

## **Assessment of water availability and personal hygiene in the Vavunatheevu area of Batticaloa District: A Base line study**

**Sugirtharan M.<sup>1</sup>, Narmilan A.<sup>1</sup>, Dasinaa S.<sup>1</sup>, Amuthenie S.<sup>2</sup>**

<sup>1</sup>Department of Agricultural Engineering, Faculty of Agriculture, Eastern University, Sri Lanka

<sup>2</sup>Department of Agricultural Chemistry, Faculty of Agriculture, Eastern University, Sri Lanka

### **\*Corresponding Author:**

Sugirtharan M

Email: [sugirtharan818@yahoo.com](mailto:sugirtharan818@yahoo.com)

**Abstract:** The current study was developed to find out the availability of the water and the sanitation approaches where the supply is diminished with the increasing demand of adequate water in Vavunatheevu area of the Batticaloa District, Sri Lanka. A predesigned questionnaire and direct observation were used to find out the water availability and the conditions of the water for the domestic and drinking water needs. The sanitation conditions which was adopted by the people was also recognized. And the information regarding those issues were analyzed using SPSS (Version 22). The results showed, more than 60% of the people used dug well in both rainy and dry season for the collection of water where the storage vessels were covered safely (48.6%) for providing protection for drinking water. Further, the shared water resource was mainly in unprotected condition (46.6%) which was in double fold while comparing with the protected conditions of the shared/common (22.6%) and household (21.9%). As far as the hygienic condition is concerned, 70.3% of the total respondents wash their hands before cooking and which was vice versa (60.1%) with the visual observation of the home nature. Around 66.4% and 70.7% of the children and adults, wash the hands before having their meals in all the situations. As the protection measure, approximately 41.7% of the total uses boiled water where the same percent of the adults and children used to adopt this. Cleaning facilities were supported with the renovation of cleaning latrine (50.2%). Not only had that, but the surrounding environment also considered a lot as the sanitation of the people where it was partially cleaned (58.3%). Among those stagnant of water (14.5%) and the untidy garden (14.5%) was predominantly visualized. As the result, the hygienic conditions of the study area should be improved a lot with the technically approved renovation approaches in future.

**Keywords:** Drinking water, environment, personal hygiene, sanitation, water availability, Vavunatheevu area.

### **INTRODUCTION**

Water is one of the important and critical natural resource for developing country where it supports the economic growth and maintains the daily life of the individual. In these circumstances, Agriculture contributes a lot for the nations' development where the usage of fresh water is in an increasing trend. In Sri Lanka, the land allocation for the farming site is higher especially in dry zone where the scarcity of the water for farming as well as domestic purposes also is in challenge. Only a considerable amount of the water from the total is used for the residential purposes. The increasing demand for water has put pressure on water supply system, which has led to environmental problems such as over exploitation of water resources, and breaks in the balance of the ecosystem. The increase in the demand for water has created more wastewater. Improvements in household water efficiency could reduce the pressure upon water supply and waste water treatment. Water efficiency

does not mean controlling the water supply but its sustainable water use, which will reduce wastage [1].

Domestic water availability and sanitation are fundamental requirements for human life. Without water, life cannot be continued beyond a few days and the lack of access to adequate water supplies leads to the spread of disease. Children bear the extreme health burden associated with poor water and sanitation. Water supply and sanitation are among two of the most important sectors of development [2].

Development of community water supplies and sanitation result in improved social and economic conditions and improved health [3]. The benefits of improved water supply and sanitation are many, including prevention of disease, improved basic health care, better nutrition, increased access to institutions such as health centers and schools, improved water quality, increased quantity of access water, reduction in time and effort required for water collection, promotion

of economic activity, strengthening of community organization, improvements in housing, and ultimately, improved quality of life [4]. The need for domestic water supplies for basic health protection exceeds the minimum required for consumption (drinking and cooking). Additional volumes are required for maintaining food and personal hygiene through hand and food washing, bathing and laundry. Poor hygiene may in part be caused by a lack of sufficient quantity of domestic water supply [5]. Further, household water use is usually the most important part of municipal water use, because it accounts for over half of the total municipal water use in many countries. It usually requires high water quality and reliability which leads to high cost. Residential water use is also directly linked to the general public health. Improving the health of the poor is one of the main goals of water and sanitation projects [6].

