



# Luta Hamutuk

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## Assessment Result on Clean Water services in Díli District

### Abbreviation list

BESI	:	Water, Sanitation and Hygiene
KM	:	Kilometric
LPCD	:	Liter per capita per day
MDGs	:	Millennium Development Goals
OGE	:	Orsamentu Geral do Estado/Estate Budget
PDL	:	Local Development Program
PDD	:	District Development Program
SAS	:	Serviço Agua e Saneamento/Water and Sanitation service
SEASU	:	Sekretariu do Estado Agua, Saneamentu e Urbanizasaun/Secretary of Estate for Water, Sanitation and Urbanization
WHO	:	World Health Organization

## Introduction

According to census 2001, the data shows that only around 48% from total population is able to access clean water. In 2010, the percentage was increased to 66%, and such access was through water canalization, from a well, pumping the water and water bottle/gallon<sup>1</sup>, yet Dili had a better percentage to 86%<sup>2</sup> in terms of such access. This data signifies that the access toward clean water in Dili is better compared with other districts. However, this hasn't been able to resolve health problem in Dili, which mostly coming from the consumption of unhygienic water and sanitation problem.

Data also shows that water and sanitation are giving significant contribution toward Mortality Rate of children, particularly under 5 years old (64 death from 1,000 of birth number); contributing as well toward Mortality Rate of woman-mother and infection diseases during pregnancy and giving birth (557/100,000 live births<sup>3</sup>). Water pipe do not provided within school, therefore contributes also toward diseases within student (particularly young-adult woman student) and the absence number within school<sup>4</sup>. This condition should to resolve immediately, otherwise this would generate social and economic problem in Timor Leste in the future. Based on such fact, the government put sanitation as important element within social-economic development and set it as well within strategic national development plan.

Annual policy has also being developed by the government in respect of allocation upon state budget aimed to resolve such problem. In 2011, through infrastructure fund, budget had allocated to finance clean water aimed to realize the goal of MDGs 2015. This budget was estimated as \$20,420 million. This number then being added by the government in 2012, and it estimated around \$40,420 million (including the allocation from loan). In 2013, the government through MDGs program has allocated around \$ 6,930 million. As set within Strategic Development Plan 2011-2030, it stated that clean water becomes as priority, therefore will periodically receive such allocation every year till the number reach around \$94.2 million, and aimed to complete clean water facility in urban area<sup>5</sup>. The allocation of Budget toward Dili district from period of 2010-2013 is like the following table:

Year	Budget Category	Total
2011	PDL+PDD	\$ 816 mil
2012	PDL+PDD	\$ 290 mil
2013	PDL+PDD	\$ 608 mil

Source: OGE 2011-2013

Though the government has an intention to improve this sector through such allocation of budget, however to date, clean water problem within Dili district hasn't been able to resolve yet. Based on such problem, Luta Hamutuk has an initiative to investigate and assessment on clean water problem which has occurred in Dili district during this time.

<sup>1</sup> Strategic National Development Plan Timor Leste, page 79.

<sup>2</sup> Annual Report 2012, Direcção Nacional Serviço De Agua.

<sup>3</sup> Demographics And Health Survey 20109-2010, key findings, page 10

<sup>4</sup> UNICEF presentation, in FONTIL, 29/04/2013 .

<sup>5</sup> Luta Hamutuk's Press Release, <http://www.lutahamutukinstitute.org/news/detail/pressrelease/88/>

## **Objective**

The objectives from this assessment are like:

1. Identify the root of clean water problem in Dili district, which still becomes as obstacle toward community, particularly in accessing it.
2. Produce recommendation coming from assessment result toward government, therefore could be used as reference within clean water development in Dili.

## **Assessment Location**

The location for this assessment activity was Dili district. The team obtains sampel of population within sub-district of Dom Aleixo, Cristo Rei, and Vera Cruz. Luta hamutuk also selects villages to become site of activity namely Lahane Ocidental, Lahane Oriental, Culahun, Comoro, Bairopite, Becora and Camea.

## **Methodology**

Methodology which used within this assessment was the combination of qualitative and quantitative method. In the meantime, data were gathered through interview method, particularly toward State Secretary of Water-Sanitation and Urbanization, Director of Water-Sanitation Dili district, community leader and international organization which has been conducted service within clean water during this time. Survey has also conducted toward households who considered as beneficiaries. Observation method was used as well aimed to obtain data. The final method was data analysis which used to analyze documents in respect of State budget allocation.

Within survey toward households, this assessment used sample of calculator size aimed to determine sample and confidence interval. Total households coming from such villages were 18908. There were around 9454(50%) taken by Luta Hamutuk for calculation purpose, particularly toward confidence interval and confidence level. The results from such calculation of sample size calculator were: 95 from 9454 household have 95% of confidence level.

Sample of calculation was 10% coming from 95 household of 50% sample. This signifies that when 10% from total population respond to the questions given within assessment, this could represent total population. These 95 households were coming from 6 village and 9-10 households of each villages were then being interviewed.

## **The Standard of Clean Water Theory**

According to World Health Organization stated that “*Standard: population has secure access toward water, to be used for drinking, cooking, as well as personal and household hygiene. Public Water facility should take place near to the storage therefore, minimum of water demand would be easy to address*”. Such standard are like the following:

### Key Indicator:

- At least 15 Lpcd is fulfilled.
- Minimum stream velocity in every storage is 0.125 liter per second.
- At least 1 water facility for 250 persons.
- Maximum distance from water storage to water public facility is 500m.

### Guideline: Individual:

- The allocation of life demand is 7 Lpcd in minimum (can be retain for several days)
- Minimum of 3-4 Lpcd for drinking purpose
- Minimum of 2-3 Lpcd for cooking and cleaning

### Mid-term allocation: 15-20 Lpcd (can be retain for several months)

- Minimum of 3-4 Lpcd
- Minimum of 2-3 Lpcd for cooking and cleaning
- Personal hygiene: 6-7 Lpcd
- Washing: 4-6 Lpcd

### Other purposes

- Health Center, 5 liters for every out patient; 40-60 liters for every hospitalized patient
- Hospital (including its washing facility): 220-300 liters per bed
- School, 2 liters per students; (10-15 liter per students if used flushed toilet)
- Feeding facility, 20-30 liters per patient
- Refugee Administration (do not include accommodation for staffs): 5 Lpcd
- Accommodation of staff, 30 Lpcd
- Mosque, 5 liters per visitor
- Sanitation (hand washing, toilet hygiene, etc), depends on technology

