Evaluační teorie a praxe; https://www.evaltep.cz
HUMŇALOVÁ, H. (2016) „Latrine coverage and associated factors among rural communities in Cambodia. Case study form the Kampong Chnang Province“. Evaluační teorie a praxe 4(2): 35–59

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# Latrine coverage and associated factors among rural communities in Cambodia. Case study form the Kampong Chnang Province

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## Abstract

Despite its great importance in health and wellbeing, sanitation has been for a long time at the bottom of the international development attention. Still more than 2,4 billion people have limited access to basic sanitation services, of these 946 million defecate in the open (WHO, 2016). Lack of basic sanitation is closely related to the transmission of water borne diseases and contamination of water sources and soil. Water-related diseases are the second leading cause of death in children under five (WHO & UNICEF, 2015). Poor sanitation contributes to malnutrition in children, reduced resistance to infections and when prolonged, to impaired physical and cognitive growth and development as well as school readiness and performance (Sclar et al., 2017; WHO & UNICEF, 2015). Moreover, there is growing understanding that lack of access to improved sanitation impacts on psychological stress, increases women's vulnerability and deepens the poverty (House & Cavill, 2015).

Although the main risks associated with inadequate sanitation are related to health and health was being used in most interventions as a motivator for behaviour change, various studies approved that people do not adapt toilets only because of preventing health risks but because of other motivations such as prestige, urban lifestyle, power relations, privacy, security or comfort (Gross & Gutner, 2014; Jenkins & Curtis, 2005; O'Reilly & Lou-

is, 2014; Routray et al., 2015). Reflection of this knowledge led to the shift in approach from supply driven to more demand driven sanitation interventions arguing that low demand is one of the causes for the failure of sanitation initiatives (Evans 2005; Jenkins and Sugden 2006; O'Reilly & Louis, 2014). In addition, the latrine ownership is folded in other diverse factors such as wealth, education, occupation, life stage, gender, number of children, physical and social composition of the village, village proximity and road connectivity, local leaders attitudes towards sanitation, social norms etc. (Admassie et al.; 2009; Jenkins & Scott, 2007; O'Reilly & Louis, 2014). The complexity of potential underlying factors illustrates that there is a wide range of factors which needs to be considered for increasing access to sanitation facilities as well as improving the long term sustainability of sanitation programs in developing countries.

The main aim of this paper is to explore sanitation situation in rural areas of Cambodia and factors influencing sanitation behaviour and its adoption. The history of sanitation interventions in rural areas of Cambodia is explored, as well as an assemblage of factors that influence adoption of latrines is outlined. The research disclosed that latrine adoption and latrine use are deeply embedded in various determinants which intersect/intertwine with and create a number of complex interrelationships with poverty, local perception and practice, and physical environment.

The research was institutionally and financially supported by the Czech organisation People in Need (PIN) and was conducted in February, March, and April, 2012.

## Keywords

Latrine, sanitation, health, rural, Cambodia

Příprava textu byla podpořena z projektu "Faktory a podmínky ovlivňující změny v sanitačním chování v rozvojových zemích (GA 15-21237S)".

## 1. Sanitation in Cambodia

Cambodia has the lowest coverage of access to improved sanitation facilities in South-East Asia (WHO & UNICEF, 2015). The Cambodian population approaches nearly 15 million people, with more than 80% of Cambodians living in rural areas (MoHC et al., 2014). 37% of rural population has access to improved sanitation facilities (WHO & UNICEF, 2014). Although the number of latrine owners is slowly increasing over 9 million people still do not have access to improved sanitation and defecate in the open. At the current trend of latrine construction and population growth, the Cambodian Millennium Development Goals[1] (CMDGs) which aim at 60% coverage by 2018 will not be reached. In addition, if the recent trend continues, the universal rural coverage which is planned to be achieved by 2025 will be attained in 130 years (WSP, 2008).

Cambodia's national strategy for improving the sanitation situation in rural areas is framed by several policies, including the Rectangular Strategy for Growth, Employment, Equity and Efficiency – Phase II. This is the most relevant document related to the rural water supply, sanitation and hygiene (RWSSH) in which continuing decentralisation and deconcentration policy is stressed. The National Strategy Development Plan Update 2014-2018 reiterates the points from the Rectangular Strategy and furthermore sets the time frame for the Program for Sub-National Democratic Development. Another policy document the National Water Supply and Sanitation Policy: Part III – Rural Water Supply and Sanitation is the main guide for the RWSSH sector. It sets important principles such as roles and responsibilities of government, communities, private sector, etc.