The primary objective of this study is to assess the water supply and sanitation situation in the Vavunatheevu DS area, Batticaloa District and to identify water supply and sanitation problems in the Vavunatheevu DS Area and to propose solutions to improve the village water supply and sanitation situation. Therefore, this study was aimed to identify the existing water availability and sanitation conditions and gathered information can be used to conduct an assessment related with needs and provide a starting

point for potential water supply and sanitation improvement projects.

## MATERIAL AND METHODS

A questionnaire survey was conducted in order to have a clear vision on the water availability and the sanitation conditions of the people who resided in the Vavunatheevu area, Batticaloa (Figure 1). The fact of this special location is the area which was highly affected by the ethnic conflicts during last three decades. And also, the land availability in this dry zone for the future farming and livelihood activities also higher without much attention on the available water resources. Additionally, these particular village of Vavunatheevu areas comes under the Manmunai West Divisional Secretariat Division where the economic status of the people is low and need to be considered in future as well.

According to that, questionnaire was consisted the household data, available water resources, water availability and personal hygiene conditions as the main theme and was subdivided into further and deeper for the analysis. Not only that, but pre structured questionnaire was clearly elaborated and discussed with the households too. Finally, data were spreaded in MS Excel and SPSS (Version 22) for the analysis to identify the present conditions in the water availability and the sanitation conditions of the people in Vavunatheevu DS area, Batticaloa District, Sri Lanka.

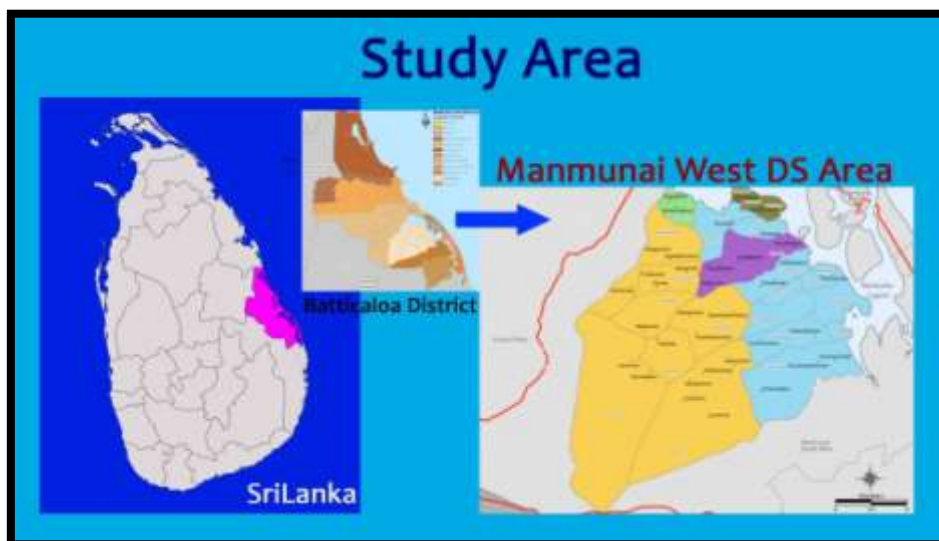


Figure 1: Location of study area

## RESULTS AND DISCUSSION

According to the present study carried out in one of the rural villages named Vavunatheevu in Batticaloa District showed the following as its conditions regarding its water, sanitation as well as the personal hygiene in two different aspects. The following information was gathered based on the survey

conducted among the randomly selected three hundred people who are residing at the particular village since their birth.

### Water availability and its sanitation

At the current study, people used to adopt different water sources for their domestic purposes as

well as the drinking purposes with the support of pipeline, tube well, shallow/dug well, river/tank/stream and rain water tank. It means that the village is actually located in the dry zone where the availability of water is based on the seasonal pattern of the Monsoon Rainfall.

And also the high temperature (dry season) falls with the period of March to September and the lower temperature (wet season) ranges within the period of October to February in Batticaloa District.