### Farm and Agriculture

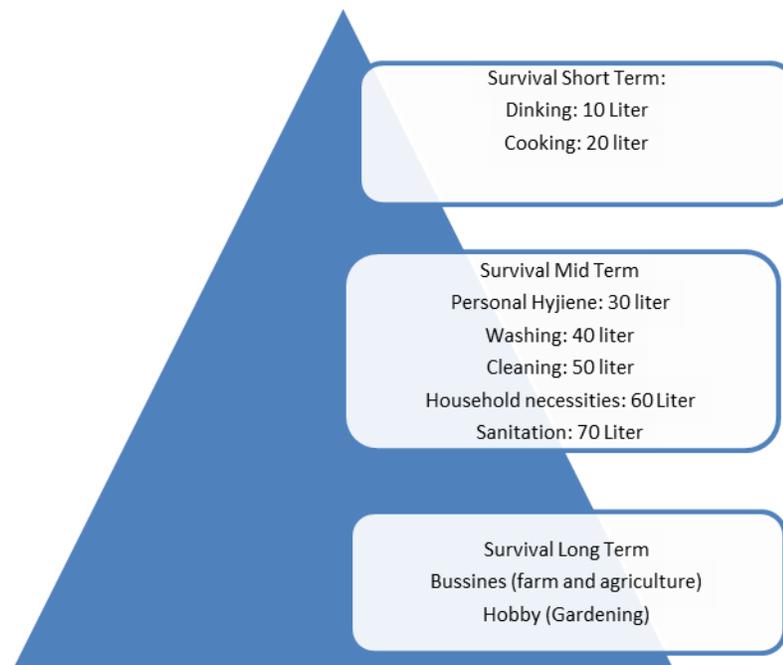
- Cow, horse, donkey, 20-30 liters per animal
- Goat, sheep, pig, 10-20 liters per animal
- Chicken, 10-20 liters per 100 animals
- Vegetables soil, 3-6 liters per m<sup>2</sup>

The exact number is depends on variables (exp; culture and climate) and should be judged by expertise.

**Source: WHO Regional Office for South-East Asia**

In addition to that standard, WHO also set consume standard of clean water per household. This standard is based on Abraham Maslow theory in respect of basic necessities hierarchy (1908-1970). Based on this theory, clean water is categorized within 3 periods of short term, mid-term and long term. WHO highlights clean water necessities, particularly within short term and mid-term categories.

WHO transform the pyramid of clean water necessities as below:



Picture 1.1 the hierarchy of clean water necessity of a household (inspired by Abraham Maslow necessities hierarchy, 1908-1970)

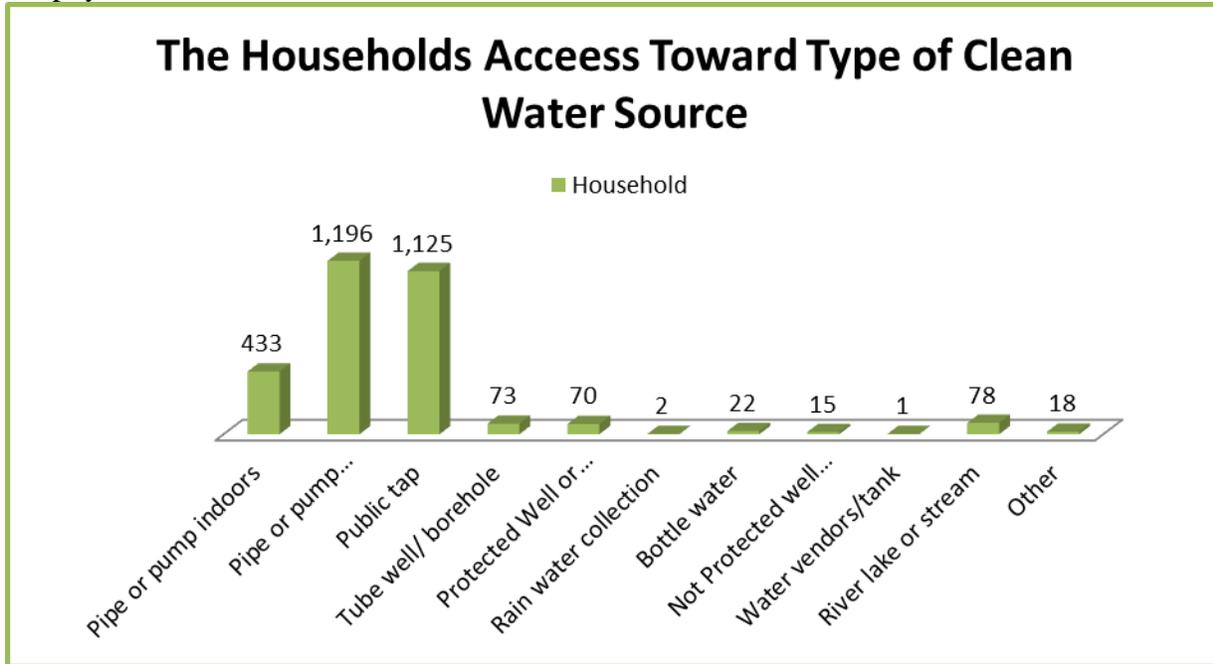
## Discription of Data

Based on interview, which has been conducted by Luta Hamutuk toward households within 7 villages, below is its description of tabulation of data/results:

### 1. Becora Village

Becora village has 20,893 of total population and 3,033 households. Becora is part of Cristo rei sub-district. Clean water facilities within this village are like water canalization, water storage, water pump and well as water tank provided by the government.

Graphyc 1.1



Source: Timor Leste's Census 2010, Volume 4.

Based on graphic 1.1 it shows that households within Becora village are easy to access clean water since such facility is surround its area and water tanks are plenty. This graphyc also shows that some of households are still consuming water below such standard both within quantity and quality aspects, such as; consuming water which coming from rain water and river.

Graphyc also shows that most of households are accessing clean water through water canalization and public water tank. According to Luta Hamutuk's finding within this activity, it tooks around  $\pm 50$  to 1 km for the households to be able to access these kind of water resources.

However, clean water pipes/distribution is often being damaged by those who can't access such facility. This condition has caused problem toward clean water distribution within this village. Graphyc 1.1 also shows that households, who have well as their source of clean water and use water pump to suck up the water, are often facing such obstacles in respect of electricity needed to turn on the pumping machine. As consequence from such situations are; the broken pipes, the reduce of water pressure and debit as well as distribution problem.

This condition has made 75% households within this village couldn't properly access clean water managed by SAS. Therefore based on water consume hierarchy, this population could only consume clean water within short term period, since most of them have only consume 50 liters/day/person. In order to fulfill mid-term necessities, community look for another source of clean water for domestic purposes such as; washing clothes, to take a bath and planting.

According to Luta Hamutuk's research, it signifies that clean water being distributed toward community is coming from Water Treatment Center; means that this has been underwent certain procedures to meet with clean water standard. However, based on graphic, most of population within this village still access water from public water tank, signify that the pipes/distribution haven't been able to reach inside the houses. Therefore, it is difficult to guarantee that community has consumed clean water based on standard since the circumstance doesn't support it properly.

Community in Becora village, has lack of knowledge as well as information in respect of water quality should to consume, based on certain standard. This has been reinforced by graphic, signifies that some of households still consume water coming from rain, river and a well. The other condition was that the community didn't have other alternative of water source to fulfill other domestic demands.

Distribution system of clean water in Becora village hasn't been managed properly since only some of populations were able to benefit from such distribution managed by SAS of Dili district. During this time, the water will entering the village from day 1 to 3, however there isn't any precise schedule in respect of such shift. Distribution line which hasn't been able to reach community's residences and uncertain of water shift have generated community who didn't able to benefit from SAS program, to violate the clean water facilities.

