FACTORS INFLUENCE HOUSEHOLD TO USE LATRINE AFTER OPEN DEFECATION FREE DECLARATION IN ERMERA DISTRICT, TIMOR-LESTE

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Public Health
College of Public Health Sciences
Chulalongkorn University
Academic Year 2012

ปัจจัยที่มีผลต่อการใช้ส้วมในครัวเรือนภายหลังประกาศนโยบายการใช้ส้วมของอำเภอเออร์เมอรา ประเทศติมอ เลสเต้

นายไอโว คอนเนลิโอ โลเปซ กูเตอเรช

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2555

Thesis Title	FACTORS INFLUENCE HOUSEHOLD TO USE LATRINES AFTER OPEN DEFECATION FREE DECLARATION IN ERMERA DISTRICT, TIMOR-LESTE
By	Mr. Ivo Cornelio Lopes Guterres
Field of Study	Public Health
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Accepted by the College of Public Health Sciences, Chulalongkorn University in Partial Fulfillments for the Master's Degree

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ไอโว คอนเนลิโอ โลเปซ กูเตอเรซ : ปัจจัยที่มีผลต่อการใช้ส้วมในครัวเรือนภายหลังประกาศนโยบายการใช้ส้วมของอำเภอเออร์เมอรา ประเทศติมอ เลสเต้ (FACTORS INFLUENCE HOUSEHOLD TO USE LATRINE AFTER OPEN DEFECATION FREE DECLARATION IN ERMERA DISTRICT, TIMOR-LESTE) อ.ที่ปรึกษาวิทยานิพนธ์ : ผศ.ดร.เขมิกา ยามะรัต, 90 หน้า.

วัตถุประสงค์ของการศึกษานี้เพื่อหา ร้อยละของการใช้ส้วม และ ความสัมพันธ์ระหว่างการคงใช้ส้วมกับตัวแปรต่าง ๆ เพื่อใช้ประโยชน์ในการขยายโครงการการใช้ส้วมทั่วประเทศในติมอ เลสเต้ การศึกษานี้เป็นการสำรวจภาคตัดขวางในอำเภอเออร์เมอรา เก็บข้อมูลจากหญิงและชายอายุระหว่าง 18-65 ปี จำนวน 417 คน เมื่อเดือนกุมภาพันธ์ 2013 โดยใช้แบบสอบถามประกอบการสัมภาษณ์ และใช้ไคร์สแควร์ในการวิเคราะห์ข้อมูล ผลการศึกษาพบว่า ครัวเรือนร้อยละ 47.2 ที่ยังคงใช้และบำรุงรักษาส้วม ในขณะที่ครัวเรือนที่เหลือคือร้อยละ 52.8 ที่หยุดการใช้ส้วมภายหลังการนำโครงการใช้ส้วมในพื้นที่ เมื่อปี 2011 ผู้ตอบแบบสอบถามเป็นชาย 57.6 % ซึ่งส่วนใหญ่ (54 %) ไม่รู้หนังสือ และพบว่าระดับการศึกษามีความสัมพันธ์กับการใช้ส้วมที่ระดับนัยสำคัญทางสถิติที่ 0.001 ผู้ตอบส่วนใหญ่มีอาชีพเป็นเกษตรกร และเลี้ยงสัตว์ 34.1 % ซึ่งอาชีพมีความสัมพันธ์กับการใช้ส้วมอย่างมีนัยสำคัญทางสถิติ รายได้ต่อเดือนส่วนใหญ่คือ 59.2 % ต่ำกว่า 100 เหรียญสหรัฐอเมริกา ซึ่งรายได้นี้มีความสัมพันธ์กับการใช้ส้วมเช่นกัน ครัวเรือนส่วนใหญ่ (49.2%) มีสมาชิกระหว่าง 6-10 คน กลุ่มตัวอย่าง 44 % มีเพื่อนบ้านใช้ส้วม 36.8 % มีเพื่อนบ้านที่ชักชวนหรือส่งเสริมการสร้างและใช้ส้วม ซึ่งตัวแปรเหล่านี้ต่างก็มีความสัมพันธ์กับการใช้และการบำรุงรักษาส้วม การศึกษานี้พบว่าความรู้ (p-value 0.002) เจตคติ (p-value < 0.001) และการปฏิบัติตัว (p-value < 0.001) เกี่ยวกับการส้วมและโรคที่สัมพันธ์กับการใช้ส้วม มีความสัมพันธ์กับการใช้ส้วมอย่างมีนัยสำคัญทางสถิติ อย่างไรก็ตามพบว่าตัวแปรที่ไม่มีความสัมพันธ์กับการใช้ส้วมได้แก่ อายุ สถานภาพสมรส และ ประเภทของ แหล่งน้ำใช้ การส่งเสริมและให้ความรู้เบื้องต้นเกี่ยวกับการใช้และบำรุงรักษาส้วมเป็นสิ่งจำเป็นและยังคงต้องพัฒนาทั้งความรู้ เจตคติและการปฏิบัติตัวต่อการใช้ส้วมของทุกคนในครอบครัวรวมทั้งเด็กที่อายุต่ำกว่า 5 ปี

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2555 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก .....

ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม .....

5578834953: MAJOR PUBLIC HEALTH

KEYWORDS: LATRINE USE/ TRADITIONAL BELIEVE/ ATTITUDE/ KNOWLEDGE AND PRACTICE OF LATRINE USE/ TIMOR-LESTE.

IVO CORNELIO LOPES GUTERRES: FACTORS INFLUENCE HOUSEHOLD TO USE LATRINES AFTER OPEN DEFECATION FREE DECLARATION IN ERMERA DISTRITCT, TIMOR-LESTE. ADVISOR ASST. PROF. KHEMIKA YAMARAT, Ph.D., 90 pp.

The objectives of this study were to find out percentage of association between variables and use and maintain latrines. This information is needed to scale up programs in the Ermera District of Timor-Leste. The respondents were males and females 18-65 years of age in Haupu village. The study was designed as a cross-sectional survey, based on quantitative data. Overall 417 respondents agreed to participate and data were collected through interview by using a structured questionnaire and chi-square test was applied for significance. The study was conducted in February 2013. The results of the study showed 47.2% households had latrines used and maintained them, while 52.8% has stopped using them after 2011. 57.6% of respondents were male. 54% had no education and there was a strong significant association between level of education and latrine use, 34.1% of respondents' occupations were "primarily farmers" or "managed livestock" and there was a significant association between occupation and latrine use (p-value 0.005), 59.2% earned incomes of less than 100 US dollars per month and there was a strong significant association between income and latrine use (p-value < 0.001). With regard to family size, 49.2% had 6-10 members, which had strong significant association with latrine use and maintenance (p-value 0.001), 44.0% had neighbors who used latrines and there was a strong significant association of this with latrine use and maintenance (p-value 0.001), 36.8% of neighbors influenced building and using latrines and there was a strong significant association with latrine use and maintenance (p-value < 0.001). In the study found that knowledge (p-value 0.002), attitude (p-value < 0.001) and practice (p-value < 0.001) were strong significant association with latrine use and maintenance. However there were insignificant association between latrine use and age, marital status and waters source.

Regular basis health education and promotion about latrine use and maintenance to improve knowledge, attitudes and practices, including family members and children under five years old to use and maintain latrines.

Field of Study……Public Health…… Student's Signature:……

Academic Year: ……2012…… Advisor's Signature:……...

Co-Advisor's Signature:…….

ACKNOWLEDGEMENTS

I would like to express my appreciation to Prof. Dr. Surasak Taneepanichsakul Dean of college of Public Health Science for his creative and guidance and encouragement throughout the period of study.

I specially wish to acknowledge my gratitude and profound appreciation to my Thesis supervisor Assist. Prof. Khemika Yamarat, PhD for her valuable and accurate advice. Even though she is very busy but still devoted and tried to find out time to share with me as much as possible.

I wish to acknowledge Dr. Nanta Auamkul as my thesis examiner, Dr. Peter Xenos as my co-advisor and Assist. Prof. Wattasit Siriwong, PhD, as my Chairman for their kindness and guidance throughout the study.

I want to express my gratitude to the other academic and administrative staff college of public health that has helped me in many ways.

I would like to express my gratitude and thanks to the Ministry of Health Timor-Leste for their support and guidance to study in College of Public Health Chulalongkorn University.

I wish to express my deepest gratitude to WHO Timor-Leste and WHO Regional Office Bangkok for their support and grating me the fellowship to study in this field.

Lastly I would like to thank to my dear friends, colleagues, my lovely spouse and family for their encouragement and support me during the study.

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Aus AID	Australia Aid for development
CLTS	Community led total sanitation
ECCU	Ethics Committee Chulalongkorn University
GDP	Gross domestic product
KR24	Kuder-richarson 24
KUBASA	Kategorizasaun uma baseia ba saude ambiental
MDG	Millennium development goals
NSD	National survey demography
NGO	Non government organization
ODF	Open defecation free
PED	Planu estratejia dezenvolmento
RDTL	Republic Democratic Timor-Leste
SPSS	Statistical Package for the Social Science
SISCa	Servicos integrado saude comunitaria
TL SLS	Timor-Leste standard living survey
VIP	Ventilated improve pit
WRI	World resources institute
WHO	World health organization

CHAPTER I

INTRODUCTION

1.1 Background and Rational

Sanitation is one of the basic needs and an important element of human rights worldly recognized; however sanitation is still a problem in low-income countries because of the influence of other factors that are not supported, so it continues to be a challenge for donors and governments. Timor-Leste is one of the newly independent country in this new era millennium, has recently endorsed Community-Led Total Sanitation in 2009 as an approach to increasing sanitation coverage and reducing health burdens in rural areas. Through the use of this innovative low-cost approach facilitators ignite communities to take action; to overcome sanitation issues; and ultimately take development into their own hands.

Community-Led total Sanitation (CLTS) represent a radical alternative to conventional top-down approaches to sanitation and offers hope of achieving the Millennium Development Goals (Movik and Mehta). To achieve the objectives that set out in the Millennium Development Goals (MDG) and the National Strategic Development Plan (PED) 55% rural sanitation coverage and 80% urban sanitation coverage by the year 2015, Government Timor-Leste through Ministry of Health commenced pilot using the Community Lead Total Sanitation approach (CLTS) in 2009. The CLTS approach has been implemented in 3 District (Baucau, Lospalos, and Ermera) and was successful. The CLTS approaches is one the approaches that can facilitates a process to influencing local communities to behaviour change from the open defecation to build and use latrines without any subsidy.

By the General Assembly of Unite Nation, 1980. The main objective of the Decade was to substantially improve the standards and level of services in drinking water and sanitation by the year 1990. However 62% present of the world's population has access to improved sanitation facilities (Frumkin, 2010).

More than 50 infectious diseases can be transmitted from an infected person to a healthy by the route of transmission human feces. However, 2.4 billion people, 40% of the total world population, lack of improved sanitation and 80% of the people live

in rural areas in developing countries. In the WHO African Region 631 million people (40%), not access to a wide range of improved sanitation facilities in 2000 (Anteneh and Kumie, 2006).

By the 99% population in developed region has access to improved sanitation facilities. In sub-Saharan Africa only 31% populations has access to improved sanitation facilities, 33% in Southern Asia and 52% in Oceania (Frumkin, 2010). However in developing country an estimated 1,4 billion people still do not access to save drinking water and 2,9 billion do not have access to adequate sanitation (UN, 1997). And according to the World Resources (WRI, 1998) inadequate access to water and sanitation contribute to 2,5 million child hood death each year from diarrhoea (Yassi, 2001).

Today many people in rural areas in Timor-Leste in general still living with the condition of sanitation facilities is very low except for lack of clean water as well as other determining factors such as the level of education, Socioeconomic and beliefs and tradition which is still exist and practiced. Based on Timor–Leste Demography health survey 2009-2010 showed that, 41 percent of households use improved, not shared toilet facilities. There are marked differences by urban-rural residence. Sixty-five percent (65%) of urban households and 34 percent (34%) of rural households use improved toilet facilities that are not shared with other households. However, 37 percent of households have no toilet facilities, a situation that is more common in rural areas (45 percent) than in urban areas (14 percent). Essential hygiene behaviours such as hand washing with soap are practiced in less than 25 present of households. 88.2% of community with sustainability access to an improved water source in urban area and 56% in rural area. However time to obtain drinking water 30 minutes or longer in urban 7.4% and 34.4% in rural area.

Basic sanitation shall be one of the Government's priority areas of infrastructure improvement public investment is a priority in basic sanitation services, to improve the quality of life of the Timorese. The IV Constitutional Government Program 2007-2012, states that the Government "is going to be specially committed in sanitary and nutrition promotion which is crucial especially in the most remote areas of the Country.

Since long time Government and partners has been working with several approaches to increase number of household access to sanitation including subsidy approach. However these approaches have not been found to yield sustainable behaviour changes at the local communities, even the sustained use of latrines after the end of project. Means that, the fundamental issues that need to be improved in the context of sanitation in Timor-Leste is not only dependent on the strategic or approach, but also be influenced by other factors such as environment, culture, economics, level of education and human behavior itself.

Factor unequal population distribution, most of the community of East Timorese live in rural areas with mountainous geography, lack of transportation, communication and information becoming challenge of access to clean water, sanitation and hygiene. Seventh (70%) of the Timor-Leste population lives in the rural areas only 30% of population lives in urban area, (NSD, 2010).

Timor-Leste is geography generally mountainous and cultural belief to ancestor's way of life still stronger. However the Ministry of Health and partners have tried often to run health promotion activities through a variety of print and electronic media, including education and directly in the field regarding to water, sanitation and hygiene. Education is important key to help individuals make informed decisions that have a positive impact on their health or well-being.

The state of natural resources is one important element to determine the form of sanitation facilities in Timor-Leste. In certain areas there are many sources of water, but in other parts difficult to clean water to meet their daily needs including for the latrine. There are three models of latrine such as Pit latrine, semi-flush latrine and flush latrine, that had been introduced accordance to economic conditions and the availability of natural resources.

Economics is one of the determinants of the status of human life, including health status. If the economy adequate to meet the housing needs by means of good sanitation and hygiene, quality nutritious food, adequate levels of schools, access to quality health care. However the 2007 Timor-Leste Survey of Living Standards reported that nearly 50 present of Timorese lived below the national poverty line, estimated at $ 0.88 per capita per day. The majority of people living in rural

livelihoods are farmer's plantation and fishery for those who live on the coast (TL SLS, 2007).

Respiratory and diarrheal diseases remain the top two causes of infant and child mortality in Timor-Leste, both of which are strongly linked to inadequate sanitation and hygiene. Diarrhoea alone is responsible for more than 380 child deaths per year in Timor-Leste (Timor-Leste National Basic Sanitation Policy, 2012). There are also strong links between inadequate sanitation, intestinal worms and malnutrition, whose combined effects make young children susceptible to predatory diseases like pneumonia, malaria and measles, and can lead to lower school and work productivity, impaired cognitive function, and reduced learning capacity (Timor-Leste National Basic Sanitation Policy, 2012). With this epidemiology substantial numbers of the community suffer from both acute and chronic illness related to poor hygiene, inadequate sanitation and/or unsafe water supply, poor housing and workplace conditions among other outstanding public health issues in Timor-Leste (TL. National Environmental Health Strategy, 2006).

Timor-Leste is estimated to suffer economic losses of $16.9 million a year due to poor sanitation and hygiene. This loss was estimated at 4.8% of GDP in 2006, equivalent to $17.00 per person per year, based on the economic impact of the preventable mortality and morbidity attributed to inadequate sanitation. (Timor-Leste National Basic Sanitation Policy, 2012)

CLTS-based approaches have been adopted by the Government of Republic Democratic Timor-Leste (RDTL) as a component in their national sanitation policy and the approaches are being implemented by the majority of sector stakeholders, covering almost 60% of the country. Many communities have been verified as open defecation free (ODF) with all households in the community using a toilet through these approaches. It is important however to understand the rate of regression back to open defecation after this status has been verified and how this status can be sustained beyond the achievement of 'ODF' status.

1.2 Research Questions

1. Does the socio demography associated with use and maintains latrines?
2. Do traditional practices belief and attitude associated with use and maintains latrines?
3. Does the socioeconomic status of a household associated with use and maintains latrines?
4. Does the environmental factor associated with use and maintains latrines?

1.3 Hypothesis

H_0:

- There is no association between socio demography with using and maintain latrines.
- There is no association between traditional practice belief and attitude with using and maintain latrines.
- There is no association between socioeconomic statuses of household with using and maintain latrines.

There is no association between environmental factor and using and maintain latrines.

H_1:

- There is an association between socio demography with using and maintain latrines.
- There is an association between traditional practice belief and attitude with using and maintain latrines.
- There is an association between socioeconomic statuses with using and maintain latrines.
- There is an association between environmental factor with using and maintain latrines.

1.4 Research Objectives

Referring to the research question mentioned above, the objectives to be achieved through this research are:

1.4.1 General Objective:

- To find out the relationship between latrine use and Socio Demographic, traditional believe, attitude, socioeconomic status and environmental factors.
- To find out key information related to Environmental Health Department for scaling up CLTS program.

