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Socio-Cultural Barriers of Safe Water, Sanitation and Hygiene Practices in South Punjab Pakistan

Abstract

Access to safe drinking water and sanitation is the basic right of every human being which directly influence health and social outcomes. Without adopting a project to its cultural settings, the project has very little or no chance for success or to be sustainable. The objective of the present study was to examine the socio-cultural barriers towards safe water, sanitation and hygiene practices in southern Punjab, Pakistan. It was a mixed method of research comprising qualitative and quantitative design. The qualitative data was collected through FGDs, and quantitative data was collected through an interview schedule. It was found that Cultural constraints like satisfaction and reliability towards traditional and myth-based norms are hampering the water, sanitation and hygiene practices. It is necessary to start comprehensive programs of WASH sector development with a special focus on social mobilization for the transformation of social norms along with resource allocation to improve WASH conditions/practices.

Key Words: Water, Sanitation & Hygiene (WASH), Socio-Cultural, Cultural Norms, Social Mobilization, Southern Punjab, Pakistan

Introduction

WASH is a comprehensive term that referred to Water, Sanitation and hygiene. Access to WASH includes safe water, adequate sanitation and hygiene conditions. WASH reduces illness, death, and poverty, and improves human health and directly influences the Sustainable development of all institutions as well. Many developing countries are already today struggling to cope with chronic water shortages and the inadequacies of their existing water infrastructure. Rich countries and international organizations firstly began to give assistance in the shape of funds for water and sanitation improvements through the World Bank in 1961 (Botting et al, 2010). Most of the funds went to the supply of water facilities, and hence the coverage gap between water and sanitation supply increased. In 2004 water supply had a worldwide coverage of 83.3%, whereas sanitation had a worldwide coverage of 59.1% (WHO, 2009).

Since the start of the 21st century and onwards, international organizations which were active in the field of water supply and sanitation advocacy, i.e. “The Water Supply and Sanitation Collaborative Council” and “The International Water and Sanitation Centre” in the Netherlands, began to use term WASH as an umbrella for water, sanitation and hygiene (De Jong, 2003). The term WASH has since then been broadly adopted as a handy acronym for water, sanitation and hygiene in the context of international development. Affordable and sustainable access to WASH is a key public health issue within international development; hence it is the focus of Sustainable Development Goal (SDG) 6, which is: “To ensure availability and sustainable management of water and sanitation.

Presently, 2.2 billion people lack access to safely managed drinking water services, and 4.2 billion people lack access to safely managed sanitation services worldwide. Similarly, Unsafe hygiene practices are also widespread, compounding the effects on people’s health. For example, the impact on child mortality rates is devastating, with more than 297 000 children under age five who die annually from diarrheal diseases due to poor sanitation, poor hygiene, or unsafe drinking water (UN, 2020). It was estimated that 4.2% or more of the annual global mortality is preventable if all people had

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provided access to safe drinking water, adequate sanitation and decent hygiene practices (Tumwebaze, Orach, Niwagaba, Luthi, & Mosler, 2013).

The lack of understanding about all necessary aspects of WASH has a significant impact on the success of Water, Sanitation and Hygiene (WASH) projects. Without adopting a project to its environmental settings, the project has very little or no chance for success or to be sustainable. Looking at the history of WASH-programs, there is a very high rate of failure within the sector; for example, there are numerous constructed latrines being used as storage throughout the world as they have been insufficiently implemented and adapted to the users (Padawangi, 2010).

Pakistan is among the world’s 36 most water-stressed countries where 16 million have no choice but to collect unsafe water from unsafe sources. Pakistan stood ninth in the top ten countries with most people defecating in the open per square km (32 people per square km). Pakistan ranks number 9th in the list of top 10 countries with the lowest access to clean water 22 million people don't have clean water, and 79 million people don't have a decent toilet. More than 2 in every 5 people, nearly 19,500 children under 5 die each year from diarrhoea due to lack of access to safe water sanitation and hygiene facilities (The State of the World’s Water 2018”, by Water Aid),

The large burden of infectious disease in south Punjab, Pakistan, is known to be closely related to the lack of access to safe sanitation facilities, safe sources of potable water and safe, hygienic behaviors, which are due to poor knowledge as well as social and cultural norms set by the local community in the sector of WASH.