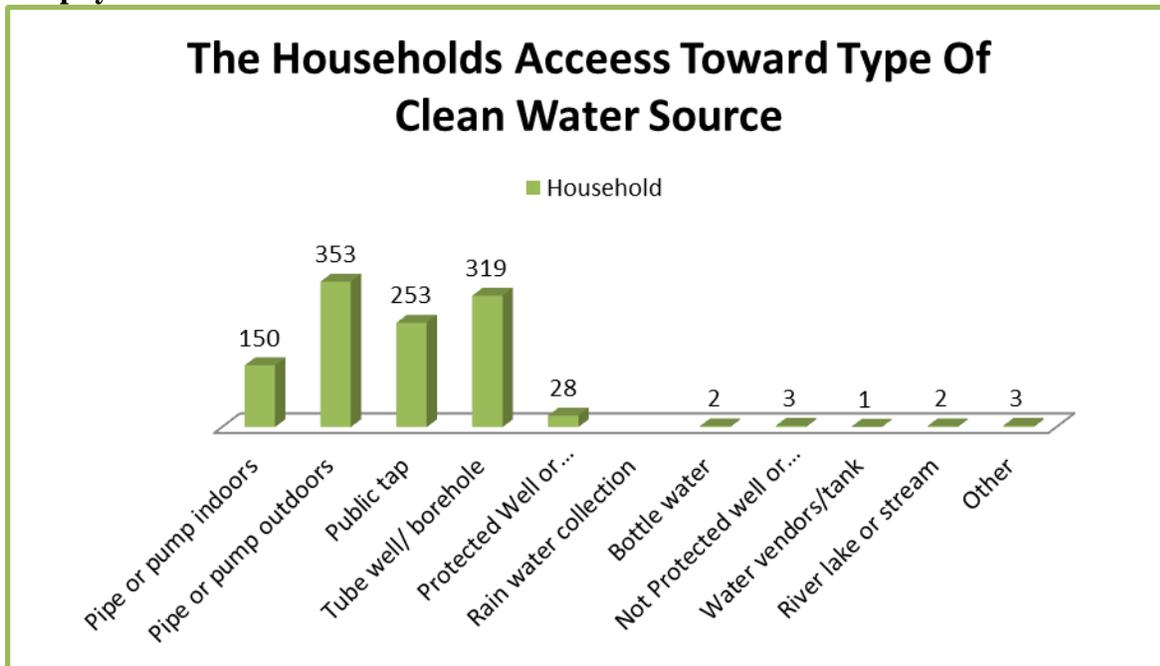
Inadequate of clean water distribution in Becora village, has forced community to purchase materials aimed to install their own clean water facility without SAS permission. This condition has caused problem within control system, since each community built its own clean water facility. In addition, generates as well problem in respect of consumer registration from SAS. Private clean water facility is believed to be damaged the same facility managed by SAS, since it doesn't build in accord with SAS technical standard.

As most of pipes have been damaged, however the government didn't take serious attention and rehabilitate such facility within this village. Luta Hamutuk has also observed that women and children were the largest group who supposed to carry such burden in getting clean water

## **2. Culuhun Village**

Total population in this village is 8,904 persons who composed from 4,596 male and 4,308 female, while the number of household is 1,114. Administratively Culuhun village is part of Cristo Rei sub-district.

**Graphyc 1.2**



**Source: Timor Leste Census 2010, Volume 4.**

Based on graphic 1.3, most of households within Culuhun village have been able to access clean water which is coming from public water tank. However there are still households who consuming water from insecure source such as river water.

Clean water sources which available within this village are water canalization, water tank, volume standard and well. The distance to access such sources is 5-25 meters from community's residence.

Community within this village has been able to fulfill its necessities of clean water, particularly for domestic purposes. The consume level of clean water within this village is beyond 50 liters/person/day. However, still that community has lack of knowledge in respect of standardized of clean water which allowed to be consumed. Graphic also shows that some of households are still consuming river water.

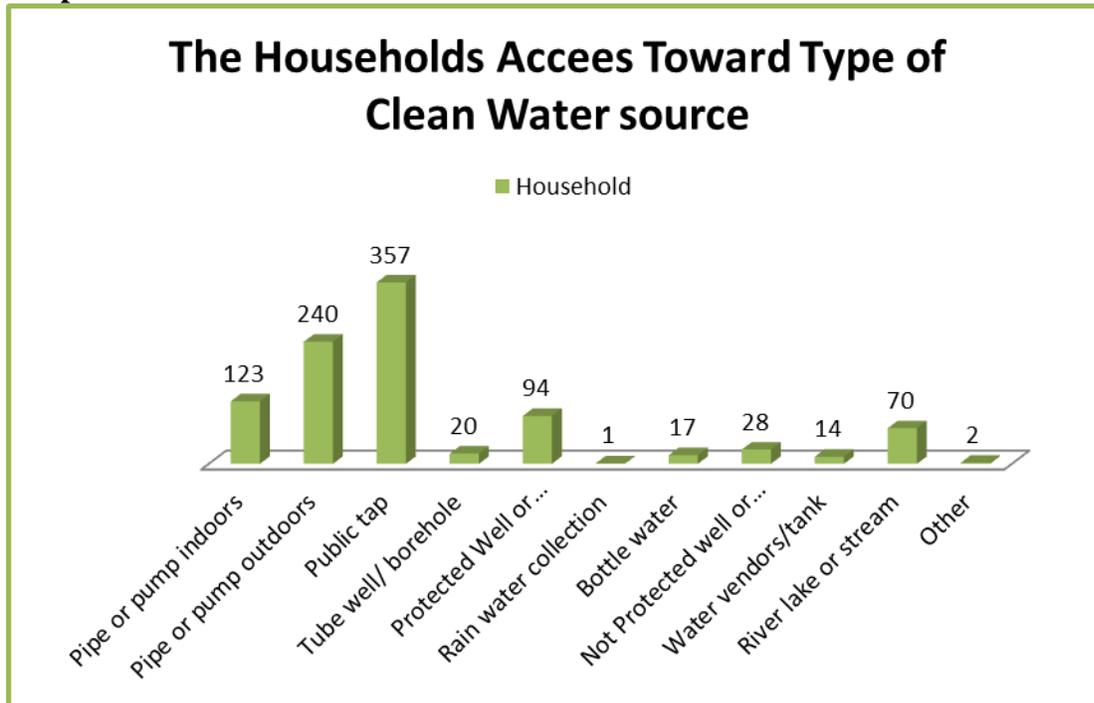
Based on graphic, there are households who has well as main source of clean water. However, according to Luta Hamutuk's observation, such facility depends on electricity energy. Most of community within this village has already registered as consumer of clean water distribution managed by SAS. In respect of registration to become consumer of clean water, SAS itself has gave such information toward community.

Research findings have identified that public water facility in Culuhun village was within secure condition means that nobody is damaging such facility; therefore clean water distribution is properly managed. Luta Hamutuk has also observed that women and children were the largest group who supposed to carry such burden in getting clean water.

### 3. Camea Village

Total population in this village is 7,589 persons who composed from 4,102 male and 3,487 female, while the number of household is 966. Administratively Camea village is part of Cristo Rei sub-district.

Graphic 1.3



Source: Timor Leste Census 2010, Volume 4.

Based on graphic 1.4, it shows that clean water access within Camea village is mostly coming from public water tank and water canalization distribution. Some of households are still consuming rain water as well as river water aimed to fulfill domestic necessities. The distance of public water facility is around  $\pm 1-2$  km to be achieved by walk for about 1-2 hours. Community within this village hasn't been able to complete all consuming levels, since they only consume around 50 liters/person/day. Such level of consuming is categorized within short-term period.

Graphic also shows that some of households within this village have wells as the main source of clean water; however they should face certain obstacles, particularly in respect of electricity dependency. When the light/electricity went on then pumping machine can be used, however when such energy went off, this then generates difficulties.