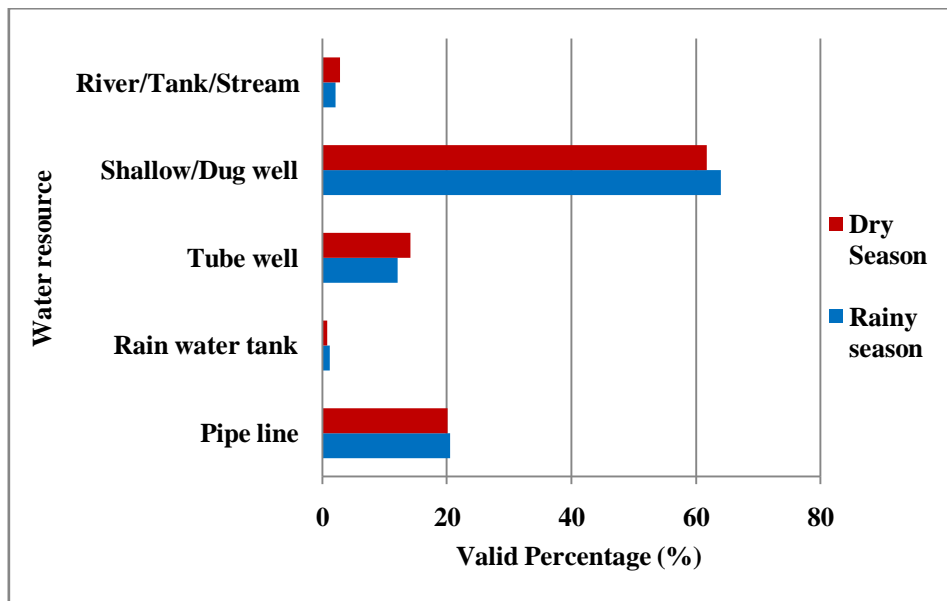


Fig-2: Availability of water sources in dry and wet season

In dry season, majority of the people used dug well (64%) and only very few of the respondents used the rain water harvesting system (1.1%) for their drinking purposes. And also, people used pipeline (20.5%), tube well (12%) and river/ stream (2.1%) with the concern of their availability of clean lines water. Further, the priority of water sources was similar in the wet season where 61.8% of the respondents used dug

well while the minority of the people adopting the rain water harvesting systems (0.7%). The usage of pipe line, tube well and river for the domestic purposes were 20.1%, 14.1% and 2.8% of the studied population respectively which trend was approximately similar as in dry season (Figure 2). Reason for majority of people used shallow/dug well is simple and inexpensive method than rainwater tank or tube well.

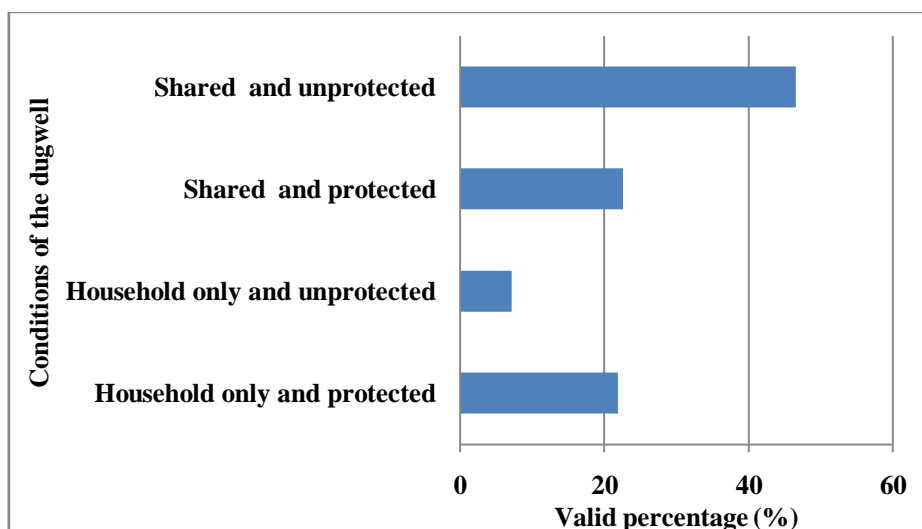


Fig-3: Nature of the water sources

In this analysis, dug well took place a remarkable identity where 56.5% of the respondents mentioned that they cover their water storage vessels

(56.5%) and 37.1% of the people did not care anything about storage vessels protection where the nature of this protection ranged (Figure 3) by means of four different

conditions as household protected (21.9%), household unprotected (7.1%) and shared protected (22.6%). At this analysis, mentality of the people (46.6%) was with the lower attention on the shared water sources (shared and unprotected) while comparing with their own household dug wells for the domestic activities. It was the evidence that the majority of the respondents were not considering their sanitation on its usage of shared wells. Reason for majority of people used shared and

unprotected dug well is low income level of people and lack of knowledge about water sanitation practices.

