

The Fuel Supply System for Rohingya Refugees: A Case Study on Kutupalong Camp

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Abstract

Rohingya refugees are considered the most vulnerable and persecuted refugees' around the world. The voluminous efflux of refugees poses a serious threat to host countries. One of the most negative impacts is the environmental problem. Environment and fuel for cooking are interlinked and interconnected. Fuel for cooking is essential for the daily life of Rohingya refugees. Almost 80% population in displaced setting use solid fuels like firewood and dry leaves for cooking. It severely affects the ecological balance. To mitigate the problem, the government of Bangladesh and UNHCR jointly started an initiative to distribute LPG gas among the Rohingya refugees and local inhabitants. Against such backdrop, this research is conducted to analyze the current fuel supply and demand of fuel. Besides, the research also focuses on the impact of LPG gas on firewood collection and on the environment. It concludes with some possible recommendations and path to further research.

Almost all the households (96%) are using LPG gas for their cooking. But 88% of the respondents have scarcity of fuel. So, they need to collect extra fuel from the local markets and forests. The cost of fuel collection is accounted for up to 1000 BDT (Bangladeshi Taka). But they need to spend on and average 200-500 BDT for the purpose of buying firewood from the market. Most of the respondents (96%) collect fuel from the market. So, the use of LPG gas is reducing a huge amount of pressure on wood fuel. Consequently, the environmental degradation due to collecting wood fuel has reduced approximately 80% after the LPG gas project was initiated in August 2018. Proper management of the project including safety training, increasing facilities and covering all the camps under the LPG gas project will play key role in both mitigating the fuel supply-demand tension and reviving ecological balance.

Keywords: Rohingya Refugees, Fuel Supply System, LPG Gas, Environment, Kutupalong

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Introduction

The Rohingya has been considered the most vulnerable and persecuted refugees around the world. The mass influx of refugees poses a serious threat to the hosting states. The problem of Rohingya refugees has been a serious concern for Bangladesh since 1978. (Milton, Rahman, Hussain, Jindal, Choudhury, Akter, Ferdousi, Mouly, Hall and Efird, 2017). At present, Bangladesh is hosting approximately 1.2 million registered refugees in Kutupalong and Noyapara camp (UNOCHA, 2018). As they are staying there since August 2017, for livelihood they need a large amount of fuel for cooking. This research paper will focus on the fuel supply and demand relationship. For a better understanding and to have a clear conception of the geographical location and the number of refugees, a map is shown below. (See figure 1)