[1] CMDG The Royal Government of Cambodia has adopted alternative national goals, known as the Cambodian MDGs, with 2015 targets set for each subsector. In the case of rural sanitation the target is very modest at 30%, however this target could probably be met as rural access was estimated to be 25% in 2012. The National Strategic Development Plan 2014-18 contains more ambitious targets of 60% improved access for rural and 85% of piped access for urban water supply respectively, and 60% for rural sanitation by 2018. Universal access targets have officially been adopted by 2025 for the rural sectors in the National Strategic Plan for Rural Water Supply, Sanitation and Hygiene (RWSSH) 2014-2025. (WSP, 2015)

An instrument helping Cambodia to make a progress in achieving the CMDGs by 2015 and to achieve the Rural Water Supply, Sanitation and Hygiene Vision of full coverage by 2025 is the National strategy paper for Rural Water Supply, Sanitation and Hygiene 2011-2025. In relation to the sanitation, the 'sector vision' sets the overall goal that 'every person in a rural community has sustained access to safe water supply and sanitation services and lives in a hygienic environment by 2025' (MRD, 2011, p. 4).

The approach of the Cambodian government used in achieving the abovementioned goals has been changed during the last few years. The time limited projects' activities (e.g. 5 years projects) have been replaced by a focus on providing and delivering services within an unlimited time frame (long term solutions) (MRD, 2011).

The sanitation sector operates on different levels (household, commune, district, province and national), but the overall responsibility for improving the sanitation situation lies with the Ministry of Rural Development (MRD). Two departments (focused on improving sanitation) shape the organisational structure of MRD: the Department of Rural Water Supply and the Department of Rural Health Care, both under the General Department for Technical Affairs. In order to better coordinate the activities undertaken by different actors within different provinces in Cambodia, MRD established two main coordinating mechanisms – Technical working group for rural water supply, sanitation and hygiene (TWG –RWSSH) and the Water and Sanitation (WatSan) Sectoral Working Group meeting every month.

### 1.1 Access to sanitation

The main component in achieving full coverage and improved sanitation which is included in the National Strategy Paper and supported by the Ministry of Rural Development, is increasing access to sanitation facilities by changing people's behaviour and increasing products and services (MRD, 2011). The activities for achieving above mentioned includes developing approaches that will change peoples' behaviour and motivate them to use latrines (e.g. CLTS) by employing strategies for creating demand. The Cambodian strategy reflects the international experience that simply the building and sponsoring of constructing la-

trines does not lead to significant and sustainable results in improving sanitation (Evans 2005; Jenkins and Sugden 2006; O'Reilly & Louis, 2014). The immediate objective is to get people to use some form of toilet (whether improved or unimproved) rather than open defecation. Followed by expectation that people will step up on the ‚sanitation ladder'[2] to an improved sanitation option.

The National Strategy Paper further develops and extends the supply side, e.g. availability of products in the market, builds the capacity of the private sector, uses advertising to promote sanitation products (latrines, services, emptying pits). There are also other aspects that need to be established and addressed: namely the operation and maintenance of toilets (emptying pits) and sanitation in schools, health facilities, and other rural institutions. Nonetheless, these components are not in the scope of attention of this study and need to be investigated further (MRD, 2011).

### 1.2 Sanitation Service Delivery

The National Strategy Paper states that all sanitation services (constructing latrines, emptying pits, etc.) which help to improve the sanitation situation should be managed at the local level. Localizing of services makes it easier to address and meet the real needs and desires of people and increases accessibility and diversity of services available to people. It also reduces "administrative costs, provide[s] cost-effective services, and avoid[s] losses due to corruption or mismanagement" (Robinson, 2010, p. 13). The crucial step for accomplishing this strategy is to make some institutional changes including decentralizing the delivery of services to the district level through the private sector. In order to have a functional decentralised system, the division of the roles and responsibilities within the sector has to be clarified (Gero et al., 2014; Robinson, 2010; Sy, Warner & Jamieson, 2014).