According to the visual inspection of the water sources (Figure 4), the conditions of the sources were clean (48.9%) in some cases, partially clean (45%), unclean (3.4%) and need repairing of sources (0.8%) in this village.

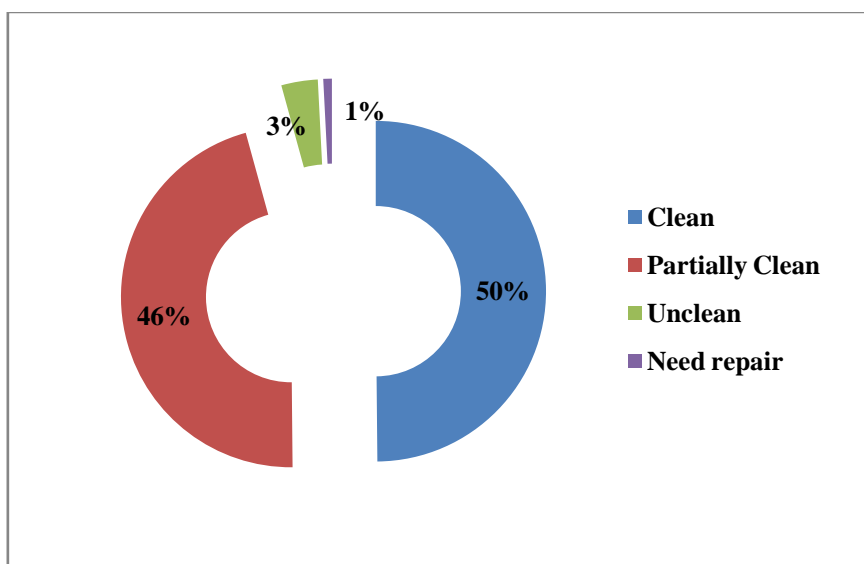


Fig-4: Conditions of the water sources

**Personal hygiene of the population in domestic activities**

*Hygiene conditions before cooking*

At the present study, around 46% of the total respondents used the partially cleaned water for their domestic as well as for the drinking purposes. For that, some health issues were adopted by the people towards their better life in future. Analyzed data showed that the 70.3% of the total respondent always washing hands before cooking while 27.9% of the respondents washing

their hands in some cases only. It was evidenced with the visual observation of the soap presented nearby the washing area, at home. Although the majority of the respondents depicted as above, the visual observation couldn't be supported that. Soap was not kept at the washing site of the home (60.1%) and it was kept only at 38.5% of the home of the study location. Reason for majority of people not kept the soap at washing site is poor income level and poor educational knowledge.