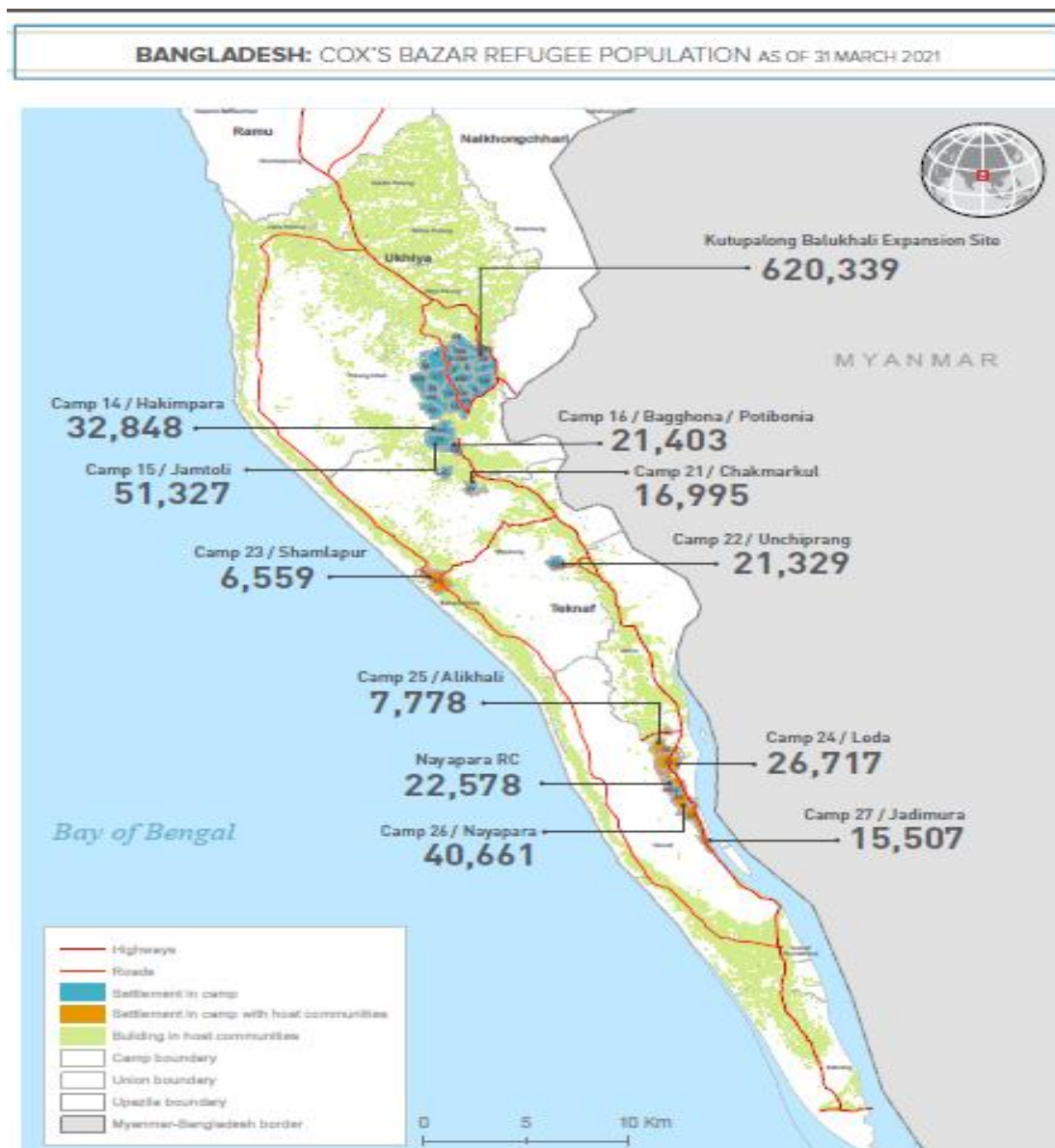


Figure 1: Map of Kutupalong refugee camp. (Source: JRP 2021)

About 80% food requires cooking to serve. In case of Rohingya people, their food menus are almost similar with us which need cooking three times daily. Study by Food and Agriculture Organization (FAO) found that access to fuel and energy is highly constrained in protracted crises. According to International Energy Association (IEA), the most common cooking instrument is biomass. 2.7 billion People are reliant on the traditional biomass for their cooking. Protracted crises create severe damage on the environment (IUCN, 2017). United Nations High Commissioner on Refugees (UNHCR) said that they will provide LPG gas facilities to reduce burden on the environment.

Against such backdrop, it is really pertinent to know that what the condition of the present cooking fuel systems is. Are the systems working well? What can be done to improve the fuel supply system?

The main research objectives are as follows:

- To access the present supply of fuel to fulfill the demand of Rohingya people.
- To access the nexus between supply and demand of fuel energy.
- To evaluate the impact of LPG gas stoves on the supply of fuel wood.

Literature Review

Since 25 August 2017, over 671,000 Rohingya refugees have fled from Myanmar and sought safety in the strategically important Cox's Bazar region of Bangladesh crossing the only boundary river between Bangladesh and Myanmar—Naf. Previously before the 2017 crisis around 303,070 Rohingya refugees were staying within the makeshift camps of Cox's Bazar. 2,200 metric loads of foods are needed per month to sustain the refugee population, a minimum of 180,000 families need cooking fuel – one 12-kilogram tank of LPG is required per month, per family, with briquettes of compressed rice husks within the season. Access to cooking fuel remains a big challenge, and widespread use of firewood is leading to significant environmental degradation and protection concerns (JRP, 2018).

A “Cooking system” means all the cooking devices that are used in time cooking. It includes both the oven and also the energy that it uses. Meanwhile, “improvement” means positive changes in efficiency, emissions, safety, durability, user acceptance, cost, fuel stability or other benefits (Vianello, 2016). It argues that a replacement of cooking system offers a better option both for the user and for all other aspect including economic, social and especially the environmental sector. “Improved cooking system” can use any type fuel and will include options that meet internationally agreed emission and safety standards further as options

that provide tangible advantages over traditional cooking methods, but not make sure to go with international standards. Rohingya people must cook for themselves everyday. The article argues that fuel must select on the premise of the environment friendly instruments.

The largest single site, the Kutupalong Expansion Site, hosts approximately 620,339 Rohingyas. While most arrived between August and December 2017, arrivals have continued since then: over 16,000 Rohingyas have arrived since January 2018. The Shelter Sector / Non-Food Items (NFI) will explore alternative approaches to in-kind distribution of NFIs. Liquid petroleum gas (LPG) interventions and solar home light systems have been continuing since the market still cannot offer items with the desired and necessary specifications quantity. The arena will facilitate access to available items within the market. NFI needs and full-fledged market, therefore, an evaluation is required to guide more partners programming. NFI interventions are informed by post-distribution monitoring mechanisms (FAO & UNHCR, 2017).