Some of households within this village are still consuming rain water and river water, as displayed within graphic. The system in getting clean water from different sources is also considered insecure, particularly toward health status.

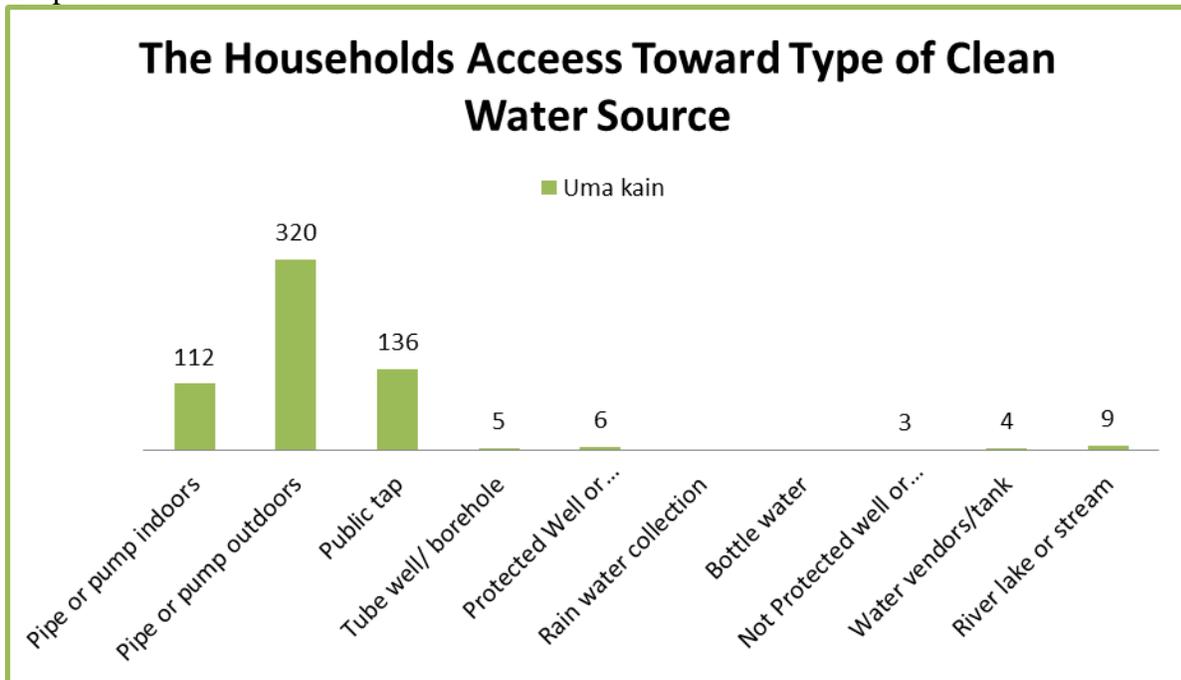
Research has also identified that households within this village haven't registered yet as consumer for clean water distribution managed by SAS, since distribution hasn't been able to

reach certain area. Findings have also revealed that pipes have been damaged by community who hasn't been able to benefit from clean water service. Luta Hamutuk has also observed that women and children were the largest group who supposed to carry such burden in getting clean water.

#### 4. Lahane Ocidental Village

Total population in this village is 5,467 persons who composed from 2,858 male and 2,609 female, while the number of household is 602. Administratively Lahane Ocidental village is part of Nain Feto sub-district.

Graphic 1.4



Source: Timor Leste Census 2010, Volume 4.

Based on graphic 1.5, it shows that most of households within Lahane Ocidental village are accessing clean water from water canalization distribution (inside and outside community's residence) and public water tank. In the meantime the rest of households are consuming clean water which is coming from well, river and gallon (should to purchase).

Public water facility within this village is like distribution of water tanks and pipes as well as water meter. Though such clean water facilities are available, community hasn't been able to properly benefit from it. This condition occurred since SAS do not have fix schedule, therefore water is sometimes unexpectedly stop.

Community within this village hasn't been able to complete level of clean water consuming, particularly within household purposes, since they only consume 50 liters/person/day. Therefore, this is categorized into short term period of consume level. Apart from that, clean water distributed toward community was sometimes didn't meet such quality standard, as water

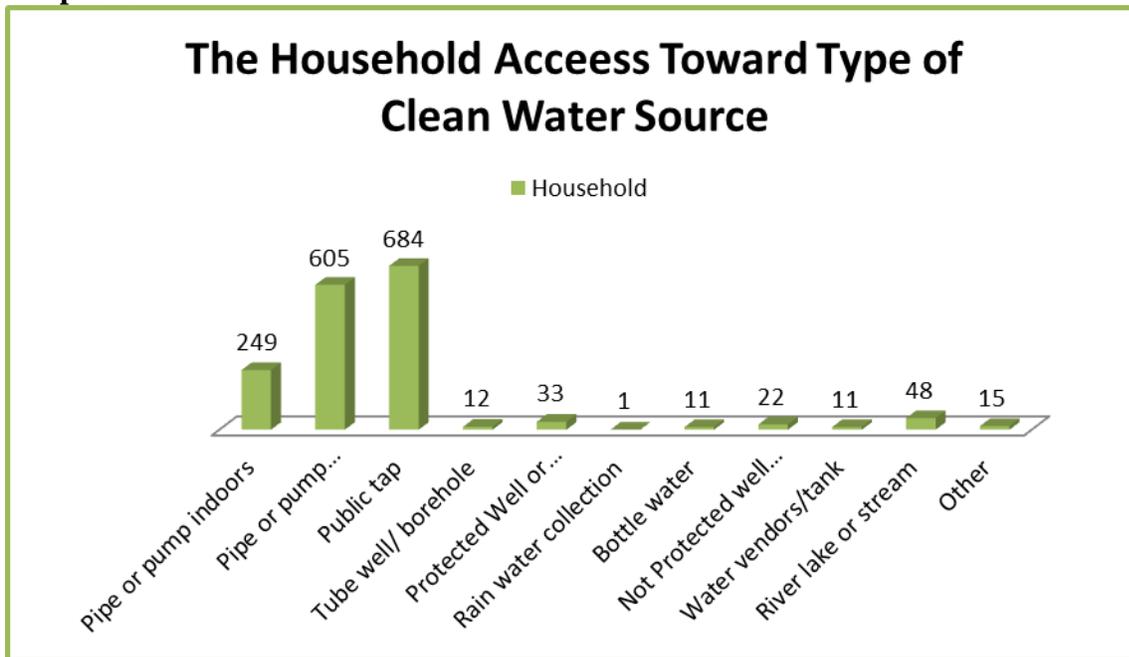
considered as contaminated. When distribution of water suddenly stops, community has to walk around **1-4 km** in order to get source of clean water.

Graphic also shows that some of households within this village have wells as the main source of clean water, however they should face certain obstacles, particularly in respect of electricity dependency. Some households within this village are still consuming river water, as displayed within graphic which could endangered health status since this kind of water haven't been controlled by SAS. Often, such water is contaminated by chemical substance or other kind of trash, therefore inappropriate to be consumed. Luta Hamutuk has also observed that women and children were the largest group who supposed to carry such burden in getting clean water.

### 5. Lahane Oriental Village

Total population in this village is 27,875 persons who composed from 13,136 female and 14,739 male, while the number of household is 4048. Administratively Lahane Oriental village is part of Nain Feto sub-district.