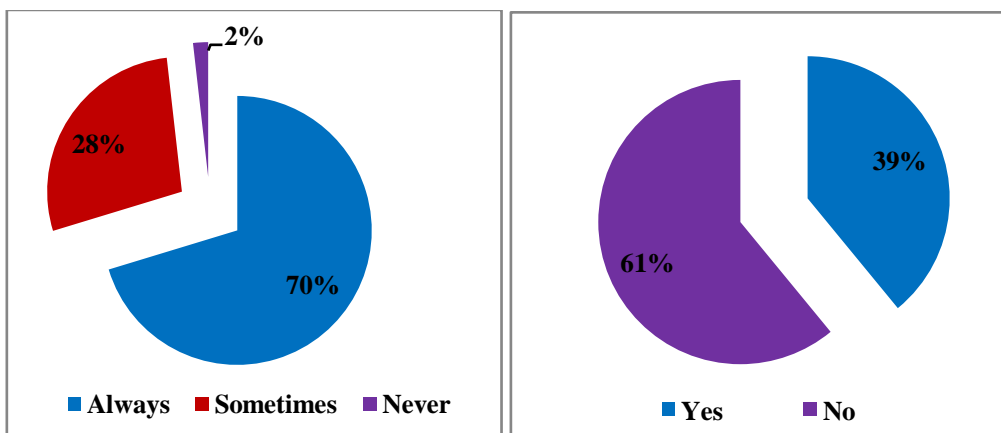
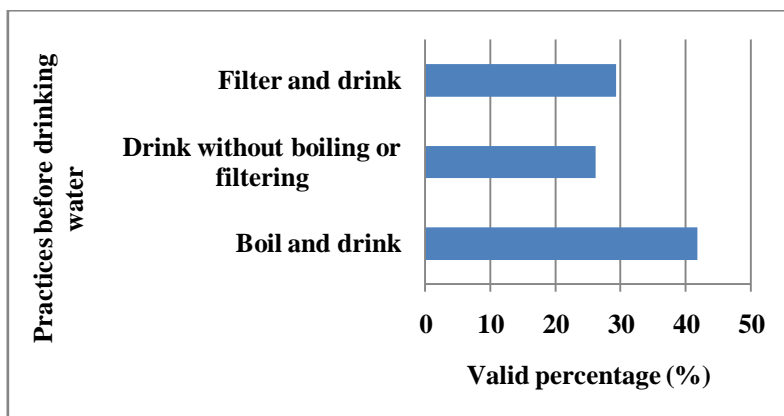


Fig- 5: Hygiene conditions before cooking

**Hygiene conditions before eating and drinking of water**

The second most important sector is washing hands before eating the main meal (breakfast, lunch and dinner) which contributes more on the functional systems of the body. This attitude should be adopted since the childhood to overcome many of the health related problems. Around 66.4% of the children at study

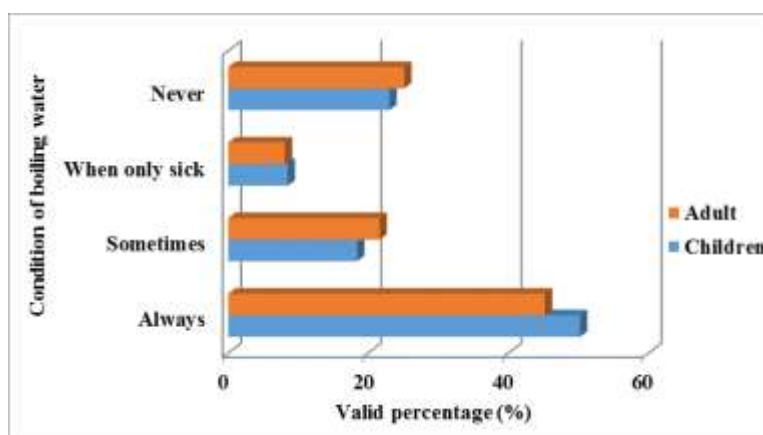
area always wash the hand before eating and 31.1% of the children wash their hands only in some cases. Additionally, 66.4% and 31.1% of the total adults wash their hands always and sometimes, respectively. Very few percentages of the children (2.5%) and adults (2.5%) never wash their hands on or before having their meals.



**Fig-6: Practices adopted before drinking water**

According to the Figure 6, nearly 42% of the total population consumes water after boiling while 26.1% and 29.3% of the total population consuming water after filtering and without filtering or boiling the water, respectively. Moreover, the data were collected in both level of children and adults regarding their adaptability of boiled water. Among the total, 50.2% of the children were always fed with the boiled water and 18.4%, 8.5% and 23% of the children drank boiled water in the situation such as sometimes, only they are

sick and never boiled, respectively. On the other hand, the adults used boiled water at the nature of always, sometimes, only when they are sick and never with value of 45.2%, 21.6%, 8.1% and 25.1%, respectively (Figure 7). In both situations, the trend was similar which meant as while parents use boiled water children also started using boiled water. Therefore, the adaptation is on the basis of the parental attitude and it needs much awareness to continue in future regarding their hygienic conditions.