Table (1) shows the non-availability of drinking water at household levels, using water treatment methods and the ratio of OD in the districts of south Punjab, Pakistan. Among these, the D.G Khan district in south Punjab is showing more households with no drinking facility as compared to other ones. Similarly, most of the households were not using water treatment method to make the drinking water safe. Taking the DG khan as an example, one can see that 98.1 percent of households were not using any water treatment method. Similarly, the ratio of OD is also very high as compared to the overall 13 percent OD ratio in Punjab, Pakistan. According to MICS (2017-18), the Punjab report overall 4.5 percent of people of Punjab were using water treatment method. While the overall situation about drinking water, sanitation and hygiene service was even worse.

Table 1. Division and District wise Distribution of Household Members without Drinking water on-Premises, using Drinking water Treatment Method & OD Ratio

| Name of Division & Districts | Percentage of HH without Drinking water on premises | Percentage using the water treatment method | Percentage of OD |
|------------------------------|---|---|------------------|
| Bahawalpur Division | 25.4 | 3.5 | 20.9 |
| Bahawalpur | 23.6 | 3.2 | 20.8 |
| Bahawalnagar | 25.7 | 6.8 | 22.4 |
| RY Khan | 26.6 | 1.5 | 20 |
| DG Khan Division | 13.9 | 1.4 | 29.5 |
| DG Khan | 28.2 | 1.8 | 34.1 |
| Layyah | 6.4 | .8 | 15.5 |
| Muzaffargarh | 5.4 | 1.2 | 29.1 |
| Rajanpur | 20.7 | 1.7 | 38.4 |
| Multan Division | 19.5 | 2.7 | 14.1 |
| Multan | 22.6 | 3.8 | 11.4 |
| Khanewal | 10.4 | 1.8 | 13.6 |
| Lodhran | 22.2 | 2.5 | 23.3 |
| Vehari | 22.7 | 1.9 | 13.9 |

(Source: MICS (Punjab) Report, 2017-18)

It is also a fact in South Punjab, where there have been services provided by the government and other non-government agencies regarding water and sanitation, but due to poor priorities, poor

knowledge and poor access, most of the population of south Punjab not getting proper benefits. Which, in turn, increases the burden of diseases and wastage of huge budgets of government because of poor sustainability of projects. Thus, the main objective of the study was to examine the socio-cultural barriers towards safe water, sanitation and hygiene practices in south Punjab, Pakistan.

Methodology

The universe for the present study was “South Punjab, Pakistan” because the south Punjab region is considered as a backward area of Pakistan with respect to WASH facilities. The present study was a mixed method of research comprising qualitative and quantitative design. Eight Focus Group Discussions (FGDs) were conducted by the researcher in order to collect qualitative data. Whereas, four FGDs were conducted with WASH professionals and service providers, one from each selected District comprising members, i.e. two representatives from the Public Health Engineering Department, two representatives from the local government & community development department, two representatives from the social welfare department and three members of ex-elected representatives of selected district councils usually. On the other hand, four FGDs were conducted with representatives of rural communities. One from each selected District. Each group consisted of 9 members of different age group (26-55 years). Members were selected through stratified sampling. The data collected through FGDs were analyzed using thematic analysis. The quantitative data collection tool in the present study was an interview schedule. The respondents were household heads who were selected by using the multistage sampling technique. At the 1st stage of sampling, four out of eleven districts of South Punjab were selected by using a simple random sampling technique. At the 2nd stage, the researcher, by using simple random sampling, selected sixteen villages to belong to randomly selected four Tehsils (One Tehsil from each selected District). At the last stage, proportionality 480 households from selected 16 villages (30 households from each village) were also selected by the researcher randomly. The sample size was calculated by using an online scientific sample size calculator with 95% confidence level. Descriptive and inferential statistics were applied to analyze the data by using SPSS.

Results & Discussions

Focus group Discussions

The main findings of FGDs were as below.

Socio-Economic/Demographic Characteristics of Rural Life

It was found during the focus group discussion with the community that unity and relations are very strong in a rural area. Leaders have much importance in rural life. Most of the old people were illiterate but new generation was mostly enrolled in schools but some poor can't afford education. Child labor in the poor community was common in rural area. The rate of female education is low as compared to male. As one of the community representatives told that:

“It is the duty of male to arrange the basic necessities for a family that is joint in nature. The poverty rate is high in rural areas as compared to urban life. Many of the families have Rs. 300 to 400 per day income as a labor occupation. He also added that the people of rural areas are very attached to their religious and cultural practices & celebrations. There is a strong ethnicity on the basis of the race.”