In Bangladesh, over 19 million people directly depend on tree and forest resources to support their daily livelihoods. With one in every of the very best population densities within the world, not to mention such a high proportional reliance on wood as an energy source, sustainable forest management could be a difficult task. Livelihood options for the Rohingya are limited as their status does not allow them to hunt employment. Returning to their original homeland is not seen as an option (“Assessment of fuel”, 2017)

Local resentment of the Rohingya communities living in Bangladeshi communities has increased since their arrival, born from a perception of increased competition for resources that are generally in poor supply. The study of IOM and FAO found that “almost all households were entirely captivated with wood fuel and traditional mud stoves for his or her cooking” (IOM & FAO, 2017). As the assessment of 2017 was totally different from this condition of the fuel supply system for Rohingya refugees, this research is conducted to mitigate the knowledge gap from 2017-2020.

Different newspaper articles and online media partially tell about this condition of fuel supply for Rohingya refugees but a concrete analysis on the premise of field level data collection is absent. From the continuing review on the existing research gap, it is found that nearly all the literature reviewed here barely specialize in the fuel supply system for the refugees before and during the crisis in 2017. But after the joint initiative of UNHCR and also the government of Bangladesh to provide the liquefied petroleum gas rather than firewood, research gap existed regarding this scenario of fuel supply system for Rohingya refugees.

In March 2017, FAO and UNHCR launched a rapid joint wood fuel assessment to determine the demand and supply of wood fuel in the area. The assessment consisted of three components:

- 1) An estimation of the demand for wood fuel;
- 2) Assessment of wood fuel supplies; and
- 3) Identifying relationships, gaps, opportunities, and alternative scenarios.

Around 80% of those living in camps have absolutely minimal access to energy for cooking and heating, and about 90% have no access to electricity. Displaced families can use renewable energy to generate income and begin their journey to recover their lives. Women and girls are safer when they have access to a cleaner source of energy for lighting and cooking. The lack of access to energy reduces the chances of creating a more productive and fruitful life (SAFE, n.d.)

Research Methodology

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic (Wikinson, 2000). The methodology used here to conduct the research will be mixed in nature.

Study Design

Both quantitative and qualitative tools are used to gather data and information on available fuel supply sources. Secondary sources are also taken into account in order to get a total scenario of supply and demand of fuel. This research is basically based on the questionnaire that is prepared to take the interviews of the Rohingya people.

Study period

The study is conducted from the 1st January, 2020 to the 31st January, 2020. The interview on the questionnaire was conducted in the Kutupalong Rohingya camp from 8 January, 2020 – 13 January, 2020.

Study Population

The study was conducted on 50 respondents. To access the fuel supply system, 50 different households were visited during the data collection to know about the present fuel supply system for the Rohingya population staying in the camp.

Sample Question Size

The questions were totally 40 with three different criteria. The first 20 questions were MCQs and then 10 SAQs. The last 10 questions were broad type questions. Besides, few subsidiary questions were asked to the respondents to know the exact information about the scenario.

Research tools

To assist the research, Micromax Q346 device is used to capture photos and videos. Besides, different pictures were taken from the Internet to rationalize the research. Stationary materials were used. SPSS Software and MS Excel are used to analyze the data which was taken from the respondents. The report of FAO and IOM titled “Assessment of fuel wood supply and demand in displacement settings and surrounding areas in Cox’s Bazaar District” is taken as the basis of the research for the further research.

Data Collection Procedure

Data collection included structured questionnaires. Although the data collection procedure was structured study, any information and opinions of the respondents what they wanted to share has taken into account. Questions were asked in Bangla. Rewriting was needed. It became clear to respondents that they can respond or not answer any question. Respondents were given full confidence on some ethical issue. Due to the fact that under no circumstances in any part of the interview / discussion will not be disclosed to an outsider and the data will only be used for academic purposes.

Data Processing & Analysis

At the end of the day, questionnaires were edited through checking and rechecking to see whether it was filled completely and consistently. After the end of the total data collection, it was codified in the SPSS to analyze the data. The frequency of the document is analyzed with graphical representation on the MS Excel software. To analyze the data and to get a proper and valid finding, the data are cross-checked by expert from the statistics department of Rajshahi University.