1.4.2 Specific objective:

- To find out how many percentage of household are using and maintains the latrines and how many are stopped after open defecation free declaration (ODF declaration) in Ermera District.
- Using information provided by a household representative to find out the continued use or cessation of the latrines

1.5 Conceptual Framework

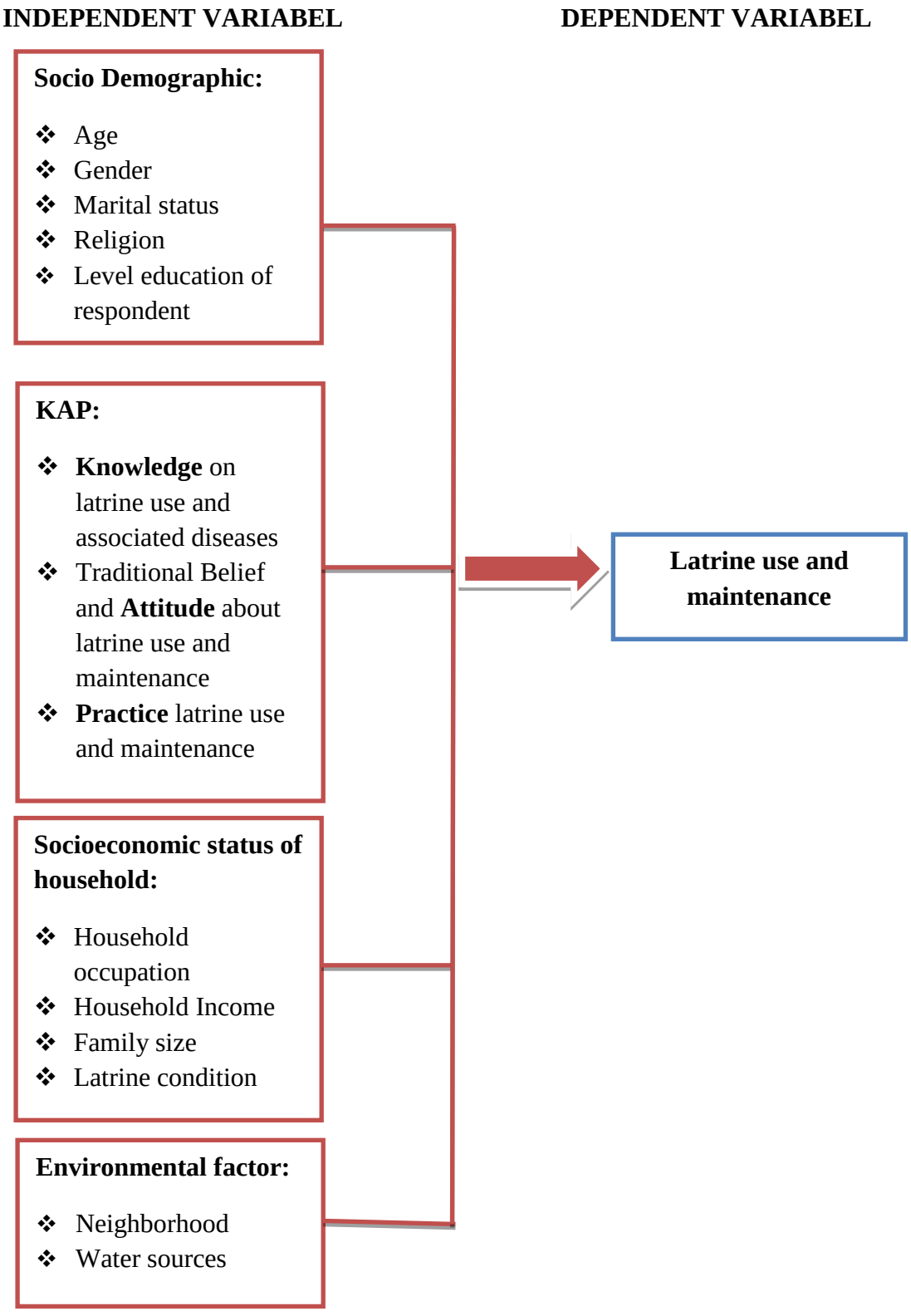

Figure 1: Conceptual framework

1.6 Operational Definition

Age refers to age of the respondent completed years before the date of interview.

Gender refers to either being male or female as subject of the respondent in the study.

Marital status refers to status of the respondent at the time interview, include married, single, living together, Divorced/separated and widowed.

Religion refers to the religion of the head of household or respondent at the time of interview. It's classified into Catholic, Christian protestant, Hindu, Muslim, Buddhist and others.

Level education of household refers to the highest education completed by household member consist head of household, spouse and any household member that have highest level of education in the household. In this study will categorize level of education base on the: No education/illiterate, elementary school, junior, senior school, diploma and bachelor degree. Non informal education refers to any kind of training related to environmental health (water, sanitation and hygiene etc.).

Household refers to a family that consisting of father and mother, children and grandparents of a marital partner including new family who do not have children yet, that living together in one house or under the same roof.

Knowledge on latrines and associated diseases refers to ability of the respondent to answer the practice of latrine use and maintenance and diseases associated, included water sanitation and hygiene, diseases and route transmission of diseases by excreta, hand washing. The knowledge was categorized into 3 parts: high, moderate and low. Consisted 10 questions and the score were being given: 2 for correct answer, 1 for not sure and 0 for false or incorrect answer. So the highest score is 20 and the lowest score is 0.

Traditional belief refers to the attitude existing in the community that have been trusted from generation to generation (old to young) since long time ago, which influence to use and maintain latrine. Included respondent opinions, agreement or

disagreement for both positive and negative aspect about latrine use and maintenance, washing hands with soap after defecate, clean the latrine and advice or teach children and others household members to use latrine. The attitudes were categorized in 5 parts according to Likert Scale (Nazir, 1985). There were consisted 10 questions for both positive and negative aspect. The score for positive aspect were 5 for strongly agree, 4 for agree, 3 for uncertain, 2 for disagree and 1 for strongly disagree. And for negative aspect were 5 for strongly disagree, 4 for disagree, 3 for uncertain, 2 agree and 1 for strongly agree.

Practice latrine use and maintenance refers to the behaviours of respondent included head of household, spouse and others household members to use the knowledge and understanding to use the latrine or not used. There were consisted 10 questions of practice latrine use and maintenance. The score were being categorized into 3 parts: score 3 for every day (seven days a week), 2 for always (3 to 6 days a week), 1 for rarely (1 to 2 days a week) and 0 for never. So the highest score was 30 and the lowest score is 0.

Socioeconomic refer to level of education, household occupation, family size and condition of latrine.

Household occupation refers to type of job that the respondent has to earn at the time interview. Included continuity of employment and gross income of head of household, spouse, and any other family member in the household that has job to support family income, average of household income was in monthly.

Family size refers to average number of persons or members of household in one house were categorize based on male adult, female adult, younger, school age children and children under 5 years old.

Neighborhood refers to a household to another household either with family relationship or none, that living near one another mutual trust and often meets each other talk about anything that relates to their life’s, include share the information and influence each other to build the latrine, use and maintenance. Family relationship refers to parents, brother/sister, uncle/aunt father /mother in low, and

grandfather/mother that has separate house and none relation refer to no relation family just neighbor.

Water sources refer to type of water source and the distance from home to get the water. Distance of water source was depended on tentative distance in meter from house to water source. Type of water source were include spring water, river, piped water, tube well/borehole, dug well, rain water that collected in drums, concrete jar and others store water. Piped water at the rural area in several parts of Timor-Leste refers to public tank and public tap. It's mean that every household has to be collected water with some distance from their home. Therefore type of water source depended to how many distance obtained by the household to collect the water.

Latrine condition refers to type of latrine, availability of water to flash the faces and for washing the hand. Type of latrine will include pour flash latrine, ventilated improved pit latrine (VIP latrine), pit latrine without slap/earth, pit latrine with slap and composting latrine. Children under five years old use latrine categorizes: 2 until 4 years old and time household started to use latrine. Distance of latrine to home refers to inside the home and outside the home with distance in meter. Target of use latrine refer to adult male and female, younger, school children, children under five years old.

Latrine use and maintenance refers to how often and prefer time a respondent use latrine, responsibility to maintain cleaning, emptying or repairing and improve physical construction of latrine. Time refer to day time, evening and no preference. Maintain and cleaning refers to once a week, twice a week and never/no cleaning and maintenance. Responsibility refer to female, male and children who normally repairing the latrine construction.

Respondent refers to head of household but if he is not available during the time interview or survey can respond by any one of household members such as spouse, and others household members male and female at the time interview.

CHAPTER II

LITERATURE REVIEW

2.1 Definition of basic sanitation

Basic Sanitation is defined as the access to adequate sanitation facilities including a latrine for defecation, hand washing facility, safe waste disposal, and drainage to eliminate standing water (Timor-Leste National Basic Sanitation Policy, 2012).

2. 2 Community Lead Total Sanitation Approach

Community Lead Total sanitation is an approach to community-based behavior change by way of facilitating their own to determine the best way to their health. Awareness will arise from themselves without element of duress from anyone else. The development of facilities is implemented directly in the field based on the ability of households without outside aid or subsidies from any of agency or organization (Tsegaye et al., 2009).

Through triggering in Community Lead Total Sanitation approach can promote sustainability of hygiene and good sanitation in the community to achieve a healthy life. Especially for people who do not understand the importance of using latrines and still throw feces everywhere or do not have latrine facility (Samuel, Ado & Sanitation Officer, and July 2007).

2.2.1 Factor influences using latrine related to CLTS Approach

An Evaluation of CLTS program in Nigeria 2007, showed that CLTS approach to empowering people aware to change the behavior in a clean environment, especially related to feces and latrine, however still determinate by others factors such as cultural and religious, natural conditions, socio-ecological, technological and socio-technological interactions issue are affecting to the sustainability of the CLTS approach.

Although the CLTS approach is one of the simplest approach and effectively using various strategies including use of outsiders as facilitators to mobilizing the community to participate in establishing their latrine. But it is still difficult to

implement in the community, especially for those who had received subsidies from other agencies.

Need to be aware that there are habits, custom, religion and culture in the community that affect to their lives. It often imposes differences in assumptions and contraception with outsiders, so that the whole things are important issue that needs to be adopted in Community Lead Total Sanitation approach before starting the program in the community.

The process of triggering community lead total sanitation approach, involving several people from different relevant ministries, stakeholder and partners from outside together with local communities to accelerate the achievement of ODF. The frequency of visits of outsiders or facilitator from outside the village is one of the critical points that can motivate people to leave their past defecate in any place. This situation is very disgraceful because outsiders can know the status of the sanitation matter in the village were very poor (Tsegaye et al., 2009).

2. 3 Factor traditional practice belief and attitude influence to use and maintenance of latrine

To achieve effective CLTS approach, needs further strengthening and adaptation context of the local environment particularly in relation with socio-cultural factors and belief. There are certain regions, defecated in any place is a traditional practice tied at the traditions and the values of the local culture. So the behavior and attitudes of the ethnic groups refuses use the latrine.

Several studies have found that changes in human behavior to water, sanitation and hygiene not only because it is based on the health education but the old culture belief also plays a role in changing human behavior, even though more leads to comfort and privacy as basic motivation rather than health (Bill and Melinda, 2012).

According to Lawrence Green, a person's behavior can be influences by a number of predisposing factors including knowledge, beliefs and attitudes towards an object of personal health (Notoatmodjo, 2003).

2.3.1 Factor Knowledge on latrines use and diseases associated

Knowledge is experience that is intended by the person or family on the impact that may occur related to health. For example, a father or mother knows the importance of the use and utilization of latrines after children affected by diarrhea or other diseases that cause by human feces. That experience can learn within their own families as well as through neighbors or information regarding to environmental health program that provided by health staff and any other agency, institute and also health volunteers (Notoatmodjo, 2003).

Knowledge greatly affects a person's behavior. Because before people adopt new behaviors should be started from knowledge, interest, evaluation considers whether or not, trial and finally adoption of new behavior (Rogers, 1974).

2.3.2 Factor Belief influence to use and maintenance of latrine

Believe is something which has happened in the past and believed without any evidence first. This belief is usually obtained from the parents, grandparents generations and generally they only believed, but without any evidence. For example, human waste is something that disgusted and has to defecate away from home and should not be seen; therefore they have to go far from the home or to the forest to defecate.

Timor-Leste Society that living in rural areas, belief in doctrine of ancestors still strong. According to their believe that human feces, it is smelly and disgusting, therefore must be disposed of away from home and not be seen by others. Another reason why people in rural areas they don’t use latrine because some of them still use pigpen as facility to defecate. However, this belief has begun to decrease, especially among the younger generation.

2.3.3 Factor Attitude influence to use and maintenance of latrine

Attitude is an assessment of a person toward health object including diseases. The Attitude describes the experiences of a person or another person who encourage to determining likes or not of an object. For example, washing hand with shop after using the latrine (positive respond). Throw human feces in the pit latrine is less convenient because of the smell, the feces can be seen and many flies, better defecate

in the forest more comfortable. Even defecate in an open environment that can cause health problems (negative respond). In addition it can also be a positive attitude when associated with a person or family dignity. Dignity is more important in social life so that rather than going to the forest better use the latrine more secure and comfortable (Notoatmodjo, 2003).

Access to latrines not only to prevent the disease but also related to dignity, privacy, and security. People who have access to clean, safe, and convenient sanitation services also showed the greater dignity, privacy, and security. It is very important for women and girl, when they are menstruating, or the risk of sexual violence (Bill and Melinda, 2012).

The shame becomes a private practice for particular community, when they go to use latrine. Because people will know that he was away for defecation. So to avoid it, better go to the forest. There were an uncomfortable feeling in the latrine because smell, so go to the forest more pleasant (Dittmer, 2009).

2. 4 Factor socio-economic household influence to use and maintenance of Latrine

Another study about socio-cultural evaluation of hygiene sanitation conducted in Sylhet city of Bangladesh in 2006 showed that the problem of water supply, sanitation and hygiene there are close relationship with socioeconomic status and level of education. It was found that most of the people living in the suburbs / Slum area own a condition clean water, sanitation and hygiene are very poor. It is due to the factor of low income, high-level illiteracy, no knowledge about the attitude and behavior change. Additionally there are families who do not want to use the latrine because clean water is not available and only used for the visitor.

2.4.1 Level of education and knowledge influence to use and maintenance of latrine

Besides the school is a place to learn science, the school is also a place to promote a healthy environment. Children usually use the toilet during school hours; this habit can be adapted and implemented in their homes. An assessment has been done in the Wereda District, East Gojjam Zone of Amhara Regional states that the

presence of primary or secondary school children in a household relatively increased latrine utilization (Anteneh and Kumie, 2006).

Health education and behavior change is not the only responsibility of government or Ngo but it can be done through the social norms approach to religious activities, village meetings and other social activities. Through those events can deliver a message, brochure distribution and demonstration of the importance of the use and utilization of latrines in the family and society (Hanchett et al., 2011).

Education and careful monitoring by health authorities could help to improve the design and management of latrine system and an excellent option to recycle human excreta (Dalhammar & Mehlmann, 1996; Winblad, 1996).

Implementation of health education and promotion activities especially to improve sanitation and hygiene behavior will not be effective and accomplished, if only done alone. Therefore need to be integrating with others activity as well. Monitoring and supervision is an essential activity for all programs. Only through this way we know the extent of progress and changes in the intervention, and also to find appropriate solutions to solve the problem. In other part through the subsidy also will not solve the problem in term of behavior changes and attitudes (Ganesh et al, 2010).

2.4.2 Factor Influence Neighborhood to use and maintain latrine

Environmental contexts as holistic, complex and naturally that can be influence an individual's health, including aspect of physical and ambient environment, social relationship others things that might result in environmental issue (Frumkin, 2010).

Changes in attitudes and behaviors in the community can be achieved if the triggers can be done well. It is really depends on the ability and skill of a facilitator to influence people can be changing bad habits that being practiced (Mehta forthcoming, 2010).

Human life within a community is always mutual dependency and need each other. And also life in the society always related to social and health problems that can be having positive and also negative impact. In the other side life in society might also affect each other to do something good for the public interest, families and

individuals. For example, mutual influence between household to establish family latrines and use it or influenced each other to behave well living in a clean and healthy environment. The study has done by Anteneh and Kumie showed that the existent of latrine utilization was constructed by learning from peer groups.

2.4.3 Factor latrine condition influence to use and maintenance of latrine

2. 4.3.1 Type of latrine:

1. Pit latrine

This type of latrine is often called traditional latrines are usually found in rural areas with low-income and difficult to get clean water. This type of latrine only dug a hole and all of the materials use from local. The traditional latrine construction although relatively simple technology but has huge benefits especially to prevent the spread of diarrhea control. This type of facilities commonly found in developing country that still living in under line of poverty (Anteneh and Kumie, 2006).

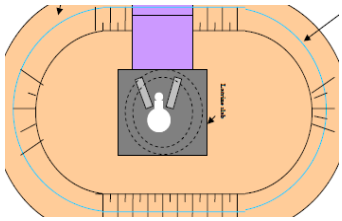

Figure 2: Type of pit latrine

Source: Technical guideline for the construction and management of household latrine (GOSS and MWRI, 2009).

2. Ventilated improve latrine (VIP)

This type of latrine has a vent pipe attached to the pit as ventilation for out the foul air from the pit. It has an open drop hole and dark squatting space is desirable for effectiveness of air ventilation and flies control.

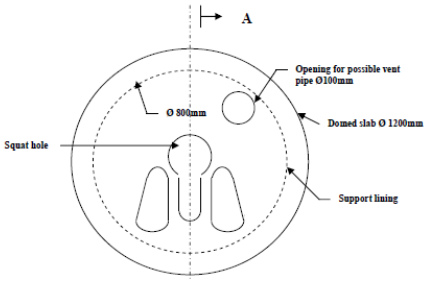

Figure 3: VIP latrine

Source: Technical guideline for the construction and management of household latrine (GOSS and MWRI, 2009).

