of brick above the ground and there is a door for removal of feces. The latrine floor is mainly made of bamboo or wood. This latrine can include urine diversion or non-diversion. The diverting urine latrines are often built so that urine is collected in a storage ceramic jar for later irrigation, or directed by a bamboo pipe to the near-by soil. These latrines typically do not have easy access to empty the feces. When the pit is full, people have to shovel the feces out. This type of latrine is unhygienic since households have to remove the raw, fresh feces when the latrine gets filled. The required composting process is not applied and no professional sludge removal services are provided either in the communes.



Double vault composting latrine: Most double vault composting latrines observed were incorrectly built without ventilation pipes, feces leaking from the emptying doors, urine flowing into the vaults, etc. Common defects observed were the absence of the cover lids. The emptying doors were often not properly made and in some cases wood, stone or a broken piece of the fibro-cement sheet was used. Ventilation pipes were wrongly installed in most cases. None of the observed double vault composting latrines met the MoH standards on hygienic latrines classification.



Soakage pits: The improper installation of the latrine pans and soakage pits was very common. The soakage pits were modified and used as a collection tank for excreta. In Kim Boi, there was a popular type of latrine, known as the "single tank" wet latrine (hen the latrine gets filled. The required composting process is not tank, which is kept open, or half open so that households can use excreta for daily use as fertilizer. Having only one pit instead of two makes the tank emptying more difficult. This version of the soakage pit latrine makes it unhygienic.



[✓] **Septic tank:** This type of latrine was new in many villages, especially in the more remote villages. All septic tanks in these communes were built either with 2 or 3 compartments but without ventilation pipes.

Materials used to build latrines

Observational data collected by interviewers provided information on the most common materials used for building latrine substructures, middle and superstructures.

Local materials are commonly used for building all components of the latrines (wood, bamboo, palm leaves, etc.), and these are easily accessible, as illustrated in the photo below.

Photo 1: Example of a latrine superstructure built with local materials

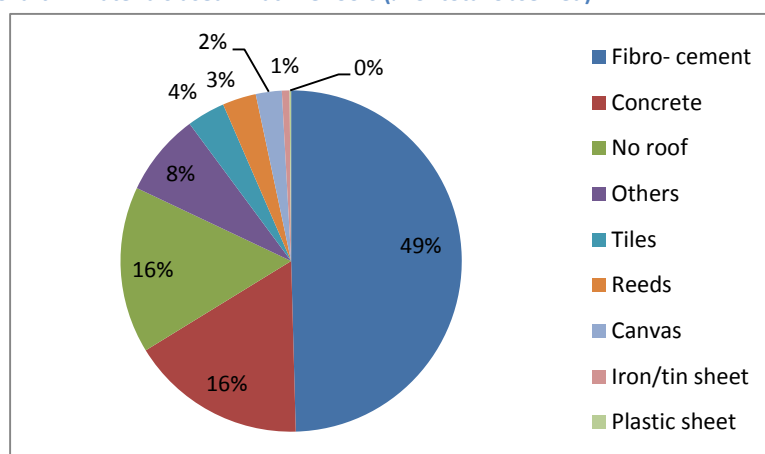


However, observation data show the use of other materials in the construction of the different types of latrines. Materials commonly used for latrine superstructure:

Roofing

- **Most latrines have roof.** Only 16% of observed latrines had no roof, most of them hanging, bucket or bridge latrines.
- **Most roofs were made of fibro cement** (most of double vault latrines, soakage pits and single vault latrines), while most septic tanks had concrete roofs (69%).

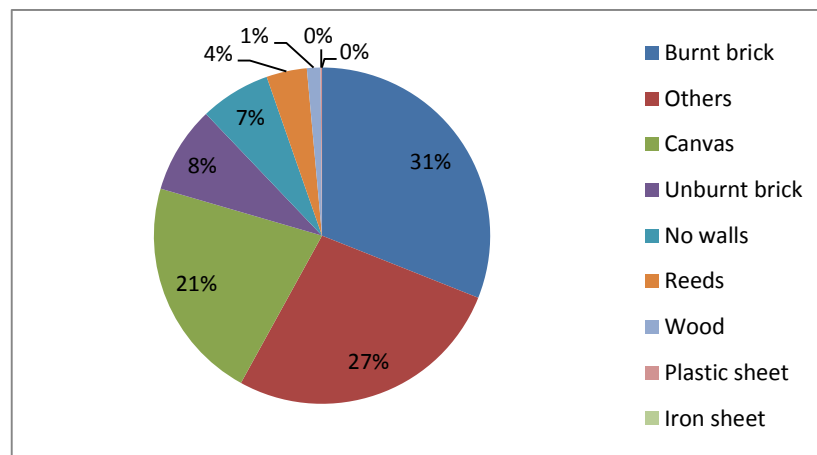
Chart 2: Materials used in latrine roofs (% of total observed)



Walls

- **Only 7% of the latrines have no walls.**
- **Burnt brick** was the most common material used for building the latrine walls (31%), particularly for septic tanks (72.7%) and in around one third of single vault latrines and soakage pit latrines.
- **Local materials like wood and bamboo** were widely used in most types of latrines (27% of total), especially for double vault latrines and soakage pits (~41%),
- **Canvas** was the most used in hanging, bucket and bridge latrines (~41%).

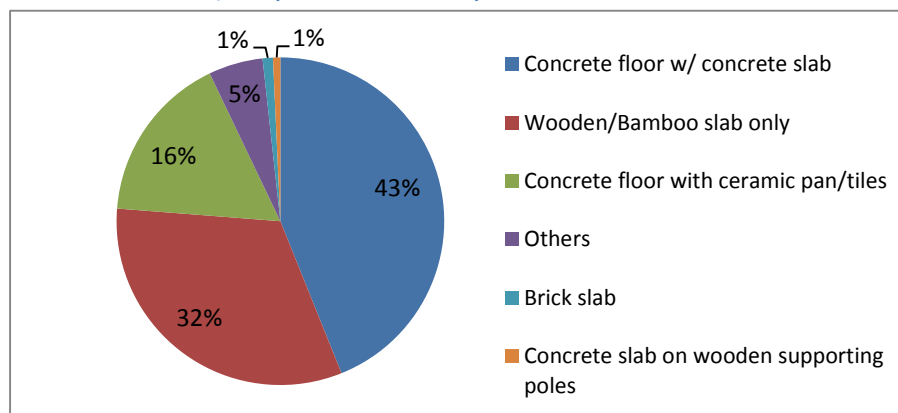
Chart 3: Materials used in latrine walls (% of total observed)



Floors

- **Concrete flooring with concrete slab** was the most common latrine floor (43%), particularly for single (83.4%) and double vault latrines (91.7%).
- **Ceramic pans** were only found in septic tanks and soakage pits, with squat pans being more commonly used (63.6% and 51.9% respectively) than sitting bowls (21.2% and 39.7%).
- **Concrete flooring with a ceramic pan** was most commonly found for latrines with septic tanks (70.3%).
- One third of the households used local materials for building the slab.

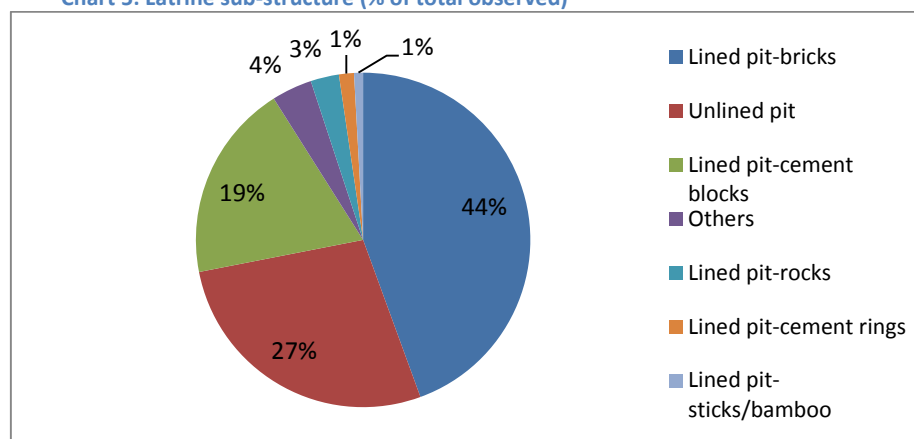
Chart 4: Latrine floor/slab (% of total observed)



Materials commonly used for latrine sub-structure:

- **Lined pits with bricks** were the most common type of underground structure (44%), mostly used in single vault latrines (58.0%), soakage pits (37.1%) and septic tanks (73.2%).
- **Unlined pits** were the most common type of underground structure in hanging, bucket and bridge latrines (67.1%) and unimproved pit latrine (60.6%).
- **Cement blocks** were mostly used to line the pits in double vault latrines (52.1%).

Chart 5: Latrine sub-structure (% of total observed)



Tanks and soakage pits

In terms of the design of the substructure for hygienic types of latrines, most septic tanks observed had three (61.2%) or two (26.6%) chambers and infiltration trench/soakage, while most soakage pits had one chamber and infiltration trench/soakage (50.0%).

2.1.2 Household sanitation facilities

Data on the households' type of latrine were collected using both household questionnaire and observation checklist. Types of latrines were classified into hygienic and unhygienic types according to VIHEMA criteria. Additionally, MoH standards on hygienic latrines were used to determine if a latrine is considered to be hygienic or unhygienic. According to these guidelines, latrines must fulfill all construction criteria and at least three of the use and maintenance criteria in the observation checklists to be considered hygienic. Unlike DHS or JMP standards, sharing a latrine is not considered in the definition of hygienic or unhygienic. A hygienic latrine therefore could be shared by other households. Improved pit latrines, double vault latrines, soakge pit latrines, latrines with septic tanks and latrines connected to biogas plant are classified as hygienic types of latrines.

Table 10 illustrates the rates of household latrine ownership and shows that 27.7% of households own hygienic types of latrine facilities (23.8% in Mai Chau and 30.7% in Kim Boi). Among households that own latrines, 4.8% of these are shared. More than half of households (55.9%) own unhygienic types of latrine facilities (58.7% in Mai Chau and 53.9% in Kim Boi). Rates of unhygienic types of latrines were similar between poor households (57.2%), near-poor (59.6%) and better off (54.0%) households. The most common type of latrine is a hanging bucket or bridge latrine (25.1%), as well as a single vault latrine (24.2%). The most common type of hygienic types of latrine is a septic tank, found in 17.4% of households, and this is more common among 'better off' households (24.4%) as compared to 'poor' households (7.8%). Thirteen percent of households did not own a latrine, and this was most common among poor households (19.8%) as compared to the near-poor or better off households (10%). This

was also notably high among the Dao ethnic group (61.5%). In addition, one third of households without a latrine reported having previously owned a latrine.

Results from observations of household latrine facilities were consistent with those from the respondent reported information. However, when additional observational data on the MoH minimum standards on latrine construction and maintenance criteria is accounted for the analysis, hygienic latrine coverage drops from 27.7% to only 7.5%, and only septic tanks met the minimum standards. Based on the observational data, none of the double vaults, soakage pits, biogas plants and improved pit latrines could be classified as hygienic.

Examples of latrine deficiencies noted from observation checklists

- Double vault: only 54% of the chambers and 27% of the chamber doors were sealed, which increases the risks of feces leakage. Ventilation pipes were wrongly installed in most cases. Only 29% of the composting chambers were properly covered, and there was an observed general presence of flies and mosquito larvae in the water and urine buckets.
- Soakage pits: only 57% had a proper seal for the tank and 60% for the pan. Most of these soakage pits are actually what people call “single tank” wet latrine, as described in the qualitative latrine description (section 2.2 of this chapter).
- Septic tanks: ventilation pipes were not installed correctly for many of these facilities. However, most of the septic tank latrines were observed clean and without smell.

Table 10: Household sanitation facilities by district, economic status and ethnic group¹⁴

	Region		Economic status			Ethnic groups				Total
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	
	N=341	N=460	N=243	N=136	N=422	N=119	N=445	N=196	N=39	
	%	%	%	%	%	%	%	%	%	
<i>Hygienic types¹⁵</i>	23.8	30.7	17.7	27.2	33.6	61.3	26.5	14.3	7.7	27.7
Improved pit latrine	0.3	0.7	0.8	1.5	0.0	0.8	0.7	0.0	0.0	0.5
Double Vault	2.3	8.9	4.5	11.0	5.5	1.7	8.8	4.1	0.0	6.1
Soakage pits	2.6	3.9	4.1	2.2	3.3	5.9	3.4	1.0	7.7	3.4
Septic tank	18.5	16.5	7.8	12.5	24.4	52.9	13.0	9.2	0.0	17.4
Latrine connected to biogas plant	0.0	0.7	0.4	0.0	0.5	0.0	0.7	0.0	0.0	0.4
<i>Unhygienic types</i>	58.7	53.9	57.2	59.6	54.0	29.4	57.8	74.5	25.6	55.9
Hanging, bucket or bridge latrine	28.7	22.4	33.3	30.9	19.0	16.8	25.4	30.6	23.1	25.1
Unimproved pit latrine	9.7	4.3	5.3	5.1	7.8	0.8	5.8	13.3	0.0	6.6
Single vault	20.2	27.2	19.3	23.5	27.3	12.6	26.5	30.6	2.6	24.2
No facility/bush/field	13.5	12.0	19.8	9.6	9.5	5.9	12.4	6.6	61.5	12.6
Don't know	4.1	3.0	4.5	3.7	2.8	2.5	3.1	4.6	5.1	3.5
Total	100	100	100	100	100	100	100	100	100	100
Among households with latrines, those that are shared latrines	N=295	N=406	N=196	N=123	N=382	N=112	N=391	N=183	N=15	N=701
	4.7	4.9	5.1	4.1	5.0	1.8	6.1	3.3	13.3	4.8

¹⁴ From household questionnaire

¹⁵ The hygienic types of latrine according to VIHEMA guidelines

Additional mining of the data shows that among households with hygienic latrine facilities (N=60), respondents typically work as farmers (31.7%), in trade or businesses (20%), or are civil servants or officials (18.3%), ‘workers’ (8.3%) or as casual labors (5%). Twenty percent have ‘other’ occupations. In addition, 83.3% are respondents from ‘better off’ households and 56.7% belong to the Kinh ethnic group [data not shown].

Places where non-adopters defecate

Common places where people defecate in the open include neighbors or friends latrines (44.9%), household garden (27.6%) hills or forest (17.3%), springs or streams (6.6%), cattle sheds (6.1%) (multiple responses were possible). (See Table 11).

Table 11: Places where non-adopters defecate by economic status and ethnic group

	Ethnic group				Economic status			Total
	Kinh	Muong	Thai	Dao	Poor	Near poor	Better off	
	N=9	N=58	N=13	N=30	N=50	N=16	N=46	
	%	%	%	%	%	%	%	%
Neighbors’ or relatives’ latrine	71.4	53.8	76.9	0.0	51.1	33.3	41.0	44.9
Public latrine within your village	0.0	1.9	0.0	4.2	0.0	0.0	5.1	2.0
At any open field/bush	0.0	1.9	0.0	8.3	0.0	8.3	5.1	3.0
Household garden	14.3	25.0	0.0	50.0	23.4	33.3	30.8	27.6
Paddy-field	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hills/mountains/forest	0.0	9.6	15.4	41.7	17.0	8.3	20.5	17.3
Cattle-sheds	28.6	5.8	7.7	0.0	2.1	25.0	5.1	6.1
Stream/spring	14.3	1.9	0.0	16.7	10.6	8.3	0.0	6.1
River/lake/pond	0.0	7.7	0.0	0.0	0.0	8.3	7.7	4.1
Others (local schools)	0.0	3.8	0.0	4.2	2.1	8.3	2.6	3.1

Open defecation behavior among latrine owners

Among households with a latrine, 16% of respondents stated that there were times when they did not use their latrine and defecated in the open, most of the times when working in the fields (75%). Small land areas and proximity between households’ plots can also help to explain it. When asked if other members of the family members use the latrine, 72% stated that all members used the facility. Most commonly, children were cited as not using the latrine (24%).

2.1.3 OPPORTUNITY

2.1.3.1 Access/availability

Sanitation products and materials ¹⁶

Local available materials are commonly used for building all components of the latrines (wood, bamboo, palm leaves, etc.), and these are easily accessible.

Respondents were asked about the nearest location of suppliers that sold construction materials and sanitation products. Around three-quarters of respondents answered that they could access sanitation materials and products in their communes or communes nearby (see Table 33 in the Annex). With the exception of Tan Mai, suppliers can be accessed within a 4km village radius. In Tan Mai commune, which is the furthest commune from district town in the survey, there is less access to masons (only 48.8% of respondents answered there is a mason in their village). Additionally, some of the communes surveyed were located near the district town, where suppliers are more available.

However, sanitary ware and ceramic tiles were less accessible than other sanitation products, as suppliers of these products are more concentrated in shops located in district towns (Table 34).

When all respondents, were asked the question *“Have you ever visited or purchase construction materials or sanitation products at that supplier/shop?”*, over half stated that they had visited and purchased materials or products (53.8%), while 25% stated that they had never visited a shop/supplier (Table 13). Of note are differences between adopters and non-adopters, where around one in three (27%) of non-adopters stated that they had visited and purchased materials. This supports the findings that households that currently did not own a latrine, had at some point perhaps constructed a latrine in the past. The finding that 17% of adopters visited a store but did not purchase any items is also indicative that many latrines are made with local materials, a finding supported by observational data as well.

Sanitation services

Masons

There was good perceived availability of masons with 90% of households affirming that there were masons in their communes capable of building latrines. When asked about the type of latrine masons in their communes could build, 75% of households believed that they could build septic tanks (Table 35: Access to masonry services (all respondents)).

In addition, respondents were asked if local masons had ever introduced or advised them on specific information related to sanitation services and materials. Findings presented in table 11 show that there were higher response rates by adopters than non-adopters. Most commonly adopters report that masons have provided them with information on construction materials that are available, sanitation products sold at local shops and instructions on how to use a hygienic latrine (~40%). Around one in three also mentioned that they discussed different types of hygienic latrines and the

¹⁶ See Table 28: Cost of materials and products for latrine construction

benefits of having a hygienic latrine. Non-adopters mentioned less than 20% of any response. There were few regional differences.

Table 12: Information on sanitation provided by masons

	Region		Ethnic group				Latrine adoption	
	Mai Chau	Kim Boi	Kinh	Muong	Thai	Dao	Adopters	Non adopters
	N=284	N=441	N=111	N=404	N=184	N=25	N=645	N=80
	%	%	%	%	%	%	%	%
Types of hygienic latrine	33.5	32.9	36.9	33.9	32.6	8.0	35.5	13.8
Construction materials available in your village/ commune	37.0	40.6	40.5	41.1	38.0	12.0	41.6	20.0
Sanitation products sold at local shops/ suppliers	37.3	37.9	43.2	36.9	39.1	16.0	40.0	18.8
Benefits of a hygienic latrine	31.0	32.1	30.6	32.1	34.2	12.0	33.3	18.8
Instructions on hygienic use of latrine	36.3	36.1	43.2	36.9	33.2	16.0	38.1	20.0
How to deal with problems/damages of latrine	32.7	34.5	43.2	33.7	31.5	12.0	35.9	17.5

Key findings: There is a good perceived availability of construction materials, masons and sanitation products in the sampled communes with only some more remote areas reporting limited access. However, sanitary ware and ceramic tiles were less accessible than other sanitation products, as suppliers of these products are more concentrated in shops located in district towns, suggesting that access to materials needed to construct hygienic latrines may be more difficult. Many latrines are still built with local, natural materials. However, most households have visited shops of construction materials or sanitation products suppliers, with over half of them actually having purchased from them.

Table 13: Households experience contacting suppliers and buying sanitation materials and products

	Region		Economic status			Ethnic groups				Latrine adoption		Total N=728 %
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Adopters	Non adopters	
	N=302	N=426	N=208	N=127	N=393	N=115	N=408	N=173	N=30	N=643	N=85	
	%	%	%	%	%	%	%	%	%	%	%	
Visited but purchased materials in another place	0.0	0.5	0.0	0.8	0.3	0.0	0.5	0.0	0.0	0.3	0.0	0.3
Visited and purchased materials or products	48.7	57.5	45.7	52.8	58.5	69.6	52.5	49.1	40.0	57.4	27.1	53.8
Visited but have not purchased	22.5	16.0	21.6	21.3	16.3	10.4	17.9	26.0	16.7	17.7	25.9	18.7
Never even visited	27.8	25.1	31.2	24.4	24.2	19.1	27.9	24.3	43.3	23.5	47.1	26.2
Do not remember	1.0	0.9	1.4	0.8	0.8	0.9	1.2	0.6	0.0	1.1	0.0	1.0
Total	100	100	100	100	100	100	100	100	100	100	100	100

2.1.3.2 Product attributes

Attributes of existing products and services

Respondents were asked to provide their opinion on a series of statements. The table below shows the distribution of responses for each of these statements, which addresses product attributes. It is notable that respondents agreed or strongly agreed that latrines should be dry, clean and free of smell, and that a good latrine has water storage for anal cleaning.

In addition, when asked about the type of facility they would like to have the most, the most frequent response was a septic tank, and there were few differences between economic statuses (Chart 6). When asked about which type of latrine they most likely would build, most people also mentioned septic tanks (51%), followed by composting latrines (21%) (data not shown). Soakage pits were a more attractive option for poor households than for non-poor (data not shown).

When respondents were asked why they would like their preferred type of latrine (namely a septic tank), the most common response were: clean (74%), no smell (42%), easy to use (18%) (data not shown). It is noteworthy that almost none of the households interviewed would choose a type of latrine simply because it was easy to build or maintain or because of its low price alone. Additionally, the use of gas or fertilizer from the latrine was not one of the main reasons for preferring a latrine. Other criteria like being private and safe, comfortable, stable and easy to use, having a septic tank with two or three chambers, a sit latrine bowl and hand washing basin were also mentioned in less than 3% of the answers.

Table 14: Importance of latrine features for households (all respondents)

	Strongly disagree	Disagree	Agree	Strongly Agree
A good latrine is dry, has no smell and flies	0.1%	0.1%	43.1%	56.7%
A good latrine has a septic tank of solid structure, not cracked or sunk.	0.0%	0.6%	47.0%	52.4%
A good latrine has water storage for anal cleaning, latrine flushing and hand washing	0.0%	0.9%	55.9%	43.2%
A good latrine has soap and water nearby for hand washing	0.0%	0.9%	59.1%	40.0%
A nice pan is very important since it makes the latrine cleaning easier.	0.0%	2.4%	74.0%	23.6%
We wouldn't mind paying more for a more durable latrine than having to renovate the latrine every few months	0.5%	3.7%	67.9%	27.8%

Attributes of desired products and services

Chart 6: Preferred type of latrine by economic status (all respondents)

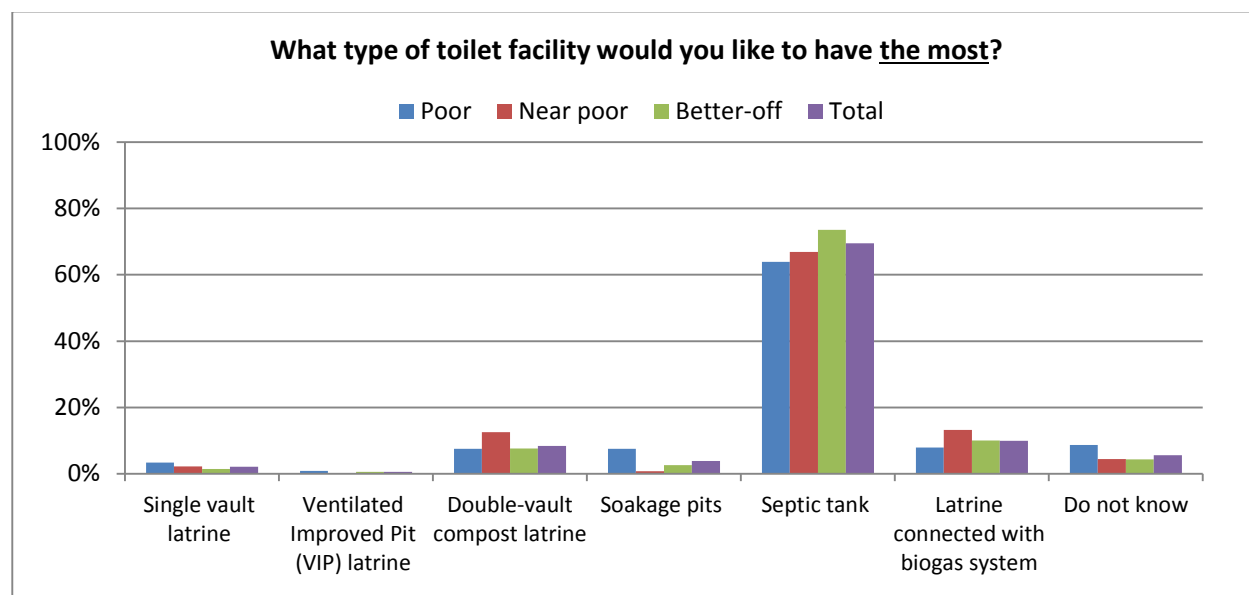
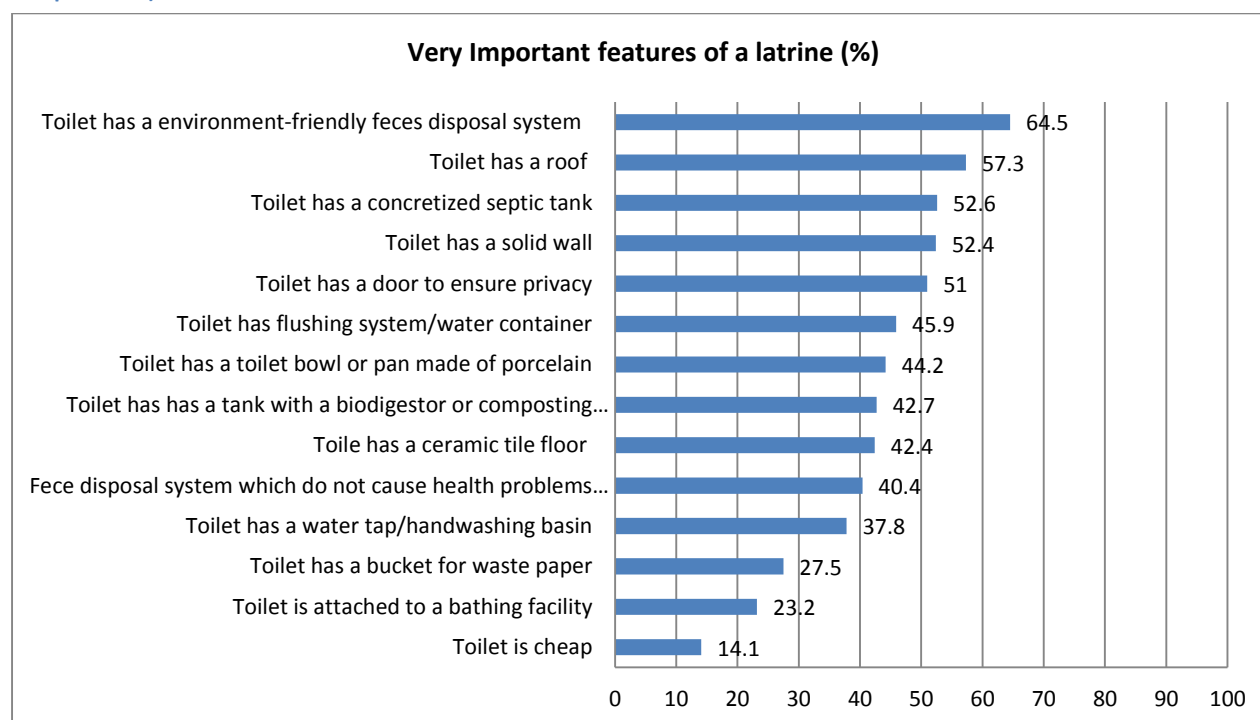


Chart 7: Preferred latrine features (all respondents, options were read by surveyors and cards of importance scales shown to respondents)



The most important latrine features reported by respondents include an environmental-friendly disposal system, followed by a number of structural components such as roofing, septic tanks, solid walls and a door (between 50%-60% of responses). Price does not appear as one of the main attributes, most likely because people focused on the physical attributes of the latrine when answering.

Key findings: Cleanliness and lack of odor are the key product attributes of a desired latrine. Other positive product attributes include: being easy to clean, solid and durable, and affordability. Latrines that ‘avoid environmental contamination’ are also a considered desirable attributes. Septic tanks are the most desired type of latrine. However it is acknowledged that most respondents are unaware of other types of hygienic latrines (see Knowledge). In addition, having a superstructure is also considered to be a very important component of the latrine, and this may have particular relevance for men.

2.1.4 Ability

Hygiene and health (positive and negative benefits of having hygienic latrines)

Respondents were asked the question ‘*In your opinion, what is a hygienic latrine?*’ Table 15 shows that respondents most commonly associate this with a latrine that does not smell bad or stink (62.3%). Around one in four also mentioned that a hygienic latrine does not contaminate the environment, and ensures that the feces are covered. 20% of non-adopters did not know of any criteria.

Knowledge disease transmission

When asked about the harms associated with open defecation (Table 16), respondents mentioned environmental pollution as the main harm (81% of responses), followed by diseases (42%). Less than 15% mentioned contamination of water sources. There were few notable differences between segments, though adopters were more likely to state transmission of diseases as compared to non-adopters (45.6% and 34.3% respectively).

When asked what diseases would using a hygienic latrine help to prevent, the most common response was ‘*diarrhea*’ (45.6%) (See Table 17). However, 34% of the respondents did not know of any disease, and this was as high as 46.5% among non-adopters. Similar findings were found regarding the harmfulness of untreated human feces (See Table 37: Knowledge on diseases caused by untreated human feces). Knowledge on diseases associated with both open defecation and untreated human feces is higher among Kinh households and better off households.

Diarrhea was the most common disease associated with both unhygienic latrines and untreated human feces. However, more than a third of the respondents did not know any disease related to both of them, up to almost half of non-adopters.

Knowledge of latrine types and price

The type of latrine that households could most frequently recall was the septic tank (75%), followed by single vault latrines (35.8%), double vault latrines (26.7%) and hanging latrines. Very few respondents knew about other types of hygienic latrines, though knowledge was higher among better off households and among adopters. It was noted that 20% of respondents in three of the communes (Binh Son, Nam Thuong and Tan Mai) could not recall any type of latrine, and 36.4% of non-adopters did not know of any type of latrine. Many respondents found it difficult to identify the type of latrine that they owned, or how to name it, particularly for unhygienic types of latrines, and would use descriptive language to allow the interviewer to determine the type of latrine facility.

Respondents were asked the question ‘*What information/advice about building a toilet did you already know?*’ and results are presented in Table 18. Most households did not know the cost of hygienic latrines (79% of respondents), the price of sanitation products (83% of respondents), or of construction materials (63% of respondents). Knowledge on sanitation materials and product suppliers was higher. Around one in three did not know where to find construction materials suppliers and around half (53.3%) knew where to find sanitation products. In general, adopters had greater awareness, and 31.3% of non-adopters have received no information. The higher knowledge among better off households may suggest a higher level of connection with market actors in the construction and sanitation supply chains.

Key findings:

Knowledge of health causes/disease: Most respondents are not aware of the risks of untreated human feces, and 35% of the respondents did not know of any disease caused by untreated human feces. Open defecation is commonly associated with the risk of environmental pollution rather than transmission of diseases (mentioned by less than half of the respondents) or contamination of water sources (13%).

Knowledge of different latrine types and cost: When asked about their awareness of different latrine types, most respondents are only aware of septic tanks. Few respondents know about other hygienic latrine options such as soakage pits, biogas plants, or improved pit latrines, though this knowledge is somewhat higher among better off households.

Despite the finding that most respondents report having visited a sanitation shop, three quarters report a lack of knowledge regarding the price of latrines. When asked generally about the price of different sanitation products, over eighty per cent also report that did not know.