[2] The 'sanitation ladder' presents sanitation coverage as a four-step ladder that includes the propostion of the population: practising open defecation, using an unimproved sanitation facility, using a shared sanitation facility, using an improved sanitation facility (UNICEF, 2008).

The other aspects that have to be developed and improved in order to achieve the sustainable service delivery are: human resources and capacity development, supporting private sector, management of the information systems, monitoring and evaluation, research and development of new technologies, and environmental issues (Gero et al., 2014; Robinson, 2010).

### 1.3 Sector financing

Sanitation is a public domain (Robinson, 2012), thus the financing of this sector is not only a matter of user contributions but relies heavily on funding from the government, external loans, and grants from development partners (multi-laterals, bi/laterals and NGOs) (MRD, 2011).

The funding mechanism of the Cambodian strategy follows the international trend of not using hardware subsidies to increase the coverage and tries to discourage other players from doing so. The reasons for this attitude is associated with a number of problems, such as deterring other sources of funding, expensive infrastructure, limited access to the poor, etc. The hardware subsidies from public funds are recommended to be used only to target the poorest of the population in order to achieve 100% coverage (MRD, 2011). However, as evaluations of different programmes (Plan International, IDE, MRD) throughout Cambodia have shown, this is not working as optimally as it should. The programmes and projects which do not provide any hardware subsidies tend to promote, both intentionally and unintentionally, the buying and constructing of undesirable latrines that are, after some time, abandoned. The sustainability of the interventions is not ensured and the sanitation situation stays unimproved (Davis, 2011; MRD, 2009).

The National Strategy Paper clearly defines financing mechanisms, roles and responsibilities of various development actors within the sector financing. Nonetheless, it does not come with a concrete budget allocation plan (WSP, 2008).

## 2. Methodology

### 2.1 Overall approach & study site

In this study the case study approach has been applied in order to emphasize and scrutinize the role of contextual factors, idiosyncrasies and local specifics of studied phenomena. The case study approach enables a holistic and in-depth understanding and explanation of sanitation situation and practice in a given context (Zainal, 2007). To see the real-life context in which the analysed phenomena occur helps to identify and explain possible casual links (Crowe et al., 2011). Since this approach allows presenting profiles of different social groups within the study population, it enables to focus on both disparities and similarities. The case study approach structures the sample design around 'the case' which could also be a certain geographical area (Crowe et al., 2011). Province Kampong Chhnang serves as the study case in this research. By employing mixed-methods (quantitative and qualitative), case study helps to explain processes and outcomes of sanitation. These are the reasons why I have chosen this approach to frame my research. I am aware of limits of the case study approach which is considered as microscopic because of the limited sampling. There is a little basis for scientific generalisation as it uses only one case. It is also accused from having little scientific rigour (Noor, 2008; Zainal, 2007).

The selection of both the research area and the respondents was undertaken in close cooperation with the organisation People In Need (PIN). The area selection was thus primarily constrained by a practical feasibility stemming from the fact where the PIN operates. The decision was made based on purposive sampling of districts where several criteria were required: low access to improved sanitation facilities within districts, low average of households' income, previous CLTS intervention, and the district should not have been entirely regularly flooded as it would lead to misleading results in the research. The Kampong Tralach district was selected.

### 2.2 Data Collection

In my research I have used mixed-methods in order to assure data triangulation. Relevant secondary data are obtained from policy documentation, project records, web information, evaluation reports, academic arti-

cles, and other published sources related to sanitation situation in Cambodia. The literature review led mainly to understanding of a broader context, including a political dimension of sanitation in Cambodia. For the primary data collection I combined methods such as in-depth interviews, structured interviews, semi-structured interviews and observation of predefined parameters of sanitation.

The survey was accomplished by one team of two data collectors and researcher over a five week period in March and April 2012. Prior to the survey both data collectors were trained and instructed by the researcher when bearing in mind that a complete understanding of the purpose of this survey by the interviewers was fundamental for data collection. The training lasted for two days and it was followed by the pilot interviews and pre-tests in one village. Corrections were made accordingly. Sections which showed any discrepancies underwent revision. The survey was done in Khmer language with results translated into English. According to findings from the pre-test, survey instrument was adjusted and finalized.