3. Pour-flush latrine

Type of latrine is more prevalent in areas of sufficient clean water, because it takes water to clean human waste. This type of latrine has a squatting pan with a water seal, in addition to a leaching pit and the superstructure. Can use in both rural and urban area.

4. Composting latrine

This type of latrine can store human waste including urine for composting that can be used as organic fertilizer to improve soil fertility and does not pollute the environment. Normally this type of latrine appropriate in areas that people use human excreta as a fertilizer.

2. 4.3. 2 Using and Maintenance of latrine

According to an assessment conducted in Bolivia, 2012 after 6 years intervention found that the maintenance and uses of household latrine showed that only (50%) half number of the household still use the latrine. But half of them did not use any more and some of the household they use to store firewood (Eder et al, 2012).

Despite all of the members the family been using latrine but if the children still defecated around the house, still a problem for the environment and health. This condition commonly found in the low income communities; many parents think that the children's feces are not Harmful as of adults and defecation in the open space by the children is a common practice (Ahmed et al, 2006).

A study of long-term sustainability of improved sanitation in rural Bangladesh in 2011, it was found that the sustainability of the use and utilization of latrines can be influenced by several factors including a lack of leadership, poverty and social norm.

Water, sanitation and hygiene are one of the health packages that cannot be separated. Despite the fact that occasionally it is difficult to measure. But experience shows that the availability of clean water and sanitation technology itself without hygiene behavior change, not yet achieved significant results/ maximum.

Maintenance of latrines will be adjusted to the type of existing facilities, but generally can be done as follows:

1. Latrine needs to be cleaned on daily basis. Floor and defecation hole can be either brushed or washed clean with a broom specifically meant for this purpose only.
2. In dry latrines prevent too great of amounts of water entering the pit. Floor of the latrine can also be brushed with ash, which has a disinfecting effect.
3. Fly screen should be checked every month and if holes appear changed immediately.
4. Condition of latrine facilities is to be checked on regular basis and possible problems fixed immediately.

Using and maintenance of latrines is important for parents to teach family members to utilize existing facilities (Huuhtanen and Laukkanen, 2006).

2. 4.3.3 Hygienic toilets

The minimum requirements of a hygienic toilet are that it:

a. Prevents human contact with human excreta.

b. Prevents the discharge of human excreta into open spaces, drains and water bodies.

c. Prevents fly, other insect vector, and animal contact with human excreta.

d. Includes a solid, raised, platform with a smooth and easy-to-sweep finish.

e. Prevents the emission of bad smells (Timor-Leste National Basic Sanitation Policy, 2012).

2.5 Factor water sources influence to Use and maintenance of Latrine

Water is one requirement that essential for human life, in addition consume as drink water, also has function to manage and remove everything that didn't used by human body which we call human waste. Human waste should be taken care properly, so it could not affected to health and the environment, in terms of hygienic and latrine used and maintenance. To ensure that must be available sufficient water supply. Water source has been complicated by the poor quality of what mentioned above. Many of the health problems related to disease that occurs because of lack of water (Yassi A. et al., 2001).

Type of water source. Based on Timor-Leste Demography Health Survey 2009-2010 showed that mostly community consumes water from several source for drinking, washing, bath, latrine and others depend on the household needs. The type of water sources that available in this state are: piped water, tube well/borehole, dug well, rain water, spring water and surface water/river.

2.6 Disease relate to sanitation:

Unimproved sanitation system will produce contamination from human and animal feces that will affect the quality of drinking water sources such as surface water, ground water, wells. Therefore improved sanitation facility and ensuring hygiene separation of human contact the only way to prevent and break the chain of disease causing microbes, including bacteria, viruses, protozoa, and other small animal such as worms (Frumkin, 2010).

Lack of access and serious concern to sanitation and hygiene will effect on the contamination of water sources, food and other things that eventually will cause diarrhea (WHO, 1997).

Inadequate sanitation and hygiene can transmit several kinds of diseases such as:

1) **Diarrhea** is the most important disease that caused by excreta. The main factors in transmitting of diarrhea are inadequate personal and food hygiene, lack of safe drinking water, high residential density and increase of bottle-feeding instead of breast-feeding. Children are remarkably more vulnerable to

diarrhea than adults. Diarrhea also as the main factor cause of malnutrition of children.

2) **Hepatitis A** is caused by RNA related picorna virus. It is transmitted through contaminated food and drink in contact with water or soil, infected individual, or excreta contaminated water, and directly from one individual to another.

3) **Leptospirosis** is caused by Leptospira spp. microbe. This disease is transmitted through the feces of humans and animals. It is transmitted by direct contact with animal urine or urine contaminated water ground or plants and also can be transmitted through digestive system, skin lesions, eyes and mucous membrane.

4) **Schistosomiasis** is the second largest infectious disease caused by helminths. It is cby Schist somas haematobius, S. japonicum or S. mansoni flatworm. Because excreta of both infected humans and animals spread the helminth to water bodies.

5) **Ascariasis** is one of the most common parasitic diseases caused by Ascaris lumbricoides roundworm. It is transmitted through uncooked food contact with contaminated ground by human excreta.

6) **Hookworms:** is one type of worm that can be caused by soil contaminated with feces. Worm eggs develop into larvae and enter the human body through the skin. It can be prevented by avoiding walking barefooted and contact to human excreta contaminated ground. Use of adequate toilets and proper hygiene are of great importance in defeating the disease (Huuhtanen and Laukkanen, 2006).

2.7 Route transmission of disease by excreta:

Improved sanitation could contribute significantly to a sustained reduction in the prevalence of many diseases**:**

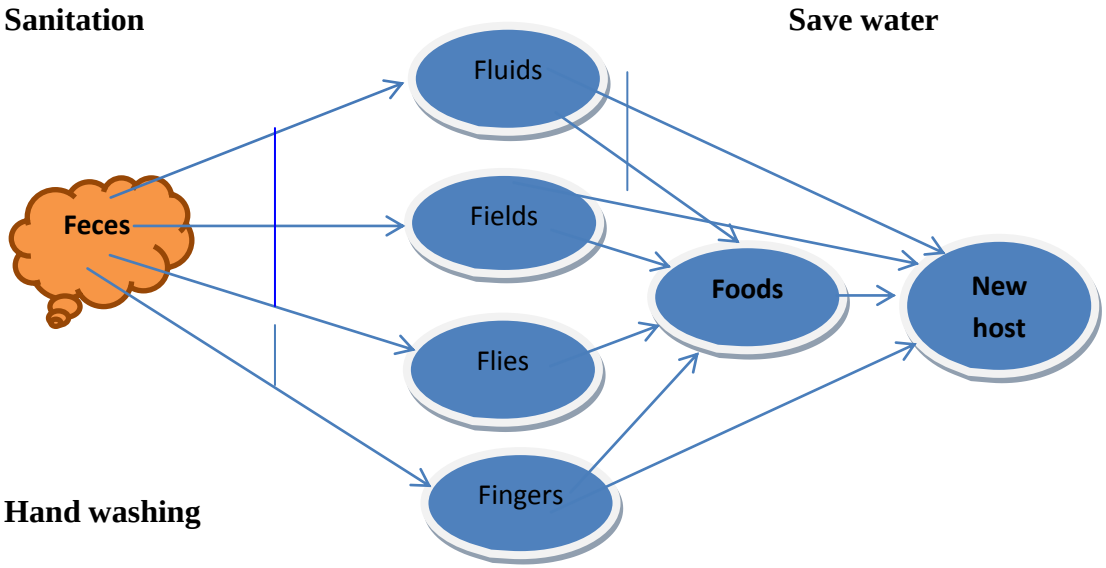

Figure 4: Route transmission of disease by excreta

Sources: PLoS Medicine www.plosmedicine.org, 2010

Improving access to water and sanitation facilities alone can reduce the incidence of diarrheal disease by 20% (WRI, 1996).

Five critical time hand washing: (1) after defecate, (2) after cleaning a child's bottom, (3) before preparing food, (4) before feeding a child and (5) before eating (TL National Basic Sanitation Policy, 2012).

"Water must be free from hazardous substances that could endanger human health. Sanitation must be hygienic and not pose a threat to the environment. It must be capable of effectively preventing human, animal and insect contact with excreta and the passage of diseases. Sanitation facilities must be safe to use. Excreta and wastewater need to be removed and/or disposed of safely. Governments should promote hygiene awareness and provide information on household water treatment and safe storage" (Albuquerque, 2010)

The most important excreta related diseases could be classified according to their transmission routes as follows:

- Diarrheal diseases
- Worm infections
  - With no intermediate host
  - With an aquatic intermediate host
  - With an animal intermediate host
- Insect transmitted diseases (Feachem, 1983).

2.8 District Profile

2.8.1 General overview sanitation program in Ermera District

Ermera is one of the districts from 13 districts in Timor-Leste, that famous with coffee, located in west-central part of the country. Area of this territory 746 Km2, distance 58 Km from the state capital of Dili. Total population size is 117,064 and 19,280 household, across in 5 Sub district (Atsabe, Ermera, Hatulia, Letefoho and Railaco) and 52 villages.

Overall number of schools in Timor-Leste (13 districts) totaled 48.091 schools, consisted of 1,671 Infantile School, 28.506 Elementary School, 8.457 Junior School and 7.612 Senior High School. Special in Haupu Village, there are one Elementary School, one Junior School and one Senior High School. Most of the school in Haupu Village has sanitation facility and water supply (TL Census, 2010).

The majority of the population has Catholic religion. Local dialect is Mambae, Tetum and Portuguese as Official language and Indonesia and English language as commercial language. The majority of community income in that district is coffee plantation. Generally there are three water sources used in water supply system: spring, pipe system, manual gravitas using local material and surface water.

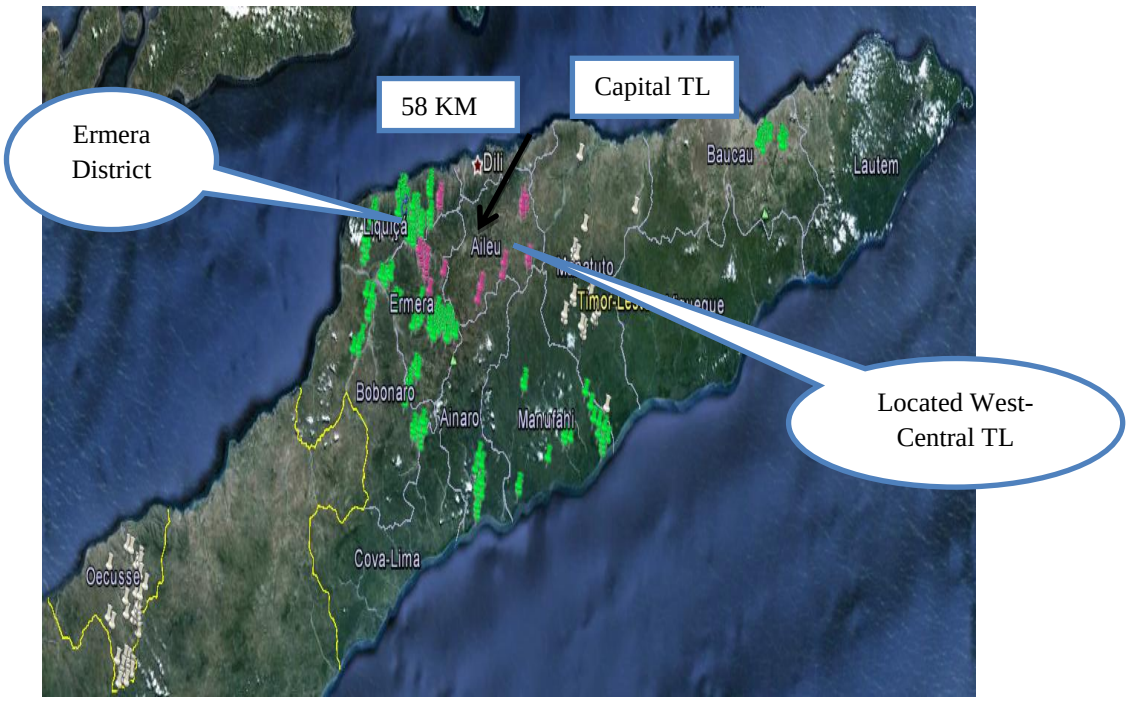

Figure 5: Map of Timor-Leste

Source: TL Census, 2010

Figure 6: Map of Haupu village

Source: TL Census, 2010

In addition access to latrines in Ermera district still very low, currently sanitation situation showed 19, 6% household access to improve sanitation, 8, 9% shared, unimproved 49, 6% and 21, 9 still open Defecation (Timor-Leste Census, 2010). About 60% of the sanitation program was implemented CLTS approach support by AusAID.

Among five Sub Districts mentioned above three of sub districts that implemented CLTS approach by the Aus-AID project in period of time 2009 – 2012, namely Letefoho, Atsabe and Hatolia Sub District. There are two villages in Letefoho Sub District that had implemented CLTS approach (Ducurai and Haupu villages). Haupu is one of the villages administratively under the Letefoho Sub District, with 12 sub-villages, 891 households and 5.068 populations that have been implemented CLTS approach and completely declared open defecation free (ODF). However in another two Sub District and village still low coverage. In Atsabe Sub District has been implemented in one village with two sub villages and has declared ODF and the other one village in Hatolia Sub District with seven sub villages with status already declared ODF.

2.8.2 Procedure Implementation CLTS approach at the village level in Timor-Leste

Community Lead Total Sanitation is one the approach base on the community that has planned, organized and developed together community to solve sanitation and hygiene issue that they faced. This approach will be involved community at the hall process of the activities included planning, developing a program activities and also in decision making during identifying the problems, setting goals and target coverage, set up the schedule and also task or responsibility.

Problem identification could be done by conducted baseline data collection. The method was used community mapping and households visit aims to identify and determine number of households who access to latrine and did not or still open defecation. The identification of sanitation problem will be facilitated by NGOs or staff at the Sub-district health office, implemented households visit to collect information regarding to categorization of household

base on the Environmental Health form (KUBASA form). It has been implemented during the village conducting triggering process by the health promoter.

Community makes their own mapping and household visit as base line data, that will be used by the community and also the village leader to develop plan for build their latrine facility in the village. The implementation of the CLTS approach will be depend on the how fast the household triggered and also depend of the skill of the facilitator to facilitate during the triggering process.

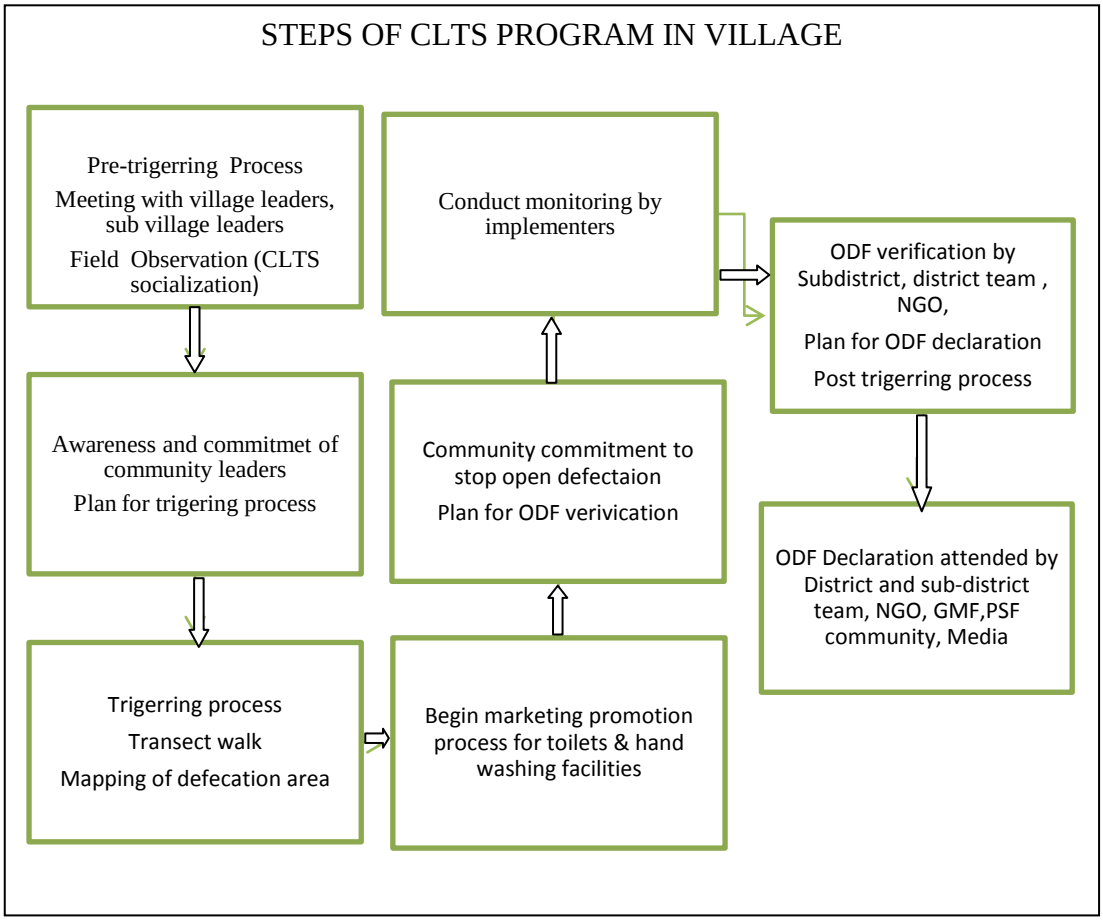

Figure 7: CLTS procedure

Source: TL CLTS Module, 2012

The role of a local authority is very important in addition to mobilizing communities, solved the problem also continuously conduct follow-up of the program. Experience showed that location often performed follow-up, there were

always changes and enhancement in comparison to the less visited locations. Therefore lack of local leadership in society affects the sustainability of latrine use (Hanchett S. et al, 2011).