Table 15: Knowledge on criteria of hygienic latrines and diseases that they can prevent

Criteria of hygienic latrines	Region		Economic status			Ethnic groups				Latrine adoption		Total
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Adopters	Non adopters	
	N=341	N=458	N=242	N=136	N=421	N=119	N=443	N=196	N=39	N=700	N=99	
	%	%	%	%	%	%	%	%	%	%	%	
No bad smell/stink	60.1	64.0	53.3	66.9	66.0	70.6	62.3	62.8	33.3	64.3	48.5	62.3
No contamination of environment (ground, water)	21.4	30.6	22.3	32.4	27.3	31.1	28.7	21.9	15.4	28.3	15.2	26.7
Feces are covered/not open	20.8	26.9	21.9	27.9	24.5	22.7	26.2	24.5	7.7	25.4	16.2	24.3
Clean, nice, solid and modern	25.2	17.1	19.0	25.7	19.8	18.5	17.6	27.0	23.1	20.2	22.2	20.4
No flies, rodent	11.1	12.2	9.1	12.5	13.1	18.5	12.2	8.2	5.1	12.9	4.0	11.8
Do not know	8.8	6.6	11.2	6.6	5.7	5.9	7.0	5.1	30.8	5.7	20.2	7.5

Table 16: Knowledge on harms associated with open defecation

Harms of open defecation	Region		Economic status			Ethnic groups				Latrine adoption		Total
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Adopters	Non adopters	
	N=339	N=458	N=241	N=136	N=420	N=119	N=443	N=194	N=39	N=698	N=99	
	%	%	%	%	%	%	%	%	%	%	%	
Environmental pollution	79.9	81.9	73.4	83.8	84.5	87.4	81.3	80.4	64.1	83.2	65.7	81.1
Transmission of diseases	46.3	42.6	39.4	41.9	47.6	58.8	41.8	42.8	33.3	45.6	34.3	44.2
Contamination of water sources	13.6	13.1	9.5	18.4	13.8	21.0	11.3	13.4	12.8	14.2	7.1	13.3
Ugly/worse landscape sight	10.6	14.6	16.2	9.6	12.1	7.6	15.1	12.9	5.1	13.2	11.1	12.9
Cause diseases (pneumonia, malaria, flu, etc.)	9.4	7.2	7.1	9.6	8.3	8.4	7.9	7.2	15.4	7.6	12.1	8.2
Unhygienic environment	9.1	6.1	6.3	9.6	7.4	5.9	6.1	12.4	2.6	6.6	13.1	7.4

Table 17: Knowledge on diseases that can be prevented by hygienic latrines

Diseases that can be prevented by hygienic latrines	Region		Economic status			Ethnic groups				Latrine adoption		Total N=798
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Adopters	Non adopters	
	N=341	N=457	N=242	N=136	N=420	N=119	N=442	N=196	N=39	N=699	N=99	
	%	%	%	%	%	%	%	%	%	%	%	
Diarrhoea	44.9	46.2	36.4	44.9	51.2	63.9	44.8	39.8	28.2	46.6	38.4	45.6
Helminthiasis	19.9	20.8	17.8	16.9	23.1	32.8	19.7	15.3	15.4	21.5	13.1	20.4
Cholera	10.6	16.0	9.9	10.3	16.9	26.9	13.8	8.2	0.0	14.6	7.1	13.7
Dysentery	8.2	10.3	7.4	5.1	11.9	19.3	8.6	7.1	0.0	9.9	6.1	9.4
Malaria/dengue fever	10.0	5.0	7.9	5.1	7.1	9.2	5.4	6.6	23.1	6.7	10.1	7.1
Respiratory Disease (pneumonia)	7.0	4.6	5.8	3.7	6.0	8.4	3.8	9.2	0.0	6.3	1.0	5.6
Do not know	32.8	34.9	41.3	36.3	29.0	17.6	37.2	35.2	43.6	32.2	46.5	34.0

Table 18: Knowledge on sanitation

Information related to sanitation households already know	Ethnic groups				Economic status			Latrine adoption		Total N=796
	Kinh	Muong	Thai	Dao	Poor	Near poor	Better off	Adopters	Non-adopters	
	N=118	N=442	N=196	N=38	N=421	N=135	N=420	N=697	N=99	
	%	%	%	%	%	%	%	%	%	
Shops/suppliers of construction materials	76.3	64.9	75.0	36.8	57.7	68.1	73.3	70.2	50.5	67.7
Benefits of having a hygienic latrine	66.1	50.9	56.1	36.8	44.8	49.6	60.0	56.7	32.3	53.6
Shops/supplier of sanitation products	69.5	47.7	60.7	31.6	46.1	51.1	58.1	56.0	34.3	53.3
Related diseases	65.3	47.7	56.6	26.3	41.9	48.9	57.9	54.5	30.3	51.5
Hygienic latrine models	48.3	42.8	41.8	21.1	37.8	40.0	45.5	45.5	19.2	42.2
Prices of construction materials	37.3	37.8	35.7	13.2	30.7	44.4	36.4	38.0	22.2	36.1
Costs of hygienic latrines	22.9	21.3	21.9	10.5	19.1	24.4	21.2	22.8	9.1	21.1
Prices of sanitation products	25.4	17.2	13.3	2.6	14.5	13.3	19.0	18.1	7.1	16.7
None	5.9	14.4	11.2	39.5	23.8	9.8	9.1	11.1	31.3	13.7
Others	0.0	0.9	0.5	2.6	1.2	1.5	0.2	0.6	2.0	0.8

Table 19: Knowledge on types of latrine

What types of latrine facility do you know?	Region		Economic status			Ethnic groups				Latrine adoption		Total N=798 %
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Adopters	Non adopters	
	N=340	N=458	N=242	N=136	N=420	N=119	N=443	N=195	N=39	N=699	N=99	
	%	%	%	%	%	%	%	%	%	%	%	
Hygienic type												
Double vault	19.8	31.9	19.9	37.5	27.1	29.4	30.1	22.6	2.6	29.4	8.1	26.7
Soakage pits	10.0	12.7	13.3	8.8	11.4	12.6	12.9	8.2	10.3	12.2	7.1	11.5
Septic tank	78.8	72.1	64.3	71.3	82.1	92.4	71.3	80.0	38.5	78.2	51.5	74.9
Latrine connected to biogas plant	5.6	5.9	3.7	5.9	6.9	8.4	5.0	6.2	5.1	6.2	3.0	5.8
Improved pit latrine	2.1	3.3	2.5	0.7	3.6	2.5	3.2	2.6	0.0	3.0	1.0	2.8
Unhygienic type												
Hanging, bucket or bridge latrine	32.9	20.5	28.5	24.3	24.8	31.1	21.9	30.8	28.2	27.2	16.2	25.8
Single vault	31.9	38.6	32.4	33.8	38.3	38.7	36.2	39.5	5.1	38.5	16.2	35.8
Unimproved pit latrine	13.9	4.1	5.8	5.9	10.5	6.7	5.7	16.4	2.6	9.0	3.0	8.3
Don't know	10.0	15.2	17.5	15.9	9.4	4.2	14.8	8.7	41.0	9.6	36.4	13.0

2.1.4.1 Skills

Latrine construction

Among households with a latrine, 67.4% built it by themselves or with some support from relatives, friends or neighbors (10%) (see Table 20). Only 21.2% hired a mason to build the latrine, though there are notable differences when observing this by latrine type. For households with septic tanks, 71.0% hired a local mason, and around one in three (28.6%) hired a mason to build double vault latrines. Masons were rarely hired to construct unhygienic latrines. For example, 94% of hanging, bucket or bridge latrines were self-built.

Most respondents with hygienic latrines and single vault latrines purchased materials to build their latrines (over 84%), while the majority of respondents who built hanging, bucket or bridge latrine or unimproved pit latrines used available local materials. Most of them acquired basic masonry skills for building latrines from experience helping masons or from observation.

Reported technical skills on latrine construction were very low. As shown by Chart 8, 70% of respondents reportedly did not know how to build any type of latrine. The type of latrine households most commonly knew how to build was the single and double vault.

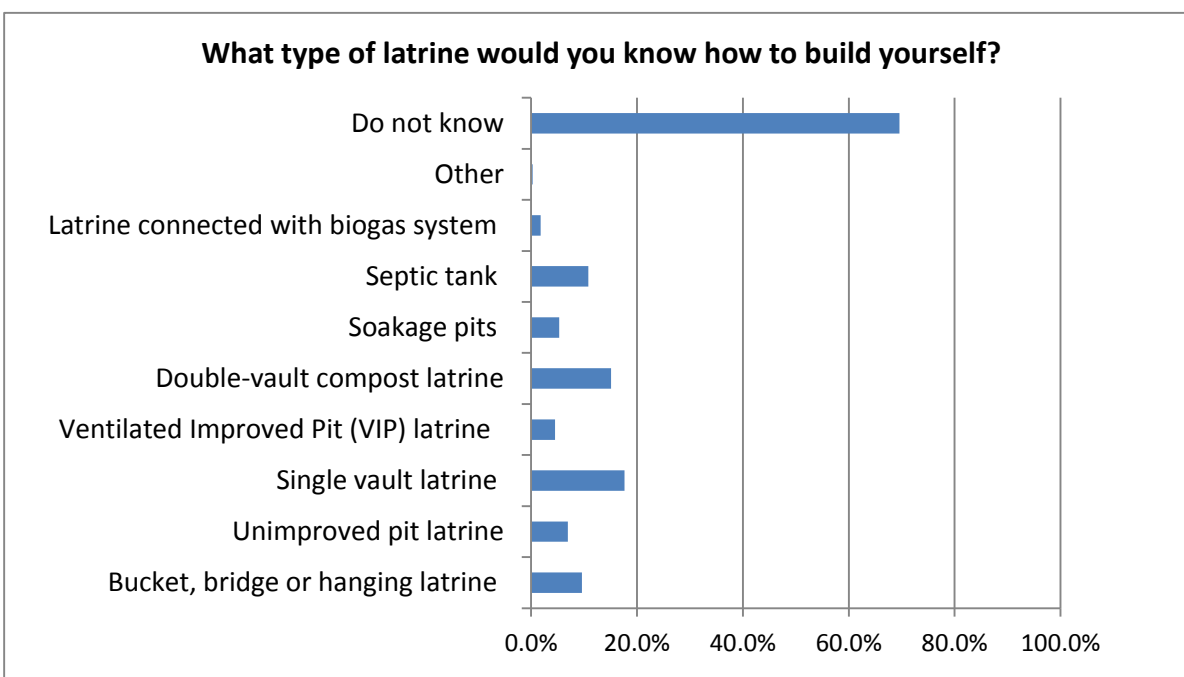
Table 20: Latrine construction by type of latrine (only adopters)

Who made/built your household latrine?	Self-built (HH alone)	Relatives, friends, neighbors with some knowledge of masonry	Self-built with help from friends/relatives	Hired local masons	Don't know
Types of latrines	N=470	N=55	N=14	N=148	N=5
	%	%	%	%	%
<i>Hygienic type of latrine</i>					
Improved pit latrine	50.0	25.0	0.0	25.0	0.0
Double vault	46.9	14.3	8.2	28.6	2.0
Soakage pit	73.1	3.8	0.0	23.1	0.0
Septic tank	13.0	11.6	1.4	71.0	0.0
Latrine connected to biogas plant	0.0	0.0	0.0	100.0	0.0
<i>Unhygienic types of latrine</i>					
Hanging, bucket or bridge latrine	94.0	3.0	0.5	1.5	0.5
Unimproved pit latrine	88.7	5.7	1.9	1.9	1.9
Single vault	77.3	9.8	3.1	9.3	0.5
Total	67.4	7.9	2.0	21.2	0.7

Table 21: Source of materials for building the current latrine by type of latrine (only adopters) (Multiple answers & Column %)

Where did you get the materials for constructing your latrine?	Made use of home materials available	Fetches materials	Bought materials	Others: given/granted materials
	N=233	N=133	N=478	N=20
Types of latrine	%	%	%	%
<i>Hygienic types of latrine</i>				
Improved pit latrine	25.0	0.0	100.0	0.0
Double vault	4.1	22.4	83.7	14.3
Soakage pit	7.4	7.4	96.3	0.0
Septic tank	0.0	1.4	98.6	1.4
Latrine connected to biogas plant	0.0	0.0	100.0	0.0
<i>Unhygienic types of latrine</i>				
Hanging, bucket or bridge latrine	76.6	24.9	27.9	1.5
Unimproved pit latrine	56.6	20.8	49.1	1.9
Single vault	16.1	27.5	87.0	3.1
Don't know	46.4	14.3	57.1	3.6
Total	33.4	19.1	68.5	2.9

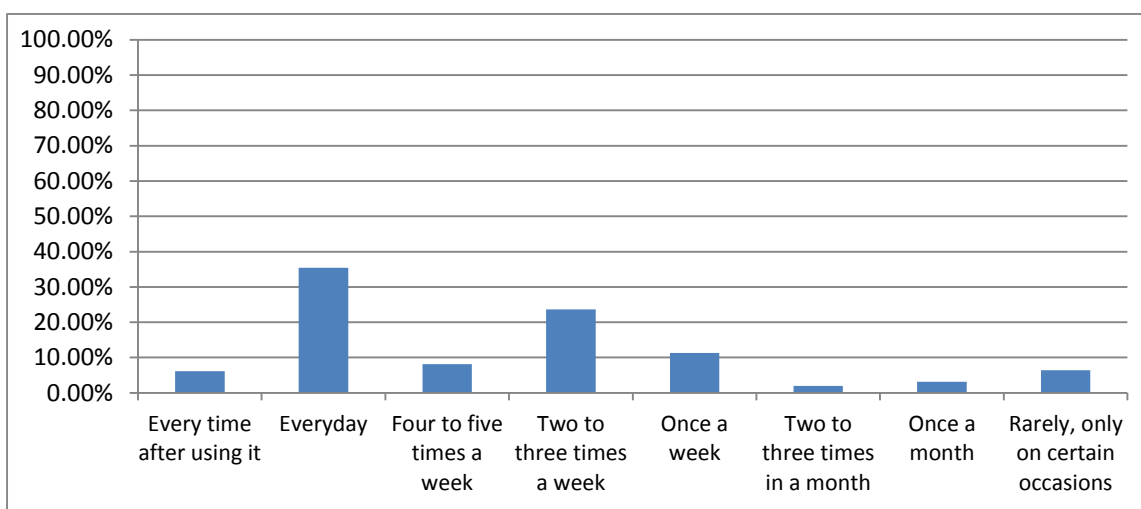
Chart 8: Type of latrine households could build (all respondents)



Latrine use and maintenance

In terms of cleaning, 93% of households affirmed that they regularly cleaned their latrine. Of these, 41.5% clean the latrine at least daily; while 43% clean it once or more than once a week. Only 12% of them cleaned their latrine less than once a week.

Chart 9: Latrine cleaning frequency (only adopters)



Additionally, when households were asked about what they use to clean the latrines, a majority of respondents answered a brush (93%), with ash and cleanser being the most common cleaning materials (36% and 20% respectively).

Regarding the feces disposal and the use of human feces as fertilizer, respondents with latrines were asked what they do when their pit is full. Almost half (46.5%) answered that they apply excreta in the paddy-field as fertilizer. This is most common among households with a single vault latrine (78.4%), though this behavior was also reported among 43.5% of the respondents living in households with buckets, bridges or hanging latrines. Ninety percent of households with a septic tank had never emptied their tanks, and no sludge removal services were found in the surveyed communes.

A high number of households with unhygienic types of latrines (78.4 of single vaults users) use untreated human feces as fertilizer in the paddy fields, increasing the health risks in their communities.

Key findings: While respondents have the skills to build basic, unhygienic latrines, the majority of respondents with hygienic latrines report using masons to build their latrines. Reliance on mason's is higher when building hygienic latrines, and thus knowing where to find a mason, and ensuring sufficient financial resources to pay for their services, is deemed necessity for hygienic latrine construction. In addition, supplies and materials are purchased when constructing hygienic latrines and reliance on local materials is minimal. In terms of maintenance, a high number of households with unhygienic types of latrines use untreated human feces as fertilizer in the paddy fields. Septic tank owners had had never emptied their tanks, and no sludge removal services were found in the surveyed communes.

2.1.4.2 Social support

To assess social support to build latrines, latrine-owning respondents who had built their own latrine, were asked how and where they learned to do did this. For those who knew how to build a latrine, most of these had learnt how to build it with support from friends, neighbors or relatives, by working together in masonry works and observing from others (see Table 22).

Table 22: Source of skills for latrine self-construction (Respondents who built their latrine themselves)

How did you learn to build this or these latrine?		
	N	%
Observed and learnt	64	34.4
Received training	15	8.1
Studied and built by myself	40	21.5
Experience with masonry work	67	36.0
Total	186	100

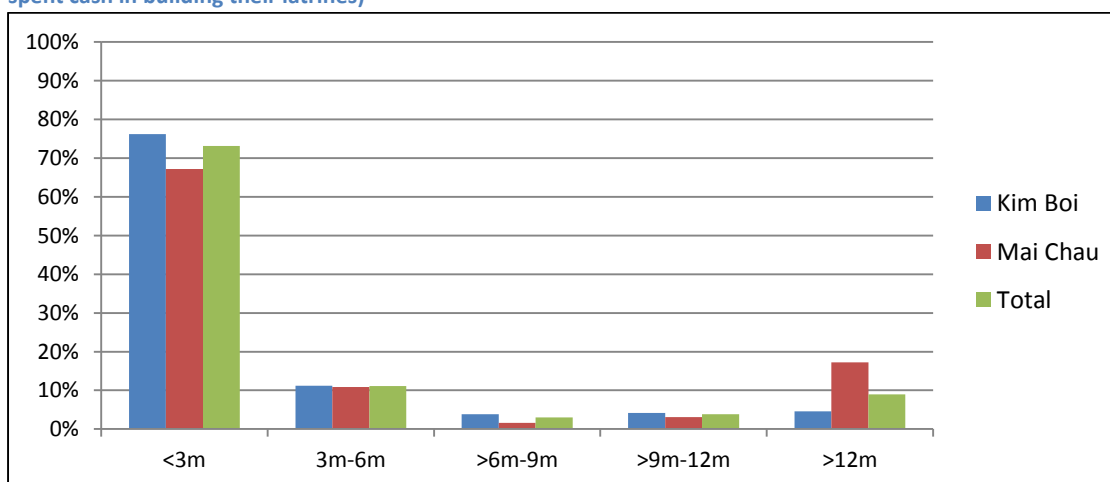
Key findings: the main source of advice for building a latrine comes from relatives, friends and neighbors.

2.1.4.3 Affordability

Ability to pay: sanitation products, services

Respondents that spent cash to buy materials and hired a mason to build their latrine (52% of respondents that owned a latrine), spent more than 4.2 million VND on average, with 6.2 million in Mai Chau and 3.1 in Kim Boi (see Table 36 in Annex). These means are positively skewed due to outliers in the data, for which some latrines were costly. In fact, when expenditure data are distributed according to a price range (see Chart 10), results showed that a majority (~70%) of respondents spent less than 3 million VND on their latrine. Also, when data were analysed using the median instead of the mean, results showed a medium investment of 1.3 million VND in Kim Boi and 1.55 million VND in Mai Chau.

Chart 10: Amount spent on latrine construction by district (by cost range in VND, % of respondents, only adopters who spent cash in building their latrines)



When segmented by type of latrine (see Table 38 in Annex), results show that most unhygienic types of latrines cost respondents less than 500,000 VND, while most hygienic types of latrines cost more

than 5 million VND. Most of the expensive latrines were mainly septic tanks built by better off households.

When data were further segmented by economic status, it was found that better off households spent more than twice the amount on their latrine, as compared to poor and near poor household respondents.

Influential factors: financial services, household income, sources of funding, availability of cash, access to credit, availability of accessibly- priced sanitation options in the area etc.

Financial services

Most respondents reported that they have accessed loans at some point in their lifetime (83.6%). Loans were obtained mainly from state owned financial institutions: VSPB (65.0%) and Agribank (33.0%), rather than mass organizations or other informal sources. Among households that had accessed a loan from VSPB, 90% reported that they did not encounter any difficulty in the application process. In short, accessing additional financial resources through bank loans is commonly practiced among all segments. While VBSP loans are meant to target those from the poorest segments, results suggest that wealthier groups are also able to access these loans.

Table 23: Access to loans by district, economic status, ethnic group and adoption

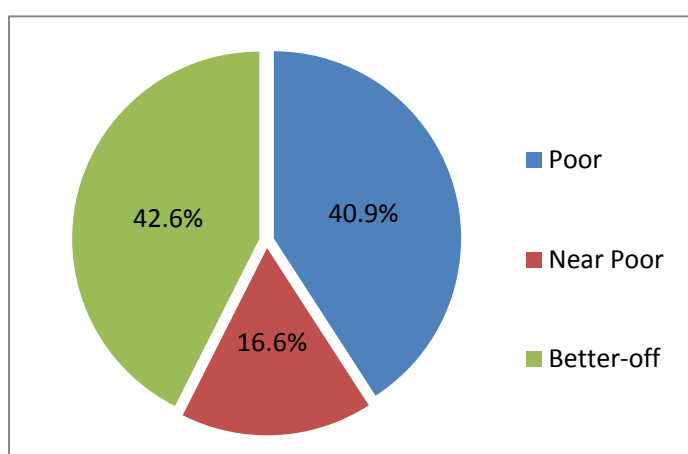
Have you ever borrowed money from a bank or a credit scheme?	Region		Economic status			Ethnic group				Latrine adoption		Total
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Adopters	Non adopters	
	N=341	N=457	N=241	N=136	N=421	N=118	N=443	N=196	N=39	N=699	N=99	
	%	%	%	%	%	%	%	%	%	%	%	%
Yes	84.2	83.2	82.6	86.0	83.4	79.7	85.8	83.2	83.2	84.7	75.8	83.6
No	15.8	16.8	17.4	14.0	16.6	20.3	14.2	16.8	16.8	15.3	24.2	16.4
Total	100	100	100	100	100	100	100	100	100	100	100	100

Sources of funding for building or upgrading a latrine:

Savings were the main source of funding latrine constructions for 76% of respondents. Only 3% reports borrowing money from VSPB to build their latrine.

The main two sources of funding for building a latrine in the future would be money from income (67%) and from savings (35%). The percentage of respondents choosing VSPB as one of the main sources of funding was only 8%. None of the respondents mentioned informal lenders as a source of funding. There were few differences by economic group (see Chart 11).

Chart 11: Access to loans since 2012 from VSPB by poverty level

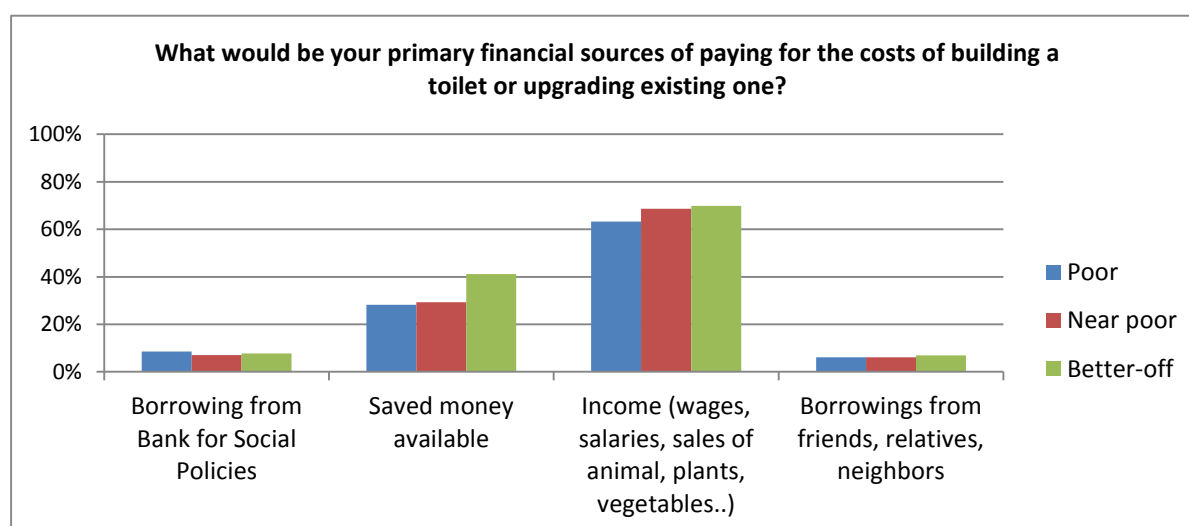


Regarding income availability and seasonality, 53% of households answered that they had a stable income throughout the year. The last three months of the year using the western calendar were the

ones with the highest income during the year for 37% of respondents. June was also reported to be a high income month.

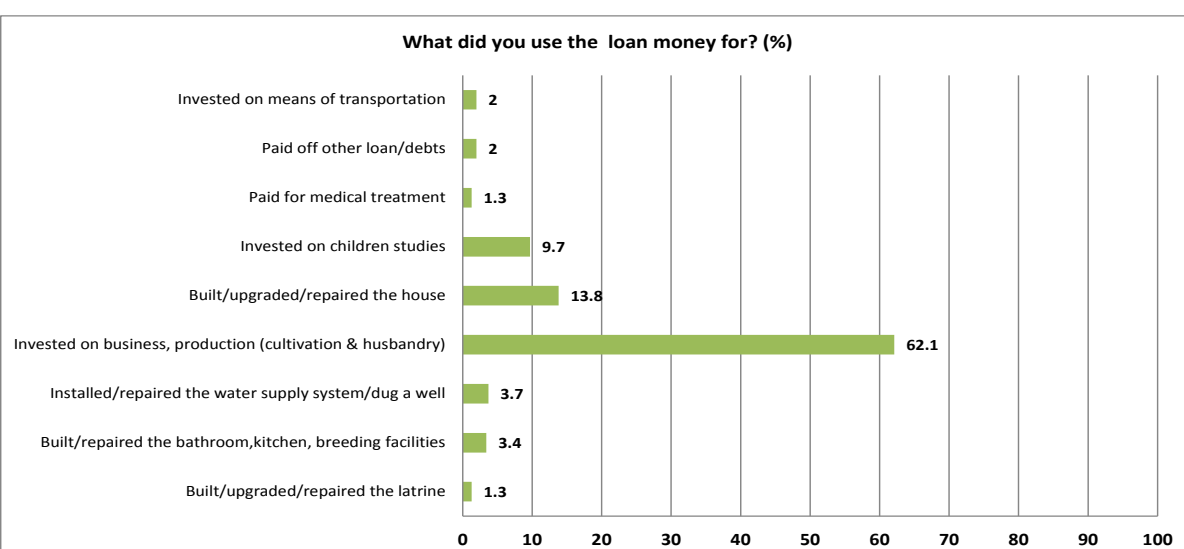
There is a good access to loans. Those households who had already accessed a loan borrowed on average 26 million VND per loan from banks (although 72% borrowed less than 20 million). Only 27% of households had paid out their loan, 55% of them had loans not due yet and 37% of households had not borrowed since 2012.

Chart 12: Preferred sources of funding for future latrine construction by poverty level (VND, Mean)



From those respondents that borrowed from VSPB, most households had borrowed only once, for an average term of 31 months and an amount of 16 million VND, at an annual interest rate of 6%. Almost all households borrowing from the VSPB have outstanding loans (93%). More than half of the respondents (60%) would apply for a loan to invest in a latrine, but they believe they would need to apply for a loan of 14 million VND, to be paid back over a minimum of three years. This shows a misconception regarding the costs of a latrine, given the amount respondents believe they would need to take out in order to afford a latrine. Respondents who had accessed a loan typically used this for animal husbandry and for building, upgrading or repairing their house. Only 1.3% of the households used the loan for building a latrine (see Chart 13).

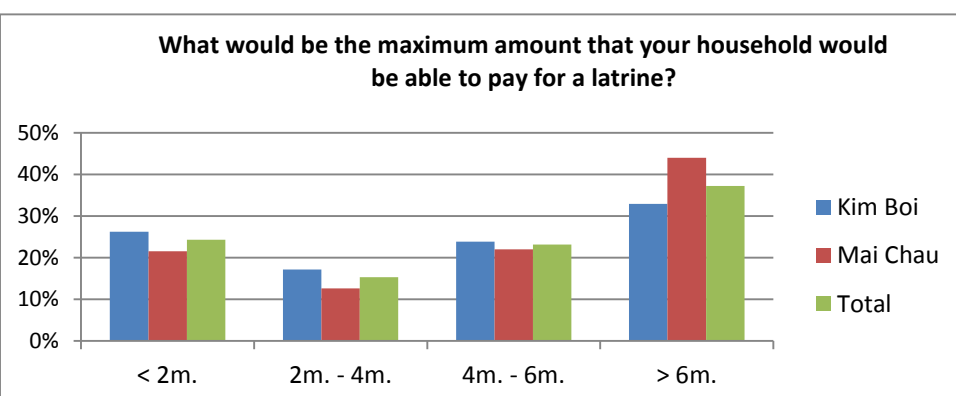
Chart 13: Use of loans (% of respondents who borrowed from VSPB since 2012)



The findings indicate that respondents usually prefer to pay for their latrine with their own savings and income rather than borrowing from banks. There is a strong culture of using loans for income generating activities, as a means to secure future financial resources in order to pay back the loan. Additionally, there is a high level of debt among the respondents that would limit additional access to credit from financial institutions in the short-term.

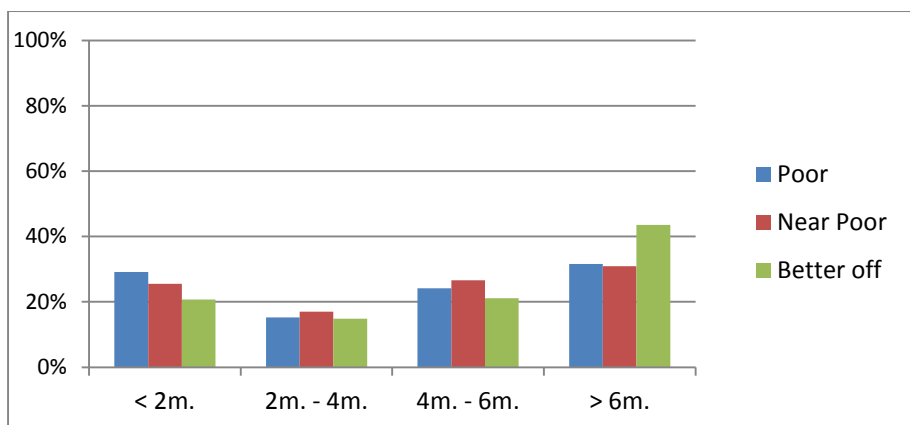
Investment in future latrine

Chart 14: Ability to pay by investment range (% of all respondents by district, mean)



Among respondents that plan to build or upgrade existing latrines, the majority (37%) believe they could spend a maximum of 6 million VND or more (see Chart 14). When observing these findings in relation to upgrading or building septic tanks, the maximum that households would spend was more than 8 million VND. These results show a general overestimation of the actual price of a septic tank (which is estimated to cost around 5 – 6 million VND as per the supply chain data). Additionally, when segmenting data by economic status, it was noted that the better off respondents were more likely to invest a maximum of more than 6 million VND.

Chart 15: Ability to pay by investment range (% of all respondents by economic status, mean)



Finally, when non-adopters were asked about the main reasons for not having a latrine, most respondents stated this was due to the high cost of the latrine (66% of respondents). However, there was little difference in reported ability to pay between households having a latrine and those not having a latrine.

Key findings: Most households who purchased an unhygienic type of latrine spent less than 500,000 VND, while most hygienic types of latrines cost more than 5 million VND. Among respondents that were willing to build or make upgrades, many were prepared to spend a maximum of 6 million VND for their latrine, and up to 8 million VND for the desired septic tank facility. Supply chain data show that septic tanks typically cost between 5-6 million VND. This suggests that respondents over-estimate the cost of hygienic latrines. This is further exacerbated by noted wealth differentials, where ‘better off’ households are willing to pay more for their latrines. In particular, the perception of that septic tanks are expensive could also be influenced by a number of very expensive septic tanks built in some of the surveyed communes (which cost more than twelve million VND), creating an inaccurate assumption about the price of a latrine.

Money for latrine construction mainly comes from income and savings, with loans being rarely used to invest in latrines due to people’s reluctance, particularly the poor, to borrow money to invest in a latrine. However, there are already high levels of debt in the surveyed communes, with a high percentage of households with outstanding loans. Income is seasonal for most households, with higher affordability after harvesting time.

2.1.5 Motivation

A series of questions were asked to ascertain general barriers and motivational reasons for unhygienic latrines. All respondents were asked ‘*In your opinion, from the following list, which do you think are the barriers that prevent local people from building a hygienic toilet?*’ and a follow up question, ‘*In your opinion, from the following list, which do you think are the factors that would motivate local people to build a hygienic toilet?*’. A series of response options were read out for each question, and results are presented in Table 24 and Chart 16. Satisfaction with current latrines is also presented. Other motivational factors are then presented according to the SaniFOAM framework.

