



Cooking Practices in Displacement Settings in Malaysia and Indonesia

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Research Development Initiative (RDI)

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1. Introduction

Cooking practices in displacement settings show a vital role during emergency response—everyone needs hygiene and healthy food, for both the evacuees and emergency response volunteers. As stated in the Malaysian and Indonesian regulations, providing food aid is one of the government's responsibilities during emergency response^{[12][13]}. In the implementation, humanitarian organizations and local communities also share considerable effort in emergency response including providing food aid. The regulation already stated clean energy should be used for conducting soup kitchens in evacuation shelters or in mobile soup kitchens. However, on many occasions the standard cannot be applied due to limited access and unavailability of the clean energy source. For evacuees, most often is the problem of affordability of the clean energy source on top of energy access. As such, displaced households often rely heavily on firewood or charcoal to meet their energy needs for cooking as those energy sources are cheaper and affordable, particularly in evacuation centres and rural areas where access to infrastructure is limited.

This report presents how displaced people in displacement settings use energy for cooking (i.e. cooking with firewood or gas) in both households and institutions. Within a range of interviews and surveys conducted, the report summarizes the information collected, including the preferences and readiness of displaced people for the widespread adoption of modern energy cooking in Sarawak, Malaysia, and Karo Regency, Indonesia. The report covers both the household evacuees, and the institutions. The topic reported in this summary is as follows:

- use of energy for cooking,
- changes in cooking practices (before and after the disaster),
- the role of institutions in food provisions,
- opportunities and challenges in modern cooking adoption,
- cooking is a cultural experience, the kinds of foods people cook and the practices they use vary widely,
- the health impacts of using biomass for cooking practice.

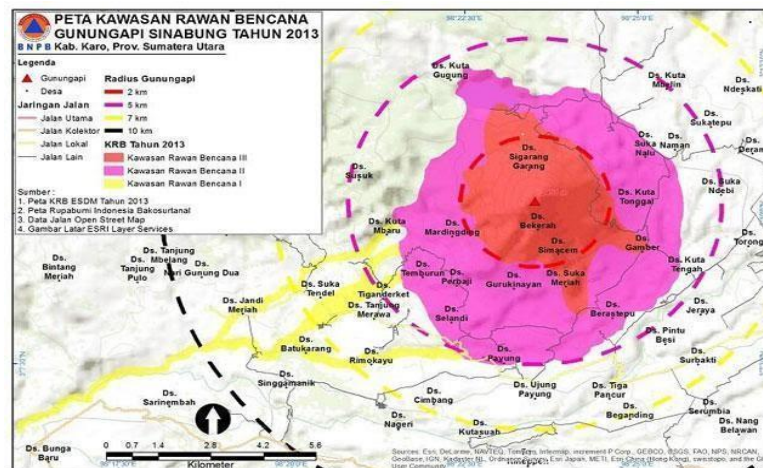
2. Situational Background

2.1. Karo Regency, Indonesia

Karo Regency is located in the Bukit Barisan range, most of which is in the highlands. Karo Regency is a fertile area so most of the population are farmers (72%) with agricultural commodities such as rice, secondary crops, vegetables, fruits, coffee, ornamental plants, and others^[14]. Based on geographical conditions, there are two active volcanoes, namely Mount Sinabung and Mount Sibayak so that the Karo area is prone to volcanic eruptions.

Mount Sinabung, with an altitude of 2,460 m above sea level, lies in the Karo Regency of North Sumatra. It is an active volcano of a strato-type. After being dormant for over 400 years since its last eruption in the 1600s, its volcanic nature became active again in 1975-1976 through small effusive eruptions in 1975-1976^[9]. On Sunday, 29 August 2010, Volcano Sinabung, a type B volcano (a non-active volcano type), unexpectedly exploded and produced a powerful burst of volcanic ash a mile high into the air. The unexpected eruptions were causing uproar and panic from people as they were not prepared for the last eruption of Sinabung 410 years ago^[2]. After the eruption in 2010, Mount Sinabung erratically erupted, with the latest eruption being in 2020.