Timor-Leste society is religious and culturally that highly loyal and being obedient to religious and local authority. The experience addressed many of the government programs succeed because of their influences. Despite there are still differences in influence of one place to another.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research design

Cross-sectional survey study, in this research was used quantitative data design to access information from the subject.

3.2 Study Area

The study was implemented in Haupu village, Letefoho Sub District, Ermera District, Timor-Leste.

3.3 Study Population

The study population was 19,280 households in Ermera District with total population 117,064 peoples. (Source: Census Timor-Leste, 2010)

3.4 Sample Technique

The sample size was calculated using Taro Yamanae's formula (Yamane, 1973) with the assumption of 95% confidence interval (two-sided). The study was conducted for 19,280 total households in Ermera district. So the total subject for research was calculated as follows:

$$n = N/ (1+Ne^2)$$

n = Sample size,

N = Population, and

e = Error of the sampling (0. 005)

n = 19,280 / $(1+19,280(0.005)^2$ = 391 + 10% = 430 households

3.5 Sampling and sample size

Multi-stage sampling procedure was used to selecting the sample. Administratively total District in this country 13 Districts. Purposively select one District (Ermera District) among 3 districts (Baucau, Ermera and Lospalos Districts) that has implemented CLTS approach supported by the AusAID through BESIK Program (Be Saneamento, Ijiene Komunidade). And by using simple random sampling method to select Letefoho Sub District among 2 other sub districts (Atsabe and Hatolia) that have implemented CLTS approach from the total of 5 Sub Districts in Ermera District. At the village level by using criteria to select one between two villages (Ducurai and Haupu Villages that has implemented CLTS) from total of 8 villages in Letefoho Sub District. The criteria are the village has declared open defecation free (ODF Declaration).

Haupu village is one of the villages that had good achievements of implementation CLTS approach compared to other villages in Ermera District. There are 12 sub villages in Haupu village. By using simple random sampling to selected 6 sub villages as the sample size. The 430 households were selected from the six sub villages. The households were selected in the selected sub village area were register to conduct house to house survey by the researcher team. To approach potential participant's first interviewer met with village local authorities to explain about the nature research. And at the same time was requested list of the household in the study area. The interviewer was randomly to select one sub village to start first. The first household that was started survey from any one of household in one sub village until cover 430 household within six (6) sub villages as sample size for this study.

The six sub villages included Duhoho, Haupu, Manucatilete, Riatoni, Hatuhou and Beturema sub village. All household in selected Haupu village has been implemented CLTS approach and been declared open defecation free area (ODF).

Flow chart sampling technique

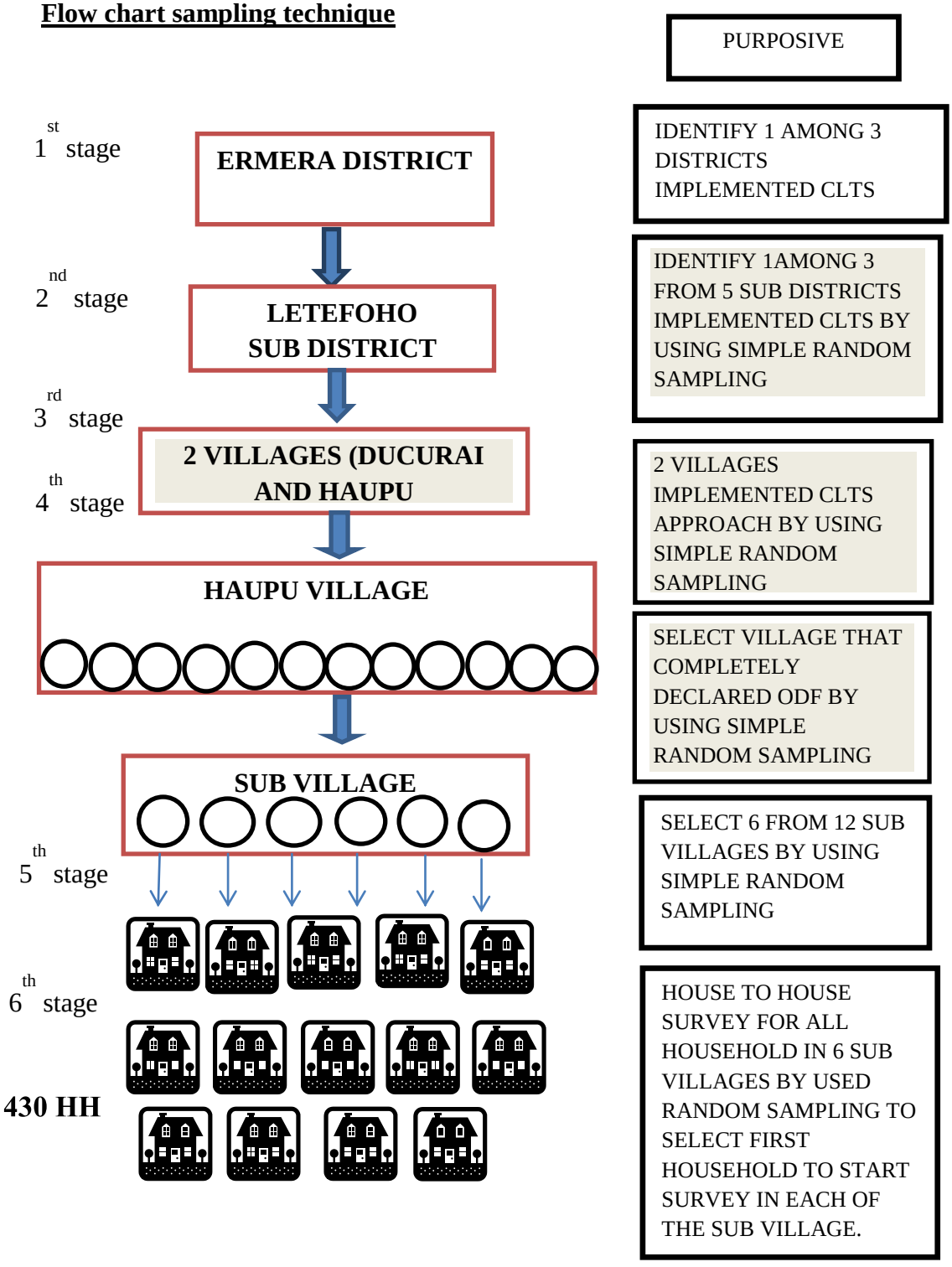

Figure 8: Sample technique

3.5.1 Inclusion criteria

3.5.1.1 Inclusion criteria for individual

- Male and female 18 to 65 years old
- Can speak Tetum (National language) or translate by others household members.
- Subject for respondent head of household or other household members if he or she is not available at the time interview.
- People living in current household not less than 6 months.

3.5.1.2 Inclusion criteria for Household

- Household with both have latrine and are not
- Household that willing to participate in the study.

3.5.1.3. Inclusion criteria for Village

- Village must be completely declared open defecation free (ODF)
- Village and Sub Village should belong to AusAID project trough Be'e, Saneamento no Ijiene Komunidade (BESIK Project).
- Village that implemented by BESIK partners (National NGOs)
- Only Village implemented CLTS approach by period of project 2009 to September 2012. At least 6 months to one year after open defecation free (ODF) declaration.

3.5.2 Exclusion criteria

3.5.2.1. Exclusion criteria for Individual:

- People with mental health base on researcher observation in the study area.
- Drunk (alcohol) during the time interview.

3.5.2.2. Exclusion criteria for Village:

- Village implemented CLTS approach by others agency or NGO.

3.6 Measurement tools

The study was used quantitative approaches to apply. Under the quantitative approach, a structured questionnaire was prepared, translated, piloting and administer through individual interview from each households in the study area to determine how many households still survive or use latrine and how many are not. And continue to search factor determinants of household, mainly related to 4 factors as already formulated in the conceptual framework of this study. The study questionnaire mainly has 6 sections:

1. Section one related to General characteristics.
2. Section related to Socio-Demography of household respondent.
3. Section related to Household characteristics
4. Section related to Traditional beliefs and attitudes toward latrine use and maintenance
5. Section related to knowledge about latrines use and maintenance, and diseases associated
6. Section related to practice latrine use and maintenance.

The interview was individual or per household. The questioners was developed in English and translated into National language (Timor-Leste official language) to facilitate participant active during the household survey.

Independent variables

- Socio-Demographic: Age of head of household, gender, status, religion and level education of respondent.
- Knowledge about latrine use and maintenance and diseases associated: There were 10 questions to measure the knowledge of the respondent about association between use latrine and diseases, benefit and effect of use and not use latrine, important to maintain the latrine, washing hand with soap after defecation, prevent diarrheal due to latrine use and maintenance and vulnerable group of diarrheal. The knowledge about use and latrine maintenance and diseases associated were being categorized into 3 parts: high

knowledge by obtained scores > 19, moderate 14-19 scores and the lowest knowledge were <14 scores that obtained by the respondent. Data was obtained by adding up the answers from each of respondent from 10 question and by using a mean and standard deviation (Mean=16.20, SD=2.61), to determine the highest, median and lowest figures obtained by the each of the respondents.

- Traditional believe and attitude: The attitude were being categorized in 5 parts and consisted 10 questions. The questions were being consisted both positive and negative aspect. In generally the content of the question related to respondent belief and attitude to use the latrine, perception about necessary to use latrine or defecation in the bush, perception about children feces, perception about responsibility to maintain and repair latrine. The score rate was from 10 to 50. Data was categorized into low attitude with < 36 score, Moderate 36-46 score and high attitude with > 46 score. Data obtained by adding up the answers from each of respondent from 10 question, and using a mean and standard deviation (Mean=40.53, SD=5.89) to determine the highest, median and lowest figures obtained by the each of the respondents.

- Practice latrine use and maintenance: There were 10 questions refer to measure respondent practice due to use and maintain latrine included respondent use and not use latrine for defecated, advise household members to use latrine and maintenance such as cleaning the latrine, cover the pit latrine after defecated, washing hand with soap after defecation, attended for any of the training related to environmental health program specific due to water and sanitation program. The Practice latrine use and maintenance were being categorized into 3 parts: high practice by obtained score > 18, moderate among 13-18 scores and the lowest practice were <13 scores. Data was obtained by adding up the answers of the respondent from 10 questions. And cut point the number into three parts by using quartiles percentage, to determine the highest, median and lowest figures obtained by the each of the respondents. The positive parts refer to respondents use and maintain latrine every day, cover pit after use latrine, clean latrine, repair and reconstruct

latrine, washing hand with soap after defecated, advice household members to use latrine. And negative part refer to respondent go to the bush for defecate feces, never clean latrine, never cover pit larine after defecated, never washing hand after defecated and no latrine maintenance. There were divided to fourth categories to measured respondents regarding to practice latrine use and maintenance: Every day (7 days a week), always (3 to 6 days a week), rarely (1 to 2 days a week) and never. Scored was based on positive and negative statement that obtained by the respondents. For positive practice statement the highest score was 3 for everyday day, 2 for always, 1 for rarely and 0 for never use latrine and maintenance. While for negative statement was 0 for every day, 1 for always, 2 for rarely and 3 for never use and maintains latrines.

- Socioeconomic status of the household:, Occupation of household , household income, family size, latrine condition
- Environmental factor: Neighborhood refers to family relationship parents, brother/sister, uncle/aunt father /mother in low, and grandfather/mother that has separate house and none relation refer to no relation family just neighbor. And Water sources refer to type of water source and the distance from respondent home to get the water. Distance of water source was depended on tentative distance in meter from house to water source. Type of water source were include spring water, river, piped water, tube well/borehole, dug well, rain water that collected in drums, concrete jar and others store water.

Dependent variables

- Latrine use and maintenance

3.7 Data collection tools

Data was collected by house to house survey in both times during the day and evening in their residence. Five interviewers with background education from senior high school were had been attended training on data survey and has experienced in many survey such as Census survey, Demography health survey and some study has done by public health graduate student. One supervisor from District Health Services (Public Health Officer) has background from public health degree and had experience

many years in public health area included environmental health assessment at the household level such as water and sanitation inspection at the household level and public place. They were recruited and trained before data collection. Two days training with the main objective to make sure the research assistants clear about the objective of the study, filling up the questionnaire and how to maintain the confidentiality. The orientation training was given by the principle researcher and included also the head of village. Field supervisions and daily meetings during data collection were intense to ensure the quality of data collection.

Before start interview the purpose, interviewer was introduces and explain the aims and objectives of the research. After getting the information, the interviewers started to ask question base on the questioner contents. The questioner of the study divided into 6 parts such as: Socio demography of household respondent, household characteristic, traditional practice believe and attitude latrine use and maintenance, knowledge about latrine use and maintenance and disease associated, and practice latrine use and maintenance.

3. 8 Validity and Reliability test

The pre-tested questionnaire was administered to 30 peoples or households, female and male from 18 to 65 years old, with the same area and the same population size and characteristic. All study subjects were interviewed related to Socio Demographic (Age of head of household, gender, status, religion and level education of household), Traditional practice believe and attitude and knowledge on latrine and associated diseases, Socioeconomic status of the household (Household occupation, income, family size, and latrine condition), and Environmental factor (Neighborhood, and Water sources). Respondents were interviewed with a local language after ensuring the consistency and clarity of the English version.

3.8.1 Validity

The validity of the questioner was tested by three experts from College of Public Health Sciences Chulalongkorn University Dr. Khemika Yamarat, Dr. Peter Xenos and Dr. Wattasit Siriwong and the other one from Ministry of Health Timor-

Leste Edi Setyo, M.Kes. The modification of questioner was based on their input and recommendation.

3.8.2 Reliability

A standardized and structured questionnaire was developed for the purpose of data quantitative collection. The pre-tested questionnaire was administered to 30 peoples or households, female and male with the same area, population size and characteristic. Use Cronbach alpha to test attitude and KR-24 use for test about knowledge. The perception with Cronbach's Alpha score obtained was 0.84 and level of knowledge was 0.93.

3.9 Data Analysis (statistics)

After completed all questionnaires, recheck, coded and enter into computer by researcher. Data was used Statistical Package for Social Science (program SPSS 17.0.) and Excel Program for data entry and analysis.

Data was analysis with Chi square to determine relationship between independent and dependent variables.

3.10 Ethical Consideration

Researcher had gotten an approval letter from Human Research Ethics Committee Cabinet of Health Research Ministry of Health Timor-Leste with approval reference MS/CHRD/I/2013/144, and also researcher ask permition to Local Autority before start the study.

- Information was taken, when the subjects willing to interviewed by the some of the point following:

  - Feel free without element of compulsion.

  - Confidentiality

  - Convenience

  - Access to final report through the meeting.

  - Assurance to data not to use for other purpose

- ❖ Researcher was conducted meetings with local authority and communities in order to present the results of the study before leaving the study site. And reaffirms to the public that the results only for the interests and needs of researchers as well as for the Ministry of Health to manage CLTS program more effective and sustainable in the future.

3.11 Expected Benefit and implication

Ministry of Health with partners UN agencies, International and National NGO, now work hard to improve target of latrine and hygiene in whole country especially in rural areas, by using CLTS approach to the pursuit MDG goals by 2015. This new approach was adapted and implemented by the Ministry of Health of Timor-Leste in 2009. Until now, the Department of Environmental Health, Ministry of Health Timor-Leste has been planning to expand CLTS approach into the whole country. Therefore, data and information found in this study will be useful for high level in the Ministries of Health in order to plan a program of sanitation; especially with the CLTS approach is more effective and sustainable in the future. And also this study expected to give the baseline data on the traditional practice belief and attitude of use and maintain latrines in Haupu village, Ermera District, Timor-Leste.

CHAPTER IV

RESULTS

The study was conducted on February 2013. Data was collected by 5 interviewers and one supervisor through house to house survey in both times during the day and evening in their residence. Before went to the field study, researcher and interviewer met the head of village and sub villages to get the information and data about the subject of study included number of household in the study area. A total of 417 respondents from 432 household were interviewed with structure questionnaire in the study area. Field supervisions and daily meetings during data collection and evaluated result in every evening to ensure the questioner was filled and correct.

This chapter presents the finding of data analysis. The data analysis reports are divided into six (6) sections:

1. Section one related to General characteristics.
2. Section related to Socio-Demography of household.
3. Section related to Household characteristics
4. Section related to Traditional beliefs and attitudes latrine use and maintenance
5. Section related to knowledge about latrines use and maintenance, and diseases associated
6. Section related to practice latrine use and maintenance

4.1 Univariate analyses

4.1.1 General characteristics

The description of general characteristics of the population includes name of the District, Sub District, Village, sub village and number of household. Administratively Haupu village consist of 12 sub villages, but the study was conducted in 6 sub villages randomly. The geography of Haupu village mountainous, distance from each sub villages about 3 to 5 kilometers. Most of the sub village access to elementary school facility, except Hatuhou sub village, there was no school facility available and the students should walk for 30 minutes or one hour to school. However

the distance from residence area to school ranges among 10 meter to 4 kilometer. The distance from each cluster to another small cluster within sub village average 50 to 300 meters. Each cluster average consist 5 to7 household. There was one Health Centre in the Sub District level and SISCa program available in every village for monthly health services delivery. The six sub villages namely:

1. Beturema Sub village : 11 households
2. Duhoho Sub village : 97 households
3. Haupu Sub village : 52 households
4. Manucatilete Sub village : 145 households
5. Riatoni Sub village : 72 households
6. Hatuhou Sub village : 55 households

4.1.2 Distribution Socio-demography of household.

The description of Socio-demography of household respondent consists of age, gender, marital status, and religion and level education of respondent (table 1).

