

Post Disaster Situation of Water, Sanitation and Hygiene (WASH) of Displaced Persons (DPs): A Case of the Camp in Khalte- Rasuwa, Nepal

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Abstract

The study was carried out in Khalte Camp located in Rasuwa, Nepal, to provide a post-disaster situation of WASH that focuses on the local context and highlights the unique challenges faced by the DPs in terms of WASH with potential solutions. The blended approach which encompasses a Questionnaire survey (QS), and key informant survey (KIS) was used to collect and inspect data with extensive field visits. Further microbial examination of drinking water was carried out using H₂S P/A vial. The average water consumption rate, served by improved water sources was 25 ± 7 lpcd (one sample t-test, $P < 0.05$, $n = 150$) which is below the RWSSNP (2004), NWSSP (2014) draft and WHO minimum guidelines and it took them 35 minutes round trip daily to collect water, however in the dry season they spent more than 35 minutes. Also, the water sample collected from HHs shows positive for faecal contamination. 81% of the HHs used shared toilets and a maximum of 28 and a minimum of 4 individuals were sharing the one toilet. Further 75% of the HHs reported diarrheal infection sometimes. The camp was under limited sanitation services, where only basic hygiene services were practiced. Moreover the study encourages related stakeholders to figure out the status of DPs living in the camp and bridge the knowledge gap for a more tailored disaster response strategy for similar regions in future.

Keywords

Displaced camp, IDPs, Khalte-Rasuwa, Nepal, WASH

1. Introduction

Twenty-four people are compelled to leave their home every minutes as internally displaced persons (IDPs) or refugees [1]. In general, IDPs/Refugees live on contributed resources with a finite capacity for support and economic yield, also living in an enclosed camp sometimes totally leans on the host country and foreign backing [2]. Displaced people (DP) tend to live in limited resources where access to WASH is frequently below standards and less coverage of WASH with living in a high population density lessen the quantity of safe water per individual and hence growing the probability of disease and pathogen outbreak. In addition to this DPs also spend many hours daily collecting water for daily use [3]. They suffer a higher rate of mortality, physical attack, sexual abduction and assault, deprived of frequent health, shelter, food, sanitation and other services like education, and entertainment than the general people [3]. In 2013, over 8,000 individuals living in IDP camps in Haiti died from cholera. This was a result of inadequate access to clean water and the absence of proper sanitation facilities [4]. In 2017, in Borno State, Nigeria, there were a total of 5,365 cases of cholera outbreaks that resulted in a death toll of 61 people, largely due to poor WASH facilities [5]. The temporary camp of Cox's bazar, Bangladesh, is facing the frequent diarrhoea, typhoid and cholera as a consequence of meagre water and sanitation [6]. In Plateu camp, Nigeria, IDPs frequently expose to scads of disease such as typhoid, malaria as a consequence of insufficient water in the camp for cleaning and flushing toilet which makes them prefer to use bush rather than toilet [25]. In addition, Studies indicate that the lack of secure access to essential WASH items, especially

water shortages, is linked to adverse health effects, such as emotional distress, anxiety, and depression [7].

Especially during the monsoon season, diarrheal outbreaks are not uncommon in Nepal. Nepal is ranked 51st globally for deaths due to diarrheal diseases, with an age-adjusted death rate of 29.68 per 100,000 people [8]. In Nepal, the IDPs in Dahachowk camp, Chandragiri municipality are deprived of basic WASH requirements, with the majority of households living in zinc slums and even reducing their water consumption to alleviate the crisis [10]. Moreover in the Sindhupalchowk district of Nepal, following the Gorkha earthquake in 2015, a microbial analysis of water samples (WS) indicate that 97.1% of WS during the pre-monsoon season and 98.5% of WS during the monsoon season were contaminated with a bacteria of faecal origin [11]. In Nepal, almost half of all cases of hospitalized diseases are related to diarrheal disease. Among them, the prevalence of the diarrheal disease is even higher among children under five years old, even that results in higher indirect treatment cost [9]. If we lack proper and adequate pre-assessment of WASH, the condition of different DPs camps in Nepal would have been the same as that of Haiti, Cox's Bazar Bangladesh, and other DPs camps in the world having water insecurity. There are rare studies regarding WASH in DPs camp established by disaster in Nepal, so a comprehensive study on the WASH situation of IDPs camp in Nepal is imperative. The objective of the study is to assess the WASH status in DPs camps, which are more susceptible to water and sanitation-related illnesses. Also the study provides post-disaster Situation of WASH that focus on local context and highlights the unique challenges

faced by Camp in terms of WASH that bridge the knowledge gap and help for the more tailored disaster response strategy for similar region in future.