Figure 2.1 Red Zone Area in Mount Sinabung



Source: National Disaster Management Agency, 2013

Based on the map above that is provided by National Agency for Disaster Management, there are 11 villages that were located in the red zones of Mount Sinabung. The government is in progress in relocating the villages to safer places. At the early stage, the government had relocated three villages to permanent settlement in Siosar Village. Meanwhile, the other eight villages are currently still in the temporary settlement.

2.2. Miri District, Malaysia

Miri is a coastal city on the western shore of Northern Sarawak on the island of Borneo^[3]. The city is the second-largest city in Sarawak, with a population of 300,543 as of 2020^[1], and covers an area of 997.43 km². Miri mainly relies on its oil and gas industry, which contributes significantly to the Gross Domestic Product (GDP) of Sarawak. Sarawak Shell Berhad (upstream business) and Petronas Carigali Sdn Bhd have their offices based in Miri. Other multinational oil and gas companies also set up their offices here, including Nippon Oil, Schlumberger, Baker Hughes, Halliburton, Technip, Ranhill WorleyParsons, and Petra Resources Sdn Bhd.

Miri has a tropical rainforest climate. There are two monsoon seasons: the southwest monsoon, which is the dry season from April to September, and the northeast monsoon, which is the wet season from October to March. The annual rainfall is around 250 to 380 cm (100 to 150 inches). Although rainfall is generally on a safe level, floods do occur in low-lying areas, both in specific urban and rural places. These areas include Marudi, Baram and Subis districts, *Kampung Sealine*, *Kampung Api-Api*, *Senadin*, *Kampung Batu Satu*, *Kampung Lusut*, and *Kampung Lambir*. In more severe flood cases, some families whose houses are located next to the beach are evacuated using fisherman’s boats. The victims are usually transported using the Emergency Medical Rescue Services (EMRS) van to the evacuation centre which is located at the multipurpose hall^[7].

3. Methodology

3.1. Data Collection

The data collection for this research used a mixed-method, where the quantitative approach was questionnaires and the qualitative approach was semi-structured interviews, and Focus Group Discussions (FGD). Before conducting the survey, we developed the data collection tools based on information that we gathered from the literature that related to cooking practices in displacement settings especially in Malaysia and Indonesia, to ensure its reliability and validity.

Questionnaires were distributed to 100 households in Karo Regency, Indonesia, and 73 households in Miri District, Malaysia to collect data on the intra-households dynamics in displacement settings. To collect in-depth information regarding the displacement settings, we conducted semi-structured interviews with institutions that provide aid for displaced people, which consist of 16 institutions in Karo Regency and 8 institutions in Miri District. The institutions that were interviewed consisted of government institutions, social/humanitarian organizations, community facilities, and private sector institutions.

FGDs were conducted for both institutions and households in each country. The FGDs for households were participated both by households participated in questionnaire (survey) and those who did not include in the survey. These sessions encouraged the participants to have dynamic discussions and allowed the researcher to obtain more information regarding cooking practices in displacement settings and their awareness and willingness to adopt modern cooking alternatives from both institutions and households.

Table 3.1 List of Focus Group Discussion (FGD) in Indonesia and Malaysia

Karo Regency, Indonesia	2 Institutions FGD	1 st FGD: 4 representatives from Red Cross, TAGANA and Alpha Omega School for Disability. 2 nd FGD: 7 representatives from YAPIDI, Disaster Management Agency in North Sumatera, TAGANA, Erafina Hospital, and Lecturer from North Sumatera University.
	4 Households FGD	1 st and 2 nd FGD: 10 household representatives from Mardinding Village 3 rd and 4 th FGD: 8 to 10 household representatives from Sigarang-garang Village
Miri District, Malaysia	1 Institutions FGD	With 3 representatives from PARC Group, Chef X and Miri Youth Centre
	2 Households FGD	1 st FGD: 5 household representatives 2 nd FGD: 4 household representatives

3.2. Data Analysis

The data analysis combined both quantitative and qualitative analysis. The questionnaire survey results were analysed using quantitative descriptive analysis. The raw data were transformed and visualized using tables and figures to make them easy to understand and interpret. To complement the data we collect from questionnaires, we also conducted content analysis for the data we collected from the semi-structured interviews and FGDs with the institutions that provide food aids in both Malaysia and Indonesia. The data sets were analysed to gain information and understanding on food provisions for the people in displacement settings.