The ranges age of respondent for this study among 18 to 65 years old. The majority age of respondent was 27.1% among 40-49 years old. Comparison ages among the 6 sub villages, The highest percentage age in Beturema Sub village was 31.2 at the range of 20-29 years old, Duhoho sub village was 26.6% with range 40-49 years old, Haupu 27% at the range 50-59 years old, Manucatilete sub village 35.4% at the range of 40-49 years old, Riatoni Sub village 27.6% at the range of 30-39 and 40-49 years old and and Hatuhou Sub village was 27.6% at the range ranges of 30-39 and 40-49 years old. From the six sub villages, 5 sub villages had the same highest of ages at the ranges of 40-49 years old. There were two sub villages had the same percentage within 2 groups in Riatoni and Hatuhou Sub villages and two sub villages with highest age in the range between 20-29 in Beturema and 50-59 years old in Haupu Sub village.

Regarding to gender of respondent 57.6% were male and 42.4% female. From the six sub villages the high proportion of gender was 64.9% male in Haupu sub village, 62.5% and 62.1% male in Beturema and Hatuhou sub villages, 61.8% male in Riatoni, 58.5% male from Duhoho and the low proportion was 55.6% female from

Manucatilete sub village. Position respondent in household, 62.4% respondent had position as head of household, 29.3% partners or spouse and 8.4% were members of family. High proportion respondent as head of household in Beturema Sub village 75%, Hatuhou 70.7%, Haupu 70.3%, Duhoho 61.7%, Riatoni 60.5% and the low proportion was 51.5% from Manucatilete sub village.

The majority of respondent 72.7% were married, 12.9% widowed, while 8.4% single, 4.8% respondent living together, means in Timorese context that women and men has been married according to the custom and 1.2% of respondent had been divorced. If compare into six sub villages the high proportion of respondent with status married were 81.6% in Riatoni sub village, 75.8% from Manucatilete, 70.7% from Hatuhou, 70.3% from Haupu, 67% from Duhoho and the low proportion was 62.5% from Beturema sub village. The majority of the respondent's religions were found in Haupu village, Letefoho Sub district was 100% Catholic were in the age group between 18-65 years old.

Education background of respondent's majority 54% of respondents had no education or illiterate, while 19.9% attended elementary education, 14.4% were attended for senior high school, 9.6% Secondary school and 2.2% were attended for Diploma and Bachelor degree. While highest education in household members 37.2% were senior high school, 20.6% elementary school, 18.7% secondary school, and 13.2% were illiterate, 6.7% for Diploma degree and 3.6% with background from bachelor degree. The high proportion level education of respondent if compare in six villages, high number illiterate 72.4% in Hatuhou sub village and the low number was 32.4% in Haupu sub village. The distance from Hatuhou sub village to Sub District about 4 kilometers to attend the school, there was no school available in that sub village; the student have to walk about 30 minutes to one hour to enter school. While Haupu sub village in the centre of the sub district area. There was several privet and public school available, even from elementary, junior school and senior high school except diploma and university level.

Table 1 Distribution Socio-demography of household (n=417)

Characteristics	Number	Percentage
Age of respondent		
18-19	11	2.6
20-29	65	15.6
30-39	86	20.6
40-49	113	27.1
50-59	80	19.2
>60	62	14.9
Total	**417**	**100.0**
Gender of respondent		
Male	240	57.6
Female	177	42.4
Total	**417**	**100.0**
Position of respondent		
Head of household	260	62.3
Partner/spouse	122	29.3
Member of household	35	8.4
Total	**417**	**100.0**
Marital status of respondent		
Single	35	8.4
Married	303	72.7
Living together	20	4.8
Divorced/Separated	5	1.2
Widowed	54	12.9
Total	**417**	**100.0**
Highest education of respondent		
No Education/Illiterate	225	54.0
Elementary Education	83	19.9
Secondary school	40	9.5
High school	60	14.4
Diploma	4	1.0
Bachelor degree	5	1.2
Total	**417**	**100.0**
Highest education of members of Household		
No Education/Illiterate	55	13.2
Elementary education	86	20.6
Secondary school	78	18.7
High school	155	37.2
Diploma	28	6.7
Bachelor degree	15	3.6
Total	**417**	**100.0**

4.1.3 Household characteristics

On the table 2: shown there were 6 types of occupation obtained by the respondent including 34.1% farm/livestock, 33.8% housewife at home, 16.5% self employed with small business (stall and street vender), 11.8% unemployed, 3.1% official government and 0.7% Privet Company. The comparison type of occupation between six sub villages, the high proportion 58.6% as farm in Hatuhou, 51.5% as housewife in Manucatilete, 43.8% farm in Beturema, 40.5% as farm in Haupu and the low proportion was 33% as housewife in Duhoho and 26.3% of housewife and farm at the same proportion in Riatoni sub village.

Continuity of employment respondents shown that more than half 67.9% of the respondent had continuity of employment were occasional, 28.3% were seasonal and only 3.8% had continuity employment for all year. There was the high proportion of respondent continuity employment occasional 74.7% in Manucatilete, 73.7% in Riatoni, 68.1% in Duhoho, 62.5% in Beturema, 60.3% in Hatuhou and the low proportion was 59.5% in Haupu sub village. There was less jobs available for the people to get the money in the rural area, so many of them living through small business such as open stalls, selling coffee, and others farm product. Even though there were certain small grand project from government and agency such as ILO project about road construction, water and sanitation, but just sort term contract within 3 to 6 months period time.

Regarding to the income of respondent in Haupu village, most of them 59.2% had a household income less than 100 US dollars per month, 26.9% from 101 to 200 US dollars per month and only 13.9% of them had income more than 200 US dollars per month. The high proportion of household income at the range of less than 100 US$ was 69% in Hatuhou sub village, 64.9% in Duhoho, 61.8% in Riatoni, 54.5% and 54.1% in Manucatilete and Haupu and the low proportion was 37.5% in Beturema sub village. This is due to lack of jobs, therefore the community income would be adjusted to the magnitude of the daily or monthly income as earn from sales revenue. Researcher also found that revenue per month from small business in the area of study average US$ 100.

In terms of the household size shown that 49.2% of the high level of household members was ranged from 6-10, 43.6% were ranged 1-5 members of household and only 7.2% were ranged between 11-15 members of household. The high proportion of household members in six sub village was 62.5% between ranges 6-10 peoples in Beturema, 58.6% 1-5ps in Hatuhou, 51.3% and 51.1% in Riatoni and Duhoho sub villages with ranges 6-10 peoples, 50.5% between ranges 6-10 peoples in Manucatilete and the low proportion was 47.3% between range 6-10 peoples in Haupu sub village. There were four sub villages with ranges between 6-10 peoples per household and two sub villages with ranges between 1-5 peoples per household. The high range of household size was 6-10 peoples in one household.

Table 2 Household characteristics (n=417)

Characteristics	**Number**	**Percentage**
Occupation of respondent		
Housewife at home	141	33.8
Farm/livestock	142	34.1
Official government	13	3.1
Company commercial	3	0.7
Unemployment	49	11.8
Self-employed	69	16.5
Total	**417**	**100.0**
Continuity employment of respondent		
All year	16	3.8
Seasonal	118	28.3
Occasional	283	67.9
Total	**417**	**100.0**
Income of respondent in month (US$)		
< 100/month	247	59.2
101-200/month	112	26.9
> 200/month	58	13.9
Total	**417**	**100.0**
Household member including respondent		
1-5 person/Hh	182	43.6
6-10 person/Hh	205	49.2
11-15 person/Hh	30	7.2
Total	**417**	**100.0**

As shown in the following table 3: 52.8% of respondent had no latrine and 47.2% of them having latrine. If compare within the six sub villages the high

proportion household had latrine 60.6% in Duhoho, 54.5% in Manucatilete, 50% in Beturema, 42.1% in Riatoni and low proportion was 19% in Hatuhou sub village. Deferent respondent had and uses latrine between sub village, less than 10% with respondent living nearby centre and less than 40% for those were living in remote area. However for those were living in remote area many of local material available to construct the latrine. But respondent always assumed that local material no longer to used, need to repair in short term period of time and uncomfortable to use because of bad smell and many flies inside the latrine facility and also environment nature support. In other hand high percentage illiterate in the rural area also limited of respondent knowledge due to use and maintenance of latrine. While for those respondents were living in the centre of village has high education and knowledge however still faced others factor such as not available local material, limited budget for rent and buy material from other place.

In other hand, there were 49% of the respondents use pit without slap/earth, 38% of them use flush latrine and only 13% use type of pit with slap to defecated feces. The high proportion type of latrine was 43.6% pit without slap in Duhoho sub village, 37.4% type of flush latrine in Manucatilete, 33.8% pit with slap in Haupu, 25% flush latrine in Beturema and 22.4% pit without slap and 8.6% flush latrine in Riatoni and Hatuhou. While the high proportion of pit latrine without slap in Duhoho sub village compared with others sub villages. As well as the high proportion of flush latrine type in Manucatilete compared with other places. There was other NGO and subsidy from the government implemented at the same village besides the CLTS approach. Almost 50% community Manucatilete received subsidy from NGO (HIM). And at the same time government also distributed subsidy latrine to the vulnerable groups. Regarding to the information from the head of village that total latrine has been distributed were 100 units for Haupu village; average one sub village has been received 9 to 10 units of latrine.

Regarding to respondent had no latrine, majority of them, 93.2% defecated in the bush and only 6.8% of them share with the neighbor latrine. The comparison between six sub villages the high proportion of household have no latrine went to the bush 74.1% in Hatuhou and Share with neighbor latrine 6.9%, 57.9% went to bush for

defecated in Riatoni, 43.8% went to bush and 6.2% share latrine in Beturema, 41.4% went to bush and 4% share larine in Manucatilete, 37.2% went to bush and 2.1% share with neighbor latrine in Duhoho and 47.3% went to defecated in the bush and 5.4% share with neighbor latrine in Haupu sub village.

While respondents in Haupu Village had been started use latrine in deferent time or year namely 73.6% of respondent had been started use latrine between 1-2 years, 18.3% between 3-4 years, 3.5% between 5-7 years and 4.6% more than 8 years.

As shown the following table that the majority of the respondent 98.0% having latrine outside of the home, only 2.0% having latrine inside the home. While 47.7% respondent who had the latrine outside home with distance between 6-19 meters, 28.5% less than 6 meters and 23.8% more than 19 meters.

Table 3 Latrine use in the respondents (n=417)

Characteristics	Number	Percentage
Respondent have and use latrine		
Yes	197	47.2
No	220	52.8
Total	**417**	**100.0**
Type of latrine respondent use (n=197)		
Pit without slap/earth	96	49.0
Pit latrine with slap	26	13.0
Flush latrine	75	38.0
Total	**197**	**100.0**
If no latrine where respondent go for defecate (n=220).		
Share with neighbor	15	6.8
Bush	205	93.2
Total	**220**	**100.0**
Respondents start use latrine (n=197)		
1-2 years	145	73.6
3-4 years	36	18.3
5-7 years	7	3.5
> 8 years	9	4.6
Total	**197**	**100.0**

Characteristics	Number	Percentage
Distance latrine from at home/outside (n=197)		
At home	4	2.0
Outside	193	98.0
Total	**197**	**100.0**
Distance latrine outside house (n=193).		
< 6 meters	55	28.5
6-19 meters	92	47.7
> 19 meters	46	23.8
Total	**193**	**100.0**
SD = 12.5 Mean= 6.5		

From the following table 4 shown, 49.9% of the respondent didn't have children, 31.4% of them never use latrine and only 18.7% of children less than five years old started use latrine (2-4 years old). While majority of the children under five years old 98.5% disposing feces outside of the house, only 1.53% of them disposal by burying.

Table 4 Children <5 years old latrine use

Characteristics	Number	Percentage
Children under 5 years old start use latrine (n=417)		
2-4 years old	78	18.7
Never use latrine	131	31.4
No children	208	49.9
Total	**417**	**100.0**
Children under 5 years old never use latrine (n=131)		
Disposal by burying	2	1.5
Disposing feces out of house	129	98.5
Total	**131**	**100.0**

Regarding to following table 5 shown most of the respondent 97.5% they had no preference time to use latrine, only 2.5% had preference time to use the latrine during day time. However most of them in the study area at the time interview responded that they had no preference time for defecated feces. It's depending on whenever they need to go for defecated. While some respondent reveals that it would be better and safety early morning because still dark and not many people around to use latrine.

Table 5 Prefer time respondent use latrine (n=197)

Characteristics	Number	Percentage
Day time	5	2.5
No preference	192	97.5
Total	**197**	**100.0**

As shown in the following table 6, most of the respondent neighbors 95.4% were still family relationship including brother, sister, uncle, aunt, father, mother, grandmother, grandfather. 3.6% were no neighbor and 1% were just neighbor no family relationship.

Regarding to respondent neighbor latrine 56.0% had no latrine, while 44.0% of them were having latrine. Most of the respondent 98.0% they were defecated in the bush 2.2% share latrine with neighbor. And also 63.2% of respondent they were not stopped going to the bush influenced by the neighbor, only 36.8% of them influenced by the neighbor. 55.6% respondent neighbor had latrine in Manucatilete sub village, 48.9% in Duhoho sub village, 39.5% in Riatoni, 36.5% in Haupu, while 25.9% and 25% in Hatuhou and Beturema. However for those didn't have latrine 70.7% went to bush only 3.4% share with neighbor latrine in Hatuhou, 68.8% went to bush in Beturema, 60.8% went to bush in Haupu, 55.3% went to bush in Riatoni, 48.9% went to bush in Duhoho and 35.4% went to bush and 3% share with neighbor latrine in Manucatilete. While only 46.8% has influenced by the neighbor to use latrine and stopped defecated in the bush in Duhoho, 41.4% in Manucatilete, 36.5% in Haupu, 30.3% in Riatoni, 25% in Beturema and 15.5% in Hatuhou sub village.

Table 6 Respondent neighbor

Characteristics	Number	Percentage
Respondent Neighbor		
Family relationship	398	95.4
No family relationship	4	1.0
No neighbor	15	3.6
Total	**417**	**100.0**
Respondent neighbor have latrine (n=402)		
Yes	177	44.0
No	225	56.0
Total	**402**	**100.0**
Respondent neighbor defecate place if no latrine (n=225)		
Share with neighbor	5	2.2
Bush	220	97.8
Total	**225**	**100.0**
Respondent builds and use latrine influenced by the neighbor (n=402)		
Yes	148	36.8
No	254	63.2
Total	**402**	**100.0**
Respondent stopped going to the bush defecate influenced by neighbor (n=402)		
Yes	148	36.8
No	254	63.2
Total	**402**	**100.0**

As shown in the following table 7: 54.9% respondent use water from spring water, 43.9% from piped water and less than 1% respondent get water from borehole and river. 0.7% from underground water and 0.5% get water from river for latrine use and maintenance. The high proportion of water source in Haupu village were 75% community used spring water in Beturema, 66% was used spring water in Duhoho, 60.5% was used spring water in Riatoni, 56.9% Piped in Hatuhou, 52.5% spring water in Manucatilete, 51,4% was used piped as source water in Haupu sub village.

Regarding to the water source the following table shows that 29.5% of the respondents had distance from home to water sources less and equal to 10 meters (≤10), 27.1% with distance 11-50 meters, 22.8% with distance 51-250 meters and

20.6% of them had distance more than 251 meters. While the high proportion of the distance from home to water source 31.2% within 51-250 meters in Beturema Sub village, 37.2% with distance >251 meters in Duhoho Sub village, 31.1% with distance 11-50 meters in Haupu Sub village, 39.4% with distance ≤ 10 meters in Manucatilete Sub village, while 27.6% with distance ≤ 10 meters and 11-50 meters in Riatoni Sub village and 43,1% with diatance ≤ 10 meters in Hatuhou Sub village. In conclusion respondents in Haupu villages could access to water for latrine use within distance less and equal to 10 meters (≤ 10 meters).

Table 7 Water sources

Characteristics	Number	Percentage
Type of water		
Piped water/tap	183	43.9
Spring water	229	54.9
Underground water/borehole	3	0.7
River	2	0.5
Total	**417**	**100.0**
Water sources distance (Meter)		
≤10	123	29.5
11-50	113	27.1
51-250	95	22.8
> 251	86	20.6
Total	**417**	**100.0**
Mode=10, Median= 50		

4.1.4 Traditional believe and attitude, knowledge about latrine use and maintenance and diseases associated and practice use latrine and maintenance

From the following table 8 shown that the highest score for respondent knowledge in statement 1 was 93.5% of the respondents could answer the question true, 5% not sure and 1.4% false. Statement 2, the highest score was 75.8% of the respondents answered false, 5.3% not sure and only 18.9% of the respondents could answer the question true. Statement 3 shown the highest score was 36.5% of the respondents answered the question false, 32.4% not sure and 31.2% of the respondents were answered true responds. The highest score in statement 4 was 92.1% of the respondents could answer the question true, 5% of them not sure and

2.9% respondents chose false. The highest score in statement 5 was 88.2%, the respondents could answer the question true, 7.2% false and 4.6% not sure. Most of the respondents 92.3% could answer true at the statement 6, while 4.8% of them false and 2.9% were not sure. Statement 7: most of the respondent 91.8% could answer the question true, 4.6% false and 3.6% not sure answered the question. Statement 8: majority of the respondents could answer the question true, 8.2% not sure and 4.6% of them answered false. From the statement 9, most of the respondents 87.8% could answer the question true, 6.5 not sure and 5.8% responded answered false. At the statement 10 majority of the respondents 86.3% was answered true, 6.0% false and 7.7% was not sure.