***Household Survey***

The household survey was conducted among 87 households in 9 villages (*the lowest administrative units*) in three communes. The communes within districts were purposively clustered in order to assure diverse sample. Then, I randomly selected three communes. The same random sampling method was applied in the selection of villages within selected communes. Households were selected by random walk method. The minimum number of households interviewed within each of the selected village was 9. In this way, we sought to cover the household diversity associated with spatial organization of villages.

The household survey included structured questionnaires. The intention of the survey was to target the same number of men and women and the same proportion of households with and without a latrine. However, none of this was fully accomplished.

The structured questionnaire was executed to measure a household's profile, socioeconomic situation of household, access to sanitation facilities, knowledge, attitudes, history of interventions, perceptions, basic information about social norms related to sanitation practice, current defeca-

tion practice, and information channels. Two questionnaires were developed and pre-tested, one for households with a latrine and one for households without.

***Observation***
The household survey was supplemented by a spot observation of the household environment and latrines. A pre-made checklist enabled easy and fast collection of data. The purpose of visual inspection was to determine the usage and quality of latrines. The superstructure and slab/platform of the latrines, as well as hand washing facilities, latrine cover, and distance from water source/house were examined. The essential criteria for latrine usage were visible access (a well-worn path to the latrine), and presence of faeces and/or flies in or around pit.

***Semi-structured interviews***
Semi-structured interviews conducted within households, unlike questionnaires, allowed researched team to react flexibly and enabled them to explore new questions and deepen on certain themes during the interview. The surveyors were trained in order to get data that were not included in questionnaires. 36 interviews were conducted.

Meanwhile, 9 semi-structured interviews with village leaders in targeted villages were conducted. Semi- structured interviews included open-ended questions. The interviews were conducted in order to gain insights of village socio—economic situation, history of sanitation, their main risks, problems, and challenges but also gain knowledge of functioning of health services in Cambodia and targeting different population segments in order to raise their awareness and influence their sanitation behaviour positively. All interviews were conducted in Khmer, translated in English and were recorded on a recording device. The consent to use recording devices was obtained from all informants, no one refused to participate in the study.

***In-depth Interviews with key informants***
In-depth interviews were conducted during the entire research period in order to gain both insights into the current sanitation situation in Cambodia as well as to get the personal opinions of key informants on functionality of sanitation interventions within the Cambodian context. The key informants were both from Ministry of Rural Development

(MRD), the Provincial Department of Rural Development (PDRD), as well as from several NGOs and INGOs. The total number of in-depth interview was 11. All interviews were conducted in English and were recorded on a recording device. Afterwards, the transcript of the interviews was completed by the researcher.

### 2.3 Data Analysis

All quantitative data from questionnaires were processed using Statistical Package for the Social Science (SPSS). All the recorded interviews were transcribed into English either by the researcher when they were held in English or by surveyors when they were held in Khmer. All responses were coded in order to create a set of concepts and themes. Subsequently, the content data analysis for each transcript occurred.

### 2.4 Ethical consideration

The research received formal approval by the regional authorities. All participants and informants contributed to the study voluntarily, providing free and informed consent while being assured of anonymity and confidentiality. No monetary or other incentives were provided. There was no one else apart from the researchers who had access to the data during the data collection period.

## 3. Results

### 3.1 Socio demographic characteristics

In total, 123 households (n=123) were included in the study with a response rate of 100%. The respondents were either the head of the household or their spouse. Over two thirds of respondents (70, 1%) were women. The reason for higher number of women involved in the survey is the absence of men in the house due to working duties. Age dispersion of the study population ranged from 20 to 75 years while generating mean age of 45 years. The major religion reported was Buddhism. The mean household size was 5.5 (SD 2.06) and 54% of households had at least one child under five. My study population identified almost one thirds of respondents were illiterate. The average years of education of respondents

were 2,93 years. 54% of all respondents (both latrine owners and non-owners) have at least one person in the family that had been sick with diarrhoea in the past two weeks. 95,4% of respondents are owners of the land where they live. The land of some households (26%) is flooded, but not annually. As this area is known for its economic agricultural base, the primary source of almost all households has been farming (92%) with income seasonality. Income availability peaks from December to April and is the lowest from June to September.