3.3. Study limitation

3.3.1. Karo Regency, Indonesia

The disaster in Sinabung areas has started since 2010 and yet the Mount Sinabung eruption still threatens the Tanah Karo Regency. Therefore, the field data collection was organized in the context of prolonged disaster events or threats. However, during the field data collection, there was none of the actual cooking practices for disaster events. We collected data based on Disaster Management Agency (*Badan Penanggulangan Bencana Daerah* or - Regional Disaster Management Agency of North Sumatera) of North Sumatera's previous experiences in conducting public kitchens during emergency responses.

To enrich the findings, the study also included the government institutions from national level which have main functions relevant to disaster and food security responses. However, the national institutions do not have direct service provisions since the service for disaster management was implemented at the Province or Regency (local) level. Therefore, the interview at the national level was conducted to obtain the perspective and information on the policy and observations at the national level.

In addition, the study also included qualitative information from other disaster types (i.e. floods setting in the Same Province of North Sumatra which took place in November 2021) in order to enrich information regarding food provision in displacement settings by government institutions. Therefore, there is a strategic need for further research in a more diverse displacement setting including in multiple disasters events and different provinces or regency in order to obtain more comprehensive analysis.

In addition, the study also employed observation for household cooking practices. However, this was done quite briefly and the observation took place during or after the household interview. Therefore, future research may need to involve ethnographic or participant-observers research methods.

3.3.2. Miri District, Malaysia

Most of the households faced floods, however, the severity of the flood encountered by them is mostly low to moderate risk which does not require them to evacuate from the house. Hence, the input on the public kitchen experience is limited from the household interview. It is suggested to explore an in-depth study on their experience in the household cooking process during flood encounters.

The most recent problem faced by the Miri communities is the pandemic COVID-19 situation which resulted in the displaced people becoming jobless and homeless. Therefore, the study could extend to the current issues faced by the communities of Malaysia rather than focusing only on natural disaster events.

Almost all the citizens already used clean energy cooking due to the abundant and well-established electricity and gas pipe infrastructure. Biomass is mostly used for barbecuing and rarely as the main energy source.

Most of the institutions that provide food aids distribute raw food to the people in need. Hence, it would be interesting to explore how the households prepared and stored the raw food. In-depth study regarding how they prepare the food (boiling, frying, steaming baking, etc.) with the gas pipelines

and/or gas cylinders can be explored more to make a comparison study between gas pipelines and gas cylinders.

Unfortunately, this study could not capture the recent flooding that occurred in West Malaysia at the end of 2021, as most of the households and humanitarian organizations contacted were still occupied with the flood.

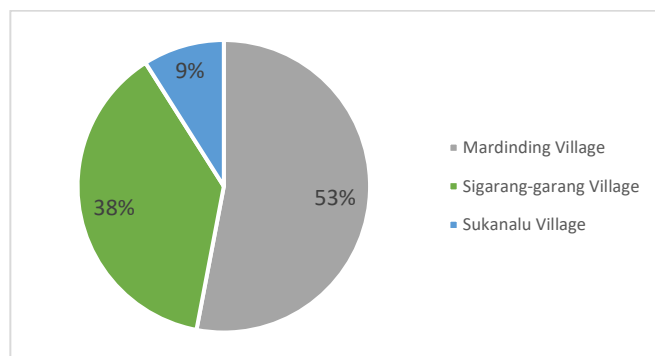
4. Findings and Implications

4.1. Post-disaster temporary settlement: study case of Karo Regency, Indonesia

4.1.1. Households Demographics

The data collection was conducted to 100 households who live in villages that are used as temporary settlements. The respondents came from 3 villages, which are Mardinding Village, Sigarang-garang Village and Sukanalu Village. The majority of them (53%) came from Mardinding Village.

Figure 4.1 Percentage of households based on the villages



Source: Survey data (2021)

The temporary settlements were mostly self-built by the displaced households in safer locations. There are some that are provided and rented by the government for the evacuees, and some of the households (8%) also live in schools that are utilized as temporary settlements. The households that live in the temporary settlements consist of 4 members on average. In several households, the head of the household is the wife (female member) because their husband has passed away.