2. Methods and material

2.1 Study Area

Khalte camp, located at Uttargaya Rural Municipality Rasuwa Nepal, about 80km North of Kathmandu, was established after the area was hit by Gorkha earthquake in 2015, is the study area. People from different parts of the Rasuwa district (Haku, Gogane and Mailung) are living here as a IDPs. The camp is located near the bank of the Trishuli River. According to ward head Maar Sing Tamang, altogether 228 HHs were living here in the Khalte camps since eight years. Socio-Economically back warded indigenous (Tamang & Ghale) and a few Dalit people had occupied this place after they were displaced by the Gorkha earthquake in 2015, followed by Subsequent aftershocks and a monsoon triggered landslide. Study area is shown in Figure 1.

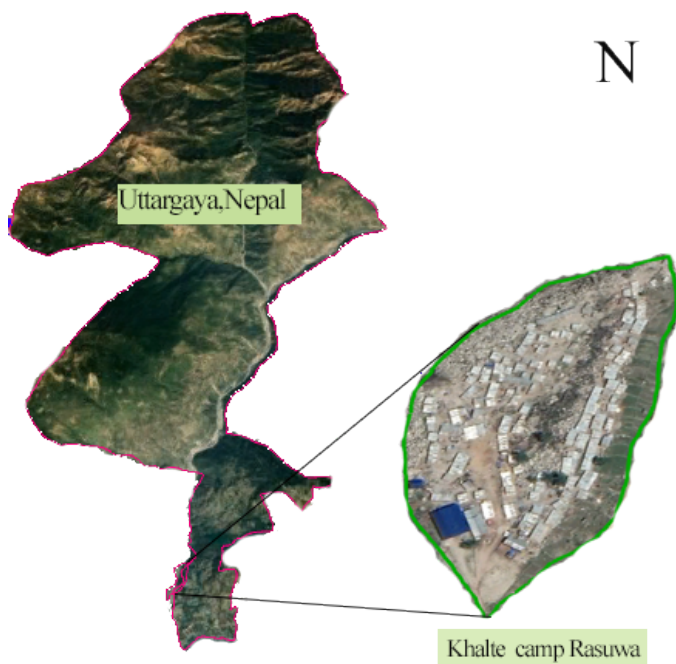


Figure 1: Study Area, Khalte Camp

2.2 Questionnaire Survey (QS)

Questionnaire surveys are most frequently used in social research where a series of questions are asked to individuals for getting answers on the related topic. Adequate questionnaire construction is critical to the success of a survey. Appropriate questions, correct ordering of questions, correct scaling, or good questionnaire format can make the survey worthwhile, as it may accurately reflect the views and opinions of the participants [12]. A QS is only useful when participants are knowledgeable about the subject and capable of responding to the questions. Respondents must have the knowledge and capacity to respond, and questions must be pertinent to them [13]. 150 QS were conducted to related stakeholders in Khalte camp from each HHs.

2.3 Key informant survey (KIS)

KIS, a qualitative process, is designed to provide in-depth information and contemplated views on open-ended questions from the identified knowledgeable people on a particular subject. The data drawn from the locals give rich, varied, and textured data attributed to their attitudes towards the study objective. The data helps emphasize the discrepancy between the expected and reality. In addition, it builds a collaborative database for future project planning [14]. KIS was used directly to get firsthand information on WASH from the locals. The knowledge can help understand the situation of DPs in the study area regarding WASH. Face-to-Face and telephone interviews were adopted for KIS based on the eagerness and capacity of persons to give varied information. For this, 16 people (Ward chair person, ward staff, camp committee head, some of the educated person from the camp etc.) were selected based on their identified knowledge in a particular subject and having willingness to give unbiased answer.

2.4 Statistical Analysis

The link between average water consumption per person per day was compared with minimum water that should be available for each persons in Nepal which is given by ministry of urban development, government of Nepal, National Water Supply and Sanitation Policy (NWSSP) 2014 draft, Rural Water Supply and Sanitation National Policy (RWSSNP) 2004 and WHO minimum guidelines which was taken as 45lpcd. IBM SPSS statistics version 26 software was used for one sample t-test where $P < 0.05$ was considered as level of margin for statistical significance. In addition Microsoft Excel was also used for the analysis of the data gathered.