### 3.2 Latrine coverage

The proportion of households claiming for use a private improved latrine[3] in our sample was 31% (slightly above the national average – 29%). Latrine coverage in selected villages varied from 1% in Trapeang Kdar village (Thma Eidth) to 46% in Kbal Thnal village (Saeb). Out of the 69% of households without having access to improved sanitation facilities, only 3 reported having access to a neighbour's latrine, the rest defecate in the open.

42, 5% of all respondents indicated that the place of defecation is the same during the rainy season and the dry season. 27, 6% of latrine non-owners claim that during the rainy season they defecate just next to the house (in their yard). The average distance of the place of defecation for non-owners of latrines is 64,1m and for latrine owners 6,18m. The distance to go to defecate is ten times shorter for latrine owners than for non-owners.

The most common type of latrine was water sealed latrine made of with brick walls and a bath or jar inside for washing hands and anal cleansing. Water sealed latrines reflects the desires of villagers for better quality latrines. The average life span of latrine was 5,27 years and 73,1% of the respondents paid for the construction of the latrine more than 100$.

[3] Improved sanitation is precisely defined as "adequate access to excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, facilities must be correctly constructed and properly maintained" (World Health Organisation and United Nations Children's' Fund, Joint Measurement Programme definition).

60% of latrine non-owners plan in the near future (up to 6 moths) to build a latrine. The rest did not have any plans for building a latrine due to lack of money (95,8%) and lack of space (4,2%). Here, the question about having loan opportunities and a willingness to borrow some money to build the latrine was appropriate although the answers were in most cases negative. 96,6% of respondents said that they are not willing to borrow any money because they are not able to repay it: „*No I do not want to borrow money from anyone because I have no capacity to pay it back*" (Anonymous, survey respondent, 2012).

### 3.3 Physical environment

Turning to village characteristics, the focus was pointed at infrastructure (consisting modified aspects of the environment which remain durable when used) such as a road, a public transport network or a hospital, as an influential element for latrine adoption and usage. The average distance from 'centres' was an hour, and varied between 2 km to 15km. This study revealed that more households with latrines lived in villages which were better endowed with infrastructure, i.e., with access to market, regional health centres, material accessibility, knowledge accessibility, NGO activity etc. This link is explained by varying degrees of exposure to health promotion programs and informational messages about the importance of latrine construction and utilisation. Remoted and/or inaccessible areas were also less easily reachable by NGO workers that promote the sanitation awareness. In addition, the distance have a positive impact on latrine coverage not only by raising awareness, but also by making construction materials more available and transport costs little. However, according to semi-structured interviews with village leaders, in most of the researched villages the 'centres' became inaccessible during the rainy season.

Identified barriers in adoption of latrines related to physical environment were also of natural basis. The difficult terrain led to frequent re-digging (e.g. stony ground, collapse of pits). Lack of local material and thus the necessity to import material for latrine construction created additional costs and raised the price of latrines. The high level of underground water caused additional constraints during the rainy season. It caused the collapse of bad quality latrines, soaking of the pit content into the ground, or at worst, the content of pits gets on the ground surface. Furthermore,

water in pits increases the smell of latrines and the number of flies (Guellemann, personal communication, March 15, 2012).

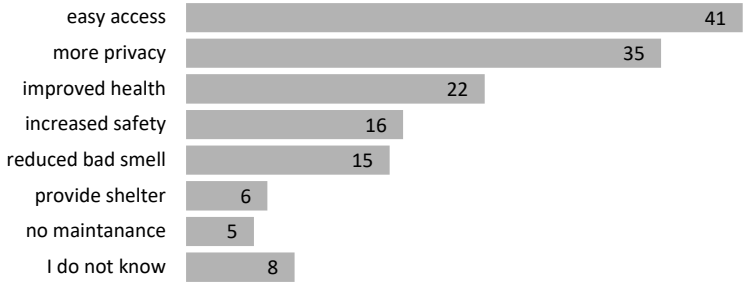
### 3.4 Motives and motives for construction and improvement of latrines