**Graphic 1.5**



**Source: Timor Leste Census 2010, Volume 4.**

Based on graphic 1.6, most of households within Lahane Oriental village are accessed clean water from sources like canalization distribution and public water tank. There are also few number of households who can access clean water from such distribution that has already reached houses. In addition there are households who still consuming rain water and other source like well or water gallon (should to purchase).

Water facilities which are available within this village are canalization distribution and public water tank which around ±20-50 meters from community housing. Though such clean water facilities are available, community hasn't been able to properly benefit from it. This condition

occurred since SAS do not have fix schedule, therefore water is sometimes unexpectedly stop. The quantity consume of community within this village is beyond 50 liters/person/day. However when the water stopped such level will reduce to less than 50 liters/day/person.

Apart from that, clean water distribution do not properly being managed, therefore community who can't benefit from such service has been damaging the pipes. The other consequence is that, this community should to walk around **1-2 km** aim to find another source of clean water to be consumed. According to Chief Village of Lahane Oriental *“There is about 50% of community within this village who hasn't been able to properly access clean water”*.

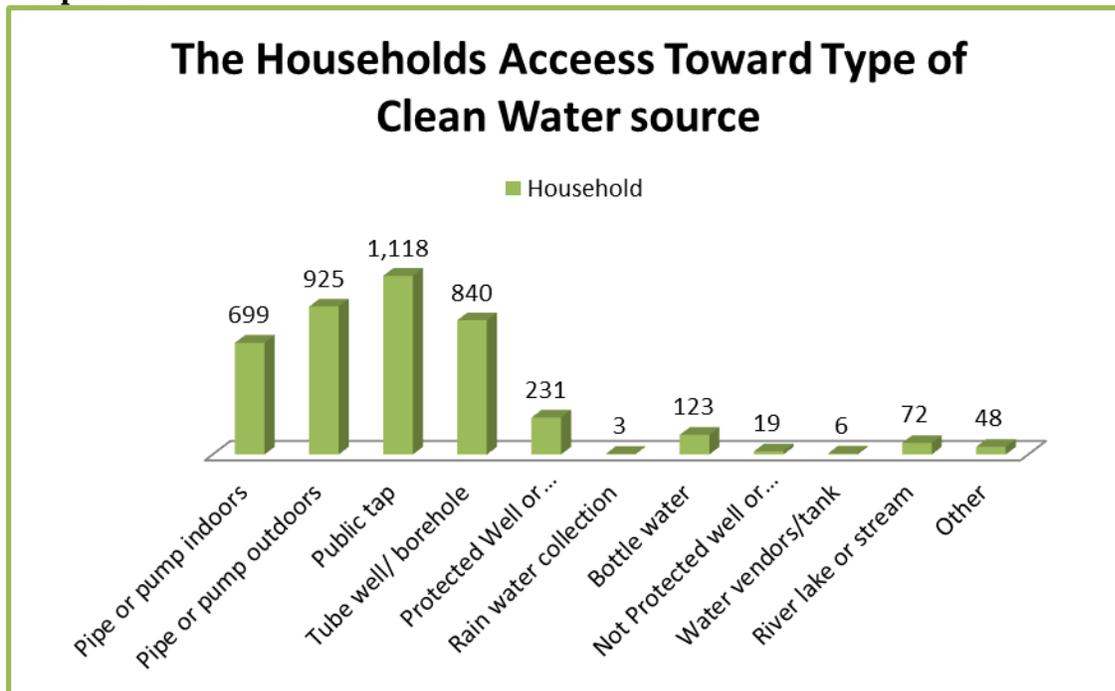
Research also revealed that there is community that still consuming river water since SAS service hasn't reached yet this area. Actually, community has such conscience that such water has been contaminated by trash or chemical substance, therefore endangered to be consumed.

Research has also identified that facility which has been damaged by community hasn't been rehabilitated yet by the government through SAS of Dili district /national. The other finding was that distribution system of clean water which managed by SAS toward community wasn't spread evenly, therefore some of community hasn't been able to benefit from such service. Luta Hamutuk has also observed that women and children were the largest group who supposed to carry such burden in getting clean water.

### 7. Bairopite Village

Total population in this village is 10,886 persons who composed from 5,212 female and 5,674 male, while the number of household is 1,691. Administratively Bairopite village is part of Dom Aleixo sub-district.

**Graphic 1.6**



Source: Timor Leste Census 2010, Volume 4.

Based on graphic 1.7, the number of households who access clean water from canalization distribution and public water tank is huge than those who access clean water from well and water gallon (should to purchase). There are also households who still consuming rain water and river water.

Public water facility within this village is like water treatment center, canalization distribution and water meter. Such facilities have also being rehabilitated already through ADB project and implemented by ENSUL. Though such clean water facilities are available, community hasn't been able to properly benefit from it, particularly sub village of Terus Nain and aldeia 02 Nikir, since SAS distribution hasn't reached yet this area.

The distance should to take by community in order to access these facilities is around  $\pm$  **100 to 1 km**, and usually able to consume 50-100 liters/person/day. Such level of consume can be beyond standard if water maintain being continuously distributed toward community.

Research has also found that community's level of consume was unstable since SAS did not have fix schedule, therefore water is sometimes unexpectedly stop. This condition has made community should to face difficulties in fulfilling domestic necessities like washing and cleaning.

As showed within graphic, many og households are still consuming river water and rain water. According to Luta Hamutuk's research community within this village has already knew that such sources of water aren't safe to be consumed however, since there isn't any other source therefore community must use this kind of water to complete domestic necessities.

Research finding also identifies that households within this village have been already registered as SAS consumers, and prepared as well clean water equipment like pipe therefore facilitate clean water distribution. Unfortunately, to date SAS hasn't conducted yet clean water canalization toward this village.

Graphic also shows that some of households within this village are also purchasing water to be consumed. Research has identified that the price water is USD \$ 35 per tank/one car.

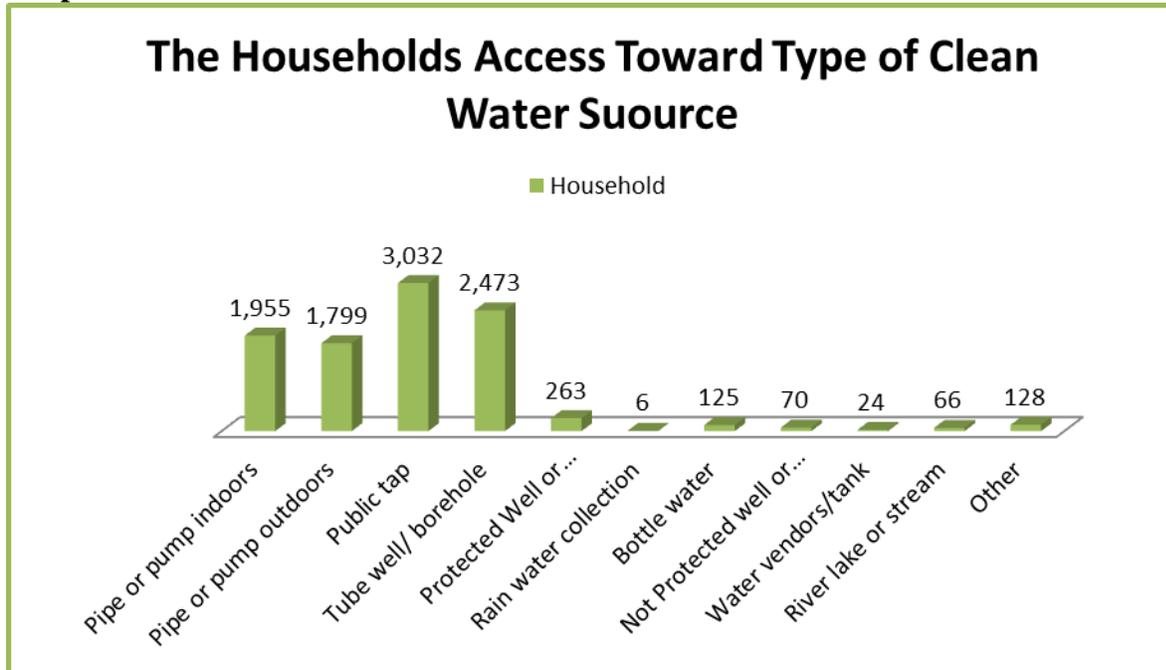
Clean water distribution in this village hasn't been properly controlled by SAS, as consequence community hasn't been able to benefit from such service. Research has identified that communication and complains system hasn't been provided yet, therefore it's difficult for community to convey certain preoccupation in respect of clean water since most of complains do not immediately being respond.