Reliability & Validity

The data were collected with recordings and photos. Each recording was taken who were willing to share their thoughts with recording. Photos were taken and different NGO members helped there to reach the respondent and to collect reliable data. The volunteers of BRAC in camp one help to communicate with the Rohingya refugees. On the other hand, the members of BDRCS in the Kutupalong Transit Camp DP were not agreed to share information due to their institutional courtesy and secrecy. But they help a lot to collect data from the Rohingya refugees. The respondents were willingly helping in the data collection except some exceptionality in camp two. The information provided by them has checked and cross-checked to get the actual and authentic data. So, it is pertinent to say that the research is fully reliable and valid.

Limitations

When collecting data, data collectors faced difficulties.

1. The major difficulty was the understanding of their language. The language barrier was higher with the people who came after the 2017 crises. Rohingya people who are staying in the Kutupalong registered camps; they were like us and were very fluent in speaking Bengali as they are staying in the camp for 20-30 years.
2. Within the host community, families were initially very reserved to respond questions. They are seemed to be hesitated a bit to talk about different things of fuel consuming especially the female household members. However, after confirming and advising the purpose of the investigation, their answer was different.
3. The community still has the knowledge of receiving goods and they were asked about the materials / relief they would receive after the investigation. Some of the respondents, not everyone, were not interested in participating in the data collection process.
4. The camp officers and workers who were supplying the fuel for the Rohingya were reluctant to discuss formally about the statistics and supply-demand nexus.

Data Analysis and Discussions

Ensuring access to clean cooking solutions that use fuel of sustainable origin is rarely a priority when it is provided to displaced populations, as this imperative faces the most pressing need to ensure adequate food and shelter. Typically, displaced persons must obtain their own fuels and the means to prepare their food, and generally turn to solid fuels and inefficient and polluting stoves that expose them to the health risks associated with Household Air Pollution (HAP). (Gunning, 2014)

Demand of fuel

The demand of fuel is one of the basic priorities for all people. In displaced setting, fuel is given less prioritized. During the assessment, Rohingya refugee households were asked about the type of fuel they used for cooking or heating and for estimating the average amount of firewood or other sources of fuel they use for cooking and heating per day. According to the data from the household survey, a significant amount of fuel is consumed in cooking vegetables, which requires a long cooking time. Fuel is also used for heating water for children's bathrooms and for heating in the mornings and cold nights. Most (96 percent) of refugee families surveyed use LPG gas for cooking and heating, and 4 percent use firewood (Table 1).

Table 1: Type of fuel used by the respondents (Fieldwork, 2020)

What kinds of fuel do you use in time of cooking?		
	Frequency	Percent
LPG gas	48	96
Firewood	2	4
Total	50	100

A revolution has occurred in the fuel supply system with introducing the new instrument of fuel- LPG gas. The Rohingya refugees had to scrounge for collecting firewood from the forests. The Rohingya women had to tolerate the fire smoked from firewood. As they live in a very slummy area, there was scarcity of place. All the family members were obliged to put up with the situation. The children of the households said that their eyes were burnt and they had to go out from their house in time of cooking. The children of the family had to go out to collect firewood from the forest and they could not able to attend the UNHCR School as they need to spend most of their time in fuel collection. But the use of gas changes the total scenario.

LPG gas is also used as the instrument of fuel in the restaurants, hotel, bakery and ready-made tea stalls. The pressure on fuelwood has decreased highly and a culture of environment-friendly fuel consumption is on the way to run in the refugee camps. Though environment has greatly damaged, still there is hope to refurbish the area with a forestation and environment friendly energy consumption.

Data collected from the field survey 2020 reveal that 96% of the respondents said that they use LPG gas as their cooking fuel. But as they have scarcity of fuel, they need to use both LPG gas and firewood for their cooking. One of the respondents named Mrs. Sanjida said:

The supply of 'tankie' (cylinder) is inefficient. The cylinder can be used for 25 days a month. The other 5-6 days, my family need to burn wood, plastic, paper and other materials to cook food". My family needs to spend 1000/- BDT to afford the extra fuel every month. The 'tankie' is good to use and we will be more benefitted if the refill days is decreased for 5-6 days.

The money that needs to spend to buy the fuel is the most scattered answer responded by the Rohingya refugees. Data revealed that most of the families (70%) need to spend 200-500 taka monthly to collect extra fuel along with the fuel provided by the UNHCR. Most of the families of the respondents consist of 04-07 members. A Rohingya refugee family

consists of five members need to spend monthly three hundred or four hundred taka (See figure 2).