In latrine investment, construction and use

Table 24: Barriers that prevent local people from building a hygienic latrine (all respondents)

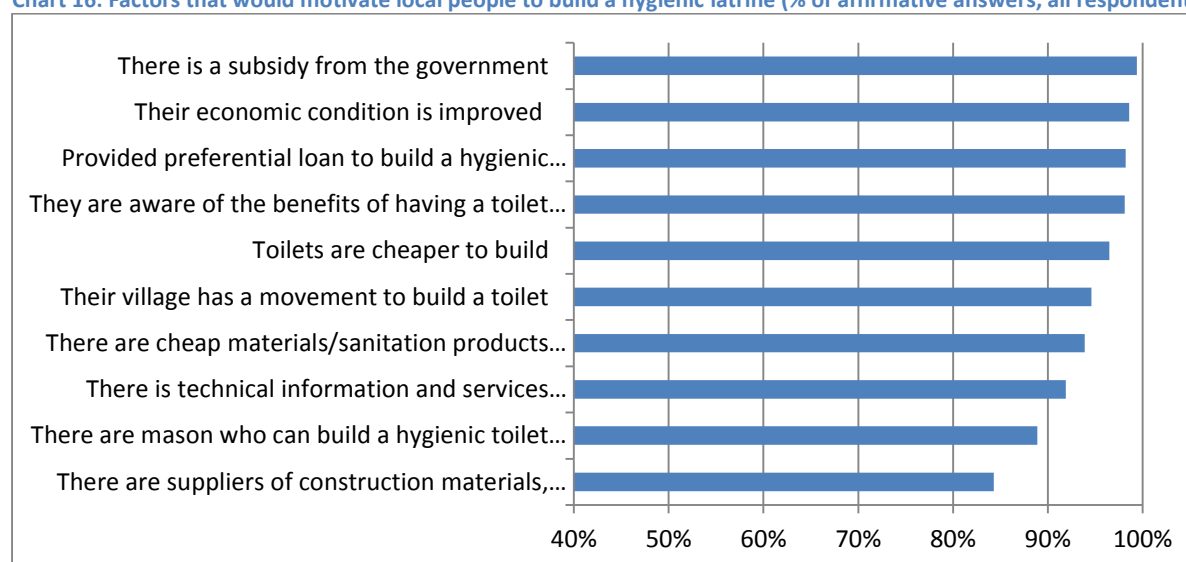
Which do you think are the barriers that prevent local people from building a hygienic latrine?	Economic status			Ethnic groups				Latrine adoption		Total N=799 %
	Poor N=242	Near poor N=136	Better off N=421	Kinh N=119	Muong N=443	Thai N=196	Dao N=39	Adopters N=700	Non adopters N=99	
	%	%	%	%	%	%	%	%	%	
Difficult economic conditions of their family	92.1	91.9	93.3	97.5	91.6	91.3	97.4	92.1	97.0	92.7
High cost of a hygienic latrine	86.8	85.3	84.6	79.8	86.2	85.2	92.3	84.4	91.9	85.4
Local people still have limited awareness of hygienic latrine	80.2	79.4	82.2	74.8	82.8	80.1	87.2	80.1	87.9	81.1
Do not know any type of hygienic latrine	62.8	64.7	62.7	55.5	63.4	64.8	71.8	61.7	72.7	63.1
Are not motivated or mobilized to build a latrine	52.1	48.5	47.6	44.9	49.2	45.9	74.4	48.2	55.6	49.1
There are no shops/suppliers of construction materials available in their community	47.5	38.2	39.4	25.2	40.9	48.5	66.7	40.1	52.5	41.7
Perceive that many households in their village still do not have a latrine.	42.1	45.6	38.7	36.1	39.5	42.9	61.5	38.7	56.6	40.9
Building a latrine is difficult because of their local geographical conditions/characters	45.5	38.2	38.0	28.6	39.1	43.9	71.8	38.0	56.6	40.3
There are no mason in their village or commune	36.0	29.4	31.4	19.3	30.5	37.8	66.7	31.1	41.4	32.4
Local people have a habit of not using a hygienic latrine	30.6	27.2	33.5	26.9	28.7	36.7	48.7	30.0	42.4	31.5
Local people still have mentality to wait for/ rely on the subsidy support from the government or a project to build a hygienic latrine	31.5	23.5	33.7	25.2	30.1	33.2	51.3	30.6	36.4	31.3

Perceptions regarding the high cost of latrines and lack of financial capacity are perceived as the two main barriers to hygienic latrine ownership/construction (92.7% and 85.4% respectively). There are few differences by the economic groups. Findings from the affordability analysis also show that hygienic latrines are associated with septic tanks, which are perceived as costly. References from better off neighbors that built expensive septic tanks including bathroom and tiling could explain people's perceptions of the costs of a septic tank. Other common responses include limited awareness of hygienic latrines (81.1%), and this was the third most important barrier to hygienic latrine acquisition.

Only 11% of non-adopters mentioned not having enough space as one of the reasons for not having a latrine. Available land is not to be a barrier for having a latrine (data not shown). In addition, Dao people reported additional barriers related to being a less socially and economically integrated, living in a more remote and mountainous area, lacking access to masons and retailers, difficult geographical conditions or not being mobilized by the government to build a latrine (data not shown).

This data is largely consistent with the responses provided by respondents when asked about which factors would motivate local people to build a hygienic latrine (Chart 16):

Chart 16: Factors that would motivate local people to build a hygienic latrine (% of affirmative answers, all respondents)



Common motivational factors include improved economic condition, latrines are cheaper to build, and a government subsidy (> 95% of responses). Additionally, awareness on the benefits of having a hygienic latrine was another important factor mentioned. There are few differences across different economic groups.

Respondents were asked about their level of satisfaction with their type of latrine. Findings are presented in Table 25.

Table 25: Satisfaction with current latrine types among those with a latrine

	Definitely not satisfied	Not satisfied	Satisfied	Completely satisfied	Total
By type of latrine	N=163	N=318	N=193	N=25	N=699
	%	%	%	%	%
Bucket, bridge or hanging latrine	47.5	46.0	6.0	0.5	100
Unimproved pit latrine	28.3	60.4	11.3	0.0	100
Single vault latrine	21.1	62.9	16.0	0.0	100
Ventilated Improved Pit (VIP) latrine	25.0	50.0	25.0	0.0	100
Double-vault compost latrine	4.1	40.8	46.9	8.2	100
Soakage pits	0.0	59.3	37.0	3.7	100
Septic tank	2.2	12.9	71.9	12.9	100
Latrine connected with biogas system	0.0	33.3	33.3	33.3	100
Total	23.3	45.6	27.5	3.6	100
By economic status	N=163	N=320	N=193	N=25	701
	%	%	%	%	%
Poor	27.0	47.4	23.5	2.0	100
Near poor	23.6	51.2	23.6	1.6	100
Better off	21.2	42.9	30.9	5.0	100
Total	23.3	45.6	27.5	3.6	100

More than two thirds of households were not satisfied with their current type of latrine or the latrine components. Satisfaction was highest among those with septic tanks or latrines that were connected with a biogas system.

Key findings: Perceptions of latrine affordability, perceived health benefits and awareness of the different types of hygienic latrines are the main barriers and motivators to building hygienic latrines. This confirms other findings. No differences were reported between poor, near poor and better off households regarding their responses on both barriers and motivations on having a hygienic latrine and on levels of satisfaction with their current latrine, though there were ethnic differences among the Dao group. Levels of latrine satisfaction were generally low, with the exception of hygienic latrine owners.

2.1.5.1 Attitudes and beliefs

There is a misconception regarding the harmfulness of human feces. Among some households that own latrines, respondents report using untreated feces for fertilizer, and report saving or keeping feces untreated for this very purpose. For example, among households with single vault latrines (i.e. unhygienic types), three-quarters (74%) report using the untreated human feces as fertilizer in their paddy fields.

2.1.5.2 Values

Values were measured using a series of statements, which assessed perceptions regarding latrine ownership as it relates being a modern family, with a good social status. Most respondents agreed with the following statements:

Table 26: Level of agreement with statements on values influencing latrine construction (all respondents)

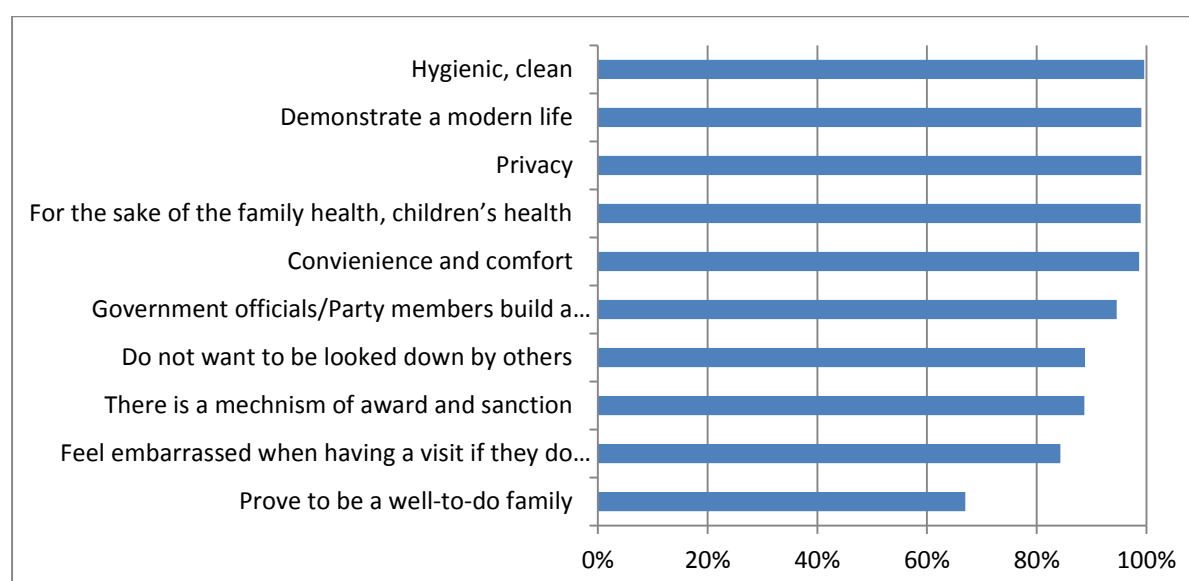
Values	Strongly disagree	Disagree	Agree	Strongly Agree
	%	%	%	%
My village will be more modern and developed if we all have hygienic latrines	0.1	0.1	45.2	54.5
My house will be more beautiful and cleaner if our latrine is hygienic	0.0	0.4	56.5	43.2
Upgrading/building a latrine will increase the value of my property	0.5	12.0	72.0	15.5
Upgrading/building a latrine will increase my social status	1.2	17.7	64.4	16.7
Upgrading/building my latrine will help to keep good face for our family members	1.9	15.9	64.4	17.8

There is general agreement that owning a latrine will make a family more modern and developed, that it will create the illusion of a cleaner and more beautiful home, and add value to the property. There is also agreement, though mean scores are lower than other statements, that owning a latrine will increase social status and help to keep good face with family members.

2.1.5.3 Emotional/physical/ social drivers

Hygienic/unhygienic latrines

Chart 17: Drivers that would motivate local people to build a hygienic latrine (all respondents)



Questions were asked to assess what might motivate respondents to build a hygienic latrine. More than 90% of respondents agreed that modernity, hygiene, cleanliness, privacy were important factors.

In addition, securing the family health, especially that of children, and seeing the example of government officials and party members building a hygienic latrine, was also reported as important drivers (99.0 and 94.6% respectively).

Additionally, most respondents agreed with the following statements, though there was less agreement with statement that *'People build latrines because our children who studied/worked in the cities are used to having one'*. Statements for which there was the highest level of agreement include perceptions that upgrading a facility will improve family members health, will allow a family to be better hosts, and will provide additional convenience at night.

Table 27: Accordance with statements on drivers for latrine construction

Drivers (social, emotional, physical)	Strongly disagree	Disagree	Agree	Strongly Agree
	%	%	%	%
I will improve/build our latrine so that it will be less of a burden to clean it	0.4	4.3	76.7	18.6
I will improve/build our latrine so that we can be better hosts to our guests	0.1	2.8	62.8	34.3
Building an improved latrine near or within the house will ensure that my family will be safe especially when they need to use the latrine at night.	0.5	7.4	58.3	33.8
Upgrading/building my latrine will help to improve our family members' health	0.1	0.1	61.3	38.4
Upgrading/building my latrine will help us not to be lower status than our neighbors	0.6	9.8	69.5	20.1
Upgrading/building my latrine will help us to comply with requirements from authorities.	0.4	2.5	67.1	30.0
It's safer for children to defecate in a latrine than in the open	0.0	0.5	60.7	38.8
Women use latrines because they are embarrassed of their body parts being seen by others	0.0	3.9	66.0	30.2
We had to build latrines because our children who studied/worked in the cities are used to having one	0.4	18.4	64.2	17.0
Having a latrine at home allows me to be a better host with guests	0.1	3.9	68.1	27.9
A latrine at home will raise my family's status in society	0.8	16.0	62.7	20.6

Open defecation

When households without latrines were asked what they disliked the most about defecating in the open, the inconvenience when it rains and when it is dark at night was the most common answer (65% of responses) as well as the dirtiness/contamination caused by it (46%).

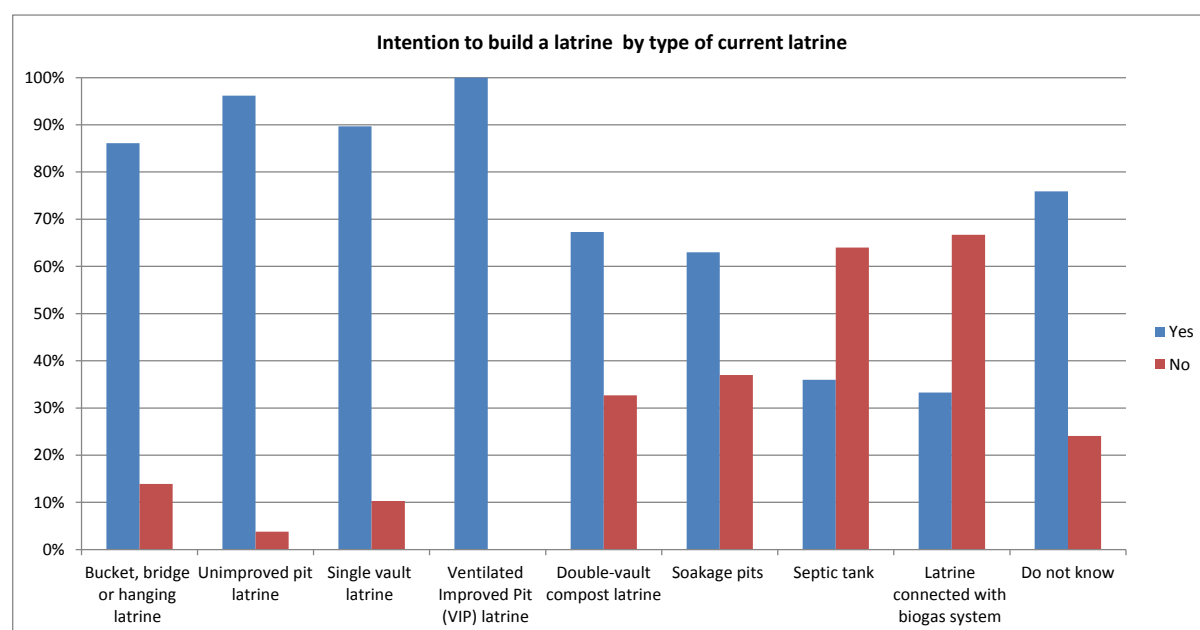
Key findings: Cleanliness and comfort, privacy and being considered a “cultural” or modern family are the main drivers for building a hygienic latrine (over 98% responses). Securing the family's health, obeying the authorities' regulations and being good host to their guests are also strong drivers. Among open defecators, motivators for latrine acquisition include the convenience of not having to go out in the dark or in the rain to defecate as well as avoiding dirtiness/contamination caused by open defecation.

2.1.5.4 Intentions

On building hygienic latrines

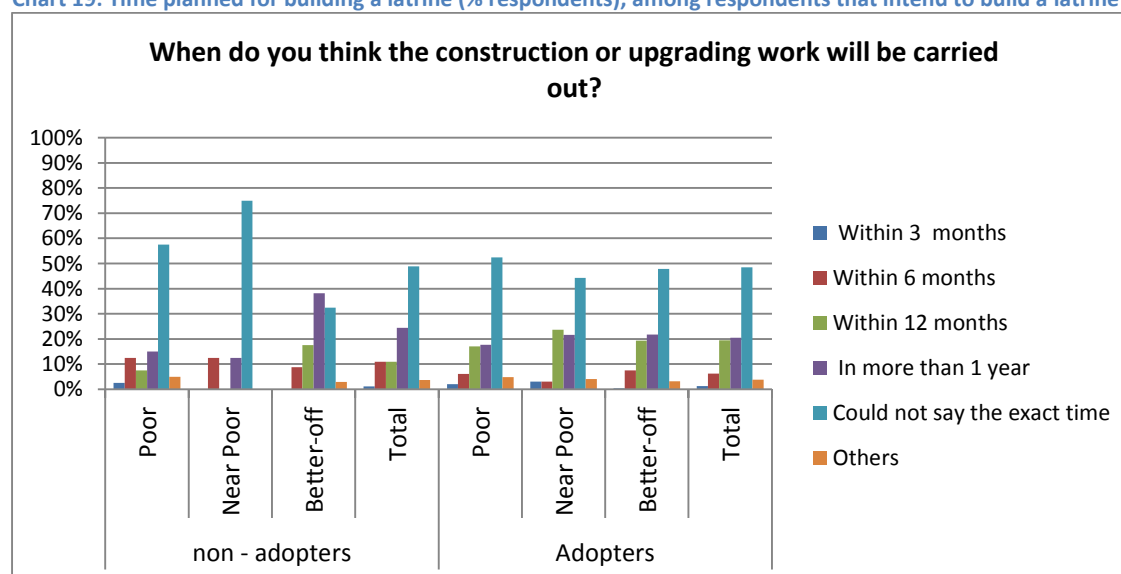
A vast majority of households intend to build latrines (87% of non-adopters) or upgrade the existing ones (75% of adopters). 82% of the adopters who intend to upgrade the latrine would prefer to build a new latrine. Those few adopters that would choose to renovate or improve the existing latrine would mainly invest on improving the superstructure (door, walls or roof). Intention was higher for those adopters with unhygienic types of latrines.

Chart 18: Intention to build hygienic latrines by type of current latrine (only adopters)



Planning

Chart 19: Time planned for building a latrine (% respondents), among respondents that intend to build a latrine



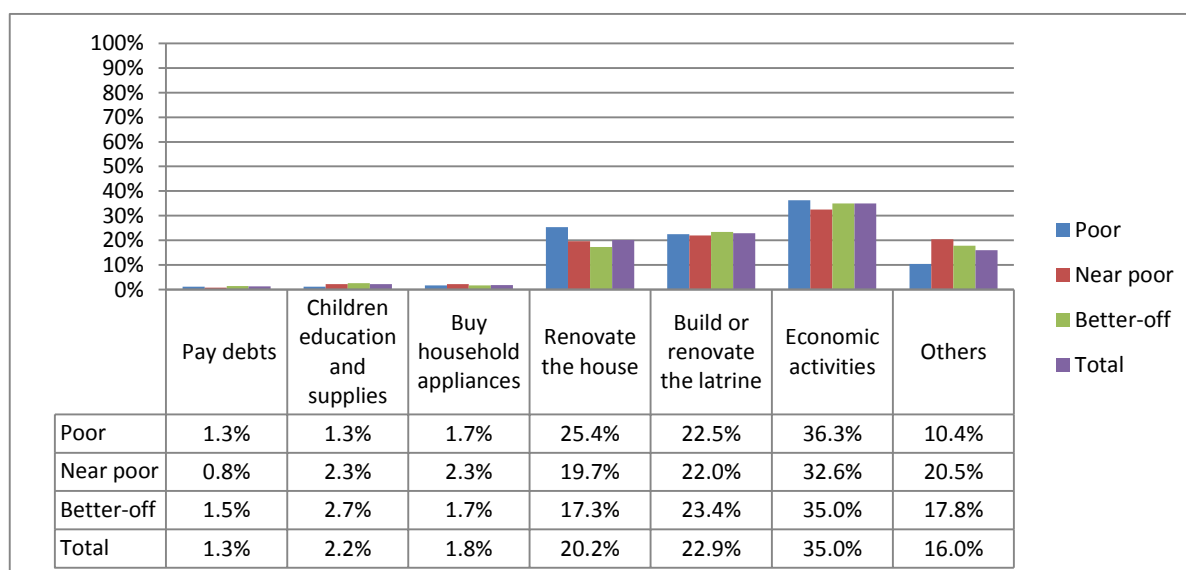
Most households who intended to build or improve the latrine did not have a clear plan about when they would build their latrines, especially among poor (75%) and near poor (57.5%) households without a latrine. Only 7% of all respondents intended to build a latrine within the year. However, better off households without a latrine seemed to have shorter term planning (only 32.4% did not have a specific plan).

This finding suggests that investing in a latrine is not an urgent priority and requests some planning, most likely to get enough savings to invest on it.

Key findings: Intention to build a latrine is high among both adopters and non-adopters. Respondents living in households with latrines would prefer to build a new latrine rather than upgrade their existing one, due to the unhygienic nature of most of the existing latrines. However, their intention is not well reflected in a clear planning to build the latrine. Respondents from higher economic status appear to have a more immediate plan to upgrade their latrine, which could be influenced by greater access to income. Intention to upgrade or build a latrine is also higher among adopters than non-adopters.

2.1.5.5 Competing priorities

Chart 20: Priorities in the use of money if available (all respondents)



When asked about the main things households would invest if they had available money, the first priority would be investing on income generating activities like family business or farming (35.0% of respondents). It is noteworthy that the second main priority was building or renovating the latrine (22.9%) followed by renovating the house (20.2%). Other priorities included building a bathroom, a kitchen or a well, or investing in children's education.

As mentioned in the **Affordability** section, when respondents had access to savings or loans they would prefer to invest in economic activities, which would generate income, rather than prioritizing latrine construction or upgrades.

Key findings: Investing the household income and savings in income generating activities is still the strongest priority (71.4% of respondents), followed by renovating the latrine (22.9%) and the house (20.2%). As households already owned a number of household assets, (TVs [95.4%], mobile phone [96.9%], motorbikes [84.8%],) this suggests that apart from economic investment, building latrines and renovating the house are main priorities.

2.1.5.6 Willingness to pay

Influential factors: subsidy, perceived marginal value

When asked about the willingness to apply for a loan to invest in a latrine, 60% of households answered positively. However, there is no consistency between this finding and the low percentage of respondents that would require a loan to invest in a latrine (only 8%) or with the current rate of households using their loans to build a latrine (1%). The reason behind it could be the overall willingness to access low cost financing, even if the general perception of households is that they would not use a loan to invest in a latrine. It is common that households declare different needs for the use of the loan than the final uses (credit fungibility).

For those respondents not willing to apply for a loan to build the latrine, the main reasons are being afraid of not to be able to pay back the loan on time (35% of respondents) and not having the need to borrow (26%).

Key findings: Overestimation of the cost of a hygienic latrine and reluctance to invest in external financial sources in a latrine affects the households' willingness to pay.

2.2 QUALITATIVE ASSESSMENT RESULTS (FROM THE IDI/FGD)

Background characteristics of hygienic and unhygienic latrine respondents

Most households with hygienic latrine facilities were latrines with septic tanks. However, many of the hygienic latrines, including the septic tank facilities, were in fact unhygienic due to poor installation or too short composting. Respondents also described how latrines had been incorrectly installed, as described by this participant:

"I looked at the septic tank drawing in the VIHEMA leaflet and realized that my latrine had been wrongly built. The positioning of the pipe and elbows was incorrect, making the flushing difficult. I will have to make a new septic tank soon." (Male, Head of Commune Health Station, Mai Chau district).

Other common deficiencies included poorly connected pipes, the absence of elbows (reducing the treatment performance), and insufficient composting time.

Most non-adopters shared latrines with relatives or neighbors, or alternatively defecated in the forest or mountains area, as illustrated by this focus group participant:

“There are some people who defecate near the bamboo bushes. They don't cover it with anything, not even with plastic bag” (Male - FGD mixed - Non Adopter - Sao Bay commune, Kim Boi district).

Men report defecating in the open more frequently than women, and some respondents suggest this is down to women needing more privacy:

“I think that there are more men who practice OD than women, as women prefer having privacy”. (Female - FGD with Female - Non Adopter - Thuong Bi commune, Mai Chau district).

2.2.1 Opportunity

2.2.1.1 Access/availability

Access to sanitation products and materials

Interviewees reported that shops selling all types of sanitation materials and products for building different types of latrines, including ceramic pans and bowls are widely available. In addition, sanitation materials and goods can be ordered by phone (and there is high mobile phone ownership as mentioned in the quantitative section). Purchased items can be delivered directly to households, as transportation services are also available. Households did not report accessibility difficulties, with vehicles being able to reach most villages. Furthermore, local materials like bamboo, wood, gravel and sand, cottage leave are available locally in the villages, and easy to gather. Thus, accessibility to construction materials and sanitation products is not a main constraint, as illustrated by this in-depth interview:

“You can call them to bring the materials to your house whenever you want” (Male – IDI - Unhygienic adopter - Khoai village, Thuong Bi commune, Kim Boi district).

Access to sanitation services

Masons

Respondents report good availability of masons in all villages, but they are described as unskilled masons. Most masons have not been trained specifically on latrine construction, as illustrated by this in-depth interview participant:

“Masons here are not real masons, just build it but don't know about technical requirements, just like me” (Male – IDI – Unhygienic adopter - Long Sang village, Bao La commune, Mai Chau district).

While there is less reliance on mason's to build unhygienic latrines, a septic tank latrine's construction is noted as more complicated by participants. In such instances, respondents describe how masons are hired, or other family members with masonry skills are requested to provide construction assistance. However, a double vault latrine is described as easier to build, and respondents believe that this can be built without assistance from masons, provided there is someone in the family that can provide technical guidance and oversight.

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Key findings: Products and services related to sanitation are available and easily accessible, though it is notable from the quantitative survey that some components, such as ceramic bowls and pans are less accessible. The technical skills of masons are limited, and most are unable to build or construct hygienic latrines, particularly those with septic tanks.

2.2.1.2 Product attributes

Attributes of existing products and services

Respondents mention preferring squatter pans rather than latrine bowls (sitter) because they were easy to clean, use, maintain and perceived as more affordable and durable than other bowls.

“The owner of the restaurant, where I work, has all latrine bowls replaced with squatter pans to prevent them being broken by customers” (Male – IDI – Non adopter – Poor - Tieu Khu village, Dong Bang commune, Mai Chau district).

Composting latrines are also appreciated because of the use of the excreta as fertilizer, but the economic value on the production of fertilizer is relative compared with animal excreta.

“We don’t want to waste the human excreta, but the amount is not relevant compared with the one we use from animal excreta” (Male - IDI - Unhygienic adopter - Dong Bang commune, Mai Chau district).

Most households are not satisfied with their current unhygienic latrines, reasoning that their latrines exude bad smell, and are dirty, particularly in the case of pit latrines.

“We are not satisfied with our pits. We only wish we have enough money to build a constructed vault, as it’s hygienic and free of bad smells” (FGD - Male group - Unhygienic adopter – Non poor - Dong Bang commune, Mai Chau district).

While some respondents believe that a single vault latrine is useful as a means to store feces for fertilizer, others disagree, stating that they have manure from animals' waste, or access to chemical fertilizers. In addition, they perceive the single vault latrine is ‘easier’ in terms of construction, use and maintenance.

Attributes of desired products and services

Most people want a latrine that is solid, clean and without bad odors. The most important part of a latrine is its superstructure, and ideally respondents would like to build the strong superstructure and latrine at the same time, rather than in stages, or having to have to use temporary materials such as bamboo and cottage leaves. Permanence of the construction is a highly desired feature.

“Next year, when I build a double vault latrine, I will not build it with bamboo and leaves so that I can use it in longer term and without risk of being burned in summer” (Male – IDI – Unhygienic adopter - Poor - Sao Dong village, Sao Bay commune, Kim Boi district).

“Many families want to have a solidly built latrine to use for a long time. If they want to build a latrine, they will build it completely. They don’t want to build only the tank, they don’t like it. For them it’s like

building a temporary house” (Female - FGD mixed group - Hygienic adopter - Bao La commune, Mai Chau district).

All households interviewed like septic tanks for their convenience, appearance, long-term use and hygiene. For some, a septic tank is associated with being a ‘luxury’ latrine, commonly attached to a bathroom. Most respondents would still prefer to invest in a single vault latrine as they perceive this as less expensive.

“We are not pleased with a temporary dug latrine. We wish we have enough money for a concrete latrine for more hygienic and odorless” (FGD Male group – Unhygienic adopter - Better off - Dong Bang commune, Mai Chau district).

“If I have enough money, I will build a latrine with tiled walls, a pan and other facilities, and attached to a bathroom. For underground part, I would just install a pipe connecting to the stream, after using, just flush water and feces will be washed away to the stream” (Male – IDI - Non-adopter – Poor - Khoai village, Thuong Bi commune, Kim Boi district).

“The hygienic latrine mainly should offer privacy above and be tightly built below, and also many other factors, not mentioning if it's beautiful or not” (FGD Male group - Unhygienic adopter - Non poor - Dong Bang commune, Mai Chau district).

Key findings: Cleanliness, durability and lack of smell are the main attributes of the desired latrine and these were mostly associated with the septic tank and ceramic pans. Households consider the latrine superstructure as a very important component of the latrine. Building all components of the latrine at once is the most preferred option.

2.2.1.3 Social/cultural norms

Respondents do not agree with open defecation practices, and believe all households should at least have a pit latrine, even if they are poor. The perception is that every household should have a latrine, since it is one of the criteria for a family or a village to be officially recognized as “cultured”¹⁷. Open defecation is considered as “backward and uncivilized” and unacceptable by the community.

“At present, nobody still practices OD. None is backward at that level” (Male – IDI - Non-adopter – Poor - Khoai village, Thuong Bi commune, Kim Boi district).

“Practicing open defecation is unacceptable. It's not the same as before, now even a 6 - 7 year old child knows that it's shameful to practice open defecation, not mentioning adults. No one can accept that you defecate in the open air anymore” (FGD Male group - Unhygienic Adopter - Non poor - Sao Bay commune, Kim Boi district).

¹⁷ Cultural family is a certificate granted by the Communist Party at village level for complying with a set of criteria in different aspects like education, economy or government regulations. One of the groups of criteria is *Family living in happiness, helping others in the community*, in which health protection is included based on the following criteria: keeping the house and surroundings clean, green and nice; using clean water, having a hygienic bathroom and latrine; all members of the family practicing a healthy life and regularly practicing sports. The list of criteria is issued by the Ministry of Culture, Sports and Tourism, its last version dating of 2011.

Open defecation while working in the fields is somehow acceptable, although not very common. This is practiced when people do not have time to find a latrine. Also, it is not so often practiced in lowlands when the paddy field is close to the village, but rather in upland farming areas, further away from settlements.

“It only happens in case of urgent and sudden need for defecation and in this case, any one has to accept it” (Male – IDI – Unhygienic adopter - Bung village, Bao La commune, Mai Chau district).

Not many people share a latrine since the latrine coverage is very high. However, sharing a latrine is still considered acceptable.

Respondents believe the latrine is the dirtiest place in the house, and thus it is normal for latrines to be dirty and have bad smells. This is the main reason why unhygienic latrines are considered ‘acceptable’. Also, the community considers the latrine condition as a private, family issue. They rarely criticize other families about the condition of their latrine, unless the odor is very strong. Furthermore, as opposed to other areas of the house like the well or the kitchen, a latrine is not perceived as a main asset of the household. As such, there is a social norm around the ownership of unhygienic latrines in the community i.e. it is ‘normal’ to have an unhygienic latrine that smells bad and is dirty.

“I just follow the neighbors, just to have a place to defecate” said a household in Thuong Bi commune, Kim Boi district.

Hygienic latrines were perceived by many households as something reserved to better off families, as they believe that the hygienic latrine must have a septic tank, and septic tanks are perceived as the most expensive type of latrine.

Key findings: Open defecation is not socially acceptable. However, respondents acknowledge that open defecation does occur when people are farming. Sharing latrines, though less common, is deemed acceptable. Unhygienic types of latrines are considered socially acceptable and the norm. Owning a hygienic latrine is perceived as something that is reserved for wealthier households.