3. Results and discussion

3.1 Drinking Water accessibility, queuing and microbial Examination

In the camp safely managed drinking water services was lacking. All the HHs of the Khalte camp utilized water from piped connection for drinking and cooking Purposes served via two distribution point-during the study period- (figure 2). Besides this piped water connection, they had no alternatives for drinking water. At monsoon they used water from unimproved sources such as nearby seasonal stream, irrigation canal. They Used water from these sources for bathing, washing clothes and cooking and other activities rather than drinking as they had past experience of diarrheal disease infection after consuming water from these unimproved sources. They faced struggle for water at dry season and queuing was their major problem after the quantity of water. On average they spent 35 minutes for water collection for round trip which was same as 40% of the Nepalese population spent each day collecting water [24] and in the camp limited drinking water service was available during the dry season. "Being temporary settlements, related stakeholder (Local/Provincial Government) could not invest on sustainable water service" said Lakshinram Tamang, one of the staff of the ward. "We spent more than hours in dry season just to collect drinking water" said Norsang Ghale one of the resident of khalte camp.

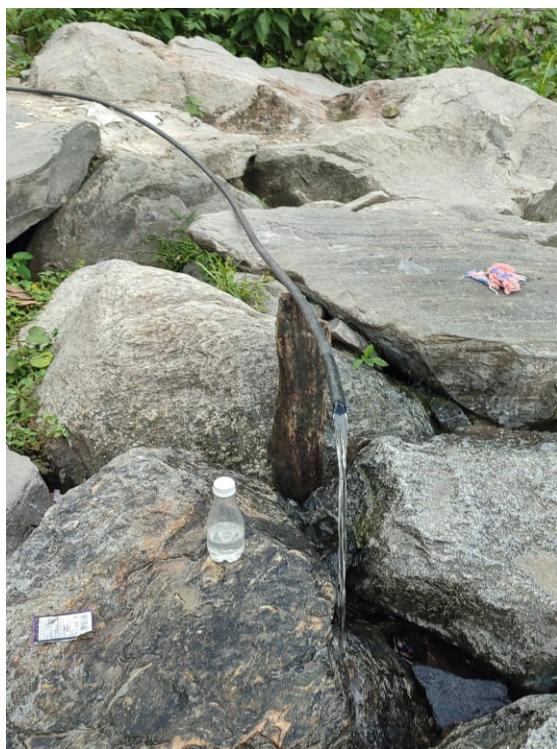


Figure 2: Major sources of water collection

The average water consumption rate was 25 lpcd with a standard deviation of $7(25 \pm 7)$ lpcd. The water consumption rate was below standard as RWSSNP (2004) mandates 45 lpcd as a minimum requirement of water for domestic purpose, camp is under the water poverty. Dahachowk IDPs camp in Kathmandu was also suffering from water shortage [10]. IDPs/refugees camps in Kenya, Uganda, South Sudan and Zimbabwe were facing similar water poverty with less than 15-20 lpcd [15, 16]. Also one sample *t* – test support the observed data failed to meet the minimum requirement of the water demand ($P < 0.05$, $n = 150$) from the QS. Sample taken for microbial examination of drinking water from all the HHS shows positive test for faecal contamination and this data is more than the rural areas of Nepal, where 82% of the population is using water with faecal contamination [24]. As per WHO standard guidelines faecal coliform and total coliform should not be detected in 100 cc of water; if they are, the water is considered hazardous. For drinking and its usage might result in several forms of waterborne illnesses such as hepatitis, diarrhea, dysentery, typhoid, and cholera. In Sindhupalchowk district of Nepal 98.5% of the sample at monsoon had faecal contamination [11]. Similarly in Dhading, a microbial contamination was higher among the temporary shelter rather than newly recovered villages [23].

3.2 Sanitation: Toilet, Excreta Management

After drinking water, sanitation and waste Management plays a vital role where sanitation focuses on managing human-induced waste [17]. Out of the surveyed HHs 122 used shared toilets and remaining 28 used private toilets. On an average 14 people used one toilet in the camp. Study revealed that maximum of 28 people and minimum of 4 people had been using a one toilet. Maximum of five people or one HH should have one private privies [20]. This requirement was not

met in the camp. Animal droppings were unmanaged properly in some of the area in the camp and surrounded by foul smells. During KIS, one of the respondents mentioned, “Since the number of available toilets is limited, and sometimes waiting for the restroom is time-consuming, people often prefer using the nearby jungle or the riverbank for open defecation.”