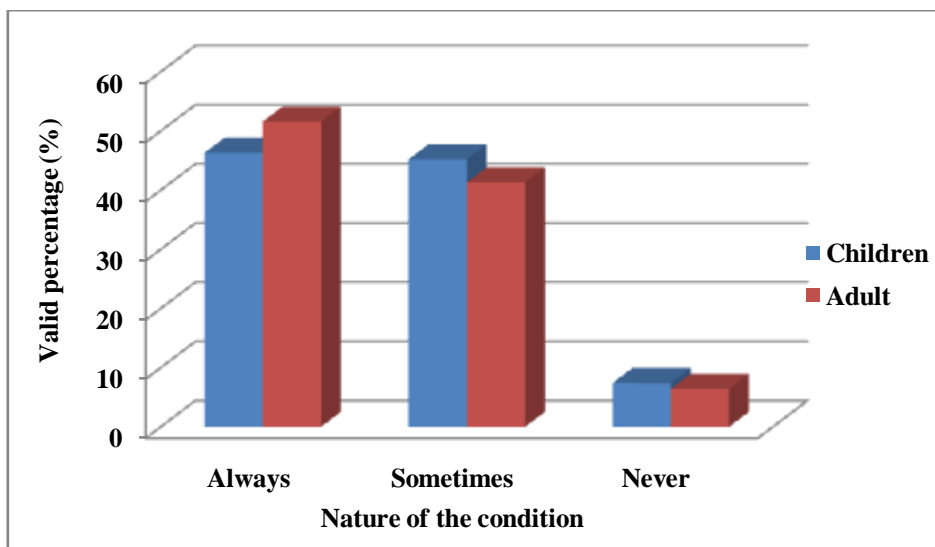


**Fig-7: Conditions of boiled water usage**

**Personal hygiene of the population in cleaning activities**

During the survey, people were undergone for both visual as well as direct interviews to identify the situation regarding their cleaning activities. It is one of

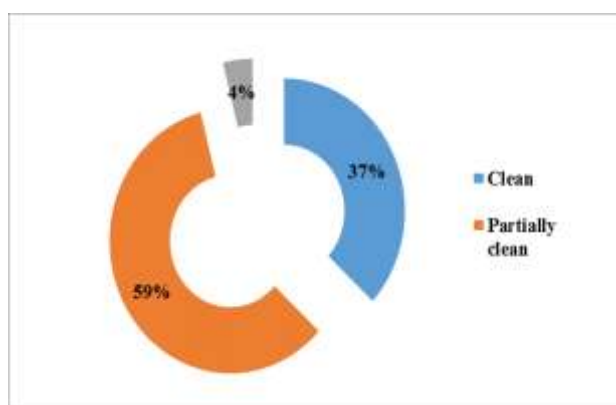
the most important activities to the health pattern of the individual. Mainly, toilet facilities and the water availability on and after the cleaning process were checked to estimate the current situation of the people in both levels (Children and adult).



**Fig-8: Conditions of washing hand during cleaning activities**

Three kind of situation were recognized in the Vavunatheevu village regarding the toilet units. Those are exclusive of house, share with another house and no toilet were noticed with the value of 42.4%, 14.1% and 43.1%, respectively. Among the total of 56.5%, bucket and pit method of waste disposals were with the count of 66.1% and 18%, respectively. Additionally, water availability for the cleansing and hand washing were checked. Approximately, 50.2% of the total people did not mention that they have adequate water for their washing and around 32.5% of the respondents mentioned they have better clean line water for their washing and supportive works.

And also, people were visually inspected with the presence of soap nearby the water sources regarding the cleaning activities. About 55.1% of the total population did not keep soap at their cleaning sites and only 42.8% of the total still maintaining the protection activities related with their cleaning. Among the total children in Vavunatheevu Village, 46.3% of the total children frequently wash their hands after their cleaning activities. And also, 45.2% and 7.4% of the total children wash their hand in some cases and in never conditions. Further, adults also were interviewed regarding the same issue where 51.6%, 41.3% and 6.4% were with the conditions of washing hands always, sometimes and never as shown in the Figure 8.



**Fig- 9: Conditions of the outside environment**

Not only the water availability but the outside environment also was checked to review a proper comment on behalf of their health care supports. As the stagnation of water in outside which may lead to the accumulation of unwanted vectors for the disease spreading. Especially, mosquito is the most dominated vector to spread disease through the stagnant water in the outside. As the evidence, 36.4% of the total area was clean without any stagnation of water, untidy

garden, uncovered well, water collection points (pots, rubbish), garbage/ waste spreads and toilet pits in close proximity to well. However, more than half of the area (58.3%) was partially clean and 3.9% of the total was with the condition of unclean environment (Figure 9). This condition may be lead to reduce the aesthetic value of the environment as well as the increased some diseases to people those who are living in that partially clean or unclean areas.