2.2.1.4 Sanctions/enforcement

Available norms and sanctions in sanitation from government and community

In a few years prior to the study, local authorities requested that all households must have a latrine. Households that did not install latrines would be fined. This government regulation helped to encourage latrine construction, and the household survey data show most latrines are around three years old.

However, local authorities in villages and communes in the surveyed area report that the village regulations do not include specific criteria on the type of latrine to be constructed, although this was included in the higher-level regulations by the Ministry of Culture. While every village has this regulation, very few of them include detailed information on the construction and minimum requirements or standards. There are also no sanctions or fines being in place for not complying with the regulation, despite initial threats that the households would be fined.

“If there are instructions from superior level, we at commune level will follow them immediately and surely will achieve 90% hygienic latrines by the end of the year 2014” (IDI - Thuong Bi Commune People’s Committee, Kim Boi district).

This seems to have had an influence on the type of latrines that were built, and may explain why most of the latrines are not hygienic facilities.

How do the rules work?

Communication and promotion on sanitation and hygiene is one among many activities undertaken by health workers. The topic is usually addressed in the community through village meetings held by the village head in which, beside the village head, representatives of mass organizations and the commune health station will speak a few words about household latrines, reminding people to have a latrine and to keep it clean. Villages have the capacity to set up their own regulation on sanitation, but village leaders often lack initiative if not informed and oriented from upper levels.

There was consensus among people and the local authorities about the need to develop additional official decisions on the regulation on hygienic latrines that could reach lower levels.

Key findings: Government regulation has helped to encourage latrine construction. However, there are few criteria or little clarity on the type of latrine that should be built. This situation has perhaps contributed to the low rates of hygienic latrine coverage. There are no sanctions or fines being in place for not complying with the regulation.

2.2.2 Ability

2.2.2.1 Knowledge

Hygiene and health

Households mainly associate open defecation with environmental contamination and health risks.

“A dirty, unhygienic environment will transmit not only one but many diseases to us, to our animals. And the flies will also spread the diseases everywhere” (Male - FGD Mixed group - Hygienic adopter - Bao La commune, Mai Chau district).

Most households interviewed knew that unhygienic latrine usage could affect their health in some way, but they did not understand the disease contamination pathway, or understand the need for latrine maintenance, including the threats associated with using untreated human feces as fertilizer and its impact on health. Use of unhygienic latrines was not associated with fear of disease, money loss or death.

Awareness of latrine types and costs

Respondents tend to classify latrines into two types: temporary and concrete. This classification of latrine types is not based on hygienic standards but simply on the materials used for latrine

construction (with cement and brick or without cement and brick), and reveals the respondent's low awareness of different types of latrines and their hygienic standards. Concrete latrines could refer to the underground structure, only the superstructure or both. A solid/concrete latrine could represent a hygienic latrine, as illustrated by this in-depth interview participant:

"We are encouraged by the village head to build a concrete latrine because it is hygienic" (Male – IDI – Unhygienic adopter - Khoai village, Thuong Bi commune, Kim Boi district).

There is also general confusion on the different types of latrines. Latrines may be classified as a septic latrine facility based on the visible parts of the latrine. For example, latrines with a pan or bowl, or that flush, may be considered as latrines with a septic tank.

"My latrine is a septic tank because it has a pan" - (Male – IDI – Hygienic adopter - Bay village, Sao Bay commune, Kim Boi district).

The septic tank was almost the only type of latrine considered hygienic by householders. Only a few considered double vault latrines as a hygienic latrine, except in Thuong Bi commune where double vault latrine is more common since it was promoted by the NTP3 program.

Most households interviewed reported not knowing the costs of hygienic latrines.

Awareness of latrine use and maintenance

Most households report a very basic understanding of the operation and maintenance work, and cleaning is done only when the latrine appears dusty, or if the latrine is in need of repair. There is low knowledge and understanding about regular latrine maintenance and feces treatment. When households are in need of fertilizer, respondents report using fresh excreta taken directly out of the latrine and immediately uses as fertilizer.

Awareness of where information can be obtained

Most respondents had not received information on different hygienic latrine options, and did not know about latrine construction techniques or their costs. If they wanted to build a hygienic latrine they did not know where to find information on this. The latrine construction and maintenance manuals are unavailable to them.

"So far, no one from outside came to my village to do communication" – (Male - Village head – FGD - Sao Bay commune, Kim Boi district).

Most people accessed to information about the septic tank types through their friends, or observation in other households, or via masons.

Access to promotional material was very limited. Of 24 household IDIs, only two reported having seen leaflets on latrine construction.

<p>Key findings: There is low awareness of different types of hygienic latrines, and how much they cost. There is also low knowledge on the impact of poor sanitation on health and a general lack of</p>
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knowledge on sanitation related diseases and hygienic latrine maintenance. Households that have hygienic latrines usually have a better understanding, awareness and knowledge about sanitation than households that have unhygienic latrines or no latrines.

2.2.2.2 Skills

Self-construction

Most households, regardless of economic status, would prefer to build their latrine by themselves, and sometimes rely on support from relatives or neighbors. If a family wanted to build a latrine, they typically ask their neighbors about the type of latrine they have. Based on the characteristics of the neighbor's latrine, they would then build their latrine based on this, and perhaps include some changes based on their personal preferences.

"I go to see the latrine from my children's house. Then I follow what I think is good from theirs to build my own latrine"- (Male – IDI – Unhygienic adopter - Bay village, Sao Bay commune, Kim Boi district).

Most households indicate that they have some level of masonry skills. There is a perception that latrines are not difficult to construct, and respondents are confident that they can do this, but a barrier is that they lack information on the technical requirements needed to build different types of latrines.

"For the 3-vault latrine, it might be costly and difficult to build; I don't know the construction techniques so only the masons can do it. But for this single-pit latrine, I think I can build it by myself" (Male - FGD Mixed - Non Adopter, Sao Bay commune, Kim Boi district).

Latrine use and maintenance

There was low awareness among households interviewed on the hygienic maintenance the latrines. Generally households have paid limited attention to the usage and maintenance of the latrines. Latrines are cleaned by sweeping or flushing dust away, and add ash only when there is bad smell. Most households still do not have a lid for their latrine, and often forget to cover the hole with a lid. Households with dry latrines do not typically cover the pit or add ash to the pit. Most vaults were not sealed and there were no ventilation pipes.

Some households still use sticks for anal cleaning instead of latrine paper. The sticks are thrown into the garden after being used.

There were unsafe practices in relation to the use of sludge as fertilizers. Most households with a single vault indicated they applied untreated feces in the paddy field.

"Why build the costly double vault? A single vault is enough. If our vault is full, we take out the feces, cover it for a while then use it on the field" – (Male – FGD - Sao Bay commune, Kim Boi district).

"Other households with one pit wet latrine use excreta liquid to fertilize and it is unhygienic because it is wet. My family use dry excreta with ash from the single vault and it is completely safe" (Female – IDI - Unhygienic adopter - Sao Dong village, Sao Bay commune, Kim Boi district).

In relation to septic tank management, respondents indicated that they did not expect that the tank would become full and would not know what to do if this occurred. Septic tank sludge removal services are only available in urban areas. Many households don't know about sludge removal and available services. Septic tanks are seen as "self-decomposing latrines" where feces will decompose and disappear automatically inside the system. Most septic tanks surveyed had only been built very recently and the need for sludge removal has not yet occurred. Lack of demand is also a reason why the service is not currently available at villages/communes surveyed. When being warned about this issue and asked about solution, one household mentioned:

"If it is full, then my family will remove sludge with a bucket" (Male – IDI – Hygienic adopter - Better off - Bung village, Bao La commune, Mai Chau district).

Key findings: Households were limited in their ability to properly build all different type of latrines, but they felt confident that they could construct a latrine if they had the appropriate technical instructions. There is a strong potential and preference for self-construction, though it is recognized that other family members may be needed to assist with latrine construction. Overall, there is poor latrine maintenance.

2.2.2.3 Social support

Physical and emotional comfort by reference groups

In all villages, there is a strong community spirit to help each other. Households often help each other in latrine construction by either sharing their technical experience or supporting each other by helping to build the latrine. In these cases, the household building the latrine does not pay for this assistance but will provide meals.

"No, we have to pay nothing for help of relatives and neighbors. They help our family and I help theirs later. We just invite them to have a meal and some local alcohol" (Male – IDI - Dong Bang village, Dong Bang commune, Mai Chau district).

At community level, there are mass organizations (Women's Union, Farmer's Association, Youth Union, and Elder's Association, and 'inter-families group') that can provide some information on hygiene to households.

Community self-management organizations known as "inter-families group" exist in some villages in Mai Chau district with the potential for organizing group activities for building latrines. They are community-based, voluntary, self-managed groups. The purpose of the group is to support community members when facing difficulties and/or when they have special events, and there are also options for savings and loans.

"Support for some poor households in our village, and the village will support them with workforce, for example, so we can help these poor households to have a qualified pit latrine" (Female - FGD Mixed group - Hygienic adopter - Bao La commune, Mai Chau district).

Key findings: Support among members of the community is common, through neighbors, families and organization. Collaborative and group work, information exchange and solidarity savings groups help to ensure latrine coverage.

2.2.2.4 Roles and decisions

Typically, the man (usually the husband) or the main income gainer (usually the eldest son) is responsible for making the final decision on important investments of the household (housing construction work, including latrines, or purchases like motorbikes or other equipment). However, before making the decision, they often discuss with adult members of their family about the matter, the way to implement it, and the money to be spent, and this includes discussions associated with latrine construction or upgrades. Although the desire to have a hygienic latrine of a woman is stronger than the man's, it's the head of the family (often male) who would make the final decisions on whether or not to build a latrine.

"We discussed between my wife and I how to build our latrine. As we didn't have enough money for a septic tank, we decided to build a single vault. My wife also agreed" (Male– IDI – Unhygienic adopter - Long Sang village, Bao La commune, Mai Chau district)

"That needs a discussion- Behind every great man, there is a great woman- everything I decide to do, I always discuss with my wife"- (Male – IDI – Unhygienic adopter - Bay village, Sao Bay commune, Kim Boi district).

"It depends on each households, but most of the times, the decision is made based after discussion between the husband and wife" (Female – IDI - Unhygienic adopter - Na Chao village, Bao La commune, Mai Chau district).

Whilst the woman pays from the household savings she doesn't purchase the materials. The man often is the one who contacts materials suppliers, and is responsible of the latrine construction and obtains the technical information needed for hygienic latrines. The woman normally is responsible for cleaning the latrine, while the man in turn will be responsible for maintenance such as having to fix the latrine's roof.

Key findings: There are gender differences regarding the decision making and purchasing. Whilst decisions in terms of the latrine construction, upgrading and investment costs are discussed among adult family members, men usually making the final decision. Since usually women are more aware of the need of a hygienic latrine than men, women may potentially have a bigger influence in the decision making process regarding latrines.

2.2.2.5 Affordability

One of the main barriers reported by households for not having a latrine or having an unhygienic latrine was lack of money. Respondents believe that they cannot afford to pay for latrines, as latrines are perceived as expensive.

“We don't have a hygienic one, so we have to use this unhygienic latrine for the moment. I really want to have a hygienic latrine but can't afford it because of our (economic) conditions.” (FGD Female group - Unhygienic adopter – Poor - Thuong Bi commune, Kim Boi district).

“We don't have much money, but we are able to pay a few millions to build a new latrine” (FGD – Unhygienic adopter - Dong Bang commune, Mai Chau district).

“Our people are not that poor to not have few millions to build a latrine” (IDI - Commune People's Committee - Dong Bang commune, Mai Chau district).

Also, in many cases people refer to septic tanks as the combination of a septic tank latrine and a bathroom, which leads respondents to overestimate the latrine cost. Many households believe that a septic tank will cost between 10 million VND up to 40 million VND depending on its facilities.

“We can afford up to 10 million dong for a septic tank” (Female - FGD Mixed group - Hygienic adopter - Thuong Bi commune, Kim Boi district).

In latrine investment, construction and use

People prefer to build either a very cheap and simple latrine like a pit or single vault latrine, no matter how unhygienic it is, until they can afford to build a longer term, comfortable and more expensive type of latrine like a septic tank with bathroom. People do not seem to be interested in mid-range options.

Many households, both better off and poor, stated that investing millions of VND in building a latrine on credit it is not the best option for them. They mostly prefer to use the loans for something that can generate economic profit (see Competing priorities).

Ability to pay: sanitation products, services

The cost of most of the latrines of the households interviewed was in the range of 1-2 million VND, with most of them building their own latrines and not investing in mason services. However, some households spent large amounts of money in septic tanks.

“My septic tank costs about 20 million VND, in which 3 million VND is labor cost and 17 million VND for materials and facilities” (Male – IDI – Hygienic adopter - - Dong Bang village, Dong Bang commune, Mai Chau district).

“I built this double vault nearly 2 years ago. It costs 2 million VND” (Male – IDI – Hygienic adopter - Sao Dong village, Sao Bay commune, Kim Boi district).

“My pit latrine costs 400 thousand VND for materials. I built it by myself so labor cost is not calculated” (Male – IDI – Unhygienic adopter - Khoai village, Thuong Bi commune, Kim Boi district).

“Brother, my latrine costs only 500,000 VND. If calculating my labor as well, it is only 1 million VND in total” (Male – IDI – Unhygienic adopter of 1 year single vault latrine - Long Sang village, Bao La commune, Mai Chau district).

Influential factors: household income, sources of funding, availability of cash, access to credit, availability of accessibly- priced sanitation options in the area, etc.

The most important financial source for latrine construction and other expenditures comes from selling their agricultural products (e.g. cow, pig, rice, corn). When households need cash, they firstly look at their savings, secondly they think of selling some products or animals and lastly they ask for a loan from banks or borrow money from relatives.

Most poor households interviewed reported financial difficulties with regards to investing in a hygienic latrine. They cannot borrow from their relatives as everyone is in the same situation. They believe that they cannot access a bank loan for sanitation because the investment (into a latrine) does not generate income to pay back the loan. In addition, respondents report that banks are reluctant to lend to them, and this is further exacerbated by the finding that most of the households have not paid off existing loans. Some respondents indicate that even if the bank granted them a loan, they would not ask for it, as they fear not being able to pay it off.

“Many families want to escape from poverty, heard that the loan is for poverty alleviation so they asked for more loan. But how can they repay the loans if they don't have any income?” (FGD Male group - Unhygienic latrine – Non poor - Dong Bang commune, Mai Chau district).

Some households are members of the revolving fund groups created by the WU but the money is small and they do not prioritize the latrine's construction either.

When buying sanitation materials from retailers, they would prefer the transportation costs to be included in the cost of materials. Respondents state that they do not have to pay for the latrine if they know the shop's owner or if they buy a lot of materials. Provided a deposit is made, they can then make contributions over the next one to two months and until the year-ending harvest by the latest. It is noted that if they pay by installments, the price will be higher.

Availability of financial services

As for financial resources, VSBP and Agribank networks are available in all communes offering different types of loans for different purposes.

Respondents do not have clear information regarding loans that are available and are not aware about options to apply for loans from VSPB to build latrines. There is the perception that loans are only available for water infrastructure, or even that VSPB would only provide loans for income generating activities. Some households were able to access loans up to 8 million VND (the program regulation states that 4 million is the maximum amount for investing in a water facility and 4 million for a sanitation facility) but they believed that the loan was for water supply investments only, as indicated by these participants:

“The bank only provides loan for animal husbandry, we have never heard that there is a loan for latrine construction” (Female – IDI – Hygienic adopter, Sao Dong village, Sao Bay commune, Kim Boi district).

“They don’t give a loan for latrine construction, only for animal husbandry like cattle and pig raising because the latrine cannot give a birth as animal so cannot bring back benefit” (Male – FGD – Hygienic adopter - Sao Bay commune, Kim Boi district).

Information from interviews with VSPB officers suggests that the loan scheme is not focused on reaching poor households, and rather provides loans to ‘low risk’ customers.

Key findings: Most respondents report paying around 1-2 million VND for their (typically) self built latrine. People prefer to build either a very cheap and simple latrine, no matter how unhygienic it is, until they can afford to build a more durable hygienic latrine. Respondents do not seem to be interested in mid-range options.

There is a substantial difference between real and perceived affordability. Most households believe they cannot afford the desired latrine. Also, in many cases people refer to septic tanks as the combination of a septic tank latrine and a bathroom, which leads respondents to overestimate the latrine cost. VSBP and Agribank networks are available in all communes offering different types of loans for different purposes. However, respondents do not have clear information regarding loans that are available and are not aware about options to apply for loans from VSPB to build latrines. The most important financial source for latrine construction and other expenditures comes from selling their agricultural products.

Poor households reported more difficulties to invest in a hygienic latrine than non-poor households and seemed to be more reluctant to borrow money to invest in a latrine because of lower capacity to pay off the loan.

2.2.3 Motivation

2.2.3.1 Attitudes and beliefs

People are unaware that open defecation or using an unhygienic latrine can cause serious sickness or even death. They associate not having latrine with environmental pollution (see Knowledge). However, respondents still believe that a hygienic latrine can help to protect themselves from diseases. Many households still use fresh human excreta for fertilizing, as they think it is harmless.

2.2.3.2 Values

All households said that to own a hygienic latrine is a pride of families. They can boast of its high price, its convenience, its cleanliness and its nice appearance. Children, especially teenagers are also happy and proud of their comfortable latrine.

“Having this (a hygienic latrine) is a pride for us, but it's a personal secret pride that we don't tell to others, because if we do, they will say "Hey, stop bragging about it!" (Male - FGD Mixed group - Hygienic Adopter - Bao La commune, Mai Chau district).

Some households believed that a sanitary latrine can also help to keep a good relation with their neighbors and can show themselves as a good example to other households. A household or community with hygienic latrine is considered as a civilized and cultural household/community.

“First of all, we gain the respect of people; secondly it is more hygienic and cleaner for our family” (Male – IDI – Unhygienic adopter - Long Sang village, Bao La commune, Mai Chau district).

Being or looking like a modern and clean household is valued by the community. People feel respected by their neighbors and pride when having a hygienic latrine.

Key findings: Modernity, cleanliness, pride as important values associated with owning a latrine. A household or community with hygienic latrine is considered as a civilized and cultural household/community.

2.2.3.3 Emotional/physical/ social drivers

The main motivation for households to build or renovate their latrines is the desire to have a hygienic latrine without bad smell that is cleaner and more comfortable. Privacy and convenience are also strong motivators, particularly for women. They do not have to look up and down before defecating to ensure they will not be seen by other people. With a good latrine, households do not have to build it very far from their house so it is convenient. Further, a hygienic latrine would have no smell and this would make the users feel more comfortable and clean when using it. It also prevents disgusted feeling. In particular, men feel it is important to obey local regulations (see Sanctions and enforcement).

“Taking the example of my family, our latrine is not secured (hygienic) enough. If there is support, I will build an appropriate latrine, of the septic tank type, firstly is to provide cleanliness to ourselves” (FGD Male group - Unhygienic adopter - Non poor - Sao Bay commune, Kim Boi district).

Some households said that having a latrine as a criterion to be recognized as a cultural family and the pride that this has encourages them to build their latrine. It is interesting to see the fact that in rural areas, the “cultural family” title is very seriously taken into account by households.

“My husband had to visit Commune People’s Committee several times to query them why my family was not recognized as a cultural family” (Female – IDI – Unhygienic adopter - Sao Dong village, Sao Bay commune, Kim Boi district).

A few households mentioned sharing a latrine with their relatives or neighbors. But they explained that it was very uncomfortable and inconvenient. For example, they cannot use a latrine while the latrine owner’s family is having their meals.

“The first reason is that using a shared latrine is not very convenient. The second is that my wife and children need privacy. Using a shared latrine has many inconveniences, and we don't want to bother the sharer either. Having our own latrine is a must” (FGD Male - Non Adopter - Thuong Bi commune, Kim Boi district).

Households without a latrine affirmed that it was very inconvenient to defecate in the rainy season and at night time. Every day they were looking for a different place to defecate away from the previous places. Furthermore, they had to be very cautious with insects, snakes and even pigs and dogs when practicing open defecation.

“In a family of 5 - 6 persons, if one is defecating there, well, then the other must go somewhere else.” (Male - FGD mixed - Non Adopter - Sao Bay commune, Mai Chau district).

“We just built our house and couldn't afford to build the latrine, so I often defecate in the stream. the open defecation is dangerous, as there are many itchy bugs in the stream, and itchy bushes on the way there. Moreover, I'm afraid of not hiding fast enough if someone passes by.” (Female - FGD with Female - Non Adopter - Thuong Bi commune, Kim Boi district).

Key findings: Cleanliness, privacy and comfort are the main drivers for building a hygienic latrine. Women have a stronger motivation to have a hygienic latrine to avoid bad smells and dirtiness and to be more comfortable, while for men it is more important obeying the authorities' regulations. Pride, being modern and the “cultural family” status are also valued. Non-adopters specially value the convenience and safety of having a latrine.

2.2.3.4 Intentions

Building hygienic latrines

The intention to repair or improve the existing latrine is more common among households owning a septic tank. This may be a consequence of having invested a greater amount on building the latrine, and they would not mind spending a little more to make it look nicer, more hygienic and convenient (tiling the wall with ceramic tiles, install water pipe system, concrete roof, etc.). For all other households, they would intend to build a new latrine.

It is also described how the seemingly more expensive parts of the superstructure are perceived as ‘less important’ and can wait.

“Due our family had not enough money, we built the septic tank without wall ceramic tile and water tank. We are saving for these parts” (Female – IDI – Hygienic adopter - Better off - Khoai village, Thuong Bi commune, Kim Boi district).

Planning

Of all the households interviewed who shared a latrine or use a temporary latrine (bucket, hanging, bridge latrine), only one had a plan to build a single vault latrine this year, together with the construction of the house. All the others expressed intentions but no actual short-term plan to build a latrine construction because of lack of resources.

“Though it is not 100% but at least 80% households want to build a septic tank. However, now households in my village still face the biggest issue regarding to capital to invest into a hygienic latrine. Though it looks like this, indeed, we are still very poor” (Female – IDI – Unhygienic adopter - Khoai village, Thuong Bi commune, Kim Boi district).

Since most households dream of having a septic tank but overestimate its cost, they never make a plan to build it because they think they cannot afford.

“We don't have enough money to build the costly latrine, so we pick the cheap model. Only the better-off can build the costly ones” (FGD Male group - Unhygienic adopter - Poor - Thuong Bi commune, Kim Boi district).

Key findings: Intention to build new latrines is high among all types of households, except for septic tank users that plan to make improvements on the existing latrine. However, respondents do not have a clear or short-term plan to build the latrine. People perceive that they need to save for a long time to be able to afford the investment of a hygienic latrine.

2.2.3.5 Competing priorities

Respondents are likely to invest their money into something that can either generate income or provide profit in the long term. Other priorities include building or renovating their house, investing in their children's education or buying furniture and facilities. While they would like to build a latrine, this priority is low compared to other investments.

"As for my family, an amount of VND 500,000 for a latrine is too much that we cannot afford. There are too many things else we have to think of, for example, repair of the house" (Male – IDI - Non adopter – Poor - Khoai village, Thuong Bi commune, Kim Boi district).

"Of course we all want that. But there are other needs which are more important, such as children's study, etc." (FGD Male group - Unhygienic adopter - Non poor - Sao Bay commune, Kim Boi district).

Key findings: While respondents would like to build a latrine, this priority is low compared to other investments, especially investments that can either generate income or provide profit in the longer term.

2.2.3.6 Willingness to pay

How much they are willing to pay, and for what: materials or/and services

Most households interviewed do not want to spend much money on their latrine. The price poor households would be willing to pay was between 400,000-700,000 VND, while for near poor was around 1,000,000 VND, and for better off between 2-4 million VND.

Key findings: Willingness to pay is lower than respondent's capacity or ability to pay. This is due to a low awareness of the necessity of a hygienic latrine, overestimation of the cost of a hygienic latrine and reluctance to invest external financial sources in a latrine.

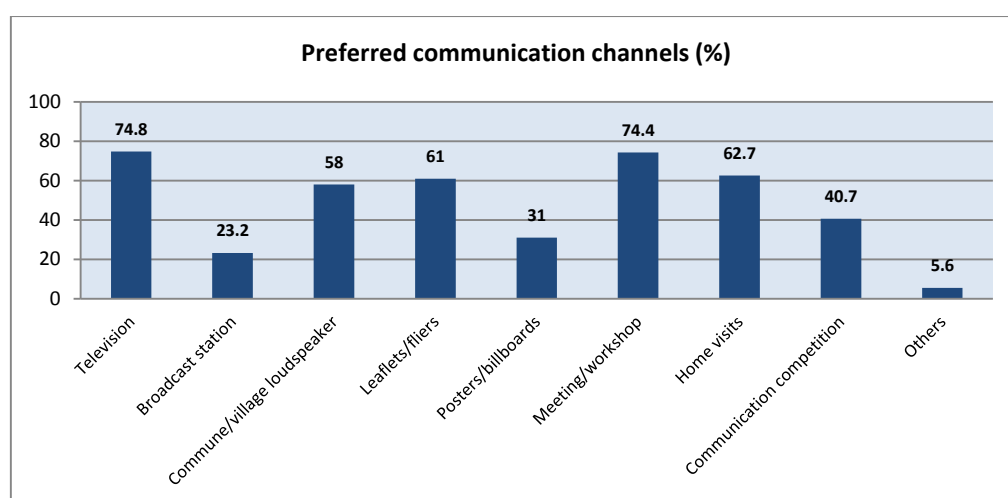
2.3 COMMUNICATION CHANNELS

This section presents information on the different communication channels through which the information reaches households, their advantages and disadvantages in terms of cost effectiveness, quality of the information and its retention by rural households. This section combines data collected through quantitative and qualitative tools of the rapid assessment.

When households were asked about their most preferred communication channels, most households mentioned television and community meetings (75% and 74% of all respondents), followed by home

visits (63%) and leaflets (61%). Broadcast network, contests and posters were the least preferred (<=40%).

Chart 21: Preferred communication channels



Regarding interpersonal communication, the source from which households would prefer to receive the information was predominantly the health staff (69%), followed by village leaders (29%) and masons (18%), though qualitative research suggests that respondents typically approach neighbors or relatives for advice on latrines. Householders perceived that health workers or village leaders currently did not provide this kind of information.

In recent years, people were informed about latrines, and the need to have a latrine, via village meetings or by local public workers. However, households consider these promotion activities ineffective due their short duration, monotony and lack of detailed information. They want to receive information on hygienic latrines from village health workers, HoVs or leaders of social organizations in the village as it's more convenient for them.

“Local organizations have done a lot of communication about sanitation at commune level, but the villagers haven't understood thoroughly” (FGD Mixed group - Hygienic adopter - Bao La commune, Mai Chau district).

“We don't know how much the fine is, but the head of village did announce it on the loudspeaker” (Female - FGD - Unhygienic adopter - Sao Bay commune, Kim Boi district).

The most relevant promotional method according to households is using demonstrative images or models of hygienic latrines so that the people can obtain the complete information related to hygienic latrines. The promotion method should be attractive, visual and specific by using demo models at local site or clear images.

Qualitative assessment also highlighted the importance of interpersonal communication channels for households, with community meetings and home visits mentioned as preferred channels

“If there is someone who visits our family, tells us clearly about different types of hygienic latrine, it will be more effective because we can ask for more details about what we still don't understand” (Male – IDI - Adopter - Sao Dong village, Sao Bay commune, Kim Boi district).

“Village meeting is not only a good chance for motivating people to build latrines but also for local functionaries to be aware of the actual sanitation situation” (Male - Village head - FGD - Sao Bay commune, Kim Boi district).

However, some constraints on the current method of communication at village level were pointed out by most of the interviewees, and suggest the need to change messaging or delivery of the message as people forget the messages.

“We often talk about something very generally and then forget about it” (Male- FGD - Sao Bay commune, Kim Boi).

Some suggestions were provided on how to improve the communication effectiveness, such as through regulations, or focusing on specific target groups.

“Communication should be combined with regular monitoring” (Male – FGD - Sao Bay commune, Kim Boi district).

“Communication should be combined with regulation enforcement. People are afraid of being named over the village/commune loudspeakers for their mistake or misconduct” (Male – FGD - Sao Bay commune, Kim Boi district).

“Communication done by respectable person in the community is effective” – (Male – FGD - Sao Bay commune, Kim Boi district).

“We should focus on motivating the non-poor” (Female – FGD - district CPM, Kim Boi district).

Regarding mass media communication channels, according to qualitative assessment, time for watching TV is quite limited for rural households.

“We can only watch TV for a while, from 6-7 PM and then go to bed around 8:30-9PM” (Male – IDI – Unhygienic adopter - Long Sang village, Bao La commune, Mai Chau district).

Video tapes were mentioned as a suitable communication channel that could be used at village level supporting community activities.

“Video tape is the best. With Video tape, people can both hear and see how to build a hygienic latrine” (Male – IDI – Unhygienic adopter - Dong Bang village, Dong Bang commune, Mai Chau district).

3 SUPPLY CHAIN

This section summarizes the findings from the supply chain qualitative assessment conducted in Kim Boi and Mai Chau districts in Hoa Binh province.

Target population

A total of 39 IDI with different supply chain respondents, subsequently referred to as ‘actors’, were conducted, covering the following product and service providers.

Sampling strategies and procedures

A non-probability, purposive sample of the target population was recruited. The in-depth interviewees were selected on the basis of their roles, functions and responsibilities with regard to sanitation and hygiene issues. Snowball sampling and preliminary lists of potential interviewees, collected with the support of CPM staff at provincial, district and commune level, were used to identify respondents:

- Construction material producers (N=9)
- Retailers and wholesalers (N=15)
- Transportation services providers (N=4)
- Financial services providers (N=4)
- Masons (N=7)

Information on different supply chain providers was collected in the selected communes where the qualitative assessment was conducted, as well as in communes nearby, district towns and Hoa Binh City. All other IDIs were conducted in the two selected districts, except for two interviews with wholesalers and two with financial institutions, which were carried out in Hoa Binh city. Additionally, 4 FGD were carried out with masons, one in each of the 4 communes selected for the qualitative assessment as mentioned in chapter 1.

The sampling strategies and procedures followed the qualitative methods described for the IDI and FGDs.

Survey Instrument

The IDI and FGD guidelines included open ended questions. These varied according to the main target groups. Guides included questions on to address the main research objectives of this section, such as where materials were sourced and by whom, how materials were sold and purchased from, and for what price.

3.1 DATA PROCESSING AND ANALYSIS

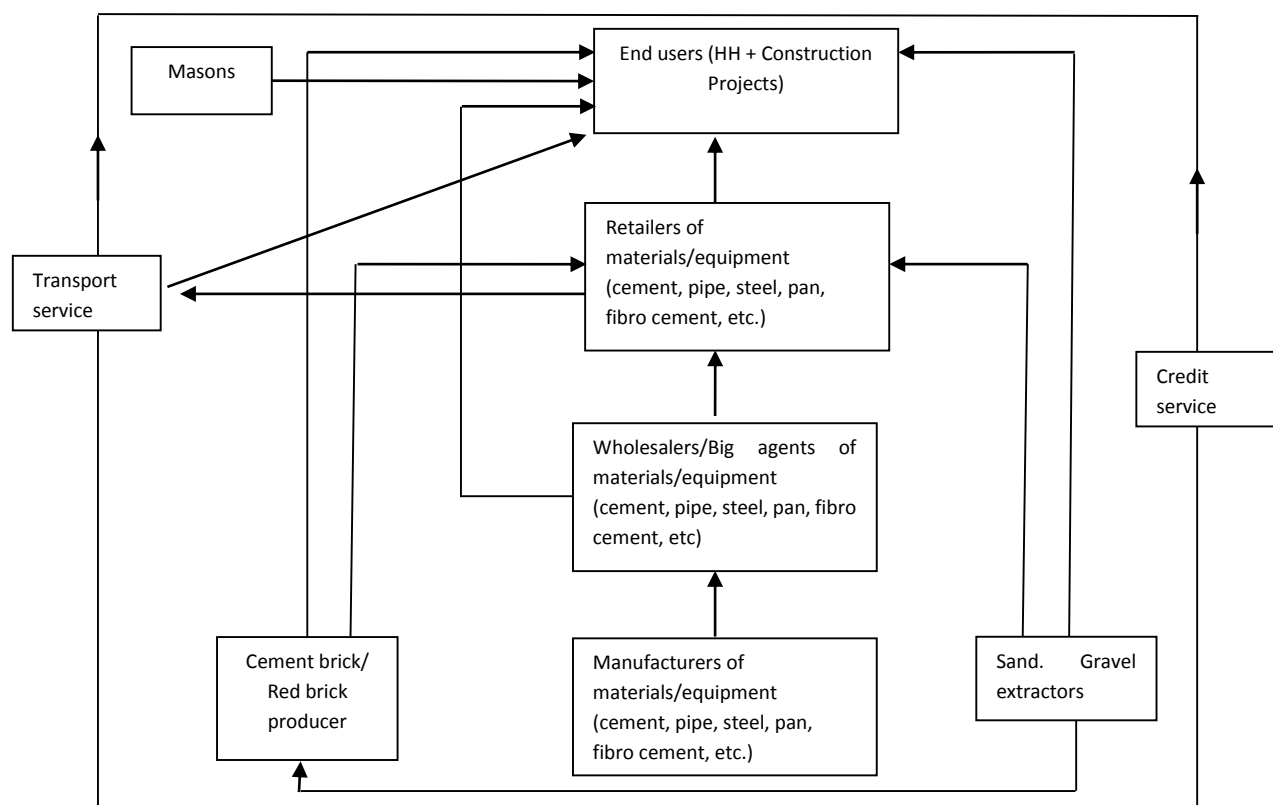
The analysis was structured according to the 4P's of the marketing mix¹⁸.