Table 8 Knowledge about latrine use and maintenance and diseases associated (n=417)

No	Variables	True (%)	False (%)	Not sure (%)
1.	Using latrine to defecate is one way to break the chain of diarrhea disease transmission.	390(93.5)	6(1.4)	21(5.0)
2.	*Open defecation is not effect on contamination of water sources, food and ground.	79(18.9)	316(75.8)	22(5.3)
3.	*The condition of latrine facility not necessary to be checked on regular basis because not possible to fixed immediately	130(31.2)	152(36.5)	135(32.4)
4.	Diarrhea diseases caused by human excreta	384(92.1)	12(2.9)	21(5.0)
5.	Defecate any place can transmit diseases to human such as diarrhea, worm infection, Hepatitis A etc.	368(88.2)	30(7.2)	19(4.6)
6.	Hand washing with soap after defecation, before preparing food and eating to prevent diarrhea diseases	385(92.3)	20(4.8)	12(2.9)
7.	Human feces transmits diseases by fluids, fields, flies and fingers	383(91.8)	19(4.6)	15(3.6)

No	Variables	True (%)	False (%)	Not sure (%)
8.	Improving clean water and sanitation facility can reduce incidence of diarrhea diseases	364(87.8)	19(4.6)	34(8.2)
9.	Diarrhea as a main factor cause of malnutrition of children.	366(87.8)	24(5.8)	27(6.5)
10.	Children are remarkably more vulnerable to diarrhea diseases than adults.	360(86.3)	25(6.0)	32(7.7)

*= *Negative statement*

As shown in the following table 9, that 47% of the respondents strong disagree, 24.2% disagree, 23.3% strong agree and the lowest percentage was 1.7% agree with the statement "Defecation in the bush is a continuation of ancestor's way of life, there for must be continued by young generation". Statement 2, there were 35.5% of the respondents disagree, 31.9% strong disagree, 15.3% agree and the lowest percentage was 4.1% agree with the statement "Human excreta smell bad, are disgusting, and attract many flies inside the latrine facility, so defecation in the bush more comfortable". The highest percentage in statement 3 was 28.5% of the respondents strong disagree, 25.9% disagree, 18.0% uncertain, and the lowest percentage was 12.7% of the respondents strong agree with the statement "I don't use the latrine because of shame at being seen approaching a latrine". While the highest percentage in statement 4 was 59% of the respondents strong agree, 36% agree, 4.1% uncertain and the lowest percentage was 1% of the respondents were disagree with the statement "I think necessary to use the latrine to defecate". Statement 5, the highest percentage was 57.3% of the respondents strong agree, 36.9% agree, and the lowest percentage was 0.5 strong disagree with the statement "I think parents necessary to teach the children and other household members to use and maintain latrine". Statement 6, there were 54.7% of the respondents strong agree, 42.2% agree and the lowest percentage was 0.2% of the respondents were disagree with the statement "I think necessary to wash my hand with soap after defecation and before preparing food and eating". Statement 7, there were 54.2% of the respondents strong agree, 42.0% agree and the lowest percentage was 0.5% disagree with the statement "I think water important to use and maintain latrine". Statement 8, the highest percentages was

33.3% of the respondents agree, 26.6% strong agree, 26.1% strong disagree and the lowest percentage was 6.5% of the respondents were disagree with the statement "I think children's feces are not harmful and defecation in the open space by the children is a common". Statement 9, there was high percentage 48% of the respondents were strong agree, 34.1% agree, 12.2% uncertain and the lowest percentages was 1.2% of them were strong disagree with the statement "I think clean the latrine and repair or reconstruction of latrine is responsibility everyone in the household". Statement 10, the highest percentage was 47% of the respondents were responded strong agree, 24.2% agree, 23.3% strong disagree and the lowest percentage was 1.7% of them disagree with the statement "I belief that channel of health information from radio and TV, NGO, health staff and volunteers can influence me to use and maintain the latrines".

Table 9 Traditional believe and attitude use and maintain latrine (n=417)

No	Variables	Strong Agree (%)	Agree (%)	Uncertain (%)	Disagree (%)	Strong disagree (%)
1.	*Defecation in the bush is a continuation of ancestor's way of life, there for must be continued by young generation.	97(23.3)	7(1.7)	16(3.8)	101(24.2)	196(47)
2.	*Human excreta smell bad, are disgusting, and attract many flies inside the latrine facility, so defecation in the bush more comfortable.	17(4.1)	64(15.3)	55(13.2)	148(35.5)	133(31.9)
3.	*I don't use the latrine because of shame at being seen approaching a latrine	53(12.7)	62(14.9)	75(18.0)	108(25.9)	119(28.5)
4.	I think necessary to use the latrine to	246(59.0)	150(36.0)	17(4.1)	4(1.0)	0

No	Variables	Strong Agree (%)	Agree (%)	Uncertain (%)	Disagree (%)	Strong disagree (%)
	defecate					
5.	I think parents necessary to teach the children and other household members to use and maintain latrine	239(57.3)	154(36.9)	18(4.3)	4(1.0)	2(0.5)
6.	I think necessary to wash my hand with soap after defecation and before preparing food and eating	228(54.7)	176(42.2)	10(2.4)	1(0.2)	2(0.5)
7.	I think water important to use and maintain latrine.	226(54.2)	175(42.0)	11(2.6)	2(0.5)	3(0.7)
8.	*I think children's feces are not harmful and defecation in the open space by the children is a common practice.	111(26.6)	139(33.3)	31(7.4)	27(6.5)	109(26.1)
9.	I think clean the latrine and repair or reconstruction of latrine is responsibility everyone in the household	200(48.0)	142(34.1)	51(12.2)	19(4.6)	5(1.2)
10.	I belief that channel of health information from radio and TV, NGO, health staff and volunteers can influence me to use and maintain the latrines	196(47.0)	101(24.2)	16(3.8)	7(1.7)	97(23.3)

** Negative statement*

From the following table 10, shown the highest percentage in statement 1 was 47.7% never use latrine, 32.6% always use latrine, 18.7% every day and the lowest percentage was 1% rarely practice use and maintain latrine. Statement 2, the highest percentage was 49.4% every day go to the bush, 27.8% never, 20.1% rarely and the lowest percentage was 2.6% always. Statement 3, the highest percentages was 51.3% Head of household never advise household members to use and maintain latrine, 25.4% Head of household always advise household members to use and maintain latrine use latrine, 18.7% Head of household rarely advise household members to use and maintain latrine and the lowest percentage was 4.6% Head of household every day advise household members to use and maintain latrine. Statement 4, the highest percentage was 60.2% never cover pit latrine after defecated, 22.3% rarely cover pit latrine and 8.9% cover every day and the lowest percentage was 8.6% always cover pit latrine. Statement 5, there was highest percentage 51.6% of respondents never clean the latrine, 35.3% every day clean the latrine, 7.2% clean latrine within 2-7 days and the lowest percentage was 6% clean latrine > 15 days. Statement 6, the highest percentage was 60.2% always wash hands with soap after defecation and before prepare food, 35.7% rarely, 2.1% every day and the lowest percentage was 1.7% never wash hands with soap after defecation and prepared food. Statement 7, the highest percentage was 52.8% of respondents had no responsibility to repair and reconstruct the latrine facility and 47.2% of them had responsibility. Statement 8, there was highest percentage in 52.8% of respondents had no attended for environmental health training and 47.2% attended for environmental health and study tour training. Statement 9, the highest percentage was 53.2% respondent had no attended for health volunteers training and 46.8% being trained as health volunteers. Statement 10, the highest percentage was 53.2% of respondents' access to environmental health information and 46.8% of them were not access to environmental health information.

Table 10 Practice use and maintain latrine (n=417)

No	Variables	Every day(7days a week)	Always(3-6 days a week)	Rarely (1-2 days a week)	Never
1.	Respondent use latrine to defecate	78(18.7)	136(32.6)	4(1)	199(47.7)
2.	Respondent go to bush for defecate.	206(49.4)	11(2.6)	84(20.1)	116(27.8)
3.	Head of household advise household members to use and maintain latrine.	19(4.6)	106(25.4)	78(18.7)	214(51.3)
4.	Respondent cover pit after defecate to prevent flies and bad smell	37(8.9)	36(8.6)	93(22.3)	251(60.2)

Table 11 Clean latrine

No	Variables	Every day	2-7 days	8-14 days	> 15days	Never
5.	How often you clean latrine?	147(35.3)	30(7.2)	0	25(6)	215(51.6)

Table 12 Washing hand with soap

No	Variables	Every day(7days a week)	Always(3-6 days a week)	Rarely (1-2 days a week)	Never
6.	Respondent use clean water to wash hands with soap after defecation, before preparing food and eating.	10(2.4)	251(60.2)	149(35.7)	7(1,7)

Table 13 Responsibility and training about water, sanitation and hygiene

No	Variable	Yes	No
7.	Respondent responsibility to repair and reconstruct latrine facility.	197(47.2)	220(52.8)
8.	Respondent attended for Environmental Health training and study tour due to water, sanitation and hygiene program.	197(47.2)	220(52.8)
9.	Respondent have been trained as health volunteer	195(46.8)	222(53.2)

No	Variable	Yes	No
10.	Respondent access to Environmental Health information regarding to water sanitation and hygiene through the radio, TV/TVTL, NGO, health staff and volunteer.	195(46.8)	222(53.2)

4.2 Association independent variable and dependent variable

4.2.1 Association between Socio-demography and household latrine use

Table 14 Association between Socio-demography and household latrine use (n=417)

Variables	Use latrine n(%)	Not use latrine n(%)	χ^2	p-value
Age (n=417)				
< 35	69(35.0)	59(26.8)	4.703	.095
36-50	75(38.1)	83(37.7)		
>50	53(26.9)	78(35.5)		
Total	**197(100.0)**	**220(100.0)**		
Mean= 43.3 ±SD=13				
Gender (n=417)				
Male	98(49.7)	142(64.5)	9.318	0.002**
Female	99(50.3)	78(35.5)		
Total	**197(100.0)**	**220(100.0)**		
Marital status (n=417)				
Single	39(19.8)	55(25.0)	1.611	
Married	158(80.2)	165(75.0)		0.204
Total	**197(100.0)**	**220(100.0)**		
Level of education respondent (n=417)				
No education	82 (41.6)	143(65.0)	28.202	0.000
Low education	66 (33.5)	57(25.9)		
High education	49 (24.9)	20 (9.1)		
Total	**197(100.0)**	**220(100.0)**		
Highest education household members (n=417)				
No education	21(10.7)	34(15.5)	21.317	0.000
Low education	59(29.9)	105(47.7)		
High education	117(59.4)	81(36.8)		
Total	**197(100.0)**	**220(100.0)**		

As shown in the above table, there was no significant association between age and latrine use and maintenance (p-value 0.095). The high level of use latrine was 38.1% at the range of ages 36-50 years old compared to 35.0% at the range of less than 35 years old and the lowest level use and maintain latrine was 26.9% at the range of age more than 50 years old.

From the above table shows, there was significant association between gender and use latrine and maintenance (p-value 0.002). In the subject of gender, high level of use latrine was 99(55.9%) at the range of female and 98(40.8%) male. Regarding to the gender most of the female were using latrine more as compared to male.

In terms of marital status as shown in the above table, there was no association between marital status and latrines use and maintenance (p-value 0.204). According to marital status and latrine use and maintenance was 158(48.9%) married and 39(41.5%) of them single.

As shown in the above table, there was statistically strong significant association between level of education respondent and latrine use and maintenance (p-value <0.001). The high level of latrine use and maintenance was 49(71.0%) at the group of high education, and the low level of latrine use and maintenance was 66(53.7%) at the group of low education and 82(36.4%) at the level of no education.

At the above table of figure shows, there were statistically strong significant association between education of family members and latrine use and maintenance (p-value <0.001). The high figure of latrine use and maintenance was at the level of high education, the low education level and the lowest at the no education level.

Table 15 Association between Socioeconomic status and household latrine use and maintenance (n=417)

Variables	**Use latrine n(%)**	**Not use latrine n(%)**	χ^2	**p-value**
Occupation of respondent				
Employed	13 (6.6)	3 (1.4)	7.721	0.005
Unemployed	184(93.4)	217(98.6)		

Household income				
Low income <100/month	104(52.8)	143(65.0)	22.224	0.000
Median income 101-200/month	49(24.9)	112(29.9)		
High income >200/month	44(22.3)	14 (6.4)		
Family size				
1-5 person/Hh	68(34.5)	114(51.8)	21.345	0.000
6-10 person/Hh	105(53.3)	100(45.5)		
11-15 person/Hh	24(12.2)	6 (2.7)		

Regarding to the above table shows, there was significant association between occupation and latrine use, and maintenance (p-value 0.005). The high level of latrine use and maintenance was at the group of unemployed and the low level was at the group of employed. Good job more income, more use and maintain latrine compared to those unemployed.

There was statistically strong significant association between household income and latrine use and maintenance (p-value < 0.001).The high level of use latrine and maintenance was at the range of high income, and the low level of use latrine and maintenance was at the range of low income.

In the above table shows, there was strongly significant association between family size and latrine use and maintenance (p-value < 0.001). The high level of latrine use and maintenance was at the range of 6-10 peoples per household, 34.5% at the range of 1-5 peoples per household and the low level was 12.2% at the range of 11-15 peoples per household.

4.2.2 Association between neighbors had latrine and latrine use and maintenance.

Table 16 Association between neighbors had latrine and latrine use and maintenance (n=402)

Variables	**Use latrine n(%)**	**Not use latrine n(%)**	χ^2	**p-value**
Neighbor have latrine				
Yes	134(72.4)	43(19.8)	1.185E2	0.000
No	51(27.6)	174(80.2)		

As presented in the above table 11 shows, there was statistically strong significant association between neighbors had latrine and latrine use, and maintenance (p-value < 0.001). The high level of use latrine was at the group of respondent who had neighbor and the low level was at the no neighbor.

4.2.3 Association between neighbor influences with latrine use and maintenance.

Table 17 Association between neighbor influences with latrine use (n=402)

Variables	Use latrine n(%)	Not use latrine n(%)	χ^2	p-value
Neighbor influences to build and use latrine				
Yes	134 (72.4)	14 (6.5)	1.930E2	0.000
No	51(27.6)	203(93.5)		
Neighbor influence stopped defecate in the bush				
Yes	134(72.4)	14 (6.5)	1.930E2	0.000
No	51(27.6)	203(93.5)		

As shown in the table 12, there was statistically strong significant association between neighbor influence and use latrine (p-value < 0.001). The high level of latrine use and maintenance was at the group of neighbor influenced to build and use latrine and the low level was at the group of no influences to build and use latrine. The respondent has been influenced by the neighbor to build and use latrine, and also stopped defecated in the bush compared to those respondents that didn't have influenced by the neighbor.

4.2.4 Association between water source distance and latrine use

Table 18 Association between water source distance and latrine use (n=417)

Variables	Use latrine n(%)	Not use latrine n(%)	χ^2	p-value
Water distance				
< 70 meters	120(60.9)	131(59.5)	0.084	0.959
70-370 meters	47(23.9)	54 (24.5)		
> 370 meters	30(15.2)	35 (16.0)		

As presented in the table 13 shows, there was no association between water source distance and latrine use, and maintenance (p-value 0.959). The high level of use latrine was at the range of water source with distance less than 70 meters compare with other water source distance with distance between 70-370 meters and more than 370 meters.

4.2.5 Association between traditional believe and attitude, knowledge about latrine use and maintenance and diseases associated, and practice latrine use and maintenance.

Table 19 The association between traditional belief and attitude, knowledge about latrine use and diseases associated and practice latrine use and maintenance (n=417)

Variables	Use latrine n(%)	Not use latrine n (%)	χ^2	P-value ≤0.05
Traditional belief and attitude latrine use and maintenance				
Low attitude (<36)	55 (27.9)	92 (41.8)	25.292a	0.000
Moderate attitude (36-46)	75 (38.1)	98 (44.5)		
High attitude (>46)	67 (34.0)	30 (13.6)		
Knowledge about latrine use and maintenance, and diseases associated				
Low knowledge <14	16 (8.1)	45 (20.5)	12.663a	0.002
Moderate knowledge 14-19	173 (87.8)	167 (75.9)		
High knowledge >19	8 (4.1)	8 (3.6%)		
Practice latrine use and maintenance				
Low practice < =14	26(13.2)	80(36.4)	46.197	0.000
Moderate practice 15-18	127(64.5)	129(58.6)		
High practice > 18	44(22.3)	11(5)		

Regarding to attitude we have categorized into 3 categories for the propose of understanding which can assume as, if the responses comes from the respondents less than 36 scores categorized as low attitude, 36-46 scores moderate attitude and > 46 scores as high attitude.

In terms of the above table 14, there was statistically strong significant association between attitude and larine use (p-value <0.001). The high figure of use latrine was at the range of high attitude, and the low figure to use latrine and maintenance was at the level of low attitude.

As well as for knowledge was categorized into 3 categories such as if the responses comes from the respondents less than 14 scores (<14) categorized as low knowledge, 14-19 scores consider as moderate knowledge and if the responses comes >19 scores categories as high knowledge.