Cultural barriers to safe WASH Practices

The discussion with WASH professionals & service providers described that socio-cultural barriers are the root cause of poor wash behaviors in rural areas. They are satisfied in their routine matters by following their forefathers. Because of the rigid mindset, many of the rural people considered the water treatment methods as time wasting. They blamed government or their fate for poor WASH conditions. A member from PHED Layyah added:

“Many people don't prioritize to construct the latrine because they consider having latrine inside the house is a curse. The use of latrine is also not regular because of poor interest in hygienic

conditions. Those who have latrines didn't notice the cleanliness status of latrines because of old formed habits.”

It was also found that according to the perception of some stereotypes in rural areas, “air has naturally quality to kill the germs of hands, diseases like diarrhoea are not because of the unhygienic condition and poor WASH conditions, but it is because of only God’s will”. One of WASH professional and service provider revealed about the community that:

“Rigid mindset, old formed habits, attachment to old traditions, cultural taboos, stereotypes, indigenous methods regarding WASH and love towards cultural identities & forefather’s habits are the cultural barriers towards safe WASH practices.”

Motivators of WASH Behaviors

It was analyzed through discussion that the motivators for currently practised behaviors in rural areas are “Molvi”, “Khateeb”, Household head, the political leader, “Sardar” of the tribe, WASH professionals, teachers, mass media, lady health worker and social activist. The ex-chairman of District counsel Dera Ghazi Khan told that:

“The strong and important motivators for WASH behaviors considered by rural people are “Molvi”, “khateeb” and family head. Because these personalities have much influence the behaviors of rural people.”

The socio-cultural constraints towards WASH are basically the values and the norms practicing in a society. This portion reveals the social and cultural hurdles contributing towards safe WASH practices.

Table 2. Distribution Regarding General WASH Conditions in Respondent’s Area

| Categories | Frequency | Percentage |
|------------|-----------|------------|
| Worst | 172 | 35.8 |
| Poor | 84 | 17.5 |
| Moderate | 176 | 36.7 |
| Good | 48 | 10.0 |
| Total | 480 | 100.0 |

Table 2 showed that according to the majority of respondents (35.8+17.5=53.3%), the general condition of WASH in their areas were very poor as 35.5% of respondents constituted that the condition of WASH in their areas were worst and 17.5% constituted that the said conditions were poor. Whereas according to 36.7% of respondents, there were moderate conditions of WASH in their area, and only 10% of respondents claimed that the said conditions were good in their area.

Table 3. Distribution Regarding Opinion about more Responsible for Hygienic Environment at the Household Level

| Categories | Frequency | Percentage |
|-------------------------------|-----------|------------|
| Self-Responsibility | 139 | 29.0 |
| Administrative Responsibility | 238 | 49.6 |
| Political Responsibility | 103 | 21.4 |
| Total | 480 | 100.0 |

This was commonly perceived that the provision of the hygienic environment at the household level is the self/household head’s responsibility, but the data revealed that the majority of respondents (49.6%) told that provision of the hygienic environment at the household level was administrative responsibility, while 21.4 percent respondents told that it was political responsibility and 29.0 percent respondents revealed that it was their own responsibility.

Table 4. Distribution Regarding Elements Influenced more Upon Respondent's Health

| Categories | Frequency | Percentage |
|-----------------------------------|-----------|------------|
| Behavior | 215 | 44.8 |
| Economic conditions | 177 | 36.9 |
| Availability of Health Facilities | 77 | 16.0 |
| Other | 11 | 2.3 |
| Total | 480 | 100.0 |

When the respondents were asked about elements that influenced more upon their health, the majority of respondents (44.8%) told that it was behavior that was influencing their health, (36.9%) told that their economic conditions were influencing their health whereas, according to (16.0%) percent, the availability of health facilities were influencing their health. As [Jhangir and Javed \(2007\)](#) pointed out that most of the people living in rural areas of Pakistan are deprived of basic needs like safe water supply schemes and environmental sanitation facilities provided by the government, which leads to poor health conditions