Research also identified that the government through Ministry of Health has conducted campaign to promote hand washing, however this seems impossible to be done since clean water hasn't been able to properly access by community. Luta Hamutuk has also observed that women and children were the largest group who supposed to carry such burden in getting clean water.

## 6. Comoro Village

Total population in this village is 65,404 persons who composed from 35,481 male and 29,923 female, while the number of household is 9,941. Administratively Comoro village is part of Dom Aleixo sub-district.

Graphic 1.7



Source: Timor Leste Census 2010, Volume 4.

Based on graphic 1.2, it shows that most of households in Comoro village has been accessing clean water from sources like canalization system, public water tank and well. In addition there is also plenty of households who are able to access clean water from canalization distribution where in this case has already reached houses. Based on such graphic, some of households within this village are still accessing clean water resource like river and rain water which considered as unsafe and do not meet with clean water standard.

The distance from community housing to of clean water resource (canalization distribution and public water tank) is about **100-1 km**. Level of consume among community within this village is 25-50 liters/person/day. Research has identified that community eithin this village hasn't been able to complete all level of clean water consume, since SAS did not have fix schedule, therefore water is sometimes unexpectedly stop.

Community hasn't been registered yet as SAS consumers, therefore hasn't been able to benefit from such service though this has been installed already within this village. Luta Hamutuk has also identified that there are households who have registered already as SAS consumer, however to date they have never benefit from canalization as well as clean water distribution.

Community has lack of information in respect of means to access clean water which based on consume standard. This has been reinforced by graphic which shows that some of households

within this village are still consuming river water which considered as unsafe to be consumed. Unfortunately, community doesn't have other alternative therefore river water become as the only source to fulfill other necessities.

Graphic also shows that there are households who have been accessing clean water from well, however they should face challenge in respect of electricity dependency. When the light/electricity went on then pumping machine can be used, however when such energy went off, this then generates difficulties.

Research has also identified that public facility in respect of clean water like pipes and water tank within this village has started to break. The government toward these broken facilities hasn't established control as well as maintenance system properly. Luta Hamutuk has also observed that women and children were the largest group who supposed to carry such burden in getting clean water.

### Results of Assessment

Based on description of data within 7 villages, Luta Hamutuk has conducted general analysis toward clean water development in Dili district. Such evaluation was toward clean water distribution and its public facilities. Sample for this evaluation were like; State Secretary of Aqua, Sanitation and Urbanization (SEASU), Chief of village (7), and 60 households within 7 villages.

### Government's Policy to Resolve Clean Water Problem in Dili Capital

Government's policy in respect of Clean Water Development has been poured into strategic plan of national development, stated that... *To increase the number of urban households in Dili with sufficient water, we will capture additional sources of water to increase current supplies and treat that water to drinking water standards. This will be achieved by: .....Constructing new water treatment facilities, Extending distribution pipework to new service areas, connecting additional households to distribution pipework*<sup>6</sup>. This signifies that clean water access in Dili become as national priority as stated already within strategic plan of national development. In order to realize this objective, government has allocated certain budget through State Budget started in 2011-2013 which can be detail seen within this table below:

**Table 1.1 The Allocation of OGE 2011 toward Clean Water Sector in Dili district**

No	Type of Project	Budget (\$ 000)
1	Installation of Clean Water in Campo Alor village	17
2	Clean Water canalization toward sub-village of Bekae and Deposito Penal, village of Lahane Oriental	18
3	Clean water canalization in sub-village of Villa, village of Vila Atauro	18
4	Rain water tank in Biquili village, sub-village Uaruana	54
5	Clean water canalization in village of Duyung, sub village Manleu	24
6	Installation of Clean Water in Comoro	50

<sup>6</sup> Strategic Development plan, clean water supply and sanitation in Dili, page 84

7	Rehabilitation of clean water system in village of Hera -Cristo Rei	90
8	Rehabilitation of clean water system in village of Sabuli –Metinaro	90
9	Rehabilitation of clean water system in village of Makadade – Atauro	95
10	Clean water perforation in benunuk-Metinaro	150
11	Rehabilitation of clean water system in Nain Feto	70
12	Construction of clean water system in village of Suco Dare Vera Cruz	75
13	Extention of clean water system in village of Camea -Cristo Rei	75
14	Installation of water pump in Metinaro	20
	<b>Total</b>	<b>846</b>

**Table 1.2 The Allocation of State Budget 2012 toward Clean Water in Dili District**

No	Type of Project	Budget (\$ 000)
1	Rehabilitation of water tank and clean water distribution in 4 sub-villages of Balibar	70
2	Rehabilitation of clean water system in 9 sub-villages of Lahane Ocidental	50
3	Rehabilitation of clean water system in sub-village of Temporal Tabeisi, village of Lahane Oriental, Sub-district Nain Feto	100
4	The Installation of clean water system in Vera Cruz	40
	<b>Total</b>	<b>260</b>

**Table 1.3 The Allocation of State Budget 2013 toward Clean Water in Dili District**

No	Type of Project	Budget (\$000)
1	Rehabilitation of clean water facility in village of Beloi Atauro	68
2	Construction of water reserve 200 m3 and the installation of pipe distribution as well as transmittion in village of Kamea Cristo Rei	217
3	Water perforation and installation in Becora	366
4	Water reinforcement in Dili (PPP)	500

Based on such allocation toward Dili district, Luta Hamutuk analyze that during the past three years the government has allocated already budget toward clean water through 13 project within this area. The allocation for example was toward project of rehabilitation of clean water in 9 sub-villages of Lahane Ocidental (2012). However from such allocation, the government had only allocated toward 6 sub-village, while the rest of three (3), like Taibesi, have to wait for such distribution. In Came village, problem has occurred within the project of The continuation of Clean Water System in village of Camea-Cristo Rei (2011) since most of community hasn't been able to access clean water. Luta Hamutuk has also found that most of community within this village hasn't been able to benefit from clean water distribution. According chief of this village *"this project does not in accord with community's plan"*<sup>7</sup>. Based on such allocation during the past three years, Luta Hamutuk analyze that this hasn't been able to resolve water distribution problem. Data has showed that distribution line has damaged and still waits for rehabilitation action. Luta Hamutuk has also analyzed that though clean water distribution has constructed and rehabilitated already by the government, however such kind of development is considered as unsustain. The reason is because SAS do not have fix schedule which made such distribution

<sup>7</sup> Interview with chief village of Camea, Sesta feira data ... June 2013 in Village office of Camea

sometimes stop unexpectedly. This condition has made community's access toward clean water is being interrupted, yet cause distandarized of consume level among community.