It can be clearly see from table 14, shows that there was significance association between knowledge about latrine use, maintenance and disease associated with latrine use (p-value 0.002). In the level of knowledge subject, high figure for use latrine was at the range of moderate, and the lowest level of use latrine and maintenance was at the level of low knowledge.

According to practice latrine use and maintenance there were categorized into 3 groups. For propose of understanding, if the responses comes from the respondents less than 13 scores categorized as low practice, among the 13-18 scores consider as moderate practice and if the responses comes >18 scores categorized as high practice of use and maintain latrine.

As presented in the table 14, there was statistically strong significant between practice and latrine use (p-value <0.001). In the subject of practice latrine use, high level of practice use latrine was at the range of moderate practice, and the lowest practice was at the range of low practice.

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMENDATION

5.1 Discussion

The main purpose for this study was to find out how many percentage of household are using and maintains the latrines and how many are stopped after open defecation free declaration (ODF declaration) in Ermera District. And using information provided by a household representative to find out factors have influenced the continued use maintain or cessation of the latrines after one year open defecation free declaration (ODF). The program was started in Haupu village on 2011 and it was declared for open defecation on 15 of November 2011.

5.1.1 General characteristics

The study was design a cross-sectional survey study, in this research was used quantitative data design to access information from the subject. The study was done on February 2013 in Haupu village, Letefoho Sub district, Ermera District, Timor Leste. Sample size was 430 household but it was decrease to 417 household and 13 household not available at the time of interview, because a few of household has been moved to capital of city and district because of new job and also some of the household closed or not available at the time of study.

5.1.2 Socio-demography of household

Regarding to Socio-demography of household, the target group for the study was identified male and female. The majority age of respondent was 27.1% among 40 - 49 years old, 57.6% of them were male, 62.4% had position as the head of household and 72.7% was married. 100% of the respondents were Catholic religion among the age group of 18-65 years old. Level education of respondent's majority of them 54% had no education or illiterate, while 37.2% of the highest education of household members was senior high school.

5.1.3 Household characteristics

In terms of the household characteristics, high percentage occupations of respondent were 34.1% farm/livestock, more than half 67.9% of them occasional

employment, 59.2% income less than 100 to 100 USA dollars per month and 49.2% level of household members was ranged from 6-10. 52.8% of respondent had no latrine and 47.2% of the respondent having the latrine, 49% of them used pit without slap/earth. For respondent who did not have latrine 93.2% defecated in the bush. 73.6% had started use latrine from 1-2 years. 98.0% had latrine outside of the home, 47.7% latrine with distance between 6-19 meters. 18.7% children < 5 years started use latrine, while 98.5% children <5 years disposing feces outside of the house. 97.5% of respondent no preference time to use latrine. 95.4% of neighbor were still family relationship including brother, sister, uncle, aunt, father, mother, grandmother, grandfather. 44.0% of the neighbor were having latrine. 97.8% neighbor had been defecated in the bush. 36.8% of respondent they were influenced by neighbor to build and using latrine and stopped going to the bush. 54.9% of the respondent use water from spring water and 29.5% of the distance from home to water sources less and equal to 10 meters.

5.1.4 Attitude, knowledge and practice latrine use and maintenance

This study was included 30 questions or statement to found out the attitude, knowledge and practice. Each of the variables had 10 question or statement. Data was analyses by the each of the question in each item to get the proportion from the respondent.

In terms of knowledge, there was include also 10 questions due to latrine use and maintenance, and diseases associated. In univariate analyses was found that high percentages (75.8%) of respondents didn’t know about the effect of open defecation that will be contaminated water, food and ground. However for bivariate analyses was found that the highest scores obtained by the respondents was high latrine use at the range of high knowledge and low use latrine at the low knowledge.

Regarding to the respondent attitude, in this study was included 10 questions with aims to know respondent perception about the positive attitude due to use and latrine maintenance. In analyses univariate was found that 15.3% of respondents still felt defecated in the bush because of bad smell and many flies. And 33.3% of the respondents still felt that children feces not harmful and common practice. While for Bivariate analyses for attitude were found we found association between attitude and

latrine use. Respondents with high attitude toward use latrine 69.0% (67) and low attitude 37.4% (55) use latrine.

For practice latrine use and maintenance subject included 10 questions to know about the respondent respond due to latrine use and practice. In univariate analyses was found that the high proportion 49.4% of respondent still practice defecated in the bush, 51.3% head of household never advised members of household to use latrine, 60.2% respondent didn't cover pit latrine to prevent bad smell and flies, 51.6% never clean the latrine, 60.2% always washing hand with soap after defecation, 52,8% respondents no responsibility to repaired latrine construction and 53.2% of respondent access to water sanitation and hygiene information.

While in bivariate analyses was found that association between practice and latrine use. Respondent with high practice had more potential to use latrine more than the one with low practice.

There for needs to be improved respondents knowledge, attitude and practice due to latrine use and maintenance. Improve knowledge of respondents about advantage and disadvantage of use and not use latrine for defecated human feces. In addition needs to be explained more clear about the manner to use and maintain latrine properly (cover pit after use latrine, regular cleaning).

In terms of attitude needs to be focus on perception and idea to prevent bad smell and flies, responsibility of parents to teach and advice household members included children under five years old to use and maintain latrine. Encourage respondent to practice uses and maintain latrine in daily life, through several training, health promotion and education program due to water sanitation and hygiene.

5.1.5 Association between socio-demography of household

The study found that use and maintain latrines in Haupu village, greater in groups ages of 36-50 years old with percentages 38.1% while low levels 35.0% at the range ages of <35 years old and 26.9% at the range age of >50 years old.

The results analyses of association between the age and latrine use and maintenance by obtained p-value 0.095. It is concluded that there were no significant association to use and maintain latrines among the respondents ‘age. However if look at the trend of use and maintain latrine, it was more likely to use and maintain larine among the younger people compared to older age.

The study found that use and maintain latrines in Haupu village, greater in groups female while the low levels was at the male groups.

Cultural norms and practices are essential factors to adopting and use latrine. Timorese culture if defecated in the bush seen by some one shame because of dignity. Particularly for women, they felt problem going out for defecation during the night, rainy season and for long distance for defecation because of privacy and security matter. And also menstruation period that faced by a woman made them uncomfortable if seen by men. So to avoid shame, latrine is important and secure for women especially for young lady for disposal feces and urine.

Women are more strongly moved by emotions of shame and disgust than men and disgust sensitivity tends to decline with age (Curtis et al., 2004). Women in a community where defecation during the day time is shame (Anteneh and Kumie, 2006).

Access to latrines not only to prevent the disease but also related to dignity, privacy, and security. People who have access to clean, safe, and convenient sanitation services also shows greater dignity, privacy, and secure. It is very important for women and girl, when they are menstruating, or the risk of sexual violence (Bill and Melinda, 2012).

This study consisted with a Water Aids evaluation CLTS program in Nigeria 2007, significant amongst women privacy and dignity because use latrine. In the past women and girl had to go the bush and have to wake up early in the morning for defecation feces. And also increase safety, not go far for defecated.

Based on the result analyses of the association between gender and latrine use and maintenance, the values obtained p-value 0.002. It is concluded that there was a significant association to use and maintain latrines among the respondents female and

male. It was greater number of uses and maintain latrine at the group of female compared to male.

The study found that use and maintain latrines in Haupu village, greater in group of married with 48.9% (158) while low percentage was 41.5% (39) at the group of single.

Results of analysis of the association between the use and maintain latrine and marital status was obtained p-value 0.204. It is concluded that there was no significant association to use and maintain latrines among the marital status.

The study found that uses and maintain latrines in Haupu village, respondent with high education more use latrine more than low education. There was significant association between level education and latrine use.

Education as essential part of human life before made decision. People start to do something good and positive way because of good knowledge and education and also from the life experiences. Latrine presence and use was associated with education level of the head of household (O'Loughlin et al., 2006).

A study report was done by Uganda National Health Research Organization and UNICEF, 1998 revealed that education household head determines a bearing on the availability of Pit latrines in the homes. The household head who had ever been to attended school more likely to have latrines in their homes compared to those who had never been to school.

The result analyses of association between use and maintain latrine and education was obtained p-value < 0.001. It is strong significant association between educations with use and maintain latrine among the respondent. Respondents who had high education more likely to use and maintain latrine compared to those who had low education.

Occupation, the study found that use and maintains latrines in the Haupu village, greater in groups of unemployed with 93.4% while low levels 6.6% at the employed group.

Jobs influence to societies behavior to use and maintaining latrine. A good job would be provided better condition in the office included latrine facility compare with to those people were working in the field. High education and skill would be obtained better job, while low education and skill would be obtained low quality of job.

From the result analyses of the association between occupation and latrine use and maintenance, the values obtained p-value 0.005. It is concluded that there was a significant association to use and maintain latrines among the respondents' occupation. Respondents who had employed more likely to use and maintain latrine compared to those were unemployed.

Income of respondents, the study found that use and maintain latrines in the Haupu village, greater in high income 75.9% use latrine compared to low 42.1% lower to use latrine.

The high income would be high earners and high use and maintain latrine. Most people who had high-income were those that has been attended a high school degree and had skill to have a good knowledge and job. In other hand low income would be low use and maintain latrine because of limited financial and also most of them were farmer.

From the result analyses of association between income and latrine use and maintenance the values obtained p-value < 0.001. It is concluded that there was a strong significant association to use and maintain latrines among the respondents' income. Respondents who had high income more likely to use and maintain latrine compared to those were had low income.

The study found that use and maintain latrines in the Haupu village, greater in group high household members with 80% at the range of 11-15 peoples per household, while the lowest levels was 37.4% at the range of 1-5 peoples.

Household size has correlated with poverty, such as workfare or low-income educational stipends. (Stopnitzky, 2011). According to the Sphere project 2009, from London School of Hygiene and Tropical Medicine, 2009 reveals that a maximum rate for use one pit latrine is 20 peoples (20/pit latrine). A study has been done in Ethiopia

reveals that larger households members more likely to be using a latrine than smaller households.

From the result analyses of association between family size and latrine use and maintenance the values obtained p-value < 0.001. It is concluded that there was a strong significant association among the respondents' family size and latrine use and maintenance. Respondent with high family size more likely to use and maintain latrine compared to those were low family size.

The study found that use and maintain latrines in the Haupu village, greater in group neighbor who had latrine with 75.7% and the low group 22.7% in the group of neighbor who had no latrine.

Living together in one small group at the village has become habits and character of peoples in the rural been staying together as neighbor in one place was important for them. Because during the life they always depend and needs each other included influences each other to build, use and maintain latrines. Majority of neighbor in one place might be influence each other to use or not use and maintain latrine. More people tend to majority group, didn't care good or bad attitude.

From the results analysis of association between the use and maintain latrine and neighbor who had latrine and didn't have was obtained p-value < 0.001. It is concluded that there was a strong significant association among the neighbor who had latrine and didn't have with latrine use and maintenance. Neighbor who had latrine more likely to use and maintain latrine compared to those didn't have latrine.

The study found that use and maintain latrines in Haupu village, greater in neighbor influence to build and use latrine and stopped defecate in the bush 90.5% and in the group of no neighbor influences was 20.1%.

The study has been done by Anteneh and Kumie in Amara Region showed that the extent of latrine utilization was about 5 times more satisfactory in the house that constructed latrine by learning from peer groups than being imposed by other people. A study in Nigeria**,** found that between 65 and 89 percent of households using a latrine share it with at least one other household.

The study found that majority of people living next door 95.4% still close family relationship including parents, aunt, uncle, grandmothers, grandfathers, brothers, sisters so it might often to influences each other either in positive or negative terms included to build and maintain family latrine.

Result analysis of association between the use latrine and maintain with neighbor influence to build and use latrine and stopped defecate in the bush, p-value <0.001. It was concluded that there were strong significant association to use and maintain latrine among the respondents neighbor. Respondent who had neighbor more likely influenced to build and use latrine and stopped defecate in the bush compared to those were no neighbor.

The study found that use and maintains latrines in Haupu village among the water source and latrine no significant.

Water is the most important thing that needs to human life and other living beings, including for latrine use and maintenance. In this study was found that most of the household 54.9%, use water from spring water, 43.9% from piped water and less than 1% household used water from borehole, underground water and river for latrine use and maintenance. The study found also that there was no association between water source distance and latrine use and maintenance. However study was done in Nigeria 2007, revealed that source of water is very important for the effectiveness of CLTS approach.

From the result analyses found that p-value was 0.959, so there was no association between water source distance and latrine use and maintenance. Because p-value greater than 0.05.

The study found that use latrine and maintenance in Haupu village, high percentage was 69.0% at the high attitude and the low attitude at the range of low attitude 37.4%.

High attitude level might be high frequency to use and maintain latrine and low attitude had low frequency to use and maintain the latrine. Attitude as individual's perception of the object imaged through perception, response, and adaptation mechanisms. Even though formal education attended by the respondent low, but if the

respondent had sufficient knowledge about the use and maintain latrine it could be better feeling and thinking rather than those who had low attitude.

From the result of analyses found that the association between attitude and latrine use and maintenance obtained p-value < 0.001. It was concluded that there was a strong significant association to use and maintain latrines among the respondents who had living in high attitude more likely to use and maintain latrine compared to those were living in low attitude.

The study found that use and maintain latrines in the Haupu village, greater in group of moderate knowledge level with 50.9% while 26.2% in the low knowledge groups.

Knowledge is something that very important to know related to use and maintain of latrines. If people with enough knowledge about the usefulness of latrines, would be easy to have good idea to practice. However, while people who don’t have enough knowledge of the meaning, benefits, and others regarding to the latrines that will be more difficult. High knowledge might better desire and willingness to have better attitude and practice. Knowledge greatly affects to a person's behavior, because before people adopt new behaviors should be started from knowledge, interest, evaluation considers whether or not, trial and finally adoption of new behavior (Rogers, 1974).

Cognitive or knowledge is very important domain for the formation of one's actions. (Notoatmojo, 1997). The study was found that 50.9% of household latrine use and maintenance at high and moderate levels of knowledge.

There were several organizations nongovernmental International and National Ngo, Agency, donors, religious included Ministry of health has been prioritized health promotion program included diarrhea diseases as priority program to promote at the hall level of community, particularly in the rural area. However the formal education of respondent at low level, but if sufficient informal education has been provided might improve knowledge of respondent regarding to latrine use, maintenance and diseases associated.

Based on the result of analyses found that the association between the knowledge and latrine use and maintenance obtained p-value 0.002. It was concluded that there was a significant association to use and maintain latrines among the respondents 'knowledge. Respondent who were living in high knowledge more likely to use and maintain latrine compared to those had low knowledge.

The study found that use and maintains latrines in the Haupu village, high percentage at the high level of practice, while low percentage was at the low practice group.

Higher level of knowledge about the latrine use and maintenance might be affected to changing of attitude and practice.

This study was consistent with a CLTS case study in Nigeria 2007 revealed it was very successful in promoting significant in the practice of open defecation in communities with many of the assessed community achieving open defecation free status.

From the result analyses of association between the practice and latrine use and maintenance obtained p-value < 0.001. It is concluded that there was a strong significant association to use and maintain latrines among the respondents had high practice more likely to use and maintain latrine compared to those were low practice.

5.2 Conclusion

Based on the description from the discussion in the previous chapter the researchers concluded that high percentages of age respondent attended the study was 27.1% among 40 to 49 years old, 57.6% of them were male and 42.4% female. 72.7% of respondent were married. 100% of respondent where attended the study were Catholic religion. High level education of respondents was 54% had no education or illiterate. While highest education in household members was 37.2% at the level of senior high school.

High percentage occupations of respondent were 34.1% farm/livestock. High percentages respondent incomes were 59.2% less than 100 US dollars per month. Household size in Haupu village was 49.2% ranged from 6-10 peoples in one household.

47.2% of respondents had latrine and use it and 52.8% of them had no latrine and stopped use it. 49% of respondent had been used pit without slap/earth. Respondent neighbor were had latrine 44.0% and 56.0% of them had no latrine. 36.8% of respondent they were influenced by neighbor to build and using latrine and stopped going to the bush. 54.9% of respondent use water from spring water and 29.5% with distance from home to water sources less and equal to 10 meters.

Most of the respondents 93% could answer the question about latrine use and diseases associated true. However the only 18.9% of respondents that could understand better about the effect of open defecation could contaminate water, food and ground. And only 31.2% of respondents could understand that the condition of latrine facility necessary to be checked on regular basis and fixed it. 59% of the respondents had positive perception about traditional believe and attitude due to latrine use and maintenance. However 15.3% of them still felt that more comfortable defecated in the bush rather than use latrine because of bad smell and many flies inside the latrine. In terms practices 56% of the respondents they have practice use latrine. However there were still many of the respondents 60.2% of them never cover the latrine and only 8.6% of them always cover pit latrine after defecation. More than half of the respondents 51.6% never clean latrine and only 35.3% of the respondent could clean the latrine every day. However still high percentages 52.8% of respondents had no responsibility to reconstruction and repair the latrine.

There was no significant association between age and latrine use and maintenances (p-value 0.095). There was a significant association between gender and latrine use and maintenance (p-value 0.002). There was no significant association between marital status and latrine use and maintenance (p-value 0.204). There was a strong significant association between level of education and latrine use and maintenance (p-value <0.001). There was a significant association between occupation and latrine use and maintenance (p-value 0.005). There was a strong significant association between income and latrine use and maintenance (p-value < 0.001). There was a strong significant association between family size and latrine use and maintenance (p-value <0.001). There was a strong significant association between influences neighbor who had latrine and didn’t have with latrine (p-value < 0.001).