However, partially cleaned area (62.2%) was created due to the stagnation of water (14.5%), untidy garden (10.2%), uncovered well (14.5%), water collection points (pots, rubbish (14.1%), garbage/ waste spreads (8.8%) and toilet pits in close proximity to well (0.8%). Because of the ethnical conflict, these areas

were without development in past three decades. And also the Vavunatheevu Village, is one of the remote area which is now under the development for the construction, renovation, and transportation etc for the future generation (Figure 10).

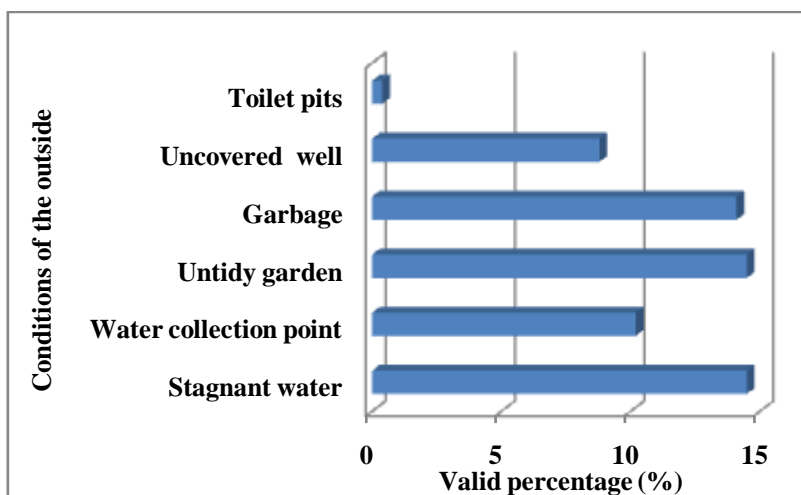


Fig- 10: Present conditions of the outside environment

Further, the water is one of the critical resources which should be supplied in the potential amount to full fill all the day to day activities of the society in Vavunatheevu Village, Batticaloa District, Sri Lanka. As the result, the hygienic conditions of the village should be improved a lot with the technically approved renovation approaches in future.

### CONCLUSIONS

Most of the people mainly depend on dug well in both rainy and dry season for the collection of water where the storage vessels were covered safely for providing protection for drinking water. The people were severely affected by water scarcity during the months of June, July and August. Further, the shared water resource was mainly in unprotected condition. Survey revealed that many of them wash their hands before cooking and which was vice versa with the visual observation of the home nature. Washing hand especially before eating and after defecation are very important among children. Boiling and filtering of water before drinking were identified as major treatment methods in the study area. Cleanliness of the surrounding environment also assessed through the condition of the surroundings and by observing the stagnant water. As the result, the hygienic conditions of the village should be improved a lot with the technically approved renovation approaches in future. The awareness on the importance of efficient water use, clean environment and hygiene practices need to be created among children and adult is an important step to improve the hygienic condition and water use in the study area.

### REFERENCES

1. Tingyi Lu; Research of domestic water consumption: a field study in Harbin, China. Water, Engineering and Development Centre Department of Civil and Building Engineering, 2007; 6.
2. Bendahmane, Diane B; Lessons Learned in Water, Sanitation and Health: Thirteen Years of Experience in Developing Countries. Arlington, Virginia: Water and Sanitation for Health (WASH) Project. 1993.
3. Davis J, Garvey G, Wood M; Developing and Managing Community Water Supplies. (Oxfam Development Guidelines No. 8). Oxford: Oxfam. 1993.
4. Okun, Daniel A; The Value of Water Supply and Sanitation in Development: An Assessment. In: American Journal of Public Health, 1988; 78(11):1463-1467.
5. Cairncross S. and Feachem R. (1993). Environmental health engineering in the tropics: an introductory text (2nd edition). John Wiley and Sons, Chichester, UK.
6. Wash baseline study; A 2013 study on current community access to and practices on Water, Sanitation and Hygiene in select rural and urban settlements in Liberia. 2013.