- The **Product** subsection describes the different available products and services related to latrine construction, the technical capacities and knowledge of the providers as well as the quality and particularities of the products and services provided.
- The **Price** subsection details the costs and prices of each product and service required for the construction of each type of latrine, including estimated total prices for different types of latrines and components with different scenarios in terms of household labor contribution and materials used in the latrine construction. Additionally, it describes the current practices of customer financing by sanitation suppliers, and how it affects household affordability.
- The **Place** subsection describes the distribution networks and how households can access to the different products and services to build a latrine.
- The **Promotion** subsection includes the current marketing practices of supply chain actors and how the information on latrine products and services is reaching households.

Additionally, a description of the current supply chain map and existing business models is provided, highlighting the best practices identified during the fieldwork.

¹⁸ The marketing mix refers to the set of actions, or tactics, that a company uses to promote its brand or product in the market. The 4Ps make up a typical marketing mix - Price, Product, Promotion and Place.

3.2 SANITATION SUPPLY CHAIN MAP¹⁹



At least 10 masons in each of the selected communes were identified. Additionally, a number of both red and cement brick producers were identified in both districts, with a higher number in Kim Boi (n=7) than in Mai Chau (n=2).

Retailers and transportation services were found available in all communes. Some of the retailers also provide transportation services.

3.3 PRODUCT

3.3.1 Supply chain actors' knowledge on latrine construction and hygienic latrines

Shop owners, material producers and transportation services reported limited knowledge on hygienic latrine types. Around 95% of interviewees mentioned that the septic tank is the only hygienic type of latrine. When asked the question "According to you, which types of latrines are considered hygienic?" the repeated reply in interviews was "A latrine considered hygienic is a septic tank". This is illustrated by another supply chain interview:

"There is no communication about hygienic latrines. In my opinion, they should be clean with no smell like a septic tank" (Ltd. Liability Company Hien Hung, Mai Chau town).

¹⁹ The map does not include latrines self-built by households with local materials or materials not purchased from suppliers.

Consequently, these respondents namely promote septic tanks to customers, while also encouraging consumers to build both latrines and bathrooms. This is a way to sell more products.

Key findings: Supply chain respondent's technical knowledge on latrine construction, such as the required components and technical specifications for construction, is very limited. Most of the respondents can only provide information on the products and services that they offer. They do not have the technical capacity to provide a full picture of what is required in terms of product and materials needed to build a hygienic latrine. There are also no references or standards available in the retailing sector about the amounts of materials or dimensions required to build different types of latrines. This may be in part due to a lack of formal training among this target group and/or insufficient communication materials.

Masons predominantly mentioned septic tanks when asked about the types of hygienic latrines. Their general perception is that a sanitary latrine is one that is clean and does not smell. Some more experienced masons (called "master masons") (all of 7 master masons interviewed in IDI) reported having the technical knowledge to build latrines, including septic tanks, and being able to read technical drawings.

"I have no technical difficulties in latrine construction" (mason, Khoai village, Thuong Bi commune, Kim Boi district).

"Latrine construction is simple and I could build both super structure and sub structure with no difficulty" (mason, Thuong Bi commune, Kim Boi district).

However, none of the interviewed masons reported having received formal training in construction techniques, and had basically learnt 'by doing' and from other masons. Most assistant masons in both districts reported having only basic skills and not being able to read technical drawings.

"I never attended any training and just work by experience. I started working as an assistant mason and then gained skills gradually" (mason, Dong Cho village, Sao Bay commune, Kim Boi District).

"It's simple technically to build septic tanks, and I just based on my experience. I could read simple technical drawings, not complicated ones" (mason, Dong Bang village, Dong Bang commune, Mai Chau district).

Masons mostly work in groups, led by a chief mason who provides technical guidance to the other less skilled masons and organizes the work in the group. Masons in Mai Chau communes reported more difficulties and technical limitations on building septic tanks, such as placing the connectors, pipes, pans and ventilation pipes.

"We have trouble with the septic tank latrine construction techniques, particularly with the tank, the vaults, placing the connectors, pipes, pan and the ventilation pipe" (FGD with 9 masons in Xom Bao village, Bao La commune, Mai Chau district).

Masons in Kim Boi were more experienced and have better general masonry skills than in Mai Chau, since most houses are built from bricks and cement, unlike Mai Chau where most are stilt houses made from wood (see Demand Section household survey findings). Masons in Kim Boi reported more

confidence and less technical difficulties when building septic tanks. However, they mentioned not having technical guidelines to build septic tanks or other types of latrines. They usually built latrines based on their experience or through trying to copy the construction of other existing septic tanks in the commune.

3.3.2 Participation in the sanitation market: Products and services provided by supply chain actors

3.3.2.1 Overall process on latrine supply

The supply chain is currently not providing standardized sanitation technologies or integral sanitation solutions at the household level in the study areas. The purchasing process is complicated in that customers cannot buy or hire a full service provider for building a latrine. They obtain information from different sources, mainly relatives and neighbors, look for a retailer, travel to the nearest construction material and sanitation product supplier to buy all the inputs required to build the latrine. Once they receive the materials, they hire masons that can build the latrine or preferably build it themselves for simpler latrines (septic tanks need to be built by skilled masons), as detailed in the Skills determinant analysis in the Demand section.

Key findings: Information is a bottleneck in the supply chain. There are no clear references or standardized guidance on how each type of latrine should be built, what materials and components should be used or much different components costs. The purchasing process is complicated in that customers cannot buy or hire a full service provider for building a latrine.

There are no specialized sanitation providers or marketing of sanitation products targeting and reaching rural households. The sanitation supply chain is integrated into the existing construction supply chain. The products offered by retailers are part of a wider range of the products they sell, with no specific marketing or information provided to customers on types of latrines, material amounts for building each type of latrine or total material costs. The retailers could only provide general advice on the products they sell, e.g. types and prices of different latrine pans, cement, pipes, etc., their use and maintenance.

“We offer a wide variety of construction materials and equipment, but products for water and sanitation just represent around 20% of total sales” (retailer, Binh Tan village, Nam Thuong commune, Kim Boi).

“We produce and sell bricks not only for construction of latrines but also for fences, houses and other construction works” (brick producer and seller, Nam Thuong commune, Kim Boi).

3.3.2.2 Construction materials: bricks, cement, etc.

Material producers: The existing producers identified in the two districts were brick producers (both red and concrete bricks) and sand and stone extractors. CPM in Hoa Binh reported to be one producer of tunnel bricks in Tan Lac district and a cement factory in Luong Son district, both also in Hoa Binh province.

Red brick producers interviewed reported that their product has better acceptance than concrete bricks among households. They consider red bricks to be technically more suitable and preferred by

households for latrine substructure as they are more solid, and believed to have less risks of cracking. Concrete bricks are believed to be more suitable for the latrine superstructure as it requires fewer bricks than if red bricks were used, making the superstructure cheaper to build (see Price section).

“Households consider that red bricks are of better quality, more solid though they are more costly in terms of more materials and labor needed.” (Retailer, Mom village, Chieng Chau commune, Mai Chau district).

“At lower costs, concrete bricks are mostly used for constructing latrines, fences, pig pens, 2-floor houses.” (Brick producer and seller, Quyet Thang village, Bao La commune, Mai Chau district).

Concrete ring producers are available in both districts, although they currently only provide rings for rural water projects, using molds for different ring sizes. Concrete rings are currently not produced or used in latrine construction.

“We produce concrete rings for water, transport, drainage projects using different mold sizes, from 0.1 to 1 meter in diameter, 1 meter in length.” (Concrete ring producer in Vinh Dong commune, Kim Boi district).

However, concrete ring producers are interested in providing their products for latrine construction as a way to increase their sales and diversify their products but technical support would be required.

“I produce concrete rings to sell them to water projects. I am interested in providing products for latrine construction but more capital may be required.” (Concrete ring producer, Quyet Thang village, Bao La commune, Mai Chau district).

3.3.2.3 Sanitation products (pans, bowls, pipes, etc.)

No local manufacturers of latrine pans and other materials e.g. pipes, steel, fibro cement, etc. were found in Hoa Binh province. However, manufacturers of these products have a wide distribution network so the shops in the two districts have no difficulty in getting supplies from different agents either in Hoa Binh city or other provinces.

“Supply is not difficult as products are available from different suppliers in Hoa Binh or other provinces and the price is negotiable” (construction materials shop, Ha Bi commune, Kim Boi district).

Most materials and sanitary equipment were found to be available in both Kim Boi and Mai Chau districts (cement, fibro cement sheets, tiles, steel, sand, stone, bricks, pipes, latrine pans, accessories etc.) with different types of products, qualities and prices.

Ceramic pans and bowls of different brands were available. The main companies providing pans and bowls in Hoa Binh are:

- HC, producing in Thai Binh province, Vietnamese company
- VIGLACERA, based in Hanoi, producing in Vietnam, Vietnamese company
- INAX, producing and distributing in Vietnam, Japanese company
- Coto (Thailand)
- Ceasar (Taiwan)
- Toto (Japan)

Import brands are covering the higher-end and mostly urban markets while local brands sell to lower end markets and rural areas.

Households and supply chain actors interviewed reported that the ‘Thai Binh’ pan is the most popular in rural areas due to its more affordable price (see section 3.4 Price). Retailers selling pans reported that poorer households mostly prefer squat pans due to their cheaper price. Bowls did not have high demand in rural areas according to retailers, and were used more widely in high-end or urban markets.

“Of the latrine pans, HC (Thai Binh) is the most popular and the squat pan costs only 150,000 VND each, thus HC occupies 90% of our sale of latrine pans. Viglacera and INAX pans are more expensive and sell less, mostly for more wealthy customers.” (Retailer, Binh Tan village, Nam Thuong commune, Kim Boi district).

3.3.2.4 Wholesaler

Of the interviewees in Hoa Binh, there is a wholesaler distributing exclusively in Hoa Binh for most of the national and international companies of sanitation products. The wholesaler distributes to other retailers in the districts and also to other provinces. Other sanitation product wholesalers distribute from other provinces, mainly from Hanoi.

3.3.2.5 Retailers

Many shops selling construction materials and sanitation equipment were found in Hoa Binh city and the selected two districts towns and communes. In the two districts, more and bigger shops were found in town and central communes than in remote areas. There were some bigger shops that sell a wider variety of construction materials and sanitation products. These are registered and established as companies, but most shops were small scale and informal businesses, family run and offering a limited variety of products. Of 15 interviewed shop owners, there are 5 enterprises established as limited liability companies. None of the retailers interviewed were specialized in sanitation products and materials and none of them offered all materials and products required for building a hygienic latrine.

Many retailers interviewed were specialized either in construction materials (in bulk construction materials like cement, bricks, etc.) or sanitation and housing products (pipes, fibro cement sheets, pans, tiles, etc.). However bigger shops in the district towns offered almost all materials and equipment for hygienic latrine construction.

Most shop owners provide transportation services (90% of interviewed shops). Most retailers have their own transportation means. Transportation costs are in most cases included in the material price. Shops usually apply the warranty policy provided by manufacturers so they could replace the products, including latrine pans, pipes or bricks if the product is defective.

3.3.2.6 Transportation service providers

Bigger shops may have a larger truck fleet to transport both their own products and to provide the service to other shops for a transportation fee. Transport service providers are usually small scale, owning 1 truck/small vehicle and are run and driven by the owner. They charge a transportation fee for the service. Some also act as mobile vendors, buying and selling materials for a margin (price difference) in addition to the transportation fee paid by the customer.

Small vehicles are considered more convenient and easily accessible in rural roads, but could only transport short distances and carry small volumes. These providers transport a wide range of construction materials and equipment, and some also transport other products (e.g. agricultural products).

“The small vehicle - xe cong nong - is more suitable for rural areas, as it is easy to drive on rural narrow roads. In addition, trucks are not allowed to drive on some concrete roads.” (Cong nong transporter, Khoai village, Thuong Bi commune, Kim Boi district).

3.3.2.7 Masons

All masons interviewed reported providing masonry services alone, without providing materials for customers, although some give advice if requested by customers on materials estimation and places to buy materials. Masons mentioned that many of the requests from customers for building septic tanks come together with building the house. Some masons offered a warranty service for a few months whilst some did not. Of a total of 7 masons in in-depth interviews, 3 reported providing warranty for their clients.

3.3.2.8 Financial service providers

There are mainly two formal financial institutions providing financial services to households and the sanitation supply chain, the VSPB and Agribank. Supply chain providers mostly accessed Agribank, while VSPB mainly provide loans to households. However, there were a number of credit programs offered by VSPB that could be applied to sanitation product and service suppliers. Sources of funding from VSPB credit programs for both household sanitation and business were limited in terms of program funding volumes.

The current credit programs and types of loans provided by both financial institutions are:

- **Vietnam Social Policy Bank** Credit program for water and sanitation for households (4 million for each water or sanitation project, with a maximum of 8 million per household for both projects)²⁰. Maturity: max 5 years, extension policy for delayed payments from 6 months to 1 year (see interest rates in Price). This program does not specifically target poor households, but rather it is a priority program of the government to increase the water and sanitation coverage. The selection of households receiving loans is made in collaboration with four social political mass organizations (Women’s Union, Farmer’s Union, War Veteran’s Union and Youth Union).
Currently the sanitation credit program represents over 10% of total credit balance of the bank in the province. Credit balance as of 31st of December of 2013 for sanitation and water credit program was more than 143 billion VND²¹. The estimated funding allocated for water and sanitation program for 2014 was 42 billion VND according to VSPB’s staff interviewed.
- **Agribank** consumption loans e.g. for building houses (including latrine construction) for households. Very few households apply for this kind of loan for building latrines, given the

²⁰The loan amount for each project (water or sanitation) and each household will be increased to 6 million VND from 1st May 2014 according to Decision 18 of the Prime Minister (QD19/2014/Qđ-TT on March 03, 2014)

²¹ Source: interview of VBSP in Hoa Binh

amount of a loan for latrine construction is very small compared with the average loan size in Agribank's portfolio.

- **Informal credit providers:** No other informal credit providers were identified. Mass organizations do not run credit programs in the selected districts apart from the support on the management of the VSPB credit programs. Supply chain financing practices were commonly reported as detailed in subsection Price.

3.3.2.9 Other sanitation related services

No sludge removal services were found in the rural communes surveyed. Masons and other supply chain actors reported that this service is not available due to the recent introduction of septic tanks in the communes, and therefore demand for this service is still very low. These services are only available in Hoa Binh city, provided by URENCO Company.

3.4 PRICE

3.4.1 Prices of sanitation products and services and pricing systems

3.4.1.1 Price of materials and labor for building latrines

The average price of sanitation materials and products for latrine construction in Hoa Binh according to the qualitative assessment are included in the table below. Prices were quoted at the lower/medium end of the retail price range reported by materials producers, retailers and masons correspondingly.

Table 28: Cost of materials and products for latrine construction

Items	Unit	Price/unit (retail, VND)
Cement	kg	1,000-1,200 (depending on brands)
Brick	unit	1,100 – 1,300 ²²
Cement brick	unit	2,000-2,500 ²³
Gravel 1-2	m3	220,000-250,000 ²⁴
Sand	m3	150,000-160,000
Round steel Ø6 (mm.)	kg	14,000-15,000
Latrine pan	unit	Squat HC: 150,000 HC Thai Binh: 850,000-900,000 Inax: 1.9 million; Viglacera: 1.3 million ²⁵
PVC plastic pipe, Ø 34 (mm.)	m	9,000
PVC plastic pipe, Ø90 (mm.)	m	11,000
PVC plastic pipe, Ø110 (mm.)	m	14,000
PVC plastic connector figure T, Ø34 (mm.)	unit	14,000
PVC connector figure L, Ø90 (mm.)	unit	15,000
PVC plastic connector figure T, Ø90 (mm.)	unit	15,000
PVC plastic connector figure L Ø100-110 (mm.)	unit	15,000-25,000
PVC plastic connector figure T, Ø100-110 (mm.)	unit	15,000-25,000
Glue	tube	10,000
Concrete ring	unit	N/A
Fibro cement cover sheet	each	40,000-45,000
Metal sheet	unit	N/A
Bamboo with 5 m length	unit	40,000
Wooden with 5 m length	unit	N/A
Wooden/plastic door	m2	220,000
Masonry fee (master and skilled)	day	150,000-170,000
Masonry fee (assistant)	day	120,000-130,000

3.4.1.2 Latrine prices by type of latrine, components, materials used and labor

Based on those local prices, the costs of different types of latrines have been estimated in the table below, including options to reduce the costs by households using local materials and providing labor for the latrine construction (see Table 29).

Simple latrines refer to superstructures built with bamboo (stall structure) and fibro cement (roof), while strong latrines refer to superstructures built with concrete or red bricks, cement and door. Self-built options do not include any mason fee for latrine construction. Households could also hire intermediate options where there is a skilled mason supervising the construction and providing the most technical parts and the household providing labor for simpler parts. Payment could be based on daily rate or made as a lump sum for a service.

²² 1,100 VND producer price and 1,200-1,300 VND wholesaler price

²³ 2,000-2,200 VND producer price and 2,200-2,500 VND wholesaler price

²⁴ 150,000 VND producer price

²⁵ 100,000 VND cheaper on average for wholesale price

Table 29: Costs of hygienic types of latrine

Latrine type	Costs in VND			Costs in USD (1 USD = 21,100 VND)		
	Lining parts	Super-structure	Total	Lining parts	Super-structure	Total
Ventilated improved pit						
Hired mason	701,780	455,000	1,156,780	33	22	55
Self-built	551,780	305,000	856,780	26	14	41
Double vault						
Simple built double vault – Hired mason	2,185,900	450,000	2,635,900	104	21	125
Simple built double vault – Self-built	1,735,000	300,000	2,035,000	82	14	96
Strong built double vault – Hired mason	2,185,900	1,459,000	3,644,900	104	69	173
Strong built double vault – Self-built	1,735,000	1,159,000	2,894,900	82	55	137
Soakage pit						
Simple built soakage pit – Hired mason	3,252,000	449,000	3,701,000	154	21	175
Simple built soakage pit – Self-built	2,802,000	299,000	3,101,000	133	14	147
Strong built soakage pit – Hired mason	3,252,000	1,445,000	4,697,000	154	68	223
Strong built soakage pit – Self-built	2,802,000	1,145,000	3,947,000	133	54	187
Septic tank with concrete ring						
Simple septic tank with concrete ring	2,482,000	449,000	2,931,000	118	21	139
Strong built Septic tank with concrete ring	2,482,000	1,445,000	3,927,000	118	68	186
Septic tank built of brick						
Simple septic tank built of brick	4,705,000	449,000	5,154,000	223	21	244
Strong built septic tank built of brick	4,705,000	1,445,000	6,150,000	223	68	291
Note 1: Self-built options are not with septic tanks (surveys show that only simple latrines could be self-built, not septic tanks)						
Note 2: Transport costs are not included in the material prices, as they depend on different factors						

3.4.1.3 Price of transportation services

Transportation costs were not included in the latrine prices as the cost of transportation depends on a number of factors that vary greatly. There are different systems to set the price of transportation services depending on the provider:

- Price per trip
- Price per value of the material transported
- Price per km

Some indicative price quotations from the shops providing transport service based on distance were (based on in-depth interviews of 4 transport service providers):

- 10,000-20.000 VND/km for smaller trucks and small vehicles (3 tons)
- 20-30,000 VND/km for bigger trucks (5 tons).
- Some truck owners who just provide transport service quote a much higher price, e.g. 50,000 VND/km.

Taking the costs reference based on distance, a household would additionally pay from 100,000 VND for a 5km distance or 400,000 VND for a 20 km trip²⁶.

3.4.1.4 Customer financing costs by product and service providers

Customer supply chain financing

Material producers and retailers: Providing credit to customers is common among retailers and brick producers, at least for part of the total amount sold. Of total 24 producers and shop owners interviewed, only 2 were found to stop or largely limit credit to their clients due to the tie-up of capital and risks involved. The term of the credit is usually short-term but up to 6-12 months in some cases, depending on the provider, and this is confirmed in the demand side qualitative assessment. Financing customers is a way to compete and is seen as a comparative advantage for the provider. The cost of the financing usually depends on the term of the financing (the longer the customers pay, the higher the price they usually have to pay). The cost of the financing is in most cases included in the price based on the interest rate of the supplier's financing (in most cases Agribank). Some bigger shops had recently changed their policy by limiting credit to only a few very prestigious loyal customers rather than providing credit to many customers as before. They claim that it is better to give a lower price without credit rather than a higher price with credit.

Some retailers provide credit for most customers (big or small amounts purchased) while some only allow deferred payment to prestigious and well known customers. Customers buying big amounts usually get a discount on the price of the material (% depending on policy of each shop).

"100% of our customers buy on credit. Price differential depends on how long customers take credit, at least equivalent to bank interest rate" (retailer, Quyet Thang village, Bao La commune, Mai Chau district).

"We used to offer credit to customers but the capital was tied up and it was difficult to collect debt while this business requires large capital. Thus we now largely limit credit, but would rather sell cheaper than offer credit" (Material shop, My Hoa commune, Kim Boi district).

Masons and transport service providers also allow customers to pay by installments, but to a more limited extent and for short periods (1-2 months maximum).

"70% of our customers pay all upon project completion and the rest pay by installments for part of the total amount" (mason, Sao Bay commune, Dong Cho village, Kim Boi district).

²⁶ The average distance from the district town in the surveyed communes was around 15 km. The most remote communes were up to 50 km from Mai Chau district town but only 22 km from Kim Boi district town.

“We allow slow payment to customers, both projects and households. Projects usually pay 50% when service is provided, then pay the rest when project is completed. For the HH, it is 70% and 30% respectively” (Truck transporter, Dam Sang village, Thuong Bi commune, Kim Boi district).

Cost of financing from financial institutions

Households can access credit from financial institutions, mainly from VSPB. The sanitation credit program offers and interest rate of 0.8%/month (since August 2013, previously: 0.9%/month).

3.4.2 Access to finance by supply chain providers

Retailing requires large amounts of capital. Retailers are the actor in the supply chain that assumes more risks and financial costs as they have to pay up front to most of their suppliers. They commonly have access to only a maximum of 1 month of credit and usually materials and equipment like cement, sand, stone and pans are not sold on credit. This same practice affects brick producers who require plenty of working capital for their production.

“Suppliers allow us to pay by installments for up to 1 month only” (Retailer, Mai Chau town, Mai Chau district).

“The suppliers just allow us to pay by installments for a few days and max 1 month. Previously suppliers offered more credit, but now it has been largely limited” (Brick producer and seller in Nam Thuong commune, Kim Boi district).

Bank credit for supply chain providers is widely available and without significant constraints. Credit lines from Agribank were the most common source of funding among retailers, although other bigger retailers and wholesalers in Hoa Binh city accessed VietInbank. The regular terms of the credit are: Land Use Certificate is requested as collateral; 1 year term with interest rate of around 11-12% at the time of the field trip

However, other options to access financing at lower costs could be explored like the following:

- **Employment generation program** provides financing for working capital and business start-up. The main requirement for accessing this program is to show that the investment will generate employment. Max amount per loan: 100 million in Kim Boi and 20 million in Mai Chau. Interest rate: 0.65%/year; maturity: depending on production business activity (1-5 years, e.g. for business: 1 year). Customers must have collateral assets. Suppliers of construction materials and latrine equipment could borrow loans from this program but the funding is low²⁷.
- **Credit program for production and business households in difficult regions** (except district town). The loans are also managed in collaboration with the four social political mass organizations. Funding is higher but the max loan per household is only 30 million (no need for collateral is required). There is no group lending scheme, only individual loans. Interest: 0.8%/month. Maturity: depending (brick production: 3 years, construction materials trading: 1 year)²⁸.
- **Credit program for enterprises in difficult regions from 2011**: max 500 million per loan. Credit volumes are limited to 1 billion²⁹.

²⁷ Source: VBSP in Kim Boi and Mai Chau districts

²⁸ Source: VBSP in Kim Boi district

²⁹ Source: VBSP in Kim Boi district

Most masons do not need or are reluctant to borrow money from the bank, even if they lack the necessary equipment (mostly cement mixers which they have to rent), due mainly to the low demand for their services in the communes.

3.4.3 Managerial and financial capacities

Because of the competition, margins are very tight in retailing and production, especially for cement. The profit margins for shops and brick producers were around 5-10%, depending on the products provided.

Almost all of the retailers and producers had never attended any training on business management or marketing.

Key findings: Retailers and producers rely on their own experience and the market in terms of pricing. Some knew about the prices of their competitors while others did not. They used different pricing strategies, some set a higher price when they offered credit, or based on higher product or service quality, whilst others offered a lower price aiming to sell a higher volume to bigger customers.

Transport service providers did the pricing based on the distance, road conditions and the volume. They also follow the market price when offering a price.

Masons usually have a daily rate for their labor and some also charged a lump sum for their labor in a project. The rates were different, depending on if they were skilled (150-170.000 VND on average) or assistant masons (120-130,000 VND). There was no competition at village level since the masons group themselves in construction teams. In some cases it affects the price of the service since they set up a monopoly or oligopoly in the village, agreeing between them on the price.

3.5 PLACE

3.5.1 Market linkages with material and product providers and between providers

The sanitation products **wholesaler** in Hoa Binh reported importing directly from Japan, Taiwan and Thailand some of the imported brands through an import agent, while products from local brands were directly acquired in the Vietnamese factories (Viglacera, HC)³⁰. Wholesalers of sanitation products in Hoa Binh city compete with Hanoi wholesalers. Due to Hoa Binh's proximity to Hanoi, most retailers in the districts can contact and buy directly from Hanoi. The wholesaler in Hoa Binh reported distributing products to the entire province and also to other northern provinces like Son La (about 30% of their market), but mainly distributes to other retailers in the districts.

Material producers and retailers in the districts and communes buy materials and equipment (e.g. cement, pans, pipes, fibro cement, steel) from different suppliers/agents in Hanoi, Hoa Binh, Ha Nam, Ninh Binh and Thanh Hoa³¹. Bricks, sand and stone are locally available. There was no reported difficulty found in terms of supply (availability, quality, price), except for the suppliers' credit policy already mentioned. Suppliers may offer a discount for large volume purchases. Some smaller retailers

³⁰ Source: Interview wholesaler, Hoa Binh city

³¹ Source: Producers and retailers IDI

reported cooperating with other bigger retailers sharing transportation or using the bigger supplier transportation to bring small volumes of products from other provinces like Hanoi.

“We have no difficulty working from suppliers in terms of availability. We usually purchase from suppliers in Ha Dong, Hoa Binh. However we are required to pay cash and not allowed to pay by installments.” (Retailer, Quyet Thang village, Bao La commune, Mai Chau district).

“We purchase cement and other products from different suppliers in different provinces such as Ha Tay, Hoa Binh, Ninh Binh, Ha Nam. Bricks and stone are available here.” (Retailer, Ha Bi commune, Kim Boi district).

All **masons** reported not having commercial relationships with sanitation materials or equipment providers.

There was good integration between retailers and **transportation services**. For those retailers who do not own trucks or vehicles, transportation services are widely available.

3.5.2 Market linkages with customers

Retailers and material producers usually sell not only in their communes but also in neighbouring communes, although at small scale. Only a few larger shops in town could cover many communes and even the whole district due to their wider product offerings, strong financial capacity and network with projects/construction companies. They could sell to both households and construction projects (the percentage of each varies depending on each shop – but usually smaller shops focus on household customers while bigger shops could sell to both households and projects).

Some material producers also sell other sanitation products and provide transportation service.

Key findings: As noted, there were no shops where households could find all of the necessary materials and sanitation products required for building a hygienic latrine. The purchasing process involves visiting different shops to get all the materials, which is time and resource consuming.

Masons could work in local areas and/or in other provinces. Many prefer to work near to their home to take care of agricultural production/family responsibilities but there is not always enough work in the local area. Almost none of them offered the service of purchasing materials for the households.

The **water and sanitation credit program** run by VSPB coordinate with social political mass organizations for reaching households, and coordinate with local authorities at commune and village level to provide the financial services.

3.6 PROMOTION

3.6.1 Motivations and perception on the sanitation business

Competition has increased in the past few years, with a large number of product and service providers entering the market. Additionally, proximity to Hanoi increases the competition at wholesale level. Reported profit margins are quite low, ranging usually between 5 and 10%. However, the biggest wholesaler in Hoa Binh reported a sales increase of between 10% and 20% per year on sanitation products.

High season for construction, including latrine construction and sanitation products sales, is from September to December, with less activity between January and March and the rainy season (June-August).

There were varied opinions on demand for construction materials, with some respondents reporting an increase in the past few years while some reported no increase or even decrease in the demand.

The demand for buying materials for latrine construction is more focused in the town and central communes where septic tanks are more common. In more remote communes, e.g. in Bao La commune where most households just used temporary latrines (bucket, hanging latrines) there was little perceived demand for buying materials for latrine construction.

3.6.2 Marketing activities (conducted and proposed)

Most actors in the supply chain do not conduct any active promotional activities. Word of mouth is the most mentioned method to attract new clients. Sanitation suppliers did not show any willingness to invest in marketing activities. The products they sell are general construction materials that are widely available so it is difficult to position and differentiate the business in the market in terms of product. They do not provide any complete sanitation product, product differentiation or any particular added value compared with other retailers.

Key findings: Most actors in the supply chain do not conduct any active promotional activities. Sanitation suppliers did not show any willingness to invest in marketing activities.

Retailers do not promote latrines. They do not have technical information about the materials and products required to build a latrine. Retailers do not provide any technical advice to customers about type of latrines or latrine components.

“We do not do marketing but clients get to know us through words of mouth. We compete by service quality, credit, variety of products” (Retailer, Hoa Binh city).

“We do not conduct promotion and have no intention to do marketing as it is not effective here in this area where people know each other” (Retailer, Mom village, Chieng Chau commune, Mai Chau district).

3.7 BUSINESS MODELS DESCRIPTION. BEST PRACTICES

3.7.1 Product/service

Mason: The model of construction service includes a chief mason (skilled mason and capable of talking to the customers), who receives a request and then forms a group of masons for the job. The chief will organize the work and allowances for the whole group and also pay them according to their parts. This model applies to the septic tank construction as well.

3.7.2 Price

Some local retailers provide financing to all customers in the average range of 3 to 6 months, up to 1 year, e.g. retailer in Bao La, Mai Chau. This financing policy allows them to compete with other bigger retailers with whom they cannot compete on price. Retailers charge the same interest rate for the

term of the financing as the one they pay when borrowing from formal financial institutions financing businesses, which in most cases is Agribank. Whenever businesses provide financing with their own capital, they can earn higher profit for their working capital than the interest rate of bank deposits.

This model allows channeling of direct financing to customers without transaction costs involved and it is able to reach poor households.

The model requires good payments collection management and good communication skills. All payments are usually collected before Lunar New Year, as it is a cultural practice to pay back all debts before a new year starts.

3.7.3 Place

Some materials producers with transport means provide not only the materials they produce but also a wider range of other construction products. They play a 3 in 1 role of material producer, retailer and transportation service. This model increases the margins of the business by achieving economies of scale, and could be one of the best options for setting up one stop shops and simplifying the buying the process. Since they produce one of the main materials required for latrine construction (mainly bricks), they could have higher incentives to promote sanitation than other retailers.