Even though shared toilets are considered as substitute to open defecation [18]. The number of users plays a remarkable role in the tidiness of the facilities [19] When the proportion of HHs to toilet drops below 4:1 the cleanliness of toilet is only 80% of private and it also drops by 40% if the ratio is more than 10:1 [19]. So the khalte camp is vulnerable due to the poor sanitation practices as well.

Improper excreta Management combined with poor sanitation accelerates faecal-Oral contamination disease like diarrhea, dysentery, hepatitis. In khalte camp, majority (75%) of the HHs reported sometimes occurrence of diarrheal disease infection, particularly during monsoon season with no reported fatalities. “Some people come to the health post seeking medicine for diarrheal infections, more in summer” said Rabindra Thakuri, the Medical Head at Uttargaya Rural Municipality.

Doors and windows of toilets should be solid (so that no holes can be poked) which might compromise privacy, especially for women, and girls [20]. In the khalte camp, a few toilets was found with rusted Zinc sheet and without ventilation so they couldn’t exchange fresh air in and out. This may have bad health implication in near future as shared/public toilet poses more risk of cross infection [21].

3.3 Bath Shelter, Hygiene and solid Waste Management

From the beginning of the stay at camp to 8 years (now), Due to limitations in space, funds and dubious resettlement status bath shelters never had been constructed though Privacy is a salient feature of bath shelters/showers [20] and it is directly linked to the of Sexual and Gender-Based Violence (SGBV). Of the surveyed HHs, they took showers/baths near the house in an open place compromising the privacy, uncommonly of adult girls and women. Having no bath shelter may have different implications, as the burden of disease is attributed to unsafe hygiene and sanitation [22].

The hygiene-related parameters for KIS and QS were washing hands using soap before food preparation, after going toilet, cleaning of water storage vessel, use of footwear, taking of bath regularly, management of solid waste etc. Hygiene and disease hold an inverse relation. In many refugee and displaced camps, sanitation and hygiene-related diseases are prominent. QS Found that less than 20% of the interviewees took baths regularly and 80% of the HHs reported regular cleaning of the kitchen, use of footwear before and after going toilet, cleaning of water storage vessel, and washing of hands using soap before food preparation and eating.

All the HH burned solid waste in the Khalte camp as they had no dumping site and had no knowledge about the separation of solid waste based on their nature like the GAZA Strip refugee camp [26]. Also some area inside the camp was rife with the offensive smell of decayed solid waste. This also affects the cleanliness of the good hygiene environment in the camp.

4. Conclusions

Using the KIS and QS with frequent field visits to the camp, post disaster situation of WASH was successfully carried out in the Khalte IDPs camp where people have been residing for eight years since the Gorkha earthquake in 2015. In terms of WASH Khalte camp lagged behind the non-displaced settlements. Firstly, the camp is under water insecurities where the average daily water consumption per capita is very below the minimum standard quantity of water that should be available for a normal person in Nepal. Secondly, all the sanitation-related issues start from the insufficient quantity of water. Improved sources of water were served via a single distribution point to the whole camp. As a sample of water from the HHs shows positive test for microbial contaminations, a cost-effective water treatment method is recommended to purify the water. In addition detailed chemical analysis of the water sample was also suggested.

Also in the camp toilet was a major problem, as the ratio of users to toilet is very high as up to 28 people have been sharing the same single toilet for eight years. Also, there were a number of people (Older age people and children) who didn't practice proper hygiene practice. In the camp limited sanitation services followed by a basic hygiene service were observed. So awareness campaign regarding Proper sanitation and hygiene is needed. It is crucial to highlight that the circumstances in this area might not accurately represent those in all the camps for IDPs in Nepal. In order to effectively target IDPs in different regions across Nepal, research and development initiatives must take into account a wider range of Key WASH-related parameters due to the country's distinct geographical and environmental characteristics.

Water should be treated before consumption using cost-effective methods such as filtration, boiling and chlorination. In addition, consumption of water from unimproved sources should be completely avoided. An adequate number of toilets should be managed to avoid open defecation as it helps to unhealthy settlement with disease transmission. Further waste management systems should be set up using universal techniques such as 5R (reduce, reuse, recycle, recover & residual management) methods. Prioritize for transition to permanent solutions such as improvement in WASH infrastructure and ways to resettle the DPs. Furthermore multi-faceted approach of coordination among different stakeholders for commitment to long-term sustainability and resilience.

The vulnerability of Nepal to various disasters highlights the significance of undertaking thorough investigations in various regions. This strategy can considerably improve disaster preparedness and mitigation plans by ensuring that they are adapted to the particular difficulties that each locality faces.

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