Table 5. Distribution with respect to reasons for not using WASH practices (n=480)

| Reasons | Culture/ Old Traditions are Strong | Lack of Awareness | Poverty | No Interest in Hygienic Behaviors |
|---|------------------------------------|-------------------|---------------|-----------------------------------|
| | F (%) | F (%) | F (%) | F (%) |
| reason for not using safe drinking water | 227 (47.3) | 63 (13.1) | 157 (32.7) | 33 (6.9) |
| reason for not practice the easy method of water filtration for using safe drinking water by people | 230 (47.9) | 171 (35.6) | 20 (4.2) | 59 (12.3) |
| reason for open defecation by people | 226 (47.1) | 84 (17.5) | 111 (23.1) | 59 (12.3) |
| reason for not using soap for hand washing | 176 (36.7) | 32 (6.6) | 107 (22.3) | 165 (34.4) |

F= number of Households, %= Percentage

There were four reasons listed for not using WASH practices. These reasons were culture/old traditions were strong, lack of awareness, poverty and no interest in hygienic behavior. Culture/old traditions were a barrier to not using safe drinking water as it constituted 47.3 percent of respondents. Non using the domestic method of water filtration, open defecation usage and non-usability of soap always for handwashing was also constrained by the culture/old traditions as it was claimed by (47.9%), (47.1%) and (36.7%) respondents, respectively. The findings of this table are similar to the findings of [Cooper, R. \(2018\)](#). He revealed that reasons behind poor sanitary condition, especially in rural areas of Pakistan, are cultural norms. Further, he explained open defecation remained higher in rural areas than urban areas in both provinces (10.9% rural & 0.8% urban in KP, while 25% rural & 10% urban areas in Punjab) as documented by KP, 2017; and Agha, 2018).

Table 6. Distribution Regarding Hurdles Behind the Poor Condition of WASH

| Categories | Frequency | Percentage |
|---------------------------------------|-----------|------------|
| Culture/Old traditions are strong | 201 | 41.9 |
| The poor economic condition of locals | 110 | 22.9 |
| No interest in hygienic behaviors | 92 | 19.2 |
| Political Issues | 77 | 16.0 |
| Total | 480 | 100.0 |

In table 6, the majority of respondents (41.9%) indicated that the culture/ old traditions were strong and causing hurdles behind the poor condition of WASH. While 22.9 percent of respondents told that the poor economic condition of locals were hurdles of WASH, 19.2 percent of respondents were showing no interest in hygienic behavior, and 16 percent of households political issues were creating hurdles behind the poor condition of WASH.

Table 7. Distribution Regarding the Availability of Soap for Washing Hand all-time at Home

| Categories | Frequency | Percentage |
|---------------|-----------|------------|
| Yes | 338 | 70.4 |
| No | 108 | 22.5 |
| Never Noticed | 34 | 7.1 |
| Total | 480 | 100.0 |

Table 7 showed that the majority of the respondents (70.4%) claimed that they have soap available for hand washing all-time at home, whereas (22.5%) respondents denied it.

Table 8. Distribution regarding family members use toilet always and family members use always safe drinking water (n=480)

| Statements | Up to 25% | Up to 50% | Up to 75% | More than 75% | None |
|--|-----------|-----------|-----------|---------------|------------|
| | F (%) | F (%) | F (%) | F (%) | F (%) |
| Always use of toilet | 25 (5.2) | 34 (7.1) | 47 (9.8) | 264 (55.0) | 110 (22.9) |
| Family members use always safe/filtered drinking water | 51 (10.6) | 49 (10.2) | 37 (7.7) | 131 (27.3) | 212 (44.2) |

F= Frequency, %=Percentage

Table 8 is showing that the majority of the respondents (55%) were using the toilet always, whereas (22.9%) were not using the toilet. It means 22.9% were defecating in the open. The findings are similar to the findings of MICs Punjab. Moreover, only (27.3%) were those who claimed they were using safe drinking water, more than 75 percent at home. It means most of the respondents were not using safe drinking water all the time.