3.7.4 Promotion

No best practices were identified apart from offering financing to customers. Only big companies in Hoa Binh city reported having marketing staff and promotion materials, but mainly oriented to higher end markets.

4 POLICY, REGULATORY, AND INSTITUTIONAL ENVIRONMENT

4.1 SANITATION PROGRAM PLANNING AND IMPLEMENTATION

4.1.1 Goals, strategy and implementation plans definition

Setting Goals:

The national goal on sanitation was set by the Vietnamese Government and is based on the MDG goals included in the NTP3 and in the National Socio-Economic Development Program (SEDP). As the Sanitation Component of the NTP3 was assigned to MoH in late 2011, VIHEMA has worked with MARD for WASH NTP to revise the sanitation goal for 2015. Based on the actual achievements, the goal was adjusted from 75% to 65% for hygienic latrine coverage.

Setting Strategy:

National Strategy on Sanitation: The National Strategy was developed by MARD for the period 2010-2020 for both water and sanitation. The strategy focuses on:

- Reaching the poor through the provision of subsidies

- Raising awareness on sanitation through communication and promotion
- Improving the coordination among related agencies
- Promoting appropriate technology application.

With sanitation assigned to MoH, VIHEMA has worked to develop its strategy for sanitation and has carried out workshops to provide guidelines on sanitation, including sanitation strategies on low latrine coverage areas, low cost sanitation technologies, and sanitation promotion models.

VIHEMA's guidelines for prioritizing and selecting the areas in the province where the NTP3 will be implemented include rates of sanitation coverage, prioritizing areas with the lowest coverage, and selecting communes with good enabling institutional environment. There is also a focus on types of beneficiaries, namely poor, near poor, non-poor and government officers.

Planning:

The NTP3 was developed by MARD in 2009-2010 and was approved by the Government in early 2012. MoH/VIHEMA started to develop the National Plan for Sanitation (2012-2015) in early 2012 under the framework of the already set-up NTP3. VIHEMA has provided support (guidelines, coaching) to all provinces in developing their Provincial Sanitation Plans.

Provincial Sanitation Plan: All provinces (including Hoa Binh) have developed their own Annual and 2012-2015 Plans on Sanitation with technical support from VIHEMA and its mobile team. The Hoa Binh Provincial Sanitation Plan has been seen as one of the best plans. However, it is common that sanitation plans were developed based on the fund availability rather than on the provincial needs and objectives.

"We planned on what we have (amount received from NTP), not on what we need. The financial contribution from the province is very limited" (female, Provincial CPM).

4.1.2 Subsidies and sanitation promotion policy and activities

Recognizing the limitations of the subsidy policy for sanitation, efforts have been made by VIHEMA and Hoa Binh to minimize the amount of funding allocated and used for subsidizing families to build their latrines and increased the amount of funds allocated and used for software (communication, training and supervision). However, the "spirit" of the Government Decision no.366/QD-TTg and the Circular no.04/TTLB leave very little room for change. As a result, the majority of the NTP funds allocated for sanitation have been used as subsidies for the poor and near-poor, and for construction of sanitary facilities in commune health stations.

"Subsidy was given to some poor families only, we need more fund to get more latrine built" (man, District People Committee, Mai Chau).

4.1.3 Implementation capacities

Human resource capacities and training needs

National level: VIHEMA has qualified and experienced officials and staff to perform the planning, management, and supervision roles and tasks related to their role in sanitation. The United Nations and other international organizations have also supported VIHEMA both technically and financially.

VIHEMA has a pool of qualified consultants to support the agency in planning, providing training/coaching, and monitoring.

Provincial level: In most cases, Provincial CPM acts as the focal point for sanitation. Within CPM, the Community Health Section is the key sector that is responsible for sanitation (and some other programs/tasks). In Hoa Binh, this section has 5 staff, with 2 of the staff receiving continuous training. Staffs have been trained on sanitation planning, sanitation technology and some communication activities. While capable of providing trainings to district CPM and commune health workers, due to limited number of staff there is a limited in the number of trainings they can provide.

“Provincial CPM could only reach the district level, but not the commune level” (Female, Provincial CPM).

District/commune level: CPM staff at both provincial and district levels have been trained on sanitation techniques. They all reported that they have the capacity to train staff at grassroots level. Refresher courses are needed for health staff in non-NTP districts. At commune and village levels, there is very limited knowledge on hygienic sanitation options and approaches among health workers and village leaders. This is even more evident in non-NTP communes.

“Can you tell me what hygienic criteria there are for each type of latrine? We need to know them to classify the latrines in our communes.” (Female – FGD - Sao Bay commune, Kim Boi district).

4.2 REGULATORY ENVIRONMENT ON SANITATION

4.2.1 Sanctions and enforcements

At National level:

Policies and regulations issued in relation to the NTP3 are available and strictly followed by planners, managers and implementers. The NTP continues to show less priority to sanitation in comparison to water supply.

MoH/VIHEMA made great efforts in advocating for sanitation through the National Assembly channels. The national Patriot Sanitation Program launched by the President was one of the newly developments in sanitation policy. MoH is working with the Party in issuing the Party’s Resolution on Sanitation. VIHEMA is working on establishing the National Sanitation Association, which will call for more partnership and involvement of the whole society to improve sanitation. VIHEMA has together with the Ministry of Culture and Information applied sanctions and award mechanisms for sanitation by introducing the “Cultural and Healthy Village” Movement and the National Health Standard Commune Program.

So far the criteria for sanitation included in the “Cultural and Healthy Village” Movement are not detailed enough to address hygienic sanitation. The main criteria have focused on eradicating open defecation but not on adequate hygienic practices on latrine construction, use and maintenance.

Other national movements like the WU’s “5 NOs and 3 Clean” do cover sanitation but again do not target specifically hygienic latrines. These have the potential to be included in a more specific way and be coordinated and integrated with the CPM sanitation promotion activities.

At Provincial level:

Most of the national policies on sanitation have reached the provinces either through the PPC or the Provincial line departments. The implementation of those policies however often depends on the level of attention and concern given by the PPC to sanitation.

Hoa Binh is one of the few provinces that have a strong political commitment to sanitation.

“Our role is to provide technical advice to PPC and we work with other departments. All concerned sectors are operating under the direction of the PPC” (Female, Provincial CPM).

At District/commune level:

WASH policies have reached the NTP districts and communes to a limited extent. Guidelines and instructions often go through the line agencies rather than the administration system (DPC/CPC). District/commune authorities and health officials are not fully aware of latest developments in the sanitation sector.

“The RWSS Management Committee is not yet in place. Sanitation is designated to Departments of Natural Resources, Environment and Health” (Male - Commune People’s Committee, Thuong Bi commune, Kim Boi district).

Sanitation policy is often “integrated” in directions for other sectors (water supply, health, culture etc.), without specific instructions on sanitation specifically. Authorities at grassroots level need written instructions from higher levels as a reference in directing and implementing sanitation activities.

District and Commune People’s Councils and CPC have the capacity so set up their own regulations on sanitation, even at village level, taking advantage of the national movements related to sanitation. The capacity to enforce regulations at grassroots levels is very high.

“We need a written document from higher level, based on which we will issue our own directions to the grassroots level” (Male - Commune People’s Committee, Thuong Bi commune, Kim Boi district).

4.2.2 Accreditation, quality control and supervisory roles

The health sector is often designated as the only agency responsible for sanitation. Health officials strongly believe that the sector alone would not be able to bring about recordable improvement on sanitation. The sector should work as “technical advisor” to the local authorities rather than the program “manager”.

“The health sector alone can’t make it. We are technical advisor and we need involvement of many other sectors” (Female, District CPM, Kim Boi district).

Supervision on how policies and regulations have been implemented was seen as the key to success. The current mechanism for supervising the implementation of sanitation policies is very loose and somehow neglected.

4.3 MONITORING AND EVALUATION SYSTEM

Design, structure, processes, activities and information system

The monitoring of sanitation programs has been managed by MARD. It is mainly based on the annual assessment conducted by the Provincial Center for Rural Water Supply and Sanitation (PCERWASS). However, in 2012 when the MoH became officially responsible for NTP sanitation, the health sector reactivated its sanitation monitoring activities that include routine monitoring at commune and district levels and regular supervisions made by provincial CPM to the project sites. Some small scope evaluations have also been conducted by the provincial CPM.

Data are collected by grassroots level staff and then reported to PCERWASS for processing. As regulated by NTP, information and data on both water and sanitation coverage presented by DARD/MARD is considered official.

“Things cannot be done without resources. We need money to carry out supervision activities” (Female, Provincial CPM).

However, there is often a disparity between data reported by the health sector and those reported by DARD/MARD. Though the health sector’s data are not seen as official, there is evidence that this may be a reliable source of information, given monthly/quarterly report mechanisms, detailed sanitation and hygienic standards, levels of reporting (commune, district, provincial and national), and routine supervision.

4.4 SANITATION MARKET DEVELOPMENT ENABLING ENVIRONMENT

Since Vietnam moved towards a market economy the enabling environment has been created to improve investments from different sectors in different markets and products. Unfortunately, little has been done for the development of rural water supply and sanitation private sector. The efforts made by the VSPB to provide credits for sanitation is a good initiative but the level of access to credits is very limited.

Recognizing that WASH activities need the involvement of the whole society, the Government has issued Circular to create a market and services for Rural Water Supply and Sanitation. However, those measures have not reached yet the sanitation market.

MoH/VIHEMA understands that it is impossible to only rely on sanitation activities through the government’s subsidy. VIHEMA plans to establish a Sanitation Association network, with the aim of involving the private sector and other government agencies in the sanitation promotion.

Hoa Binh CPM has suggested to the province authorities to consider a number of options to increase access to sanitation, including tax exemptions or reductions for small and medium enterprises (SME), financing mechanisms for sanitation market by state owned banks, and provide SME with production technologies and means (e.g. molds for concrete rings and or burn brick rings) .

Efforts have been made through VIHEMA, INGOs with the private sector to conduct BCC on sanitation and hygiene, and to facilitate access to materials to sanitation suppliers and sanitation. However, it these efforts were not done in a well-established manner and the health sector would need further coaching and support in working and coordinating with the private sector.

Chapter 3 - Conclusions and recommendations

1 ON TARGET POPULATION AND DESIRED BEHAVIORS

1.1 DESIRED BEHAVIORS

The number of households having a latrine accounted for 87.5% of the total surveyed households, with differences between communes, ethnicity and wealth noted. A total of 27.7% households own hygienic latrine facilities, and the majority of these were septic tanks. More than half of households (55.9%) own unhygienic latrine facilities (such as bucket, bridge or hanging latrines, unimproved pit latrines and single vault latrines). Rates of unhygienic types of latrines were similar between economic groups. Thirteen percent of household did not own a latrine, and this was most common among poor households (19.8%) as compared to the near-poor or better off households (~10%). This was also notably high among the Dao ethnic group (61.5%). In addition, 33% of households without a latrine reported having previously owned a latrine. The interviewer observations indicated a number of deficiencies in latrine construction, use and maintenance, indicating that many of the hygienic types of latrines do not meet the VIHEMA's standards of hygienic criteria. When applying the VIHEMA standards, the percentage of households with a hygienic latrine is less than ten percent (7.5%). In terms of hygienic usage, unsafe practices are reported in relation to maintenance and operation of composting latrines and management of septic tanks. It is concluded that the priority sanitation and hygiene related behaviors include:

- **Desired behavior 1:** Rural households without access to improved sanitation to build or improve their facilities to a hygienic state. This includes both households with no latrine and those with an existing unhygienic type of latrine
- **Desired behavior 2:** Improved the hygienic use and maintenance of latrines. This includes maintenance, usage and cleaning and safe disposal and treatment.

Behavior 1 includes - but is not limited to - targeted efforts to eradicate the remaining open defecation practices.

1.2 TARGET POPULATION

Both NTP3 and INGOs' projects tend to focus their support on the poor and ethnic minorities that represent less than 20% of the population of the province. It is recommended that the provincial sanitation strategy provides an overarching broader and more inclusive emphasis by promoting hygienic latrines under a market – based approach that can cover all socioeconomic strata to be able to significantly increase the hygienic latrine coverage supported by behavior change communication strategies.

Thus, the target population would cover all rural men and women without access to hygienic sanitation. It is inclusive of but not limited to specific groups with higher rates of open defecation, such as Dao or Hmong people.

2 ON CRITICAL DETERMINANTS FOR THE TARGET POPULATION

Determinant/ Marketing mix P/ Institutional factors	Conclusions	Recommendation
Attitudes and beliefs/ Perceptions of affordability Product / Price	<p>There are strong beliefs that a hygienic latrine is an expensive latrine. People associate hygienic latrines mainly with septic tanks with a strong superstructure, and which include in some cases tiling and bathrooms. They are influenced by the examples constructed by better off households within the communities. As a consequence, most people believe that they cannot afford a hygienic latrine. Although they are not satisfied with their existing type of latrine they prefer to wait until they can reach the model, despite other affordable hygienic options being available that would potentially meet their aspirations. Additionally, people are not fully aware of the benefits of having a latrine. Thus, hygienic latrines could be perceived as a facility that only provides more comfort, easier to clean, and smells less (which are noted as important latrine attributes).</p> <p>This also translates into misconceptions about the criteria for a sanitary latrine within the health and commune leaders. At the same time, the sanitation market is geared towards meeting these high end consumer needs and preferences, also being the most profitable segment of a market characterized by a strong competition and low margins.</p>	<ul style="list-style-type: none"> • Develop, target and test behavior change communications that include social marketing strategies that increase exposure to and promote the concept of affordable hygienic latrine options and products, that still meet their consumer preferences (Link to Product attributes and Motivations). • Increase the government resources allocated to software for promotion and communication activities that raise and expand people's awareness on hygienic latrines and their benefits. • Link supply chain providers with health network and mass organizations for coordinating sanitation promotion, communication and marketing activities (see business models section).
Knowledge Product / Price	<p>A key barrier towards improving access to hygienic latrines is the limited knowledge on the market cost of latrines and affordable options, and the different types of latrines that may be available.</p>	<ul style="list-style-type: none"> • Incorporate supporting communication tools within the BCC strategy to address the knowledge gap. This could include informed choice catalogues and sanitation marketing materials for supply chain providers, specifying the amount of materials for each type of latrine and total prices (set up

	<p>An additional barrier refers to the lack of knowledge on the links between health and using a hygienic latrine. People are conscious about their lack of knowledge on sanitation related topics and believe it is a matter of importance, but lack enough information that limits and inhibits the decision on building a hygienic latrine.</p> <p>There is also limited knowledge in terms of the use and maintenance requirements for the different types of latrines, posing important health risks for the entire population. These mainly relate to the use of untreated human feces, lack of desludging of septic tanks, and poorly built substructures with open tanks, unsealed tank doors, etc. as noted through latrine observation.</p> <p>The supply chain does not provide market information on affordable latrine options or full costs for different types of latrines, and the health network does not provide accessible information on costs and options. Thus, it is very difficult for the households to judge the total price of a latrine, its maintenance requirements and the different options available.</p>	<p>by the provider) for each component and the entire latrine that meets their consumer preferences and in a way that is visually understandable. Specific maintenance and servicing requirements could also be included.</p> <ul style="list-style-type: none"> • Use interpersonal communications and existing health channels to raise people's awareness on the benefits of having a hygienic latrine and on safe hygienic usage. • Specific activities to raise the awareness of the health risks related to open defecation, with focus on for ethnic minorities with higher open defecation rates. Available materials adapted to ethnic minorities could be applied (CLTS for ethnic minorities). • Involve sanitation supply chain providers with community communication activities.
<p>Affordability</p> <p>Price and Product</p>	<p>There is a gap between perceived and real affordability caused by the high price of the ideal latrine. This factor, coupled with reluctance to access loans for latrines, and insufficient savings, poses a barrier to hygienic latrine acquisition.</p> <p>According to the reported amounts that households could afford to spend in a latrine, at least 76% of them could afford to build a hygienic latrine.</p> <p>Reducing the perceived cost of a hygienic latrine could motivate households to enter in the sanitation market without further low cost technology adaptation.</p> <p>Still, 24% of the households could only afford to build hygienic latrines (most of them in the range of 1-2 million), like the improved pit. There</p>	<ul style="list-style-type: none"> • Link the concept of affordability to the behavior change communication campaign so that it reinforces the affordability of having a hygienic latrine, and the available options, to ensure it is perceived as affordable to all economic segments. • Include the promotion of affordable technologies and the use of local materials to reduce the cost of latrine construction. • Promote more integrated sanitation solutions according to the households' preferred latrine attributes (durable, clean, easy to use and clean, mainly septic tank and soakage pits) and maximize the opportunities that reduce the costs. • Test product bundling options to simplify the buying process. • Develop latrine components that could facilitate material producers entering the sanitation market and becoming

	<p>are opportunities to make the market more inclusive by reducing the cost of durable and desired latrines introducing low-cost technology adaptations for septic tanks or soakage pits.</p> <p>The lack of standardized sanitation technologies or integral sanitation solutions provided by the supply chain at household level also increases the transaction costs of building a latrine.</p> <p>People are reluctant to borrow money for building latrines. Additionally, there are high debt rates in the surveyed area which could dissuade people from borrowing from the sanitation credit program. However, direct financing from retailers allowing customers to pay by installments is common practice and appreciated by customers.</p>	<p>specialized sanitation products providers (for example, developing concrete rings producers for latrine construction).</p> <ul style="list-style-type: none"> • Explore the options to provide loans to sanitation product producers and suppliers from one of the VSPB credit programs to reduce the cost of financing in the supply chain. For example promoting and facilitating access to the ‘employment generation program’, or other preferential rates credit program by VSPB targeting businesses, to sanitation material producers and retailers.
Product attributes Product	<p>Cleanliness and lack of smell are the main desired attributes of a latrine and these were mostly associated with the septic tank and ceramic pans. Squat pans are the most preferred because of their low cost. Reducing the cost of solid underground and super structures could allow many households to enter the market without sacrificing other desired attributes such as durability and easiness to clean.</p>	<ul style="list-style-type: none"> • Address the preferred product attributes and physical drivers within the social marketing campaign noted above. • Test and promote affordable options for different types of hygienic latrines and components that meet the preferred attributes, like septic tanks with cement or brick rings. Promote more affordable solid superstructures using locally available concrete bricks. • Developing improved technologies for more affordable hygienic types of latrines could considerably increase the rate of hygienic latrines at a low-cost for households, especially among the poorest households. This could be further supported by behavior change communications to promote safe practices.
Emotional, physical and social drivers	<p>Cleanliness and modernity are the main drivers for building a hygienic latrine, particularly for women. The first one is related to the product attributes while the second is more related to the regulations, the social norms and the relationship between them (the influence of the social movements on the development of social norms).</p>	<ul style="list-style-type: none"> • Develop a communication campaign putting the emphasis on those drivers to increase people’s willingness to invest in a hygienic latrine.
Access	<p>The hygienic coverage rate according to the results from the observation checklist is very low (7.5%) compared with the secondary data used for the selection of the communes (38.3% on average). Data</p>	<ul style="list-style-type: none"> • Monitoring and supervision activities should be assigned to village and commune health worker as a must-to-do task.

	<p>was collected by surveyors trained on the MoH criteria on hygienic latrines and carefully collected during households' visits. The significant difference between results suggest the constraints of the latrine monitoring procedures and the supervision of the health network on assessing the hygienic criteria of latrines, since many health workers have not been trained in the specific criteria.</p> <p>Poverty does not seem to be the main factor explaining the high rate of unhygienic types of latrines, since rates are similar between poor households (57.2%), near-poor (59.6%) and better off (54.0%) households.</p> <p>Masons are widely available in the villages but they are not the main source of information and advice on topics related with building latrines. Masons are not particularly focused on building latrines and have other working priorities like building houses or working in other communes or district towns.</p>	<ul style="list-style-type: none"> • Data collectors should be trained on sanitation techniques (criteria, standards) and on M&E framework. • Data collected and reported by the health sector should be recognized as official. • Access to information on topics related to building latrines should be improved, particularly from a reliable source at village level.
Skills Price	<p>Most households that have a latrine built it themselves or with the support from relatives, neighbors and friends, but without complying with technical requirements, leading to very low rates of hygienic latrines.</p> <p>There is a strong preference for self-construction and potential for households contributing labor and materials to reduce the cost and increase the actual affordability.</p> <p>There is though a need to provide technical instructions to masons (most unskilled or not formally trained on latrine construction) and potential latrine suppliers on building hygienic latrines. Technical supervision of the latrine construction needs to be improved to increase the latrine quality and compliance with the hygienic criteria.</p>	<ul style="list-style-type: none"> • Include motivational messages in the communication campaign, emphasizing the capacity of households to contribute to build their latrine while at the same time highlighting this as affordable. • Include technical instructions in the promotion materials related to the household contribution to the construction of the latrine (for example, digging the pit). • Use interpersonal communications and existing health channels with support of printed material to raise people's awareness on the risks of untreated human feces. • Develop and test simple and understandable technical material on latrine construction for sanitation supply chain providers. • Set up an accreditation mechanism on latrine construction for trained masons.

	<p>In terms of hygienic usage and access, most households use human feces as fertilizer but do not safely treat the feces which currently present health risks. At least 34.5% of the existing latrines are composting latrines, all of them built or used in an unhygienic way.</p>	<ul style="list-style-type: none"> • Define responsibilities on latrine construction supervision at village level.
<p>Intentions, willingness to pay and competing priorities</p> <p>Price</p>	<p>Once people are aware that they could afford to build a durable type of hygienic latrine, their intentions in terms of planning (currently long term or undefined) could be put into action and supported by financing mechanisms. Supply chain financing mechanisms guarantee that households are investing in a latrine, preventing them from spending resources from loans on alternative uses.</p> <p>There is no sense of urgency to have a hygienic latrine. Unhygienic latrines are considered normal, and households are not receiving information or pressure from local authorities on regulation of hygienic latrines. This influences the lack of urgency to build hygienic latrine.</p>	<ul style="list-style-type: none"> • Once people are aware that they could afford to build a durable type of hygienic latrine, their intentions in terms of planning (currently long term or undefined) could be put into action supported by financing mechanisms. • Facilitate low cost and cost efficient supply chain financing mechanisms, exploring options like connecting supply chain providers with local promoters belonging to mass organizations in facilitating and managing sanitation financing to households. • Additional awareness on the urgency of having a hygienic latrine should be raised to speed up the decision making process. Communication activities could highlight this regulation.

<p>Sanctions and enforcements</p>	<p>Government structure and socio-political networks have the potential capacity to transform regulations into social norms through mass movements like the <i>Cultural Family or Village</i>, the <i>3 Clean</i> or the <i>New Rural Program</i>. Specific regulations on hygienic latrine must reach villages and communes through one of those channels in order to be effective.</p> <p>The existing social norm rejecting open defecation in the main ethnic groups in the survey area does not apply yet to other ethnic minorities like Dao or Hmong people.</p> <p>The existing monitoring and reporting system lacks reliability and shows constraints in terms of technical capacity of the staff in charge of the supervision.</p>	<ul style="list-style-type: none"> • Reinforce the regulatory mechanism on hygienic latrines through a review of regulations and criteria of the New Rural Development Program, the National Health Standard Commune Program, the WU “5 NOs and 3 Clean” Program and the Cultural Village Movement. • Make sanitation (hygienic latrine) a mandatory criterion of the Cultural Village Movement. • Establish new procedures of monitoring/supervising progress/achievement for awarding • Implement monitoring, evaluation and reporting following the M&E framework/guidelines recently developed by VIHEMA. • Reinforce the regulation on having latrine with awareness raising activities like CLTS adapted to ethnic minorities groups. • Develop simple software for reporting progress (used and updated by all levels). • Use external consultants to evaluate the impact of the program, focusing on that of communication and regulatory enforcement. • Draw lessons-learned and experience sharing with other districts and provinces.
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3 ON COMMUNICATION CHANNELS

The following are the most recommended communication channels for implementing a behavior change communication campaign.

	Channels	Conclusions	Recommendation
Mass Media	Television	<p>TV should be considered as a supporting but not main channel of the communication campaign.</p> <p>The focus of this channel should be general awareness and motivation to promote any kind of sanitation movement at mass scale.</p> <p>It is not suitable to support the decision making process at household level or to provide detailed or technical information.</p>	<p>This channel should play the role of a supporting channel</p> <ul style="list-style-type: none"> - Potential as part of a social marketing campaign that includes interpersonal communications. - Try to use existing materials or coordinate with campaigns at national level. - Broadcasted between 18:30-20:30
	Loudspeaker	<p>Attractiveness of the messages must be improved to increase the effectiveness.</p> <p>Preferable as supporting channel to regulations dissemination.</p> <p>Not for technical or detailed information on sanitation.</p>	<p>This channel should be used as supporting channel only</p> <ul style="list-style-type: none"> - Can be used for short notice or announcement for information purposes. Especially in case of announcing regulations, circulars, decision - Gather people for community events (meetings) - Update sanitation situation of the village
	Mobile phone	<p>Mobile phone text messages can be used as a supporting channel of communication campaign on awareness raising</p>	<ul style="list-style-type: none"> - Content of information should be very precise, simple and short so that even the simple mobile phone models can receive/decode them. - Find a way to distinguish from spam messages; give users an option to unsubscribe. - It should be used for announcement and advertisement than knowledge provision.
Direct consumer	Community / organizational meetings	<p>Most preferred channel, but must be conducted in a more dynamic way and supported by printed material.</p>	<p>This is a key channel</p> <ul style="list-style-type: none"> - Can be used for both awareness raising and knowledge provision - Allocate sufficient time of facilitators for this activity - Building capacity for facilitators is required

		<p>Best channel to introduce peer pressure and collective action mechanisms suited to different contexts.</p> <p>Previous training of facilitators by upper levels is required.</p> <p>Resource intensive at scale.</p>	<ul style="list-style-type: none"> - There should be separate events (meeting, workshop) for only sanitation and hygiene topic organized regularly - Provide supporting printed material like leaflets, posters or flipcharts. - Combine with peer pressure mechanisms like the village mapping, village planning, village goals, collaborative groups' organization, etc.
	Promotional Events	<p>Most participatory and motivational channel, with potential to involve the entire village, but needs to be conducted in a cost effective way.</p> <p>It requires support and supervision from upper levels.</p>	<p>This is a supporting channel</p> <ul style="list-style-type: none"> - Can be combined with sanitation marketing activities and peer pressure mechanisms like village planning or village goals, collaborative groups' organization, etc.
	Demo latrine	<p>This channel is very important and should be used as a main channel of communication. It is useful for both awareness raising and knowledge, skill provision. However, it should be implemented carefully to ensure the effectiveness.</p>	<ul style="list-style-type: none"> - To make it effective, the demo latrine construction should be carried out as a part of a training workshop. - Type of demo latrine should be selected based on the demand of HHs - Pay more attention to attract/mobilize as many HHs as possible to attend/visit and learn - Taking pictures of main steps for reference by HHs later
Interpersonal communication	Home visit / peer support	<p>Can be targeted and linked to sanitation marketing /supply chain activities.</p> <p>It is the most personalized channel.</p> <p>Outreach cannot be guaranteed without incentives.</p>	<p>This is a key channel</p> <ul style="list-style-type: none"> - Linking with commercial activities of the promoters and economic incentives. - Assign this channel to mass organizations, preferably the Women's Union. - Combine both awareness messages with specific products promotion. - Build capacity of facilitators - Combine with printing material (product catalogue, leaflets). - Contact info should be provided to HHs after the visit.

Promotion materials	Leaflet	<p>Only cost effective and good outreach if properly used and combined with interpersonal communications.</p> <p>Need to be simple, easily readable, no need to include complex technical details or much text,. A more marketing approach is needed.</p>	<p>This is a supporting channel</p> <ul style="list-style-type: none"> - Use it as promotional and marketing material, not as a manual for building latrines. - Link the distribution with activities of a commercial network. - Involve the supply chain in the distribution and coordination with village level agents (last mile).
	Video tape /DVD	Can be targeted and integrated as part of interpersonal communications or community activities. Adequate channel to show technical and more detailed information.	<p>This is a supporting channel</p> <ul style="list-style-type: none"> - Potential as part of interpersonal communications to provide technical / knowledge based information. - Resource for commune health station, village head and village health worker for showing at village meeting on sanitation and hygiene - Short duration to keep people's attention (10-15 min). - Could be used as a training tool for masons' teams.
	Posters	<p>Good supporting channel to combine with direct consumer contact activities, mostly in public places to increase outreach.</p> <p>Improve design and more market oriented to increase impact. Not good to provide technical information.</p>	<p>This is a supporting channel</p> <ul style="list-style-type: none"> - Use for awareness and marketing. It needs to be very visual and attractive. - Visually link benefits of having a latrine with the attributes of the desired latrine.
	Manual / product catalogue/ flipchart	<p>Most manuals have been designed for upper user levels, not village level.</p> <p>Most technical manuals are still too complex to read and not visually clear or attractive.</p> <p>The use of drawings does not provide a clear visual to the customer about the product that could have.</p> <p>Need to be produced in a cost effective way.</p>	<p>This is a key channel</p> <ul style="list-style-type: none"> - Use for trainers, facilitators and motivators and not for HHs. - Use it as a marketing tool and not as an educational tool. - Supports interpersonal communications.

4 ON PRODUCT DEVELOPMENT

The following sanitation product testing and technology adaptations are recommended in order to increase the affordability and inclusiveness in the sanitation market, particularly of poor households.

- **Vertical brick layering for ring tanks:**

Ring tanks made of red bricks: each ring has 900mm diameter and 630mm height. Each ring consists of 3 vertical layers of bricks (20 bricks per layer). One ring would then require 60 pieces of bricks. A pit would need 2 rings (120 pieces of bricks). The brick rings could be very affordable.

- **Concrete rings for septic tanks:**

It is a similar adaptation as in the option above, using concrete to produce the rings instead of bricks. This option allows off-site production, and larger scale production, allowing a significant cost reduction. Molds are used to produce the rings. Different mold sizes allow for differently sized rings.

- **Use of concrete bricks:**

Their advantage is that the technical requirements for production are very simple. Concrete bricks are cheaper to produce than red bricks and can be produced locally. This reduces transportation costs and the need for transportation. Testing could be conducted on how to improve the quality of the concrete composition (right proportion of cement/gravel/sand) to be able to use it for latrine substructures at reduced costs. Additionally, it is recommended to conduct tests to accurately estimate the cost reduction in superstructure construction when using concrete bricks instead of red bricks.

5 POTENTIAL BUSINESS MODELS

Based on the above analysis of the supply chain, the following business models are recommended:

5.1 MODEL 1: ONE STOP SHOP (OSS) MODEL FOR RETAILERS

As described in the supply chain section, the purchasing process is complicated given the materials and products required for building a latrine cannot be found in a single location. There are no supply chain providers (or group of providers) who offer a full service for a latrine construction/installation. Households must separately acquire construction materials, sanitation products and hire construction services for building a latrine, which is time consuming, more costly and works as a disincentive. According to the survey, the OSS model would be appealing to households due to lower costs at higher convenience and thus could be explored for development. It is recommended to establish OSS as part of existing businesses rather than establishing new businesses due to the risks associated. Below is the detailed explanation of this business model:

5.1.1 1A. One-stop-shop model (providing all latrine components and materials, without masonry service)

5.1.1.1 Product/Service:

- Product “bundles” being a consolidation of all latrine components, materials and guidance at a single ‘One-stop Shop’ location to simplify the purchase process for customers.
- Some of the existing retailers mostly in district Centers are already offering a wide range of products related to sanitation, although shops at commune level are the ones that need to be strengthened the most.
- As the current supply chain is not providing standardized sanitation technologies or integrated sanitation solutions at household level, the OSS should offer standardized designs and technologies at different prices. They should provide a package of materials, sanitation products and services, and offer a catalogue of latrine options to customers at the shop, so they customers understand the advantages and disadvantages of each type of latrine before making a decision (including information on use, longevity and maintenance).
- As selling only latrine components may not be financially feasible for shop owners (revenues may not be enough for long term business viability as survey results show), the OSS may sell also materials for general construction.
- The OSS should offer associated services including credit, transportation and delivery or installation services of latrine components like pans or pipes.

5.1.1.2 Price (financial resources, access to finance)

Resources

- OSS are recommended for existing businesses already working in the construction/sanitation sector in terms of diversifying rather than establishing new businesses.
- The preconditions to become an OSS would be:
 - o Adequate space and convenient location for product display and stock.
 - o Good credit history and Land Use Certificate to guarantee access to credit.
 - o Means of transportation available (trucks, small vehicles) for delivery services (preferred but not required, transportation service offered to customers in any case).
 - o Good communications skills.
 - o Good financial management capacities (basic accounting, financial calculations).