There was a strong significant association between neighbor influence to build and use latrine and stopped defecate in the bush with latrine use and maintenance (p-value <0.001). There was no significant association between water source distance and latrine use and maintenance (p-value 0.959). There was a significant association between knowledge with latrine use and maintenance (p-value 0.002). There was a strong significant association between attitude and latrine use and maintenance (p-value <0.001). There was a strong significant association between practice with latrine use and maintenance (p-value <0.001).

This study found that 52.8% of household were stopped to use and maintain latrine and 47.2% of respondents still continue to use and maintain latrine after more than one year open defecation free declaration in Haupu Village. Most of the respondents reveal that traditional latrine use local material and need to be repaired every time and not comfortable because of bad smell and many flies. There were implemented two different approaches at the same village and period of time. It could be influenced household to depend to latrine subsidy rather than CLTS program.

5.3 Recommendation:

Because most of the respondents in this study found that didn't know and didn't understand about the effect of open defecation in any place, important of regularly checked and fixed the latrine, therefore recommended to Environmental Health Department and relevant Department within Ministry of Health to strengthening health education and promotion program specifically during the triggering process and regular program to explain more focus on advantage and disadvantage to use and maintenance latrine. Prioritize and extent scope of health education and promotion in remote area to increase community knowledge and awareness due to latrine use and maintenance.

Although in this study found that most of the respondents had positive perception about traditional believe and attitude due to latrine use and maintenance. But many of the respondents still felt that more comfortable defecated in the bush rather than use latrine because of bad smell and many flies inside the latrine. In other hand more than half of the respondents didn't practice to cover pit latrine after defecated, not regularly clean the latrine, still high number of respondent didn't

reconstructed and repaired the latrine. There for recommended to Environmental Health Department with relevant Ministry, and partners should have plan to monitoring and to do inspection to CLTS project by using KUBASA form after the end of the project.

In this study was found that most of the respondents were no education there for health education and promotion regarding to latrine use and maintenance need to be programmed in a regular basis and also through several channel of media such as TV, radio, brochure and etc, use simple messages and easy due to community daily practice about latrine use and maintenance. The message should be focus on improvement of latrine condition to prevent bad smell and flies, engage parents to teach and advice household members included children under five years old to use and clean and reconstruct and repair latrine and hygiene personal.

More than half of the respondent back to the original state or stop used the latrine after a year open defecation free (ODF) declaration. There for recommended to the implementer NGO, relevance institutions and ministries expected to be oriented towards behavior change at community level not only focus on latrine construction.

Many of the children were found in this study were not used the latrine, so recommended to further research in the future, could be conducted to determine factors influence latrine use of children under five years old.

This study only found out the factor association between independent variable and dependent variable, there for in the future could be continue to search factor-factor determinant household to sustain and stopped use latrine and maintenance.

5.4 Limitation of study.

- ❖ The study was conducted in one village within the district, so cannot generalize to all population.
- ❖ Lack of information regarding to project implementation by the researcher.
- ❖ Behavior aspects of the community cannot be understood in short time.
- ❖ Few household, interviewer could not interviewed because not available in the time of study.

- Limited of time for search information more deeply. Some weakness in this study was researcher could not find out the reason of peoples still use and maintain latrine and why some of them been stopped.

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APPENDICES

Appendix A

Respondent No.	1 ☐ 2 ☐ 3 ☐

RESEARCH QUESTIONNAIRE

FACTORS INFLUENCE HOUSEHOLD TO USE LATRINES AFTER OPEN DEFECATION FREE DECLARATION IN ERMERA DISTRIC TIMOR-LESTE

1. GENERAL CHARACTERISTICS:

1.1. District Name	Ermera		
1.2. Sub District Name	Letefoho		
1.3. Village Name	Haupu		
1.4. Sub village Name (6)	☐ 1. Duhoho ☐ 2. Haupu ☐ 3. Manucatilete	☐ 4. Riatoni ☐ 5. Hatuhou ☐ 6. Beturema	4 ☐
1.5. Household no.			5 ☐ 6 ☐ 7 ☐

2. SOCIO-DEMOGRAPHY OF HOUSEHOLD RESPONDENT

Instruction: The subject of interview is head of household but if he or she is not available, interviewer will collect the information from any one of the respondent at the time of interview (age over 18). Please mark the box **(**√**)** base on respondent respond.

2.1. Age of respondent	……years old	8 ☐ 9 ☐

2.2. Gender	☐ 1. Male	☐ 2. Female	10 ☐
2.3. Position in household	☐ 1. Head of household ☐ 2. Partner/spouse ☐ 3. Member of household		11 ☐
2.4. Marital status			
☐ 1. Single	☐ 4. Divorced/separated		12 ☐
☐ 2. Married	☐ 5. Widowed		
☐ 3. Living together			

Instruction: The highest level education of respondent. Respondent refers to head of household, spouse and one of the household members that have highest level of education. Interviewer only selects one person in each household. If two persons within the same household have the same highest level of education, interviewer will select based on the seniorities (base on the year of graduation).

2.5. What is the highest level education of respondent?		
☐ 1. No education/Illiterate	☐ 4. High school	13 ☐
☐ 2. Elementary education	☐ 5. Diploma	
☐ 3. Secondary school	☐ 6. Bachelor degree	
2.6. What is the highest education of household member?		
☐ 1. No education/Illiterate	☐ 4. High school	14 ☐
☐ 2. Elementary education	☐ 5. Diploma	
☐ 3. Secondary school	☐ 6. Bachelor degree	

3. Household (HH) characteristics

Instruction: Please mark the box (√) base on respondent respond.

3.1. What is the occupation of respondent?		
☐ 1. Housewife at home ☐ 2. Farm/livestock ☐ 3. Official government	☐ 4.Company commercial ☐ 5.Unemployment ☐ 6. Self-employed	15 ☐
3.2.What is the continuity respondent emploment?		
☐ 1. All year	☐ 2. Seasonal ☐ 3. Occasional	16 ☐
3.3. What is the respondent income ($)?		
☐ 1. < 100/month	☐ 2. 101- 200 /month ☐ 3. > 200/month	17 ☐

4. How many members in your household including respondent? (Fill in number of people based on the age)		
4.1. Male adults (+ 18 years old)	…….. person	18 ☐
4.2. Female adults (+ 18 years old)	……person	19 ☐
4.3. Younger (13-17 years old)	……person	20 ☐
4.4. School age children (5-12 years old)	……person	21 ☐
4.5. Children under five years old (0-4 years old)	……person	22 ☐

5. Do you have household latrine?	☐ 1. Yes	☐ 2. No (go to no 8)	23 ☐
6. If yes do you use it?	☐ 1. Yes	☐ 2. No (go to no.8)	24 ☐
7. What type of latrine do you have?			
☐ 1. Pit without slap/earth	☐ 4. Composting latrine		25 ☐
☐ 2. Pit latrine with slap	☐ 5. Flush latrine		
☐ 3. VIP latrine			

8. If no (no. 5 and 6) Where do you go to defecate?	☐ 1. Share with neighbor ☐ 2. Bush ☐ 3. Other specific ……	26 ☐
9. When did your household start using latrine?	……month	27 ☐ 28 ☐
10. How distance of latrine from home?		
☐ 1. at home /inside the home	☐ 2. Outside the home (go to question 11)	29 ☐
11. If outside, how many meters from home	……meter	30 ☐ 31 ☐ 32 ☐
12. What is starting age of latrine use by children under five years old? if never use go to 13)		
☐ 1. At 2 years old ☐ 2. At 3 years old ☐ 3. At 4 years old	☐ 4. Never ☐ 5. No Children	33 ☐
13. If never use latrine where disposal means of feces children under five years old?		
☐ 1. Disposing feces near by Pit latrine ☐ 2. Disposal by burying	☐ 3. Disposing feces out of house ☐ 4. Others specific……	34 ☐
14. What is the preferred time for respondent to use latrine?		
☐ 1. Day time	☐ 2. Evening time	☐ 3.No preference	35 ☐
15. Who is your neighbor?		
☐ 1. Brother/Sister ☐ 2. Uncle/aunt ☐ 3. Father /mother in low	☐ 4. Grandfather/mother. ☐ 5. Just neighbor no family Relationship ☐ 6. No Neighbor (if no go to 20)	36 ☐ 37 ☐ 38 ☐
16. Does your neighbor have a latrine?	☐ 1.Yes (go to no. 18) ☐ 2.No	39 ☐
17. (From question 16) if no where they go to defecate?		
☐ 1. Share with neighbor	☐ 2. Bush	☐ 3. Others specific……..	40 ☐

18. Does your household build and use latrine because of the influence of your neighbor?	☐ 1. Yes ☐ 2. No	41 ☐
19. Did you stop going to the bush to defecate because you were influenced by the neighbor?	☐ 1. Yes ☐ 2. No	42 ☐

Instruction: Interviewer will ask type of water source that often been obtained respondent for latrine use and other's needs.

20. What type of water source do you have? (The answer can be more than one)		
☐ 1. Piped water/tap ☐ 2. Well ☐ 3. rain water ☐ 4. Spring water	☐ 5. Under ground water/borehole ☐ 6. River	43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐
21. What distance from house do you go to get Water? (distance in meter/kilometer)		
1…….meter 2……..meter		49 ☐ 50 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐

4. Traditional beliefs and attitudes latrine use and maintenance

Instruction: Please give your opinion to the following statement and mark it in the table **(**√**)**.

No	Statement	SA	A	UC	D	SD	Score
1.	Defecation in the bush is a continuation of ancestor's way of life, therefor must be continued by young generation.						59 ☐
2.	Human excreta smell bad, are disgusting, and attract many flies inside the latrine facility, so defecation in the bush more comfortable.						60 ☐
3.	I don't use the latrine because of shame at being seen approaching a latrine.						61 ☐
4.	I think necessary to use the latrine to defecate						62 ☐
5.	I think parents necessary to teach the children and other household members to use and maintain latrine.						63 ☐

6.	I think necessary to wash my hand with soap after defecation and before preparing food and eating						64 ☐
7.	I think water important to use and maintain latrine.						65 ☐
8.	I think children's feces are not harmful and defecation in the open space by the children is a common practice.						66 ☐
9.	I think clean the latrine and repair or reconstruction of latrine is responsibility everyone in the household						67 ☐
10.	I belief that channel of health information from radio and TV, NGO, health staff and volunteers can influence me to use and maintain the latrines						68 ☐

5. Knowledge about latrine use and maintenance, and diseases associated

Instruction: Interviewer will mark **(√)** the Columns base on the respondent respond. Mark in first column (2) for correct answer, second column (1) for not sure and 0 for false or incorrect answer.

No	Statement	True	False	Not sure	Score
		2	0	1	
1.	Using latrine to defecate is one way to break the chain of diarrhea disease transmission.				69 ☐
2.	Open defecation is not effect on contamination of water sources, food and ground.				70 ☐
3.	The condition of latrine facility not necessary to be checked on regular basis because not possible to fixed immediately				71 ☐
4.	Diarrhea diseases caused by human excreta				72 ☐
5.	Defecate any place can transmit diseases to human such as diarrhea, worm infection, Hepatitis A etc.				73 ☐
6.	Hand washing with soap after defecation, before preparing food and eating to prevent diarrhea diseases				74 ☐
7.	Human feces transmits diseases by fluids, fields, flies and fingers				75 ☐
8.	Improving clean water and sanitation facility can reduce incidence of diarrhea diseases				76 ☐
9.	Diarrhea as a main factor cause of malnutrition of children.				77 ☐
10	Children are remarkably more vulnerable to diarrhea diseases than adults.				78 ☐

6. Practice latrine use and maintenance

Instruction: Please mark in the box that you think the most correct. Interviewer will give Score 3 for every day, 2 for always, 1 for rarely and 0 for never.

No	Statement	Frequency				Score
		Every day (7 days a week)	**Always** (3 to 6 days a week)	**Rarely** (1 to 2 days a week)	**Never**	
		3	**2**	**1**	**0**	
1.	Respondent use latrine to defecate					79 ☐
2.	Respondent go to bush for defecate.					80 ☐
3.	Head of household advise household members to use and maintain latrine.					81 ☐
4.	Respondent cover pit after defecate to prevent flies and bad smell					82 ☐
5.	How often you clean latrine?	☐ 1. Everyday ☐ 2. 2.-7days ☐ 3. 8-14 days		☐ 4. > 15days ☐ 5. Never ☐ 6. Others……		83 ☐
6.	Respondent use clean water to wash hands with soap after defecation, before preparing food and eating.	☐ 1. Every time ☐ 2. Always		☐ 3. Rarely ☐ 4. Never		84 ☐
7.	Respondent responsibility to repair and reconstruct latrine facility.	☐ 1. Yes		☐ 2. No		85 ☐
8.	Respondent attended for Environmental Health training and study tour due to water, sanitation and hygiene	☐ 1. Yes		☐ 2. No		86 ☐

	program.			
9.	Respondent have been trained as health volunteer	☐ 1. Yes	☐ 2. No	87 ☐
10.	Respondent access to Environmental Health information regarding to water sanitation and hygiene through the radio, TV/TVTL, NGO, health staff and volunteer.	☐ 1. Yes	☐ 2. No	88 ☐

Data collected on : _____/ _____/ _____

Interviewer Name :…… Signature: ……

Supervisor Name :……. Signature:……

Appendix B

Attitude Reliability test

Cronbach's Alpha	N of Items
.838	10

	Mean	Std. Deviation	N
Neg_1	4.93	.254	30
Neg_2	3.73	1.461	30
Neg_3	3.73	1.363	30
Pos_1	4.40	.724	30
Pos_2	4.43	.728	30
Pos_3	4.37	.669	30
Pos_4	4.43	.679	30
Neg_4	4.07	1.363	30
Pos_5	4.50	.630	30
Pos_6	4.47	.629	30

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Neg_1	38.13	35.085	.052	.849
Neg_2	39.33	23.126	.715	.807
Neg_3	39.33	23.540	.749	.800
Pos_1	38.67	28.161	.862	.800
Pos_2	38.63	29.137	.718	.811
Pos_3	38.70	30.217	.631	.819
Pos_4	38.63	30.378	.597	.821
Neg_4	39.00	31.379	.136	.881
Pos_5	38.57	29.702	.759	.812
Pos_6	38.60	30.386	.653	.819

Appendix C

REPUBLICA
DE!JIOCRATICA DE
TIMOR-LEST£
\IJN/STER/0 ADJ/NISTRASAUN ESTATALE
ORDENA/.t 'ETO DO TERITORIO, DISTRITO ERMERA,
SUB DISTIRO LETEFOHO, SUCO HAUPU

DECLARASAUN

Ohin Joron Terra Ft:irtJ. dia Quinji de No\·emhro de Dois A/ill Do=i (15 de Novembro de 2011), Farm Ceclt Stt o 1laupu, AIdea Sanulu resin ida. hane.mn: DuhoJm. Haupu, J'ltlankatl Leten, Hauleun. Lur/ala. Roipusa, Beturema, Cairia. Assi, Rialoni, Riamori. Beturema-Goulolo. ho

total Chefe de Familia 108-1 (UMA), rota/ Popula.wun .J8({9 deklara lcarak: 1..-111#161111,.

"'11 liSIJe1#'6/INIn•JlJIJb'l 141b1114kl/Jit ..LIVRE ONA HUSJ SO£*

FŒR BOOT ARBIRU f ALFAJ':

Anu nia Declara\llWl mak haue an Juir maine'e:

1. *Ami hapara ona tee arbiru iha.fatin nakloke*
2. *Ami rca no koidadu ami nia {jimina*
3. *Ami hele redus mora.\ Diarhea ho u=a sintina*
4. *lmi dependl! nafatin dignidade ne.ebe ami hetan hu.\·i uza ,-fntina*
5. *Ami < eifo sangsaun ba ema ne'ebe tee arhiru*
6. *Uma kainfmm ne'ebefoin hari I hari umafounlenke iha sintina*

Appendix D

PHOTO OF STUDY


10


DECLARAÇÃO
10

VITAE

A. PERSONAL IDENTITY

Name : Ivo Cornelio Lopes Guterres

Sex : Male

Place and date of birth: Baucau, 30 January 1975

Nationality : Timorese

Address : Surik Mas, Bairo Pité, Dili, Timor-Leste

Marital status : Married

E-mail : ivoguterres@gmail.com

Phone number : +670 77245707

Qualification : Public health degree, 2007

B. WORK EXPERIENCE:

Head of Environmental Health Department, Ministry of health Timor-Leste, 2010-2012

C. TRAINING PROGRAM :

No.	Training	Institution	Place	Date
1	Mosquito control Association of Australia conference	MoH. TL-NT Government	New South Wales, Australia	15-19 Sept 2006
2	First Asia-Pacidic Dengue Workshop	MoH. TL-Singapore Gov.	Singapore	10-19 March 2009
3	Inter regional Workshop on Monitoring of insecticide resistance	MoH. TL–MoH Vietnam	Hanoi - Vietnam	5-9 Oct 2009
4	Regional meeting on implementation of integrated vector management (IVM)	WHO - TL	Chiang Mai - Thailand	27-30 Sept 2010
5	Annual UN DPI/NGO Conference “ ADVANCE GLOBAL HEALTH: ACHIEVE THE MDG”	BESIK/AusAID	Melbourne	28 August-3 Sept.2010
6	Regional workshop for health care waste management	WHO-TL	Nepal	4-12 December 2011.