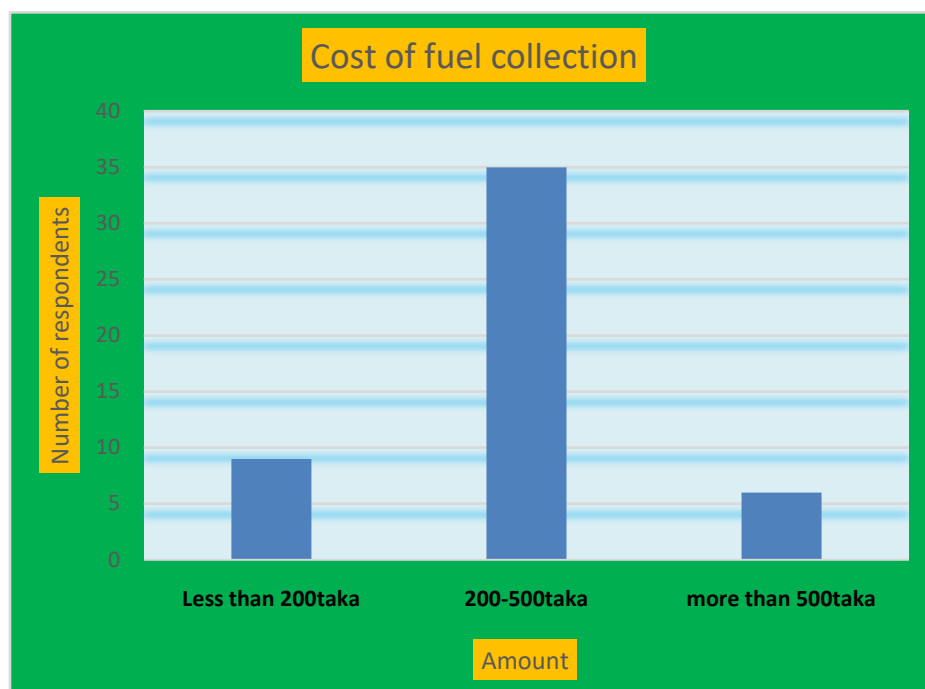


Figure 2: Cost of fuel collection (Fieldwork 2020)

Though the intensity of using woodfuel has reduced to a larger extent, data revealed that they have scarcity of fuel. 88% of the respondents said that they have scarcity of fuel. When Md. Hossain, a respondent, was asked about whether they have scarcity of fuel, he added “Sometimes we need to take our meal for one or two times as we cannot afford to buy fuel”. Though the impact on environment has reduced to a larger extent, the burning of fossil fuel is still covering the second alternative source of fossil fuel (UNDP and UN WOMEN, 2018).

The Rohingya refugees at camp one came there after the military crackdown in August 2017. They are getting full support from the UNHCR. They are not allowed to go out from the camp area. So, to collect fuel they need to collect it from the local markets. The Rohingya refugees of camp one collect fuel from the Gormohori Bazar. The fuel is basically supplied by the UNHCR with the partnership with BDRCS. Rohingya refugees need to collect them from the distribution center. But as there is scarcity of fuel, most of the respondents (88%) need to collect or buy extra fuel from forests or market. The figure shows the place of extra fuel collection and it excludes the distribution center as a category. The proportionate of fuel collection place in lying with the respondents are shown in figure 3.

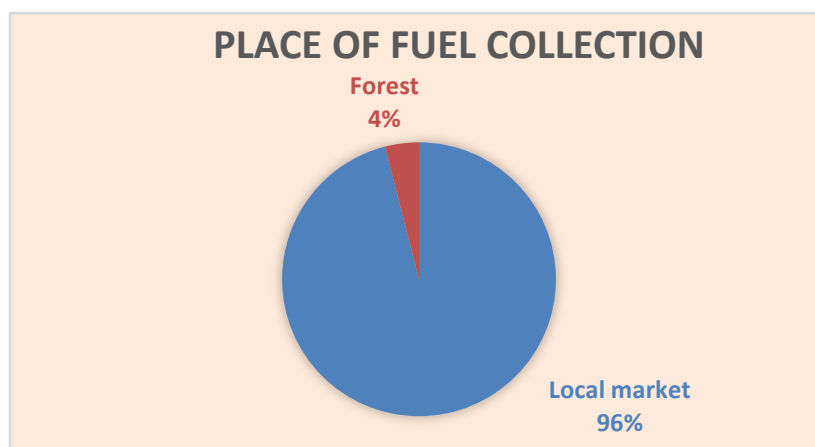


Figure 3: Place of fuel collection (Fieldwork 2020)

Supply of Fuel

The Kutupalong camp is home to more than 600,000 Rohingya Muslim refugees, crowded into a temporary city spread across five square miles. (Milko and Hammond, 2019) When they arrived, the ground was covered with jungle. After 18 months and about \$1 billion of investment in international assistance, Kutupalong camp was considered relatively stable. In November 2018, UNHCR launched a large-scale distribution of liquefied petroleum gas to refugees and the host population to use it as a cleaner and safer source of energy for cooking and heating (SAFE, n.d.).