Based on Karo Regency Statistics (2020), 88% of the population in Karo Regency have livelihoods as farmers^[4]. With the highland altitude, the district is the centre of horticulture and fruit production in North Sumatra. Before the Sinabung eruption, 86% of the respondents' livelihoods were mainly farmers. However, there was a significant decrease to 73% and changes to the diversification of livelihoods after the eruption. The changes in livelihoods is because the communities lost their agricultural land up to 1 to 3 hectares as it was covered in the remains of cold lava.

After the eruption, some communities have utilized their agricultural land that are not in red zones or rent other people's land. However, these areas are still exposed to ashes from the eruption which caused the price of the agricultural products to decrease due to low quality.

4.1.2. Cooking practice in households

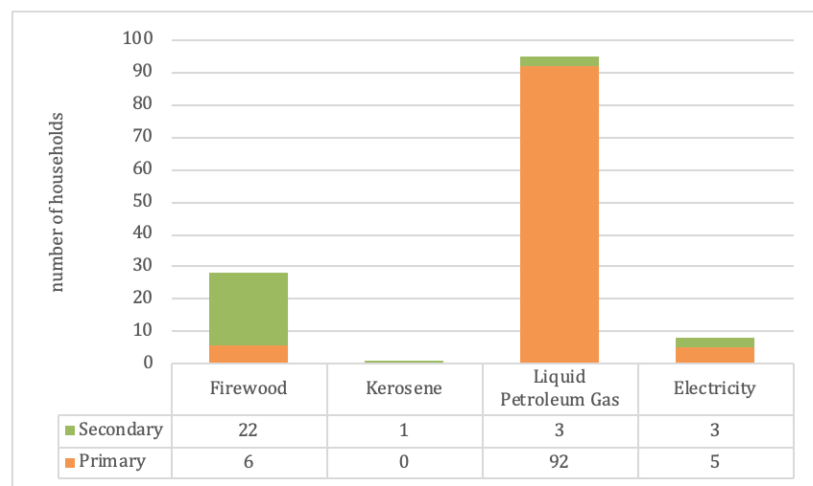
Based on the survey, households in temporary settlements commonly cook 2 times a day in the morning and evening with an average 4 portions according to the number of their household members. In the afternoon, they usually only heat up the food or eat the leftovers from their meals in the morning. Their menu mainly consists of rice, and vegetables, eggs and fish as their side dishes.

In daily lives, usually the households cook for their own family. However, when Mount Sinabung erupts, they must evacuate to the evacuation shelter for safety. In the evacuation shelter, the government and NGOs prepare a soup kitchen to provide cooked food for the evacuees. The evacuees usually take turns in cooking for the other evacuees and volunteers in the evacuation shelter.

4.1.3. Source of energy cooking

Based on the North Sumatera Province statistics (2019)^[11], 96% of the community in Karo Regency mainly uses LPG (Liquid Petroleum Gas) for cooking and 4% of households still use firewood. The survey reveals the same result, where 95% of households in the temporary settlement use LPG as their primary energy cooking source. They usually procure the gas directly from the nearest stalls or shops in their village.

Figure 4.2 Households energy cooking sources in Karo Regency



Source: Survey Data (2021)

The use of LPG gas is widely chosen by the community, because using gas is considered easier, more practical, and also faster. The use of LPG is affected by the government policy subsidy. The subsidy for LPG in Indonesia has been adopted since 2007, where people with low income can purchase the subsidized 3 kg of LPG. The program was designed to transition the community from kerosene fuel. The program provides a free LPG cooking set that consists of a 3 Kilogram LPG tank, a compact LPG stove, and its accessories (regulator and hose).

Box 4.1 Subsidy of LPG in Indonesia

The government of Indonesia subsidized the LPG for low economy population. Based on the Government Regulation No. 104/2007 concerning Provision, Distribution and Price Determination of LPG, the 3 kg LPG is subsidized for the use of household living in poverty and small and medium enterprises, with the criteria: (1) Household use for cooking; (2) Micro enterprise owned by individual and use for cooking for small business^[15].