The crucial aspect at this survey was to ascertain the motivation of respondents for construction of latrines. The most common reason for having latrines among respondents was to have more comfort (55,5%) followed by a short distance to a place of defecation (51,8%), improved health (51,8%), and saved time (51,8%). In addition, the avoidance of embarrassment and have privacy (44,4%) forms a significant motive to construct a latrine. It is difficult to avoid being seen when defecating in the open, especially in the areas where only rice paddies are. Mainly women expressed the shyness and discomfort to defecate in the open: "*I am afraid that someone see my buttock*" (survey respondent, 2012); or "*I am scared that someone will see my genitals*" (survey respondent, 2012). 18,5% of respondents, almost every fifth person, replied that the reason they have a latrine is that "it was given to them by an NGO".

### 3.5 Perception of Latrine Ownership & Latrine Purchase Decision

The survey focused, among other things, on finding the advantages of having latrines from the perspective of people who do not have access to improved sanitation facilities. Perceived advantages of having a latrine among rural population in Cambodia included easy access, more privacy, improved health, improved safety, reduced odour, and comfort. The health benefits from improved sanitation have not been identified as the primary drivers.

**Figure 1:** Advantages of having latrine




Source: Author, 2012

The main reason identified for not yet owning a latrine is inability to pay for a sanitation facility. 95% of respondents stated that they lack money and cannot afford to construct a latrine. Some of the respondents responded that the reason why they still did not purchase a latrine is that they are waiting for NGO to come and build a latrine for them (3 households): "*People in this village do not want to spend money on toilets, they are waiting for NGOs to come and pay for it*" (Anonymous, survey respondent, 2012). If there is a history of NGOs subsidising latrines, people do not have to be willing to pay for it by their own means.

In addition, the research revealed that perceived affordability differs from actual affordability. Respondent were not aware of the actual price of latrine and still claim they lack financial means to build one. The answers on the perceived amount of money needed to build a single pit latrine (the cheapest option) concerned not knowing how much a latrine costs (62,7%): 23,7% of respondents think that latrine costs more than $100 (and most of them indicated price higher than $250) while 5,1% of respondents said that the price of the latrine is less than $15. Just for a point of the comparison, the real price of a simple pit latrine in Cambodia is between $50 and $100$. However, the lowest-cost latrine alternative is not desirable among respondents (see the subchapter 'Preferred Latrines').

Financial constraints are not the only reasons for not having a latrine. People also stated that they have other purchasing priorities than latrines. Among the most cited priorities were animals, a water well, rice paddies, and other things related to the improvement of livelihood. Other obstacles for the purchase of latrines is lack of knowledge where to buy a latrine or components for construction (75% of respondents lack this information) and no transportation option for getting the latrine back home (distance of the market). 89,8% of respondents claim that they would buy a latrine if someone sold one to them directly in a village.

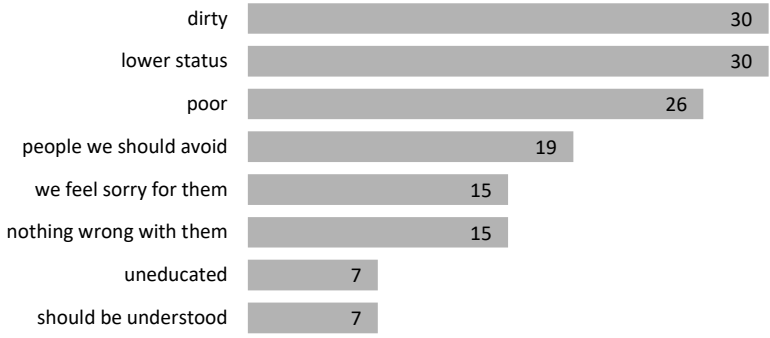
To supplement and complete picture of found difficulties we include in here also the second not less important type of identified barriers which had more socioeconomic character, such as lack of manpower, lack of knowledge and skills, and financial constraints. Respondents either did not know any skilled labourers who could construct good quality latrines, did not know how to build latrine by themselves or did not have enough means to pay for it (financial constrains).