Liquefied petroleum gas is the cheapest and cleanest alternative fuel option and provides a rapidly scalable solution to meet the needs of the entire camp and specific host communities. It is already used by families in all areas of the camp and is widely available in the host community. In March 2018, the RRRC approved a pilot project to provide liquefied petroleum gas kits and regular service stations to refugee and host communities, which require all liquefied petroleum gas projects to follow the same structure and approach. Distributions of kitchen kits, training and service stations are provided by private companies of liquefied petroleum gas licensed to operate in Bangladesh named Omera (ISCG, 2018). Mr. Mainuddin, a camp officer of camp 2 (Kutupalong Registered Camp), said that Red Cross Society of Bangladesh (BDRCS) is providing the logistics support under the scheme of Refugee Relief and Repatriation Commissioner (RRRC).

As a partner of UNHCR, Bangladesh Red Crescent Society is providing the full support to distribute the LPG gas cylinders. Md. Khairul Islam, camp officer of Kutupalong Transit camp, assured the author that camp one and Kutupalong registered camp are totally under the scheme of LPG gas distribution. No wood fuel is supplied to the Rohingya people after the initiative was taken in November 2018. He

added that, Omera is working as a distributing partner of providing the gas stoves, cylinders and other materials for cooking.

Study found on the Kutupalong Transit camp that there is a nexus between family size and the refill days of the gas cylinders (See table 2). From the table it is easily understood that a family consists of 04-05 members get a cylinder gas for 38 days. After the 38 days they go to the transit camp or the nearest distribution camp to refill the cylinder. The family with 06-09 members gets around a month to use the cylinder

Family Size (members)	Refill days
01-03	47
4-5	38
6-7	32
8-9	29
10-11	24
12+	21

Table 2: Nexus between family size and refill days (Fieldwork, 2020)

As it is noted earlier that 96% of Rohingya refugees are now using LPG gas as the medium of fuel, they were asked about which sources of fuel is best to use. They were also asked whether they are satisfied with the service provided by the authority. On an average above 90 percent of the respondents said that the best alternative source of fuel is LPG. They said that there is now no smoke in time of cooking. The LPG gas is healthy, easy to use and helps to keep the house clean. (See figure 4). Besides, they said that they are satisfied with the current fuel system. They had to face severe problems before the initiative of LPG gas supply.

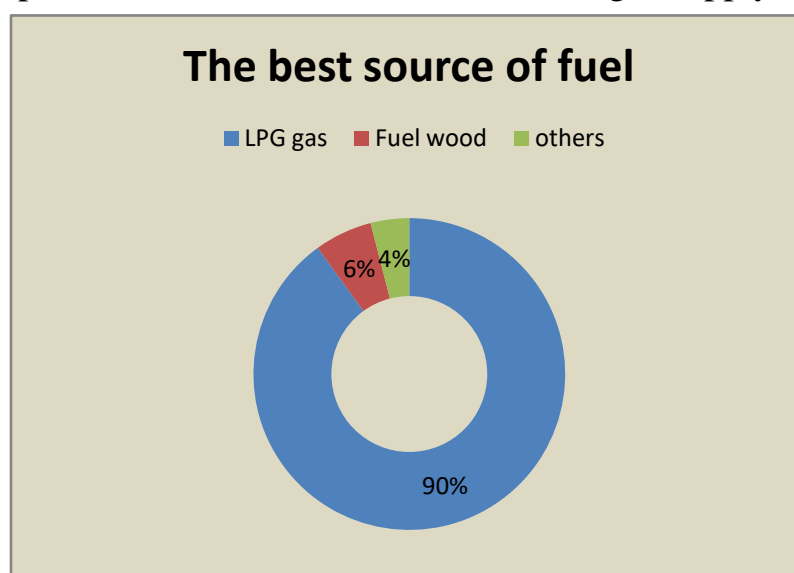


Figure 4: The best source of fuel (Fieldwork 2020)

Integrating Supply and Demand

Before the arrival of the Rohingya, about 95,000 tons of firewood was used. They were collected through the market or from local sources. However, after the launch of the liquefied petroleum gas distribution program, the demand for firewood fell to 37,000 tons (“Population Analysis”, 2014)

The use of LPG gas improves air quality and human health, as refugees no longer have to cook at the stake with firewood. The alternative fuel initiative is supported by the Government of Bangladesh, including the Commissioner for Repatriation and Assistance to Refugees (RRRC) and the Department of Disaster Management (MoDMR), as well as other UN agencies, including Food and Agricultural Organization (FAO), IOM and the World Food Program (WFP). The Bangladesh Red Cross Society (BDRCS) and BRAC are working as the partner, distributor and logistic supporter of the fuel supply system for the Rohingya refugees.