The subsidy is allocated within the State Budget (APBN – Public Budget of State Expenditure). The subsidy is allocated for the price subsidy, value added tax subsidy. The Ministry of Finance Decree No. 116/PMP.02/2016) concerning Procedures for provision, Budgeting Calculation, Payment as well as Accountability, mentions the formula as follows^[16]:

Price Subsidy (PS)= per kg price subsidy x V

Per kg price subsidy = [(grocery price of LPG 3kg tube – VAT – MA) – Set Price of LPG 3 kg]

PS = Price Subsidy

V = volume of LPG 3 kg tube

VAT = Valu Added Tax

Some households in the areas still use firewood, but no longer as their main energy source but for complementary to LPG. Only 6% of the household respondents still use it as a primary energy cooking source. The use of firewood is generally for heating and for boiling water for drinking and bathing, since the temperature is quite low in the mountain areas. In this way, the household can save gas usage. They usually collect firewood directly from their agricultural land or from the nearest forest.

Figure 4.3 LPG Gas Cylinder with the size of 12 kg and 50 kg



Source: Survey Data (2021)

As for the use of electric cooking utensils, only a few of them use rice cookers. This is because those who live in temporary settlements have limited access to electricity and the electricity is only available within a certain time period in a day. The electricity source is generally obtained from PLN/state services, but for the people in Sigarang-garang Village and Sukanalu Village, access to electricity is obtained from their own diesel generator or village generator.

4.1.4. Role of Institutions in Food Provisions for Displacement Settings

In Indonesia, the responsibility of the disaster emergency response is managed by the government coordinated by the Disaster Management Agency. Based on the Law No. 24 of 2007, The Disaster Management Agency is divided by their level that include, the national level (known as BNPB – *Badan Nasional Penanggulangan Bencana* or National Disaster Management Agency), the province level (known as BPBD *provinsi* – *Badan Penanggulangan Bencana Daerah Provinsi* or Regional Disaster Management Agency) and the city/regency level (known as BPBD *kota/kabupaten* or Local Disaster Management Agency).

During the Mount Sinabung eruption, the BPBD North Sumatera was the one who was responsible in coordinating the disaster management responses including provision of shelter, food during emergency and other basic necessities. The BPBD North Sumatera also coordinated the public kitchen to provide food and fulfil basic needs for the affected communities that stayed in the evacuation shelter. Based on the interview with BPBD North Sumatera, the daily food provision was to cover 5,000 portions of the displaced persons in Sinabung areas. The food was provided twice a day, with the menu of staple foods (rice), vegetables and fish.

In providing food aids for the evacuees, BPBD North Sumatera involved other government agencies in Karo Regency that include the Social Affairs Agency, Police, Military Personnel, Public Health Agency. Non-governmental agencies such as churches, social /humanitarian organizations and community facilities had also provided disaster relief ever since the emergency response. They also divided the cooking task with the evacuees, as part of their trauma healing therapy in post-disaster.

For the soup kitchen, the BPBD used a mobile public kitchen, which was facilitated with LPGs, diesel generators and cooking equipment. Occasionally they used firewood if the LPGs were out of stock, while some other community's facilities used firewood as their energy cooking sources.

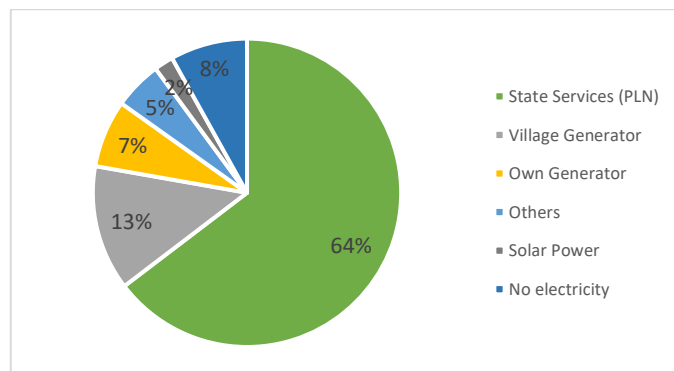
4.1.5. Opportunity and Challenges in Modern Cooking Adoption