### 3.6 Social norms & social pressure

The study showed that among respondents the social pressure to change the sanitation behaviour was not strongly present. 13% of latrine non-owners agreed with the statement '*defecation is natural, thus does not matter where you do it*'. In addition, every fourth respondent who does not own a latrine agreed with the statement '*neighbours defecate in the open, so it is ok for us to do it as well*'. People are not ashamed that they practice open defecation, because it is likely that all their neighbours do the same. Open defecation is perceived as something "normal". Open defecation is influenced by age-old habits that have been pursued for generations (Devine, 2009). Almost every third respondent that doesn't own a latrine agreed with the statement '*ancestors defecated in the open, thus it is acceptable for us to do it as well*'. Some respondents added comments like: "*We (people without latrines) just follow our ancestors. It (open defecation) was good for our ancestors, so it is good for us*" (Anonymous, survey respondent, 2012); or "*It is my habit to defecate in the open, why should I change it?*" (Anonymous, survey respondent, 2012). Using an improved sanitation facilities is not perceived as a social norm and open defecation is widely accepted among villagers.

As open defecation is perceived as something "normal" among those who do not have access to improved sanitation facilities, the opposite is true for the ones who own a latrine. Figure 2 shows latrine owners regard for 'open defecators'. The prevailing opinion is that people without latrines are dirty and have a lower social status. The next figure shows how people perceive 'open defecators'.

**Figure 2:** Perception of non-owners of latrine




Source: Author, 2012

### 3.7 Satisfaction

A third of the 'open defecators' indicated that they are not satisfied with their current place of defecation. The other two thirds claimed that they are neither satisfied nor dissatisfied. In most of the cases their answer was supported by the statement '*we don't have another choice*'. A negligible number of latrine non-owners admitted satisfaction with open defecation practice with highlighting offered privacy (they can hide in forests). "*It is difficult for us to defecate in the open, but on the other hand we have at least place to hide*" (Anonymous, survey respondent, 2012). Furthermore, they also claimed that 'it is quiet place'. "*The best place for defecation is bushes, I can hide there, but fields are also good. It is quiet there*" (Anonymous, survey respondent, 2012). Nonetheless, people who do not own a latrine had more difficulties to identify aspects of what they like about their current defecation practice than latrine owners.

During the rainy season it is difficult to defecate both in the toilet and in the open due to the constraints with water flooding (mentioned above). The rainy season was oftentimes cited as the reason for dissatisfaction among latrine owners as well as respondents without access to improved sanitation. Every third person without a latrine indicated that during the rainy season they defecate just next to the house (in their yard). Thus, the health risk is very high due to direct exposure to faeces. On the contrary, about 13% of latrine non-users go further from the house than usually. Considering the average distance to a place of open defecation is 64m, the time spent by defecating during the rainy season is very long: "*It is very difficult during the rainy season; we have to go far away*" (Anonymous, survey respondent, 2012). Besides that, the rainy season brings a higher number of snakes in rice paddies and the fear from snake bites was many times identified as a disadvantage of open defecation: "*There are cases of snake bites, but it was cured on time so far*"; or "*I am afraid of snake bites, rapes and ghosts.*" (Anonymous, survey respondents, 2012).

### 3.8 Preferred latrines

The unwillingness of Cambodians to invest in low-end cost latrines (in this case simple pit latrines) have appeared throughout the research. These latrines are considered unattractive and short lasting. The desired and 'ideal' latrine is a water sealed latrine that comprises a soak-away pit

with concrete rings, a pour-flush slab, concrete brick walls and a zinc or galvanized steel. '*Nobody in Cambodia constructs a simple pit latrine by his own will*' (Guellemann, personal communication, March 15, 2012). There are several reasons explaining this phenomenon. Firstly, water is seen as a holy substance. It is used in pagodas to purify; to transforms something dirty into something clean. As water sealed latrine uses water for flushing and anal cleansing, it is imagined as having the same transformative power (from dirty to clean) (Guellemann, personal communication, March 15, 2012). A simple pit latrine doesn't have this advantage '*simple pit latrines smell, you cannot really wash yourself inside, there is usually no water connection and if you use a lot of water it stinks even more. You don't feel that cleansing is ceremonial. So, there is no qualitative progress against open defecation*' (Guelleman, personal communication, March 15, 2012). Hence, open defecation is seen as better alternative to a dry simple pit latrine. Secondly, a dry simple pit latrine does not have ventilation pipe, thus all the smell and ethane goes back up and fills the latrine shed with terrible smell and attracts flies (Torresani, personal communication, March 6, 2012). Thirdly, as the construction is very simple, it is concerned over collapses of the latrines during the wet season (the wood floors wash away, the feces lift out of the pits, etc.). Fourthly, it is associated with negative memories from the Khmer Rouge regime (enforced simple pit latrines) (Baker et al., 2011).