The environmental impact of the refugee flow since August 2017 has been significant. Since then, more than 730,000 Rohingya have left Myanmar, joining tens of thousands of people already in Bangladesh. Approximately 900,000 Rohingya refugees in the Cox's Bazar area need 700 tons of wood every day to cook (Mahecic, 2018). Experience in implementing reforestation programs in other places shows that in order for this scenario to be sustainable and attractive for end users, it is necessary to choose tree species in accordance with the needs of these users. In addition, multipurpose trees that can meet additional needs (such as food, animal feed, and shade) should be included in this option (UNHCR and IUCN, 2019).

The LPG gas cylinder contains 12.5 kg of liquefied petroleum gas; this is enough to satisfy all the needs of a family of five for a month. Refugees will also be the right to regular replenishment during the monthly periods. Most stoves are produced locally, creating jobs in the local economy of Bangladesh. In addition to helping refugees, one in six gas stoves and cylinders are delivered to vulnerable families in Bangladesh in local communities where Rohingya refugees live (UN, n.d.).

Challenges of fuel collection

Mr. Anwar is staying at the camp for two years. In his words, the fuel system is “nakula” which means insufficient. He needs to buy fire wood for 5-10 days which costs around 700-taka. Besides, they are facing other challenges of fuel collection like when it is government holidays, the distribution becomes turned off. They have to wait for the next work day. As for example, Md. Elias was talking about his problems faced few days

ago. His LPG gas was finished on Thursday so his family needs to wait for Sunday. He argued that sometimes they use polythene, paper or others materials as fuel when they are out of LPG gas. The challenges are sorted up in the following figure 5.

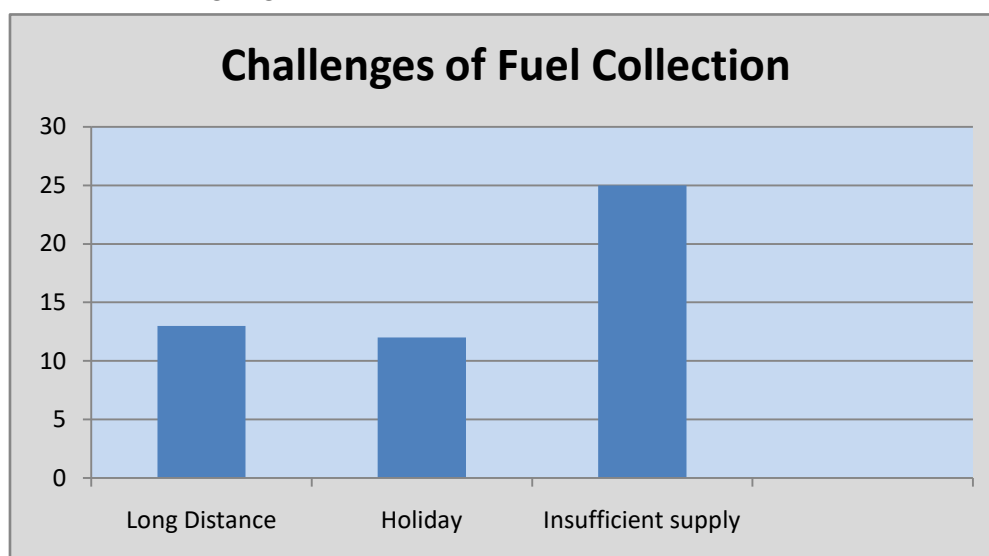


Figure 5: Challenges of fuel collection for Rohingya refugees (Fieldwork, 2020)

After taking the initiative of LPG gas distribution, a lot of challenges have reduced. But still there are some challenges left. Most of the Rohingyas were talking about the distance they need to cover to refill their “tankie”. The camp officer, Md. Mainuddin, was telling that a new distribution point was under construction inside the Kutupalong registered camp two. After the end of the construction, the Rohingya refugees will no longer need to cover a long distance or to cross the road.

Conclusions, Findings and Recommendations

The joint efforts of UNHCR, IUCN, the Government of Bangladesh and its partners on the refurbishment of the Rohingya refugee in the Cox's Bazar areas are becoming a reality. The well-known environmental problem, which was exacerbated by the influx of Rohingya refugees into Cox's Bazar, has decreasing day by day. Large extent of firewood collection from the local forest to cook fuel was one of the main causes to ecological imbalances in the Cox's Bazar region. To counter this practice, alternative fuel in the form of Liquefied petroleum gas (LPG) and improved stoves have been distributed from August 2018 onwards.