### **Community Hasn't been able to Complete Level of Consume based on WHO Standard**

According to Chief of SAS Department, he stated that *"We have been proceeded water meter every year from 17 water pump machines within Dili, 3 in Hera and 14 in Dili Capital. Yet, we have also installed 4 pumping facilities in Central, Lahane, Be mos and Benemanuk during this year and have produces 12 million meter cubic"*<sup>8</sup>. Based on this data, Luta Hamutuk analyze that this water debit do not sufficient to complete all levels of consume among community, since if we divide 12 million meter cubic into 225,026 total population within Dili district (do not include Atauro), this will equal with level of consume around 53 liters/day/per capita. Such result means that only 75% members of households of sample are able to consume clean water based on WHO standard. Based on Pyramid of Clean water Consume, such necessity has been divided into short term, mid-term and long term period. Therefore, Luta Hamutuk analyze that households of sampel haven't been able to meet such standard of clean water consume since most of them could only consume around 53 liters/day/per capita. This condition signifies that level of clean water consume of most of households within this village, who became sample of research, have only able to meet with short-term period category. This also signifies that there are still efforts to be done by community aimed to fulfill its demand on clean water to be able to complete all levels. Luta Hamutuk has also analyzed that this condition happened since water canalization/distribution hasn't reached community caused by the broken pipes and uncertain scheduled should to establish by SAS. In addition, Luta Hamutuk also concludes that the distance to access clean water sources ( $\pm 100$  m to'o 2 km) is also contibuting toward the ability of community in completing clean water level of consume.

As consequence, community should to find another source of clean water such as river water, spring water and well-aimed to fulfill other necessities. However, based on report of Joint Monitoring Program/JMP, it stated that *".....Less than half of Dili's water is supplied from a water treatment plan, with unsafe sources including shallow boreholes, wells, springs, and rivers meeting remaining demand"*<sup>9</sup>. This signifies that other clean water sources, which do not trough water treatment, center considered as unsafe and could endangered the health status of community.

### **The Reinforcement of Wtaer Facility Hasn't Met with Standard**

WHO's Standar of Clean Water said that *".....Public Water container should take minimum distance from community housing, therefore minimum of water consume can be fulfilled. While its key indicator stated that ".....at least 0.125 liters per second, at least 1 public water container is provided toward 250 persons, maximum distance to public water container is 500m"*. Based on such standard, Luta Hamtuk analyses that 50% of clean water facilities which provided by SAS toward community is to far from community's housing. Data has revealed that the distance of public water tank/container toward community housing is 100 m to'o 2 km. As the distance is huge, this will have such influence toward clean water level of consume among community. Luta Hamutuk also analyzed that still have to walk on such distance since

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<sup>8</sup> Be'e Mos iha Dili Liu Utilizasaun Komunidade, Diario Nacional, 11 June 2013, page 2

<sup>9</sup> Timor-Leste Wash Sector Brief, page 2, WHO/UNICEF Joint monitoring program.

distribution of the pipe hasn't reached inside the community houses. In addition, though pipes are available however since there isn't any water station within community's area, these equipment can't be installed/reinforced. This condition, yet generate violation toward such facility done by community who hasn't able to benefit from SAS service. Such violation is contributing toward water pressure reduction.

Unfortunately, though distribution of clean water has underwent such technical problem, however the allocation still do not being addressed to rehabilitate such facilitation during the past three years. Based on Luta Hamutuk's observation, most of community hasn't been reached by clean water distribution, instead should to walk around  $\pm 1-2$  in order to access clean water facility.

Luta Hamutuk has also identified that community maintain to consume clean water by violating the pipe. This signifies that the government is failed to well interpreted strategic plan of national development which stated that "*Sourcing and treating new water as required from bores, rivers and other sources, Extending distribution pipework to new service areas, Connecting additional households to distribution pipework*"<sup>10</sup>. The allocation of budget during the past three years hasn't been able to reflect on such strategy, particularly in extending the pipes therefore able to cover inside the community's housing. Fact has showed that during the past three years the allocation toward clean water development has no longer became priority within Dili district. This has been reinforced by data showed that Dili has only received 13 project of clean water development, and from such development these haven't been able to facilitate community's demand.

Luta Hamutuk has also analyzed that according to strategic plan, the government should to develop another source for clean water aimed to reinforce community's demand particularly Dili district. However, Luta Hamutuk analyzed that during the past three years there were only 2 projects which receive such allocation aimed to develop clean water sources in Dili district (do not include sub-district of Metinaru&Atauro). Actually, the government should develop another source of clean water which is nearest to the community area therefore facilitating clean water demand.

Based on Luta Hamutuk's analysis, the allocation of budget 2013 particularly toward clean water project is smaller than last year. This considered as illogic since community's necessities toward clean water hasn't been resolved yet. Actually, the allocation toward clean water project particularly Dili district, should to continue untill the problem of clean water demand is addressed.

Luta Hamutuk has identified that water distribution which hasn't covered inside community housing, has become contributing factor why community should to find other source of clean water trough water perforation (of a well). However, such behavior will have certain influence in the future, since such action is prohibited and could endangered water reserve which strongly needed particularly within crisis situation.

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<sup>10</sup>Strategic Development plan, clean water supply and sanitation in Dili, page 84.

### **Control System within Clean Water Distribution**

Control System within clean water distribution become as an important factor which could guarantee its sustainability. Based on description of data within previous sections, composed by Luta Hamutuk through sample of research, it showed that distribution of clean water considered as unsustainable since control system didn't well develop to guarantee community's ability to access clean water managed by SAS.

Luta Hamutuk has also analyzed that control system toward water distribution line was inadequate since sometimes pipes became dysfunctional by natural disaster and haven't been immediately rehabilitate by SAS. In addition, there isn't any fix scheduled as well in respect of water distribution therefore become such obstacles toward community in accessing clean water.

The pipes have also being damaged by community who can't able to benefit from SAS service. As consequence, water distributions sometimes fail to reach community housing since a lot of water have wasted from the broken pipe. According to State Secretary water debit from water treatment center is within sufficient level to be distributed toward community. However since there are many disruption (community who violate the pipe) the debit is reduced significantly. This condition is believed to be happened since SAS assistance toward community who hasn't been able to benefit from such service, was received less attention.

Luta Hamutuk has also analyzed that such violation behavior performed by community toward water pipes distribution, was an indication that there wasn't any conscience to take care public facility. However, such in-conscience also has been triggered by lost of patient among community since clean water was distributed unevenly among community in addition SAS assistance toward this particular community received less attention.

The government has already Water Treatment Center, a place where water is being proceeded prior to distribution toward community. However, control system is considered as inadequate, particularly in respect of its quality, therefore most of water still contaminated even when it's already distributed toward community. This condition will influence community health status since this can generate water-borne diseases.