Table 9. Distribution of Types of Cultural barriers influencing safe WASH practices according to severity (n=480)

| Statements | Mean | Standard Deviation | Weighted Score | Rank Order |
|---|------|--------------------|----------------|------------------|
| Cultural habits effects on safe WASH practices | 2.09 | 1.38 | 1003.2 | 1 st |
| Satisfaction from their old tradition regarding WASH practices | 2.16 | 1.42 | 681.6 | 9 th |
| They don't want to lose their cultural identity regarding WASH practices | 2.29 | 1.46 | 700.8 | 8 th |
| Indigenous methods regarding WASH practices are more reliable | 2.47 | 1.51 | 724.8 | 6 th |
| The habits of forefather regarding WASH practices are more reliable | 2.47 | 1.52 | 729.6 | 5 th |
| The idea of social change regarding any WASH practices belongs to the west agenda | 3.50 | 1.48 | 710.4 | 7 th |
| Having a latrine inside the house is a curse | 4.24 | 1.29 | 619.2 | 10 th |
| Underground water was always safe for drinking | 3.39 | 1.74 | 835.2 | 3 rd |

| Statements | Mean | Standard Deviation | Weighted Score | Rank Order |
|---|------|--------------------|----------------|-----------------|
| The handwashing is critical timings doesn't require soap always | 2.58 | 1.62 | 777.6 | 4 th |
| Women participation was essential in the WASH education program | 3.09 | 1.77 | 849.6 | 2 nd |

Table 9 is indicating the cultural constraints ranked in order as per their severity by comparing weighted score. It was evident that the cultural habits were influencing more than the other factors because it has more variability (M=2.09, SD=1.38, Weighted Score=1003.2) and ranked 1st as compared to other factors. Poor women participation in WASH education program was ranked 2nd (Mean=3.09, SD=1.77, Weighted Score=849.6), underground water was considered always safe for drinking (Mean=3.39, SD=1.74, Weighted Score=835.2) was ranked 3rd the hand washing in critical timings doesn't require soap always (Mean=2.58, SD=1.62, Weighted Score=777.6) was ranked 4th, the habits of forefather regarding WASH practices are more reliable (Mean=2.47, SD=1.52, Weighted Score=729.6) was ranked 5th, indigenous methods regarding WASH practices are more reliable (Mean=2.47, SD=1.51, Weighted Score=724.8) was ranked 6th, the idea of social change regarding any WASH practices belongs to west agenda (Mean=3.50, SD=1.48, Weighted Score=710.4) was ranked 7th, they don't want to lost their cultural identity regarding WASH practices (Mean=2.29, SD=1.46, Weighted Score=700.8) was ranked 8th, satisfaction from their old tradition regarding WASH practices (Mean=2.16, SD=1.42, Weighted Score=681.6) was ranked 9th, and the perception that having latrine inside the home is a curse (M=4.24, SD=1.29, Weighted Score=619.2) was ranked 10th contributing factor influencing upon safe WASH practices. The findings of this table are in resemblance with the findings of Job [Wasonga \(2016\)](#), as he revealed that WASH issues were gendered and its use was socially and culturally categorized like bound by traditions and taboos.

Table 10. Cross-tabulation of respondent's opinions between hurdles behind poor Condition of WASH and General WASH Condition of Area

| Reason | General WASH Conditions of Area | | | | Chi-square value | P Value | Df |
|--|---------------------------------|--------------|--------------|--------------|------------------|---------|----|
| | Worst | Poor | Moderate | Good | | | |
| | F (%) | F (%) | F (%) | F (%) | | | |
| Hurdles behind poor Condition of WASH | | | | | | | |
| Culture/Old traditions are strong | 55 (32.0) | 23 (27.4) | 79 (44.9) | 19 (39.6) | 32.586 | .001 | 9 |
| Lack of Awareness | 8 (4.7) | 13 (15.5) | 9 (5.1) | 2 (4.2) | | | |
| Poverty | 36 (20.9) | 29 (34.5) | 33 (18.8) | 9 (18.8) | | | |
| No interest to hygienic behaviors | 73 (42.4) | 19 (22.6) | 55 (31.2) | 18 (37.5) | | | |

Table 10 showed the cross tabulation between hurdles behind poor condition of WASH and current WASH condition of targeted area. It was seen that the no interest to hygienic behaviors were more responsible for worst condition of WASH in targeted areas as it contributed 42.4%, culture/old traditions were strong contributing 32% as compared to lack of awareness (4.7%) and poverty (20.9%) towards the poor condition of WASH in the area. Analysis showed that there is strong association between the hurdles behind poor condition of WASH and current WASH condition of targeted area. As the chi-square value is 32.586 having p-value .001 that is less than .05 at df=9.