Customer financing service

- Up to three months of credit term. Try not to extend the lending term more than 6 months.
- Bulk purchases/group purchase discount policy that could be offered during the village meetings or through recommended masons.

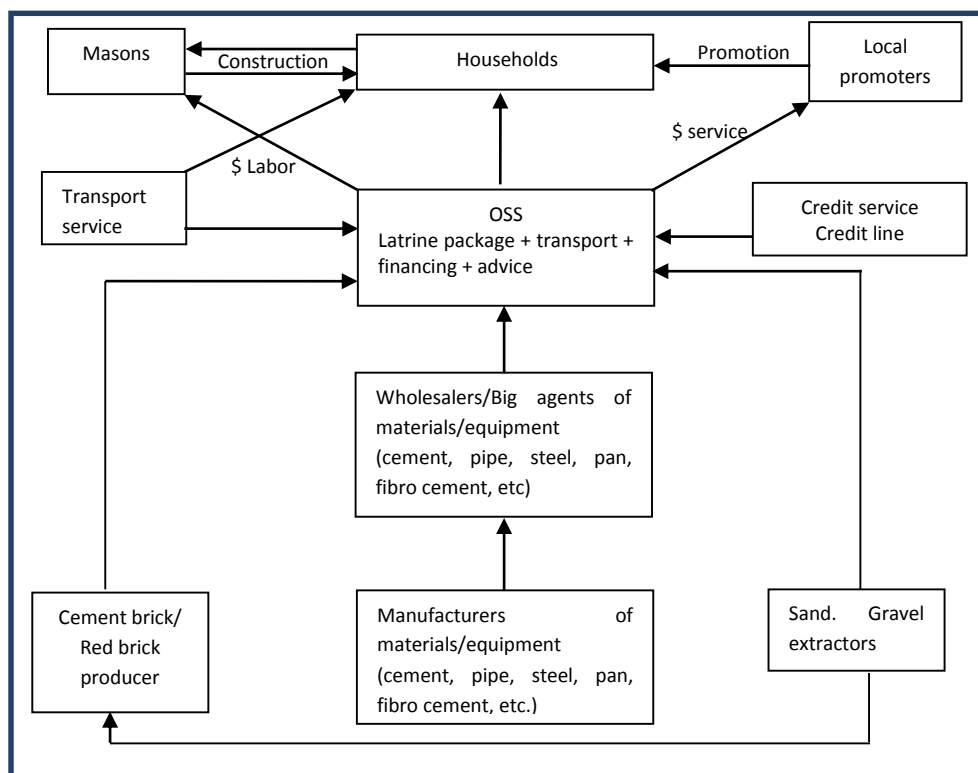
5.1.1.3 Place

- The target customers could be all households in the local area without latrines or with unhygienic latrine types within a feasible distance.
- One OSS could provide service to several communes.
- Information and marketing on hygienic latrines could be delivered to potential customers with support from mass organizations staff (e.g. WU). In addition, OSS owners should be trained in promotion skills and engage in interpersonal communication and direct consumer contact activities like village meetings, which are usually the most effective in rural settings.
- Connection with masons at village level should be promoted so they can refer each other to customers for service and product delivery. Masons could directly contact the OSS and help to plan and coordinate the materials transportation and latrine construction.

5.1.1.4 Promotion

- The OSS model could be built on some existing larger shops which offer a relatively wide variety of latrine equipment and materials to customers in the 2 districts. Promotion activities of this model should be implemented with support of local authorities. OSS can explain the products (as package) they sell in some village meetings and also contact and inform trusted masons so they can promote their products and services.
- Commission on sales could be offered to masons without any further working relationship.

Chart 22: Business model 1a supply chain map



5.1.2 1B. One-stop-shop model (providing all latrine components and materials, with masonry service)

This model has similar characteristics as above but also offers masonry service as a complete package service to the clients. This would require the OSS owner to possess strong management and financial capacity, a team of skilled masons as well as good marketing skills.

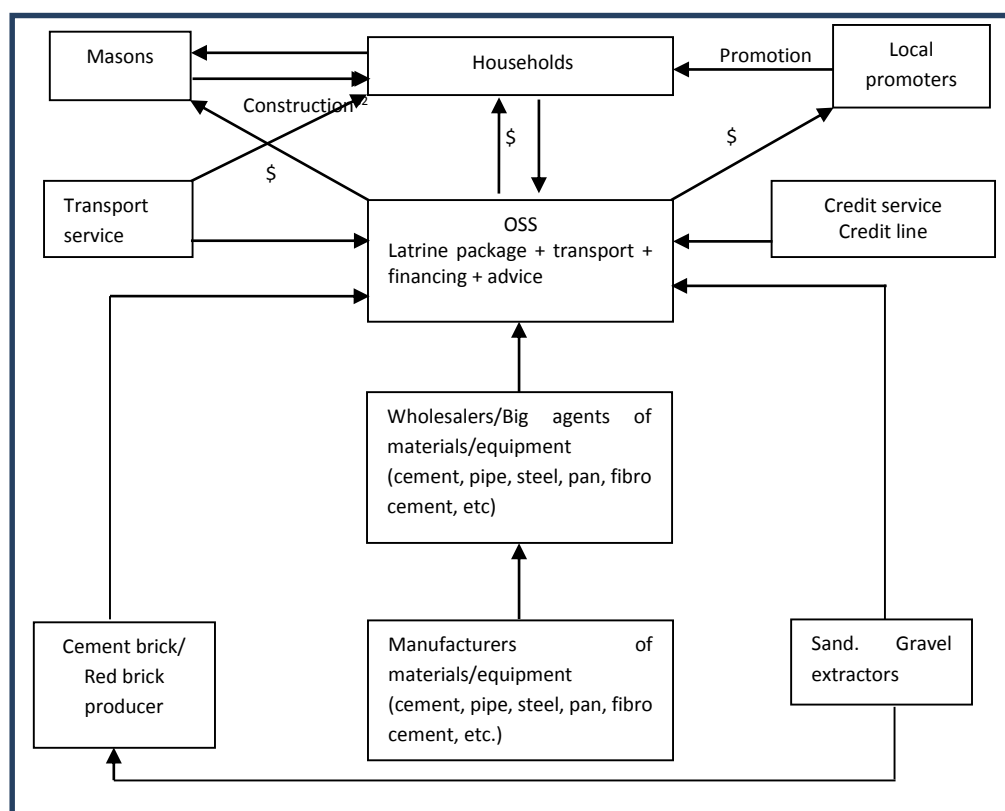
The model would require a more stable and close relationship between the retailer and the masons. The OSS should select masons that are permanently located in the village or commune, at least for the latrine construction in the high season. Also, it would be recommended to select a team of masons composed by master and assistant masons, instead of only a skilled mason, in order to reduce the risk of masons leaving the village or not being available at the time when the service needs to be provided.

Standard construction rates according to each type of latrine should be agreed between the OSS and the masons.

Full payment of the service would be received by the OSS from the customers, including labor costs.

This model could be applied after the earlier model (without masonry service) has been introduced successfully. The early adopters could be better off households.

Chart 23: Business model 1b supply chain map



³² Masonry service would be provided by the OSS, either with permanent staff or by collaborating with local masons

5.1.3 SWOT analysis (including analysis of scalability and inclusiveness, and comparative advantages with other models)

Strengths	Weaknesses
<ul style="list-style-type: none"> - Households can acquire all materials and products and establish only one commercial relationship with a provider for building the latrine and reducing transaction costs. - Lower transportation costs, with one supplier centralizing the transportation of all materials and products. - When having a permanent installation team (1b) it does not depend on local masons' skills. May result in better installation and quality control. - Facilitates providing supplier contact information to households by local promoters during community meetings or interpersonal communication activities. - Economies of scale for suppliers on buying sanitation products and materials, increasing commercial margins. - Facilitate customer financing through linkage with local promoters belonging to mass organizations. 	<ul style="list-style-type: none"> - Requires good management and communication skills to set up a wide distribution network. - New products need to be introduced in the market. - Large amounts of capital required if willing to provide deferred payment to all or most customers.
Opportunities	Threats
<ul style="list-style-type: none"> - It requires developing full latrine packages as products, promoting technology adaptations that use less or low cost materials and reduces costs. - It creates a specialized sanitation provider focused on providing integral latrine solutions. - Developing a distribution network through the Women's Union could allow to integrate in the service provided by the local promoter the financing management, decentralizing the collection at village level and taking advantage of the Women's Union experience in managing credit schemes. 	<ul style="list-style-type: none"> - Not reaching sufficient scale would demotivate local promoters to conduct marketing and interpersonal communication activities. Sales commissions must be well estimated to introduce enough incentives in the sales force. - Sanitation market is not a recurrent market so once the initial promotion campaign has finished promoters could lose the incentive to keep motivating remaining households to build latrines.

5.2 MODEL 2: CONCRETE RING PRODUCERS 2.A. MEDIUM SCALE COMBINED OFF-SITE / ON-SITE PRODUCTION AND INSTALLATION BY PRODUCERS

5.2.1 Product/Service:

- In this model a local business produces the concrete rings at a workshop, transports and delivers the concrete rings to the customer and installs the latrine. Different latrine options could be provided like soakage pits or septic tank latrines.
- Ideally, the producer would provide the full equipment and service, including not only the concrete rings, but also the pan, PVC pipes and installation service. The concrete rings would become OSS by managing the purchase and transportation of other latrine components.
- Additional products to the concrete ring could be produced at the business workshop, like cement slabs, adding more value to the service delivered to the customer.
- Alternatively, the concrete ring producer would provide only the equipment without installation service but providing instruction to the customer so they can install the latrine by themselves if they have basic masonry skills or with the support of a local mason.

Selection criteria for service providers

Essential:

- Existing financial capacity and access to capital.
- Willingness to make investment in latrine concrete rings molds and minimum stock.
- Entrepreneurship, initiative and interest in the sanitation market.
- Good communications skills.
- Existing concrete ring producers for water pipes or other purposes will be the recommended option to adapt and expand their businesses including latrines.

Desired:

- Transportation means (trucks, small vehicles) owned or transportation service offered to customers.
- Experience in providing installation service of concrete rings.
- Experience providing services to households.
- Experience providing credit to households and managing payments collection.

Alternative options:

- Another option allowing scalability of the model where concrete ring producers are not available would be small construction companies or skilled masons with interest in expanding their businesses and sufficient financial capacity to provide the service.

5.2.2 Price (financial resources, access to finance)

- This business model can reduce total latrine costs (see Table 29: Latrine price matrix in supply chain section) as well as transaction costs, simplifying the purchasing process and reducing the time spent by the household on looking for advice, travelling to the retailers' shops to buy different materials and products (or paying for transportation of each of them) and looking and paying of a mason to build the latrine.

- This model has low investment requirements (when fulfilling the mandatory requirements defined above), low risk (low stock) and flexibility in terms of both demand response and adaptability to customer requirements and geographical conditions (service could be provided on-site or off-site).
- The concrete ring producer offers a price either for the full latrine installation or only for concrete rings, depending on the selected option above.

Resources:

- The capital and investment requirements to be a concrete ring OSS would be:
 - o Need to invest in ring molds. Existing businesses would not have many constraints in ordering additional molds to the ones they own for water rings production. Need to adjust to the technical requirements of latrine construction.
 - o In the full service model, need to invest in working capital not only to produce the rings but also to buy other latrine components and be able to offer delayed payment to customers.
 - o Preferably workshop ownership. Adequate space and convenient location for rings production, display and stock.
 - o Good credit history and Land Use Certificate to guarantee access to credit.
 - o Good financial management capacities (basic accounting, financial calculations).
- In terms of access to finance, as mentioned in the Financial Providers assessment, access to preferential loans through the employment generation program could benefit the development of the business. A business plan linked to the promotion campaign from the CPM could be developed endorsing the loan application. Preferential loans to service providers would allow them to pass on lower financial costs to customers.

Customer financing service:

- Up to three months of credit term. Try not to extend the lending term more than 6 months (as current common practice, maximum until lunar New Year (Tet)).
- Bulk purchases/group purchase discount policy that could be offered during the village meetings or through recommended masons.

5.2.3 Place

- The target customers could be all households in the local area without latrines or with unhygienic latrine types within a feasible transport distance.
- The concrete ring OSS could provide service to several communes.
- The production process takes place in the producer workshop, which guarantees a better quality control. However, it would be desirable that the concrete ring OSS provides on-site ring production service allowing the business to attend more remote areas where transportation is riskier and more expensive. The enterprise would bring the molds and produce the rings at the customer's place.
- Distribution and installation could be done either by permanent staff of the business (in-house installation service) or by masons in the village. For this second option, stable relationships with masons at village or commune level would be desirable.

Additional and alternative options:

- Concrete ring producers could also distribute concrete rings through sanitation retailers in order to expand the market and reach economies of scale as soon as possible.

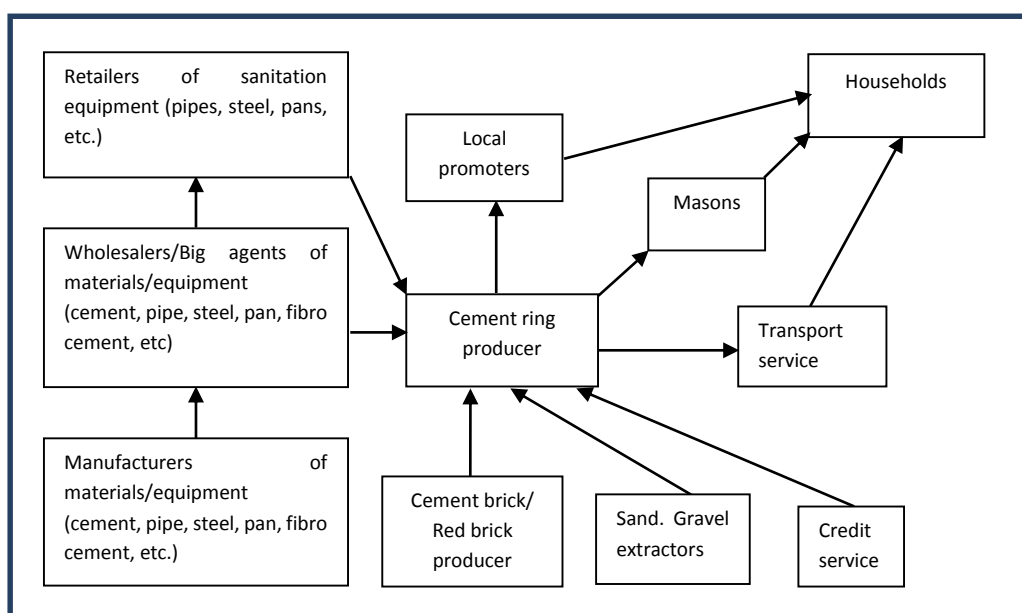
5.2.4 Promotion

- As concrete ring latrines are not known in the 2 surveyed districts in Hoa Binh, the local authorities, particularly health authorities should promote this type of latrine through official channels, including distribution of leaflets of this latrine, village meetings, etc. The WU also could promote this latrine through their channels, e.g. by integrating in current WU promotion activities. These activities will help create the demand for this product (showing clearly that this is a cost effective option for building a latrine, and much cheaper than latrines built by bricks).
- Channels of promotion could be through support of social marketing by local authorities and mass organizations (e.g. health, WU). In addition, OSS owners should be trained in promotion skills and engage in direct consumer contact activities, which are usually one of the most effective promotion methods in rural settings (e.g. village meetings).
- Establishing commercial relationships with mass organizations members could provide the necessary distribution network to the business to reach the optimum sales scale and ensure that direct product promotion is reaching the households at village level (last mile). Commission on sales could be offered to Women's Union members or other local promoters.

Alternative options:

- Local promoters (WU promoters or health workers) as village agents could constitute a more suitable scheme when including as part of their role the organization, management and supervision of sanitation collaborative groups. This activity would include the coordination with masons' teams in the village to design a construction plan and guarantee their availability. It could also contain the coordination with financial providers to provide sanitation loans for the collaborative group.

Chart 24: Business model 2 supply chain map



5.2.5 SWOT analysis (including analysis of scalability and inclusiveness, and comparative advantages with other models)

Strengths	Weaknesses
<ul style="list-style-type: none"> - Households can associate a latrine with a product (Promotion and marketing materials should link concrete rings with the cement slab and ceramic pan as in the easy latrine). - Economies of scale in centralized product production and delivery. - Better quality control of the centralized production process. - Lower customer transaction costs. - Lower transportation costs. - When having a permanent installation team it does not depend on local masons skills. Better installation quality control. - It reduces the training needs and costs of technology promotion in different communes. - One business could attend an entire district. 	<ul style="list-style-type: none"> - Requires good management and communication skills to set up a wide distribution network. - A new product needs to be introduced in the market. - Product range offered only for wet latrines. - Large amounts of capital required if willing to provide deferred payment to all or most customers. - It does not include the superstructure which is one of the most important attributes for households.
Opportunities	Threats
<ul style="list-style-type: none"> - It substantially reduces the costs of latrines among customer desired options, making the market more inclusive. - Creates a specialized sanitation provider focused on providing integral latrine solutions. - Developing a distribution network through the Women's Union could allow to integrate in the service provided by the local promoter the financing management, decentralizing the collection at village level and taking advantage of the Women's Union experience in managing credit schemes. 	<ul style="list-style-type: none"> - Not reaching sufficient scale would demotivate local promoters to conduct marketing and interpersonal communication activities. Sales commissions must be well estimated to introduce enough incentives in the sales force. - Sanitation market is not a recurrent market so once the initial promotion campaign has finished promoters could lose the incentive to keep motivating remaining households to build latrines. - Not having enough incentives for the business to attend more remote areas with the on-site production model.

Annex

- 1. QUANTITATIVE ANALYSIS TABLES AND CHARTS**
- 2. LATRINE CONSTRUCTION MATERIALS PRICES MATRIX**
- 3. LITERATURE REVIEW**

1. Quantitative analysis tables and charts

Table 30: Demographic, Poverty and Sanitation Data of Kim Boi District (Extended)

Commune	Population	Poor Households	Ethnic Minorities	HH with latrine	HH with hygienic latrine	HH with no latrine	HH w access to clean water
	N	%	%	%	%	%	%
Tu Son	6,474	28.8	93.7	53.5	15.2	46.5	65.0
Du Sang	5,141	54.1	97.9	99.1	26.9	0.9	61.3
Vinh Tien	6,119	34.5	65.6	100.0	52.8	0.0	99.4
Binh Son	2,470	48.9	94.1	100.0	11.2	0.0	10.9
Bac Son	3,013	29.3	93.9	69.4	18.6	30.6	61.9
Son Thuy	2,738	30.7	98.4	100.0	51.4	0.0	58.6
Hung Tien	2,002	38.9	97.7	100.0	9.0	0.0	49.0
Nat Son	2,361	40.6	99.5	93.8	38.0	6.2	74.9
Dong Bac	3,581	23.7	92.9	87.7	17.9	12.3	59.7
Vinh Dong	4,412	8.0	95.3	100.0	55.3	0.0	89.1
Hop Dong	3,537	33.1	99.2	79.1	43.2	20.9	67.6
Thuong Tien	1,244	56.6	98.6	100.0	18.3	0.0	100.0
Thuong Bi	2,597	26.8	98.7	86.3	4.5	13.7	34.7
Ha Bi	5,789	28.8	88.3	96.6	52.8	3.4	70.7
Kim Tien	4,208	19.3	97.5	98.0	37.6	2.0	83.7
Trung Bi	2,423	16.3	98.7	100.0	21.2	0.0	98.6
Kim Binh	4,210	14.3	88.3	98.3	33.4	1.7	30.0
Bo town	2,810	4.2	25.6	99.5	97.6	0.5	100.0
Kim Boi	3,578	21.4	97.6	86.4	60.6	13.6	83.7
Kim Truy	4,091	33.7	99.5	76.2	7.4	23.8	32.1
Cuoi Ha	6,893	43.0	99.0	92.1	5.2	7.9	14.5
Hop Kim	2,587	21.4	81.9	96.8	45.2	3.2	46.7
Kim Son	3,220	26.8	98.6	100.0	38.3	0.0	43.7
Lap Chieng	1,817	18.2	99.1	61.1	38.9	38.9	45.3
Nam Thuong	4,871	19.3	82.0	90.1	72.0	9.9	100.0
Sao Bay	3,926	24.4	95.9	93.8	37.9	6.3	42.7
Nuong Dam	3,750	31.8	98.4	75.2	3.5	24.8	26.9
My Hoa	5,427	22.8	80.9	88.4	47.3	11.6	66.6
Total	105,289	28.4	90.7	89.7	35.6	10.3	61.3

Table 31: Demographic, Poverty and Sanitation Data of Mai Chau District (Extended)

Commune	Population	Poor Households	Ethnic Minorities	HH with latrine	HH with hygienic latrine	HH with no latrine	HH w access to clean water
	N	%	%	%	%	%	%
Thung Khe	540	18.4	80.9	77.6	18.2	22.4	62.0
Pu Bin	1,705	53.7	99.4	100.0	2.6	0.0	30.0
Pieng Ve	2,354	30.8	92.7	100.0	11.8	0.0	83.0
Cun Pheo	2,171	54.8	96.5	95.2	10.3	4.8	87.0
Bao La	2,302	29.7	91.1	100.0	11.4	0.0	79.0
Mai Chau town	5,145	3.1	63.3	100.0	80.9	0.0	97.0
Dong Bang	1,353	12.2	78.0	100.0	35.0	0.0	88.0
Mai Ha	2,632	17.8	85.4	99.1	13.9	0.9	79.0
Mai Hich	3,658	16.2	84.1	100.0	12.4	0.0	55.0
Pa Co	2,584	22.8	96.3	27.1	27.1	72.9	32.0
Ba Khan	1,486	49.0	98.7	100.0	8.0	0.0	96.0
Phuc San	2,234	42.0	93.4	100.0	18.6	0.0	82.0
Tan Dan	2,072	58.7		72.7	4.0	27.3	72.0
Xam Khoe	2,654	10.9	81.8	100.0	18.7	0.0	86.0
Tan Son	1,059	27.5	91.1	88.3	19.8	11.7	54.0
Tong Dau	2,751	7.7	89.3	100.0	25.2	0.0	95.0
Tan Mai	1,564	45.7	95.5	91.3	8.4	8.7	79.0
Hang Kia	2,695	42.2	97.6	41.6	3.7	58.4	83.0
Chiang Chau	3,432	11.6	89.2	100.0	23.4	0.0	92.0
Noong Luong	1,560	44.6	99.2	100.0	3.9	0.0	90.0
Na Meo	1,360	49.4	99.3	99.4	6.3	0.6	80.0
Na Phon	1,590	21.9	99.1	99.7	17.1	0.3	81.0
Van Mai	2,996	14.2	72.5	100.0	39.9	0.0	41.0
Total	51,897	26.1	84.0	92.0	22.6	8.0	76.0

Table 32: Economic information: Food security and land availability

Variables	Region		Economic status			Ethnic groups				Latrine coverage		Total
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Non adopters	Adopters	
<i>Food Security</i>												
Households without enough food throughout the year	N=92 27.1%	N=207 45.6%	N=139 57.4%	N=60 44.8%	N=100 23.9%	N=21 17.8%	N=210 47.8%	N=47 24.0%	N=10 48.7%	N=48 48.0%	N=251 36.2%	N=299 37.7%
Average number of months without enough food	Mean 4	Mean 4	Mean 4	Mean 4	Mean 4	Mean 4	Mean 4	Mean 3	Mean 5	Mean 4	Mean 4	Mean 4
<i>Land Availability</i>												
Housing Land ownership	N=330 98.5%	N=451 98.3%	N=232 96.7%	N=132 97.1%	N=417 99.8%	N=118 99.2%	N=433 98.0%	N=192 99.5%	N=36 94.7%	N=95 96.9%	N=686 98.6%	N=781 98.4%
Agricultural Land ownership	N=229 68.4%	N=407 88.7%	N=200 84.0%	N=118 86.8%	N=318 75.7%	N=25 21.2%	N=399 90.1%	N=182 93.8%	N=29 78.4%	N=75 76.5%	N=561 80.6%	N=636 80.1%
Housing area on average (m2)	Mean 348	Mean 1002	Mean 707	Mean 905	Mean 703	Mean 729	Mean 867	Mean 439	Mean 735	Mean 640	Mean 752	Mean 739
Agricultural area on average (m2)	1,887	1,891	2,053	1,658	1,881	1,812	1,912	1,663	3,008	1667	1917	1889
Water accessibility throughout the year	N=290 85.3%	N=363 79.3%	N=189 78.4%	N=112 82.4%	N=352 83.6%	N=100 84.0%	N=354 79.9%	N=170 87.2%	N=27 69.2%	N=67 67.7%	N=586 83.8%	N=653 81.8%
Farming as main source of income	N=239 70.1%	N=407 88.5%	N=216 88.9%	N=127 93.4%	N=303 71.8%	N=46 38.7%	N=402 90.3%	N=160 81.6%	N=37 94.9%	N=87 87.0%	N=559 79.7%	N=646 80.6%

Chart 25: Proximity of suppliers to households (all respondents)

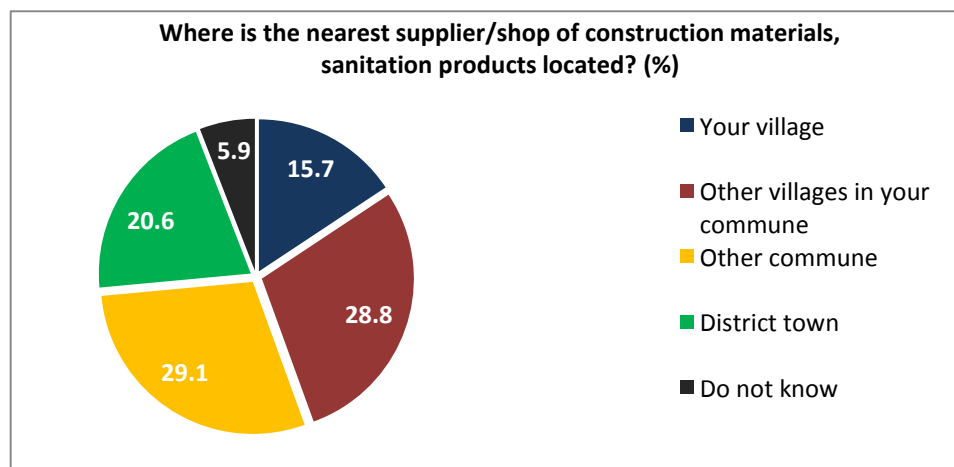


Table 33: Proximity of suppliers to households (all respondents)

Where is the nearest supplier/shop of construction materials, sanitation products located?		Your village	Other villages in your commune	Other commune	District town
		N=124	N=230	N=232	N=165
Commune	Distance	Km	Km	Km	Km
Binh Son	Mean	4	1	4	20
Nam Thuong	Mean	4	4	4	7
Sao Bay	Mean	2	2	2	11
Thuong Bi	Mean	1	1	3	5
Vinh Tien	Mean	1	2	2	13
Bao La	Mean	2	2	4	26
Chieng Chau	Mean	2	4	3	4
Dong Bang	Mean	4	3	4	9
Tan Mai	Mean	1	1	23	34

Table 34: Proximity of sanitation materials and products to households (all respondents)

Sanitation product / material	N	Your village	Your commune	Other commune	District town	Not available	Do not know	Total
		%	%	%	%	%	%	%
Building bricks	799	30.4	28.4	23.4	14.0	0.0	3.6	100
Ceramic tiles	799	9.3	21.8	28.4	35.2	0.1	5.1	100
Cement	798	24.1	30.1	21.7	21.2	0.0	3.0	100
Iron, steel	799	16.3	26.5	23.4	28.0	1.8	4	100
Sand, gravel	798	20.6	24.4	27.3	15.0	0.3	3.8	100
Concrete rings	795	7.2	15.5	20.6	22.9	12.3	21.1	100
Roof (tin/iron sheets, fibro), tiles	798	23.3	32.0	20.9	19.5	0.4	3.9	100
Plastic ventilation pipe and tube connectors	798	15.2	30.1	26.8	24.6	0.1	3.3	100
Sanitary ware (pan, washbasin, etc.)	799	8.4	21.4	27.7	35.4	0.1	6.9	100

Table 35: Access to masonry services (all respondents)

Does your village have mason (s) who can build a latrine?	Yes		No		Don't know	
Commune	N	%	N	%	N	%
Binh Son	86	95.6	2	2.2	2	2.2
Nam Thuong	90	96.8	1	1.1	2	2.2
Sao Bay	87	94.6	1	1.1	4	4.3
Thuong Bi	84	96.6	1	1.1	2	2.3
Vinh Tien	93	96.9	0	0.0	3	3.1
Bao La	80	90.9	2	2.3	6	6.8
Chieng Chau	90	97.8	1	1.1	1	1.1
Dong Bang	73	90.1	6	7.4	2	2.5
Tan Mai	39	48.8	35	43.8	6	7.5
Total	722	90.4	49	6.1	28	3.5

Chart 26: Sources of loans (respondents who accessed loans)

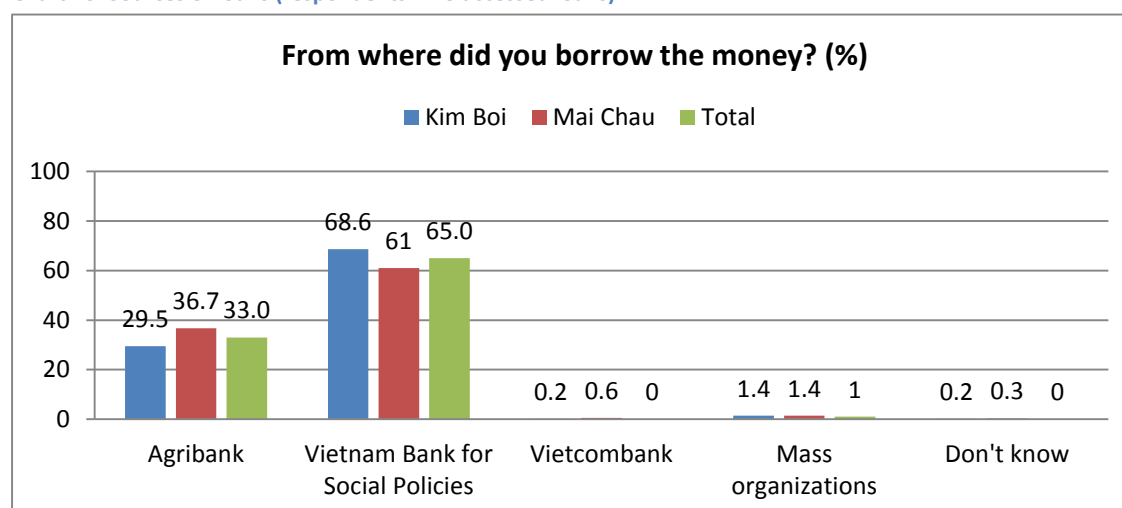


Chart 27: Amount paid for latrine construction (in VND, only adopters who spent cash on their current latrine, Mean)

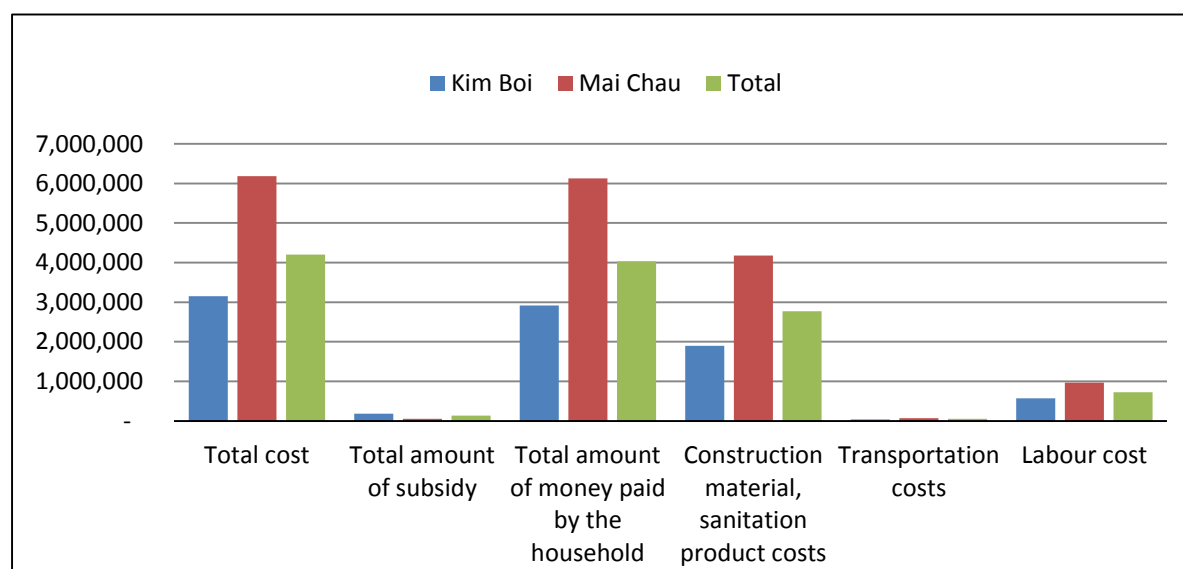


Table 36: The average amount of money that surveyed household spent on constructing their latrine