For the construction itself, what is underground is viewed as a less important investment, the superstructure of latrine is more important (McLynnen, personal communication March 22, 2012; Baker et al., 2011). "*People are very conscious about what you see on the top – shiny and white tiles are preferable*" (McLynnen, personal communication, March 22, 2012). Cambodians prefer to have brick stable walls and a bath inside and will rather wait till they could afford what they want. As the research showed respondents want to spend time and money to build the latrine only once. People would rather pay more for a desirable and stable latrine than spending time upgrading a lower quality latrine or to build new latrines when they collapse. "*People just do not go for the lowest price option and they do not want things to look cheap, they do not want to pay too much, but they do not want something they will not be proud of*" (McLynnen, personal communication, March 22, 2012). (Field work, 2012; Baker et al., 2011).

### 3.9 Messages on Sanitation and Hygiene

The majority of respondents (86%) previously received sanitation messages. The most common sources of information were from NGO workers, TV, health centres, commune councils, and schools. The respondents showed a high level of trust in family members (29,4%) and health centres (nurses) (21,6%). The other sources worth mentioning are NGO workers (14,9%), TV (12,1%), and radio (5,7%). TV and radio are the most common form of mass media in villages. A third of respondents claimed that they listen to the radio more than 5 times a week. Many people who do not have a radio own a TV.

## 4. Conclusions

Stopping open defecation should not be considered a primary goal of sanitation development interventions. The national strategy supports interventions which are focused on moving people from open defecation to any available fixed places with the expectation that people will later upgrade or reconstruct their latrines by themselves and step up on 'sanitation ladder'. Nonetheless, the research showed that there is not a willingness to invest any means to building a latrine more than once. People want to build a higher quality latrine for a longer period rather than having a 'defective' latrine that needs to be repaired or replaced after every rainy season.

The latrine design is essential for the successful sustainable behavioural change. People require certain technical standards of latrines. If these standards are not met and are replaced by unwanted, less quality solutions (simple pit latrines), after a certain period of time people abandon these solutions and tend to revert to open defecation. The desirable latrine in Cambodia is a water sealed latrine. Identified advantages of this type of latrine relate to certain socio-cultural aspects of local communities (e.g. religion).

In order to target successfully the behaviour change, it is necessary to know the motivation of people influencing certain behaviour which include habits and motives with their drivers such as beliefs, values, internal thoughts, intentions, feeling, and emotional drivers. The main risks associated with inadequate sanitation are related to health and health

was being used in most interventions as a motivator for behaviour change. This study approved that people do not adapt toilets only because of preventing health risks but because of other motivations such as privacy, prestige, urban lifestyle, power relations, security or comfort.

Public finances are required in order to mobilize households and communities. The question is not whether to use hardware subsidies or not, but what is the limit for subsidies and how they should be targeted, distributed, and utilised (Robinson, 2006). It is not well-founded that the more money spent on software the more sustainable the behavioural change will be. People in Cambodia have a high awareness about a link between health and sanitation, but it does not contribute to constructing more latrines. Raising awareness is important, but people also need more technical and financial assistance. Hardware subsidies should be considered as one of the viable components, in particular for the poorest strata of population (Guellemann, 2011). Without hardware subsidies, many poor households are excluded from buying and installing latrines. However, the subsidies should be only a partial contribution to the total cost of latrine. The contribution of families would depend on their wealth. The personal contribution helps to avoid dependency of beneficiaries on external aid.

Technical assistance is also indispensable. Hard geographical conditions of Cambodia and scarce knowledge of building and installation of latrines among masons, producers, and beneficiaries are the reasons for a technical support. Technical assistance ensures more effective and efficient intervention (e.g. by choosing suitable materials, especially in hard geographical conditions, and proper installation), thus avoiding a latrine collapse, soaking of the content into the ground or water pollution.

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