Table 11. Cross tabulation of respondent’s opinion between responsible for hygienic environment at household level and General WASH Condition of Area

| Responsibility | General WASH Conditions of Area | | | | Chi-square value | P-Value | Df |
|---|---------------------------------|------------------|----------------------|------------------|------------------|---------|----|
| | Worst F (%) | Poor F (%) | Moderate F (%) | Good F (%) | | | |
| Responsibility for hygienic environment at household level | | | | | | | |
| Self-Responsibility | 50 (29.1) | 28 (33.3) | 54 (30.7) | 7 (14.6) | 15.305 | .018 | 6 |
| Administrative Responsibility | 74 (43.0) | 44 (52.4) | 93 (52.8) | 27 (56.2) | | | |
| Political Responsibility | 48 (27.9) | 12 (14.3) | 29 (16.5) | 14 (29.2) | | | |

Table 11 showed the cross-tabulation of respondents between opinion about responsibility for the hygienic environment at the household level and the general WASH Condition of the Area. The analysis showed that there is a strong association between the responsibility for the hygienic environment at the household level and general WASH condition, as the chi-square value is 15.305 having p-value .018 that is less than .05 at df=6. WASH condition was worst in the area because of the people thinking that it was the responsibility of the District administrations as the opinion was 43% as compared to self-responsibility (29.1%) and political responsibility (27.9%). The results showed that the government was considered more responsible for a hygienic environment.

Conclusion & Recommendations

The results obtained from chi-square analysis coincided with findings of thematic analysis. It was concluded that water, sanitation and hygiene (WASH) practices were poor in the targeted area and strongly associated with social norms and cultural aspects of the targeted area. The socio-cultural factors like strong attachment to old traditions, level of reliability towards habits of forefathers, poor priorities to hygienic behaviors, rigid norms, e.g. not the participation of women due to the strong patriarchal system, myth-based WASH beliefs, satisfaction towards stereotypes values, the fear of losing culture identity and cultural taboos like considering latrine inside the house as curse and idea of social change by NGOs as negative west agenda are profounding constraints which are hampering the safe WASH practices in south Punjab, Pakistan. Following recommendations are made on the basis of findings.

- To ensure targets of SDGs regarding WASH, it is necessary to start comprehensive programs of WASH development with the primary focus of social mobilization regarding the transformation of existing rigid social norms along with resource allocation to improve WASH conditions/practices.
- Before starting any program on WASH in any area, the government ensured, need assessment studies should be conducted to understand the socio-cultural norms of that area. Especially, the WASH programs designed by National/ international organization should be designed with primary intentions on socio-cultural aspects of targeted areas instead of a universal policy.

References

- Botting, M. J., Porbeni, E. O., Joffres, M. R., Johnston, B. C., Black, R. E., & Mills, E. J. (2010). Water and sanitation infrastructure for health: The impact of foreign aid. *Globalization and health*, 6(1), 12.
- Cooper, R. (2018). Water, sanitation and hygiene services in Pakistan.
- De Jong, D. (2003). Advocacy for water, environmental sanitation and hygiene. *Thematic Overview Paper. IRC International Water and Sanitation Centre*.
- Khan, F. J., & Javed, Y. (2007). *Delivering access to safe drinking water and adequate sanitation in Pakistan* (No. 30). *Pakistan Institute of Development Economics*.
- Padawangi, R. (2010). Community-driven development as a driver of change: water supply and sanitation projects in rural Punjab, Pakistan. *Water Policy*, 12(S1), 104-120.
- Tumwebaze, I. K., Orach, C. G., Niwagaba, C., Luthi, C., & Mosler, H. J. (2013). Sanitation facilities in Kampala slums, Uganda: users' satisfaction and determinant factors. *International journal of environmental health research*, 23(3), 191-204.
- UN. (2020). Water, Sanitation and Hygiene <https://www.unwater.org/water-facts/water-sanitation-and-hygiene/> (Dated: 10-11-2020)
- Wasonga, J., Okowa, M., & Kioli, F. (2016). Socio-cultural determinants to adoption of safe water, sanitation, and hygiene practices in Nyakach, Kisumu County, Kenya: a descriptive qualitative study. *Journal of Anthropology Vol-2016*, pp 01-05
- WHO (World Health Organisation). (2009). *Diarrhoeal disease, Fact sheet N°330*. <http://www.who.int/mediacentre/factsheets/fs330/en/index.html> (accessed 25-10-2020).