Findings

The first research objective of this study is to access the present fuel supply system for Rohingya refugees. Study found that 96 percent of Rohingya refugees are now using LPG gas in the Kutupalong area which

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is playing an important role in mitigating the environmental damage. To reduce the need for firewood from a nearby forest, the LPG cooking fuel is a necessary for the daily life of the Rohingya refugees. They are using the environment friendly LPG gases and they are satisfied with the initiative taken jointly by the government of Bangladesh and UNHCR. But the insufficient supply of LPG gases leads to the consuming of fire wood. So, most of the Rohingya household use both LPG gas and firewood as their cooking energy.

The second research objective is to analyze the nexus between supply and demand of fuel energy. 88% of the respondents have scarcity of fuel. So, they need to collect extra fuel from the local markets and forests. The cost of fuel collection is accounted for upto 1000 BDT (Bangladeshi Taka). But they need to spend on an average 200-500 BDT for the purpose of buying firewood from the market. On the other hand, the distributors in the Kutupalong Transit Camp DP claimed that the supply of fuel is enough for the Rohingya refugee households. So, a mismatch has found in the nexus between supply and demand.

The third and last research objective is to evaluate the impact of LPG gas stoves on the supply of fuel wood. It is shown earlier that the use of LPG gas reduces pressure on the fuel wood collection. Those who need to collect firewood, most of the respondents (96%) collect fuel from the market. So, the use of LPG gas is reducing a huge amount of pressure on woodfuel. Consequently, the environmental degradation due to collecting woodfuel has reduced approximately 80% after the LPG gas project was initiated in August 2018. To avoid it, proper training and more supply is needed. Proper management of the project including safety training, increasing facilities and covering all the camps under the LPG gas project will play key role in both mitigating the fuel supply-demand tension and reviving ecological balance.

The Government of Bangladesh (GoB) has responded quickly to the arrival of Rohingya refugees from Myanmar since August 2017. The main participants in responding to the influx of refugees were the local communities of Cox's Bazar and the local district administration. A sharp increase in population caused tension in resources, infrastructure and public services in the area, which were still fragile before the influx. However, the challenge on environmental degradation has greatly decreased due to the alternative fuel supply system of LPG.

Currently, all Rohingya refugee homes benefit from the distribution of liquefied petroleum gas. The study showed that the distribution of liquefied petroleum gas led to a significant reduction in the demand for firewood in the Rohingya camps. On average, among Rohingya families, the demand for firewood fell by 80% per family.

Path to Further Research

In line with the goal of the Global Refugee Pact to ease pressure on host communities, UNHCR and IOM have also begun to provide the LPG gas with local families near the camps. The overall goal is to reach 55,000 homes in the host community. To date, this has increased the use of the LPG from about 7% to over 20% among the local population, which, in turn, has reduced the demand for firewood among households in the host community by 53%. Liquefied petroleum gas supplies have also completely changed the dynamics of the wood market. This research has limitations that it is only focused on the narrowly defined fuel system based on fuel for cooking and heating. Research on electricity, power supply, solar panel for self-litigation in the camps of Rohingyas can be the directions of future research.

Suggestions and Recommendations

From the ongoing discussions, it is easily assumed that the project LPG gas has a far-reaching impact on the fuelwood consumption and aggregately to the environment. UNHCR, IUCN and EETWG, with the support of partners and the World LPG Association (WLPGA), intends to expand LPG distributions among the host community, as well as joint distribution and reforestation efforts in 2020.

It is found that Rohingya refugees are facing scarcity of LPG gas. They are short of on and average 04-08 days to refill the cylinders. The camp officers said that the gas cylinders are enough for the specific family as they are accordingly planned for the household size. The Rohingya people need to be trained enough about how to manage the LPG gas for the whole month. Besides, almost all the respondents were talking about the distance they need to cover to refill the gas cylinders. The camp distribution center needs to be increased and need to be established to a suitable distance inside the Rohingya camps.

Afforestation, reforestation and restoration or rehabilitation of ecosystems must be carried out with the participation of community leaders, with special attention to the relationship between environmental and socio-cultural aspects (UNHCR and IUCN, 2015). The establishment of tree plantations for the production of firewood or for the restoration and rehabilitation of land requires the development of detailed forest management plans. The safety training on the use of LPG gas should be increased along with the expansion of the project facilities to all the Rohingya refugees. Last but not the least, the importance of proper management of the LPG gas project to revive the socio-economic and environmental condition of the Cox's Bazar area cannot be ignored at any way.

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