	Kim Boi	Mai Chau	Total
Total cost in VND	3,147,333	6,179,766	4,202,092
Total amount of subsidy	181,458	52,734	136,685
Total amount of money paid by the household	2,920,042	6,127,031	4,035,516
Construction material, sanitation product costs	1,896,084	4,176,404	2,770,862
Transportation costs	41,329	67,978	51,552
Labor cost	569,456	971,196	724,100

Table 37: Knowledge on diseases caused by untreated human feces

Diseases caused by untreated human feces	Region		Economic status			Ethnic groups				Latrine adoption		Total
	Mai Chau	Kim Boi	Poor	Near poor	Better off	Kinh	Muong	Thai	Dao	Adopters	Non adopters	
	N=341	N=454	N=242	N=135	N=418	N=119	N=439	N=196	N=39	N=696	N=99	
	%	%	%	%	%	%	%	%	%	%	%	
Diarrhea	45.2	46.0	37.2	43.7	51.2	63.9	45.3	39.3	25.6	46.7	38.4	45.7
Helminthiasis	19.4	21.6	19.0	18.5	22.2	31.1	21.0	14.3	15.4	21.3	16.2	20.6
Cholera	11.1	15.6	9.5	8.1	17.9	27.7	13.4	8.7	0.0	14.7	7.1	13.7
Dysentery	7.3	11.7	7.0	6.7	12.4	19.3	10.0	5.6	0.0	10.3	6.1	9.8
Malaria/dengue fever	9.4	4.0	7.9	3.7	6.2	8.4	4.8	5.6	20.5	6.2	7.1	6.3
Respiratory Disease (pneumonia, cough)	7.3	3.5	4.5	5.2	5.5	8.4	2.7	9.7	0.0	5.6	2.0	5.2
Do not know	35.8	34.3	35.1	43.4	36.6	29.9	17.6	38.2	36.2	51.3	33.4	47.5

Table 38: Amount spent on the current latrine by type of latrine (only adopters)

Costs Type of latrine	N	0- 500,00 0 VND	500,000 – 1,000,00 0 VND	1,000,000 – 2,000,000 VND	2,000,000 – 3,000,000 VND	3,000,000 – 5,000,000 VND	More than 5,000,00 0 VND	Total
		N=96	N=64	N=81	N=27	N=32	N=67	N=367
		%	%	%	%	%	%	%
<i>Hygienic types</i>	<i>154</i>	<i>3.9</i>	<i>9.1</i>	<i>20.1</i>	<i>11.7</i>	<i>18.2</i>	<i>37.0</i>	<i>100</i>
Improved pit	2	0.0	100.0	0.0	0.0	0.0	0.0	100
Double Vault/Composting	39	5.1	17.9	53.8	15.4	7.7	0.0	100
Soakage pits	20	20.0	5.0	30.0	15.0	20.0	10.0	100
Septic tank	91	0.0	4.4	4.4	9.9	23.1	58.2	100
Latrine connected to biogas plant	2	0.0	0.0	0.0	0.0	0.0	100.0	100
<i>Unhygienic types</i>	<i>198</i>	<i>42.4</i>	<i>23.2</i>	<i>23.7</i>	<i>4.0</i>	<i>2.0</i>	<i>4.5</i>	<i>100</i>
Hanging, bucket or bridge latrine	43	60.5	18.6	14.0	0.0	0.0	7.0	100
Unimproved pit	24	41.7	25.0	20.8	4.2	0.0	8.3	100
Single vault	131	36.6	24.4	27.5	5.3	3.1	3.1	100
Total	367	26.2	17.4	22.1	7.4	8.7	18.3	100
<i>Latrines with hygienic status</i>	<i>60</i>	<i>2.9</i>	<i>2.9</i>	<i>2.9</i>	<i>2.9</i>	<i>8.6</i>	<i>80.0</i>	<i>100</i>

Table 39: Ability to pay for a new latrine by desired type of latrine households most likely would build

Costs Type of latrine	N	0- 500,000 VND	500,000 – 1,000,000 VND	1,000,000- 2,000,000 VND	2,000,000- 3,000,000 VND	3,000,000- 5,000,000 VND	More than 5,000,000 VND	Total
		N=10	N=35	N=71	N=53	N=103	N=211	N=482
		%	%	%	%	%	%	%
<i>Hygienic types</i>	<i>432</i>							
Improved pit	1	0.0	0.0	0.0	0.0	100.0	0.0	100
Double vault	77	1.3	13.0	41.6	16.9	20.8	6.5	100
Soakage pit	22	9.1	9.1	18.2	22.7	13.6	27.3	100
Septic tank	292	1.7	4.8	6.5	8.6	23.6	54.8	100
Latrine connected to biogas plant	40	0.0	0.0	7.5	2.5	22.5	67.5	100
<i>Unhygienic types</i>	<i>19</i>							
Hanging, bucket or bridge latrine	2	0.0	0.0	50.0	50.0	0.0	0.0	100
Unimproved pit	0	0.0	0.0	0.0	0.0	0.0	0.0	0
Single vault	17	5.9	29.4	35.3	23.5	0.0	5.9	100
Don't know	12	0.0	25.0	8.3	16.7	16.7	33.3	100
Not applicable as the surveyed HH already has a hygienic latrine and doesn't intend to upgrade it	19	5.3	5.3	26.3	10.5	10.5	42.1	100
Total	482	2.1	7.3	14.7	11.0	21.4	43.8	100

Table 40: Materials used in superstructure by type of latrine

Result of superstructure latrine observation		Bucket, bridge or hanging latrine	Unimproved pit latrine	Single vault latrine	Ventilated improved pit latrine (VIP)	Double-vault / compost latrine	Soakage Pit Latrine	Septic Tank Latrine	Latrine connected with biogas / biodigester
Components	Materials	%	%	%	%	%	%	%	%
Latrine walls	1. Reeds	5.2	3.0	6.0	0.0	4.2	0.0	0.0	0.0
	2. Plastic sheet	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
	3. Canvas	45.2	36.4	11.5	0.0	0.0	2.9	0.7	0.0
	4. Un-burnt brick	3.2	12.1	11.0	100.0	25.0	17.1	5.0	0.0
	5. Burnt brick	8.3	9.1	35.2	0.0	25.0	34.3	72.7	66.7
	6. Iron sheet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7. Wood	0.0	0.0	3.3	0.0	4.2	2.9	0.0	0.0
	8. No walls	16.3	15.2	0.5	0.0	0.0	0.0	0.0	0.0
	9. Others	21.8	24.2	31.9	0.0	41.7	42.9	21.6	33.3
Latrine roof	1. Iron/tin sheet	0.8	0.0	0.6	0.0	0.0	2.9	0.7	0.0
	2. Reeds	5.2	3.0	3.3	0.0	2.1	2.9	0.0	0.0
	3. Fibro- cement	36.1	39.4	78.3	0.0	76.6	62.9	26.6	66.7
	4. Plastic sheet	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	5. Can vas	4.8	3.0	0.6	0.0	0.0	2.9	1.4	0.0
	6. Concrete	0.0	3.0	2.8	0.0	8.5	22.9	69.1	33.3
	7. Tiles	1.6	3.0	7.2	100.0	8.5	0.0	1.4	0.0
	8.No roof	37.3	24.2	2.8	0.0	4.3	0.0	0.0	0.0
	9. Others	13.9	24.2	4.4	0.0	0.0	5.7	0.7	0.0

Table 41: Materials used in middle-structure by type of latrine

Result of middle-structure latrine observation		Bucket, bridge or hanging latrine	Unimproved pit latrine	Single vault latrine	Ventilated improved pit latrine (VIP)	Double-vault/compost latrine	Soakage Pit Latrine	Septic Tank Latrine	Latrine connected with biogas / biodigester
Component	Materials	%	%	%	%	%	%	%	%
Latrine floor/slab	Wooden/Bamboo slab only	74.1	33.3	13.8	0.0	2.1	N/A	N/A	N/A
	Concrete slab on wooden supporting poles	1.2	0.0	0.6	0.0	2.1	N/A	N/A	N/A
	Brick slab	N/A	N/A	N/A	N/A	N/A	14.3	1.4	0.0
	Composite/Plastic	N/A	N/A	N/A	N/A	N/A	0.0	0.0	0.0
	Concrete floor w/ concrete slab	14.7	45.5	83.4	100.0	91.7	45.7	28.3	0.0
	Concrete floor with ceramic pan/tiles	0.4	0.0	0.6	0.0	2.1	34.3	70.3	100.0
	Others	9.6	21.2	1.7	0.0	2.1	5.7	0.0	0.0
Equipment or Facilities Inside the latrine	1. Squat latrine bowl	N/A	N/A	N/A	N/A	N/A	63.6	51.9	33.3
	2. Sit latrine bowl	N/A	N/A	N/A	N/A	N/A	21.2	39.7	33.3
	3. Washing basin and water	N/A	N/A	N/A	N/A	N/A	3.0	0.8	0.0
	4. Water Tap	N/A	N/A	N/A	N/A	N/A	0.0	2.3	0.0
	5. Water container for flushing	N/A	N/A	N/A	N/A	N/A	0.0	1.5	0.0
	6. Soap/substitute	N/A	N/A	N/A	N/A	N/A	0.0	0.0	33.3
	7.Others	N/A	N/A	N/A	N/A	N/A	12.1	3.8	0.0

Table 42: Materials used in substructure by type of latrine

Result of substructure latrine observation		Bucket, bridge or hanging latrine	Unimproved pit latrine	Single vault latrine	Ventilated improved pit latrine (VIP)	Double-vault/compost latrine	Soakage Pit Latrine	Septic Tank Latrine	Latrine connected with biogas/ biodigester
Component	Materials	%	%	%	%	%	%	%	%
Latrine tank/pit	Unlined pit	67.1	60.6	0.6	0.0	0.0	0.0	0.0	0.0
	Lined pit-sticks/bamboo	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Clay	0.0	0.0	0.0	0.0	0.0	2.9	2.2	0.0
	Composite plastic	0.0	0.0	0.0	0.0	0.0	2.9	0.0	33.3
	Lined pit-bricks	22.6	27.3	58.0	100.0	35.4	37.1	73.2	33.3
	Lined pit-concrete rings	0.8	0.0	0.6	0.0	6.2	2.9	2.2	0.0
	Lined pit-concrete blocks	1.2	12.1	33.7	0.0	52.1	28.6	21.0	0.0
	Lined pit-rocks	0.4	0.0	6.1	0.0	6.2	8.6	0.7	0.0
	Others	6.3	0.0	1.1	0.0	0.0	17.0	0.7	33.3
Latrine tank design	1. One chamber and infiltration trench/soakage	N/A	N/A	N/A	N/A	N/A	50.0	0.0	0.0
	2. Two chambers and infiltration trench/soakage	N/A	N/A	N/A	N/A	N/A	11.8	26.6	33.3
	3. Three chambers and infiltration trench/soakage	N/A	N/A	N/A	N/A	N/A	0.0	61.2	0.0
	4. More than three chambers and infiltration/soakage	N/A	N/A	N/A	N/A	N/A	5.9	2.9	0.0
	5. One chamber and outlet dispersed onto the ground	N/A	N/A	N/A	N/A	N/A	20.6	0.0	0.0
	6. Two chambers and dispersed onto the ground	N/A	N/A	N/A	N/A	N/A	2.9	3.6	0.0
	7. Three chambers and outlet dispersed onto the ground	N/A	N/A	N/A	N/A	N/A	0.0	3.6	0.0
	8. More than three chambers and outlet dispersed onto the ground	N/A	N/A	N/A	N/A	N/A	0.0	0.7	0.0
	9. Biodigester cell	N/A	N/A	N/A	N/A	N/A	0.0	0.0	66.7
	10. I cannot see	N/A	N/A	N/A	N/A	N/A	0.0	1.4	0.0
	11. Others	N/A	N/A	N/A	N/A	N/A	8.8	0.0	0.0

Chart 28: Observation of latrine hygienic criteria on double vault latrines

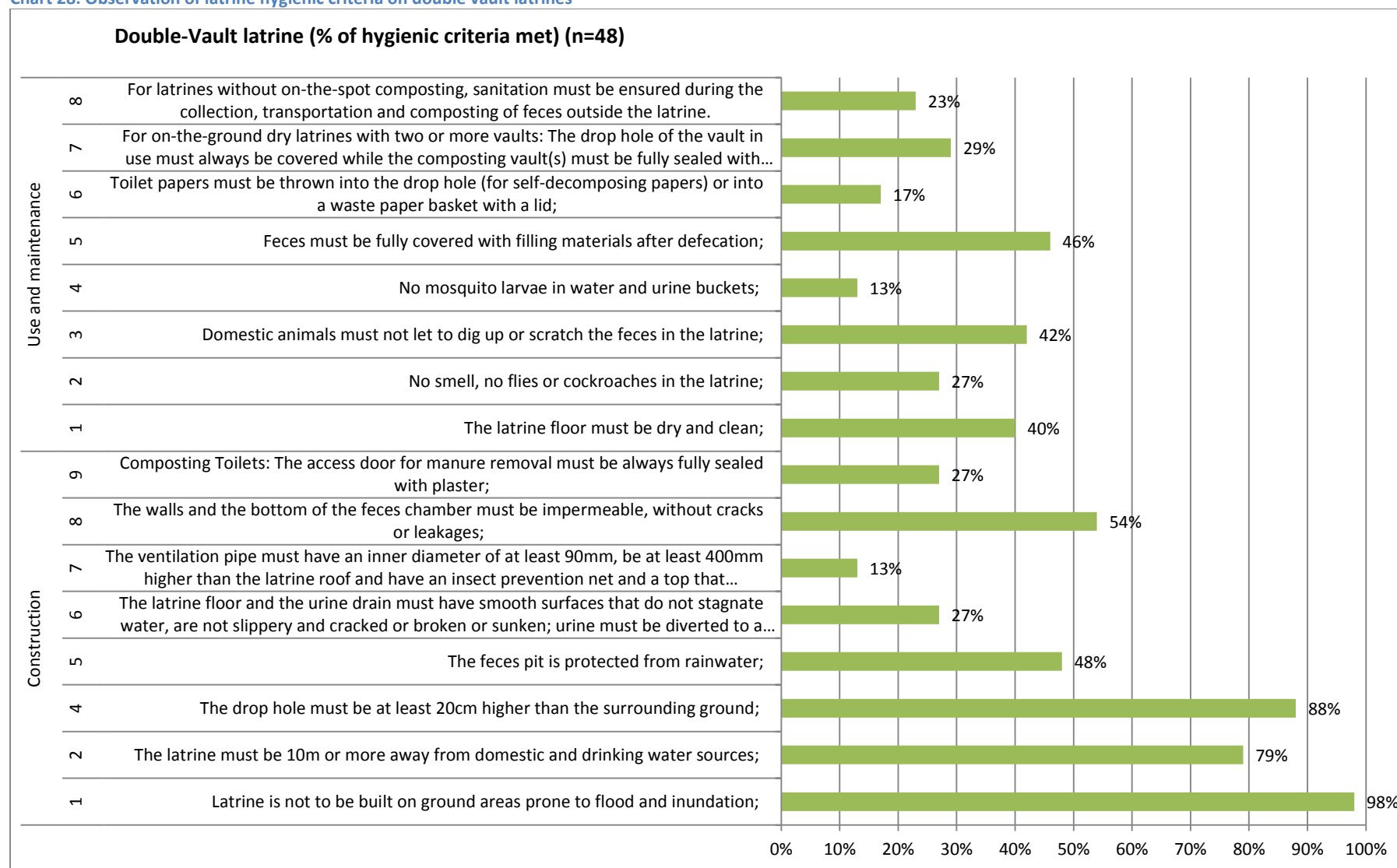


Chart 29: Observation of latrine hygienic criteria on soakage pits

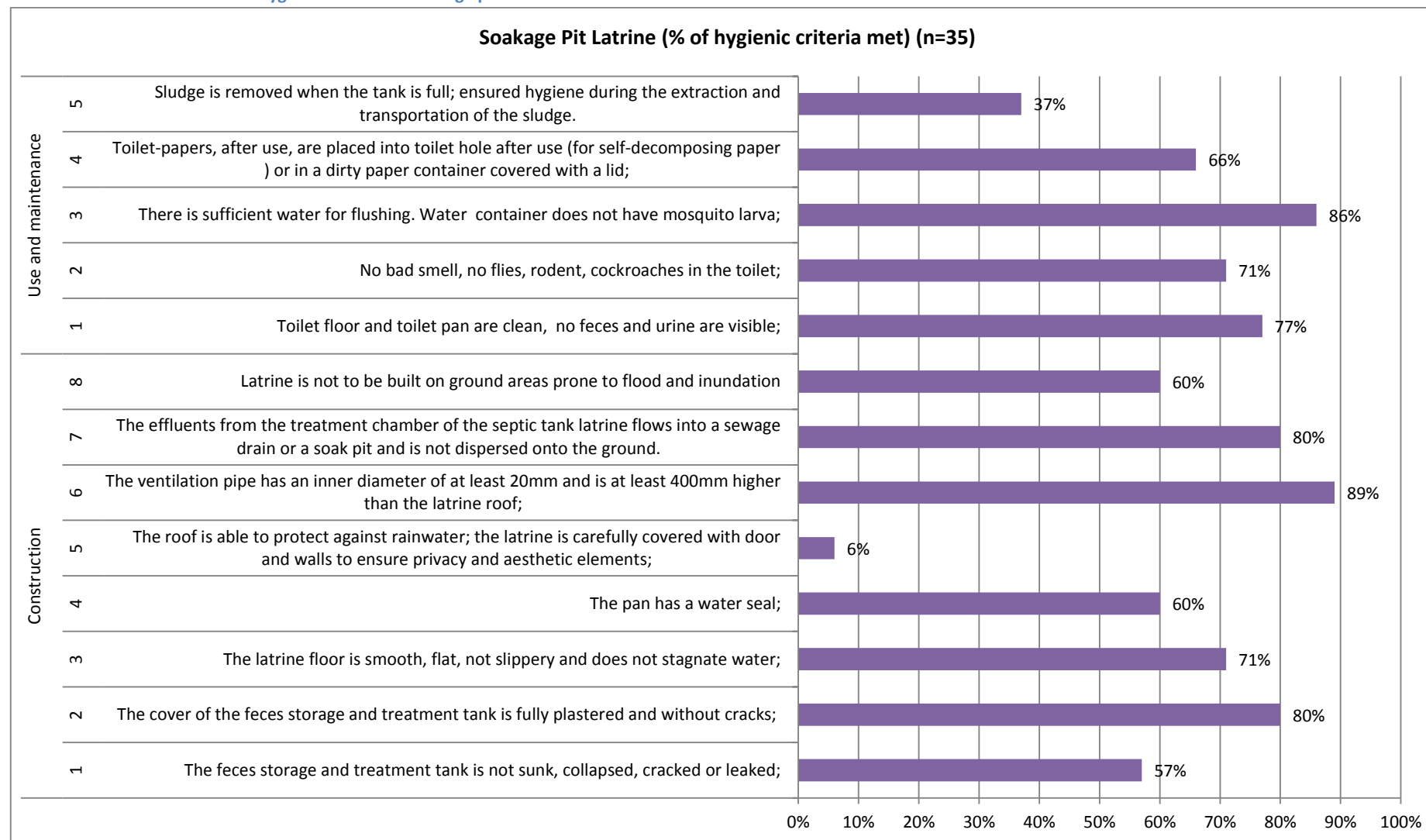
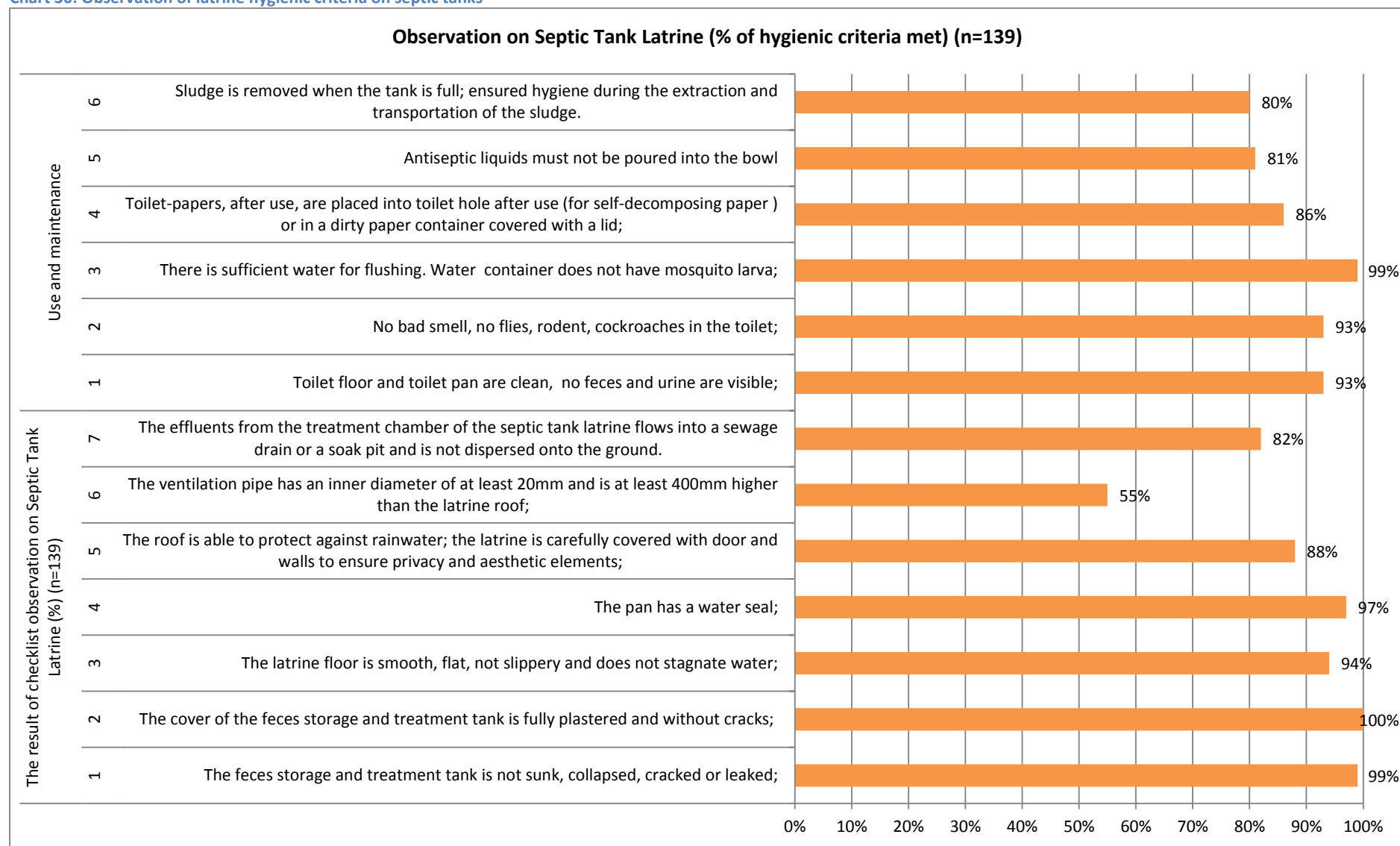


Chart 30: Observation of latrine hygienic criteria on septic tanks



2. Latrine construction materials prices matrix

Table 43 Cost estimation of improved pit latrine

No	Items	Unit	Qty	price/unit	Total
A	Lining part				701,780
1	Bricks	Each	258	1,100	283,800
2	Cement P300	Kg	26.9	1,200	32,280
3	Gravel 1x2	m3	0.15	220,000	33,000
4	Sand	m3	0.17	150,000	25,500
5	Round steel 6cm. di	Kg	6.5	15,000	97,500
6	PVC plastic pipe Ø 90	m	2.7	11,000	29,700
7	PVC plastic connector figure L, Ø90	Each	1	15,000	15,000
8	PVC plastic connector figure T, Ø90	Each	1	25,000	25,000
9	Glue	Tube	1	10,000	10,000
10	Masonry fee	Day	1	150,000	150,000
B	Superstructure				455,000
1	Fibro cement cover sheet	Each	3	45,000	135,000
2	Bamboo/wooden length 5m	Each	4	40,000	160,000
3	Steel Wire	Kg	0.5	20,000	10,000
4	Masonry fee	Day	1	150,000	150,000
Total cost (with hired mason)					1,156,780
Total cost (self-built)					856,780

Table 44 Cost estimation of double vault latrine

No	Items	Unit	Qty	price/unit	Total
A. Lining part <i>(include feces tank and latrine pan)</i>					2,185,900
1	Brick	Each	1,000.0	1,100	1,100,000
2	Cement	Kg	200.0	1,200	240,000
3	Gravel 0,1 x 0,2	m3	0.2	220,000	46,200
4	Sand	m3	1.1	150,000	165,000
5	Round steel Ø 6	Kg	7.0	15,000	105,000
6	PVC plastic connector figure L, Ø90	Each	1.0	15,000	15,000
7	PVC plastic connector figure T, Ø90	Each	1.0	25,000	25,000
8	PVC plastic pipe Ø 90	m	2.7	11,000	29,700
9	Glue	Tube	1.0	10,000	10,000
10	Masonry fee	Day	3.0	150,000	450,000
B. Simple superstructure					450,000
1	Fibro cement cover sheet	Each	3.0	45,000	135,000
2	Bamboo/wooden length 5m	Each	4.0	40,000	160,000
3	Steel Wire	Kg	0.3	20,000	5,000
4	Masonry fee	Day	1.0	150,000	150,000
C. Strong built superstructure					1,459,000
1	Brick	Each	500.0	1,100	550,000
2	Cement	kg	200.0	1,200	240,000
3	Door connector	Set	2.0	7,000	14,000
4	Door	Each	1.0	220,000	220,000
5	Fibro cement cover sheet	Each	3.0	45,000	135,000
6	Masonry fee	Day	2.0	150,000	300,000
Total cost of a simple built double vault latrine (hired mason)					2,635,900
Total cost of a simple built double vault latrine (self built)					2,035,900
Total cost of a strong built double vault latrine (hired mason)					3,644,900
Total cost of a strong built double vault latrine (self built)					2,894,900

Table 45 Cost estimation of soakage pit latrine

No	Items	Unit	Qty	price/unit	Total
A. LINING PART (Including latrine base and feces tank)					
1	Latrine base				3,252,000
1	Cement	Kg	300	1,200	360,000
2	Sand	m3	1.0	150,000	150,000
3	Brick	Each	1,700	1,100	1,870,000
4	Gravel 0.1x 0.2	m3	0.3	220,000	66,000
5	Round steel Ø 6	Kg	7	15,000	105,000
6	PVC plastic pipe Ø 90	m	2	11,000	22,000
7	PVC plastic connector figure L, Ø90	Each	1	15,000	15,000
8	PVC plastic connector figure T, Ø90	Each	1	25,000	25,000
9	PVC plastic pipe Ø34	Each	1	9,000	9,000
10	Latrine pan	Each	1	180,000	180,000
11	Masonry fee	Day	3.0	150,000	450,000
B. SIMPLE SUPERSTRUCTURE					
1	Fibro cement cover sheet	Each	3	45,000	135,000
2	Bamboo/wooden length 5m	Each	4	40,000	160,000
3	Steel Wire	Kg	0.2	20,000	4,000
4	Masonry fee	Day	1.0	150,000	150,000
C. STRONG BUILT SUPERSTRUCTURE					
1	Brick	Each	500	1,100	550,000
2	Cement	Kg	200	1,200	240,000
3	Door	Each	1	220,000	220,000
4	Fibro cement cover sheet	Each	3	45,000	135,000
5	Masonry fee	Day	2	150,000	300,000
Total cost of a simple built pour flush latrine (hired mason):					3,701,000
Total cost of a simple built pour flush latrine (self built):					3,101,000
Total cost of a strong built pour flush latrine (hired mason):					4,697,000
Total cost of a strong built pour flush latrine (self built):					3,947,000

Table 46 Cost estimation of septic tank with concrete ring ³³

N o	Items	Unit	Qty	price/unit	Total
A Lining part					2,482,000
1	Cement	Kg	150	1,200	180,000
2	Gravel 0,1 x 0,2	m3	0.8		176,000
				220,000	
3	Sand	m3	0.6		90,000
				150,000	
4	Round steel Ø 6	Kg	10	15,000	150,000
5	Brick	Each	200	1,100	220,000
6	Latrine pan	Each	1		180,000
				180,000	
7	PVC plastic connector figure L, Ø90	Each	2	15,000	30,000
8	PVC plastic connector figure T, Ø90	Each	1	25,000	25,000
9	PVC plastic pipe Ø 90	m	1	11,000	11,000
10	PVC plastic connector figure T, Ø34	Each	1	14,000	14,000
11	PVC plastic connector figure L, Ø34	Each	1	15,000	15,000
12	PVC plastic pipe Ø34	m	3	9,000	27,000
13	Glue	Tube	1	10,000	10,000
14	Steel Wire	Kg	0.2	20,000	4,000
15	Masonry fee	Day	4		600,000
				150,000	
16	Concrete ring	Each	1		750,000
				750,000	
B Simple superstructure					449,000
1	Fibro cement cover sheet	Each	3	45,000	135,000
2	Bamboo/wooden length 5m	Each	4	40,000	160,000
3	Steel Wire	Kg	0.2	20,000	4,000
4	Masonry fee	Day	1		150,000
				150,000	
C Strong built superstructure					1,445,000
1	Brick	Each	500	1,100	550,000
2	Cement	Kg	200	1,200	240,000
3	Door	Each	1		220,000
				220,000	
4	Fibro cement cover sheet	Each	3	45,000	135,000
5	Masonry fee	Day	2		300,000
				150,000	
Total cost of a simple built septic tank with concrete ring (hired mason):					2,931,000
Total cost of a strong built septic tank with concrete ring (hired mason):					3,927,000

³³ Not available in Hoa Binh

Table 47 Cost estimation of septic tank with brick ring

No	Items	Unit	Qty	price/unit	Total
A	Lining part				4,705,000
1	Brick	Each	2700	1,100	2,970,000
2	Cement	Kg	250	1,200	300,000
3	Gravel 0,1 x 0,2	m3	1.2	220,000	264,000
4	Sand	m3	1	150,000	150,000
5	Round steel Ø 6	Kg	7	15,000	105,000
6	Latrine pan	Each	1	180,000	180,000
7	PVC plastic connector figure L, Ø90	Each	3	15,000	45,000
8	PVC plastic connector figure T, Ø90	Each	1	25,000	25,000
9	PVC plastic pipe Ø 90	Each	1	11,000	11,000
10	PVC plastic connector figure T, Ø34	Each	1	14,000	14,000
12	PVC plastic pipe Ø34	m	3	9,000	27,000
13	Glue	Tuýp	1	10,000	10,000
14	Steel Wire	Kg	0.2	20,000	4,000
15	Masonry fee	Day	4	150,000	600,000
B	Simple superstructure				449,000
1	Fibro cement cover sheet	Each	3	45,000	135,000
2	Bamboo/wooden length 5m	Each	4	40,000	160,000
3	Steel Wire	Kg	0.2	20,000	4,000
4	Masonry fee	Day	1	150,000	150,000
C	Strong built superstructure				1,445,000
1	Brick	Each	500	1,100	550,000
2	Cement	Kg	200	1,200	240,000
3	Door	Each	1	220,000	220,000
4	Fibro cement cover sheet	Each	3	45,000	135,000
5	Masonry fee	Day	2	150,000	300,000
Total cost of a simple built septic tank					5,154,000
Total cost of a strong built septic tank					6,150,000

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