### **The Impact of Clean Water toward Health Status of Mother and Children**

Based on data, it was obvious that clean water as well as sanitation have significant impact toward the health status of mother and children. Luta Hamutuk has analyzed that community's access toward clean water within villages of sample has an impact toward health status, particularly children. Difficult access toward clean water will contribute toward mortality rate of mother and children in Timor Leste. Mortality rate of children in Dili is higher than other districts. Based on Demographics and Health Survey in respect of mortality rate in Dili it stated that "*Neonatal mortality is 21/1000 live births, Post neonatal mortality is 18/1,000 live births, Infant mortality is 39/1000 live birth, Child mortality is 22/1000 live births, Under-5 mortality is 60/1000 live births.*"<sup>11</sup> According to that data we can conclude that if compared with other districts, such as Baucau, mortality rate in Dili is higher. Accordingly this has close relation with different access toward public facility established by the government, means that inadequate access toward clean water will contribute toward mortality rate of children in Dili district.

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<sup>11</sup> Timor Leste Demographics and Health Survey 2009-2010, page 103

Data also shows that inadequate clean water and sanitation will contribute toward diseases like anemia and infection during pregnancy even within childbirth. This condition contributes toward mortality rate of mother in Timor Leste. Based on this data, Luta Hamutuk analyses that inadequate access toward clean water will continue to contribute toward mortality rate of mother and children in Dili district.

As mortality rate of mother and children is high caused by inadequate access toward clean water, however the allocation of budget to build such facility hasn't been increased, particularly for Dili district. Table has also showed that the allocation of budget through clean water project in 2011 was toward 14 projects; however in 2012 such project was decreased to only 4 projects. Based on such comparison, Luta Hamutuk analyze that the allocation of budget didn't respond on clean water problem in Dili district. Actually, the government must have such policy to resolve clean water problem therefore reduce mortality rate of children.

Luta Hamutuk has also analyzed that the government has already put clean water development as an important element within social-economic development. However, based on research finding, it shows that development within this sector hasn't been able to give significant contribution toward economic and social status, since community still has to face difficulties in accessing clean water.

### **Clean Water Development and Women Empowering**

Clean water development has close relation with women empowering, since we all knew that women in Timor Leste are responsible in conducting domestic work. Therefore clean water development is expected to be able to lighten such works, yet women can have another activity, in other words empowering women itself. In order to lighten the works of women, this can be simply achieved by brought the water facility close to this group, therefore save time as well as energy.

However, based on Luta Hamutuk's results of observation within villages of sample, it showed that the distance toward clean water sources such as canalization distribution, river water as well as spring water is about  $\pm 100$  m to 1-2 km, to be achieved by walk. This condition signifies that clean water development hasn't been able to lighten women's work during this time.

Luta Hamutuk has also analyzed that clean water development also fail in empowering women, to create another activity which can increase its capacity. Still that woman loses its time and energy only to access clean water. Huge distance toward clean water facility can't lighten women's work, yet in Dili district most of women suffer from malnutrition.

### **Need for Integrate Urban Plan**

In order to facilitate clean water access among community, integrate of urban plan becomes as an important key. Such plan will be able to facilitate other sector including clean water should to manage by SAS. However, reality has showed that to date, there isn't any urban plan particularly for Dili district; therefore impede SAS in conducting water canalization as well as distribution toward community. Integrate of urban plan will be able to facilitate government's service aimed to provide clean water toward community.

Luta Hamutuk has analyzed that the government has started to create plan in conducting study toward urban plan within national level, and this year the budget has been allocated toward such purpose which estimated as \$ 3,000.000.

#### **Need for Certain Circumstance to Facilitate the Implementation of Decree of Law no. 4/2004**

Decree of law no.4/2004 has implemented already since 2004, however due to political crisis in 2006 such implementation becomes interrupted up to this present day. In order to implement Decree of Law No.4/2004 which mostly about *que aprova o regime de distribuição de água para consumo público*, the government need to create condition that could facilitate such implementation?

Based on Luta Hamutuk's research, such condition is like; first the government must rehabilitate distribution line which has been damaged by community. Second is, the government must conduct new registration therefore data is available in respect of SAS consumers. Third is that clean water distribution should provide fix calendar and schedule, therefore create sustainability among community in accessing clean water.

If such condition available, such law will be able to legally implement and guarantee consumer's rights. Implementing such law means that this can become legal base in obligating consumers to pay water meter toward government, however such obligation is impossible to be executed when consumers can't access clean water service.

#### **Conclusion**

Luta Hamutuk concludes that community within villages of research sample, haven't been able to complete levels of clean water consume as set by WHO. This condition occurred since some of pipes installed for clean water distribution haven't reached yet inside community's housing. Such fact has also triggered violation toward such pipes, conducted by community in order to get clean water, though they have already knew that such behavior is also violation against the law and social norms as well.

Luta Hamutuk also concludes that community access toward clean water hasn't achieved yet WHO standard, since distribution system hasn't been enclosed with fix schedule. As consequence clean water distribution considered as unsustainable and yet generate discontrol action among community by making well (perforation). This behavior will bring negative impact toward water reserve in the future, and without immediate control this could trigger water crisis as well.

Distribution and control system of clean water toward community during this time is considered as inadequate, particularly in respect of its quality since water sometimes still contaminated though this has been through water center treatment.

Inadequate access toward clean water has also contributed toward mortality rate of mother and children in Dili; if compared with Baucau district, Dili has huge of such rate. This condition becomes as obstacle for Timor Leste in achieving MDGs indicators, which one of them is reduce mortality rate of children.

Luta Hamutuk concludes that the distance of clean water facility toward community's housing hasn't been able to contribute toward women empowerment, means that provide more time to conduct other activity which could increase its capacity. The other conclusion is that the distance of clean water facility toward community's housing hasn't been able to lighten women's work since such groups still suffer from malnutrition.

Community access toward clean water is still inadequate and continue becomes such burden toward women in conducting domestic works. Such condition also provide less time for women to conduct other activity which could increase its capacity.

Urban Plan toward Dili's citizen is immediately needed; therefore community could be well organized. In addition, such plan would be able to facilitate SAS service in providing clean water facility.

Finally, Luta Hamutuk concludes that conducive circumstance is needed aimed implement Decree of law No.4/2004, which regulates *que aprova o regime de distribuição de água para consumo público*. In addition, all pipes need to be rehabilitated and canalization should to continue until it's reaching community's housing and distribute evenly toward all citizen, yet prevent from such violation toward clean water facility.

## **RECOMMENDATION:**

1. Ask Government/State Secretary of Water-Sanitation and Urbanization (SEASU) to allocate budget within fiscal year 2014, aimed to rehabilitate distribution line (water pipes).
2. Ask Government/SEASU to allocate budget aimed to finance clean water canalization toward families who haven't been able to access clean water.
3. Ask SEASU to continue canalize clean water until it reaches community's housing within Dili district, therefore lighten women's' work within domestic area, particularly in getting clean water.
4. Ask Government, particularly SEASU to conduct quality control toward clean water prior to distribute toward community, since water which is coming from water treatment center still considered contaminated.
5. Ask Government to create Urban Plan toward Dili district, therefore facilitate government's service particularly SEASU in distributing clean water toward community.
6. Ask Government particularly SEASU to rehabilitate clean water distribution line and install new line toward community within Dili district; prior to implement Decree of Law

No.4/2004

which

regulates

*que aprova o regime de distribuição de água para consumo público.*