The majority of households and institutions in Karo Regency have used LPG gas as their modern energy cooking alternatives, which is supported with subsidies from the government to use LPG gas. Therefore, the LPG supplies are accessible in the nearest stalls even for rural areas. However, they still lack awareness of the other modern energy cooking alternatives like biogas stove, electric stove and solar power stove. More than 80% of respondents are not aware of those modern energy cooking alternatives and not interested in trying to use them because of several reasons, such as:

- For biogas and solar power stoves, most of the households are not aware of such modern energy cooking alternatives and don't know how to use them. They are already comfortable using the gas stove and they cannot afford to buy them.
- For electric stove, most of the households in Karo Regency, especially in temporary settlements, have insufficient supply of electricity. They cannot afford to buy the stove and pay the electricity bills.

More than 90% of respondents have access to electricity, where 64% of their electricity resources are using the state electricity services (PLN) and 13% using village generators. With the current available electricity supply, 56% of the respondents have transitioned to using electric cooking equipment such as rice cookers to help them cook rice faster. However, the access to electricity in temporary settlements is very limited and 8% of the respondents don't have electricity services. The households that don't have access to electricity are located in a temporary settlement that formerly was a forest area of Sigarang-garang and Sukanalu.

Figure 4.4 Sources of electricity in Karo Regency



Source: Survey Data (2021)

There is potential for transition to modern energy cooking alternatives as the Government of Indonesia has shown their support to cooking with electricity sources. In November 2021, the government of Indonesia declared the strategic needs for transformation of LPG and other energy used for cooking to electricity. However, these transitions would be a challenge for areas that have limited access to electricity supply, especially in remote areas. The insufficient electricity quality, where outages frequently happen, is also one of the barriers in shifting to modern energy cooking. In addition, the FGDs (of institutions and community/household) also noted that one of the difficulties for transitioning to using electricity energy for cooking is because they are afraid and reluctant to try on new technology.

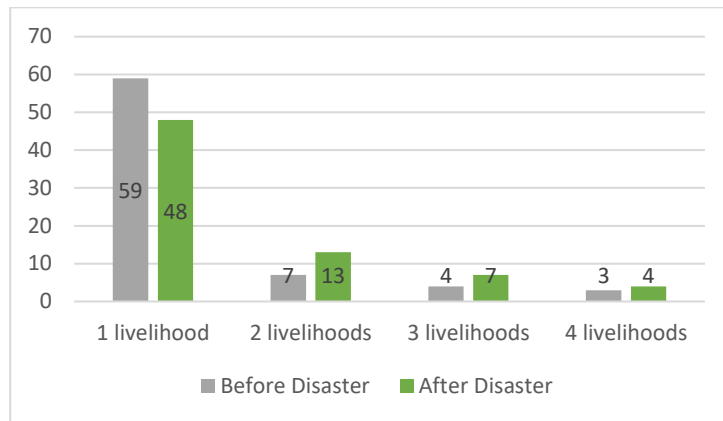
4.2. Displacement settings in multi-disaster situation: case study of Miri District, Malaysia

4.2.1. Households Demographics

The survey was conducted to 73 households in Miri District, Malaysia, where 67% of the respondents reside in self-owned permanent settlement. The average household members is around 3 to 5 members, 7% of the respondents have disabled members in their households. Most of the types of disability are categorized under paralysis, deafness, and mental conditions.

The households in Miri District occasionally had floods where 42% of the respondents had it every once a year and 45% of the respondents had it more frequently every once a month. They usually preferred to stay in their own house while waiting for the floods to recede.

Figure 4.5 Diversification of livelihoods in Miri District



Source: Survey Data (2021)

There were no significant changes in respondents' livelihoods due to the disaster. However, there was a slight change with an increase of 2% for the respondents (38.3%) who are involved in household work and (30.1%) labour work. Based on the graphic above, the change in livelihoods is also shown through the diversification of the respondents' livelihoods, which is, a slight increase in households that have more than 2 livelihoods after the disaster.

4.2.2. Cooking practice in households

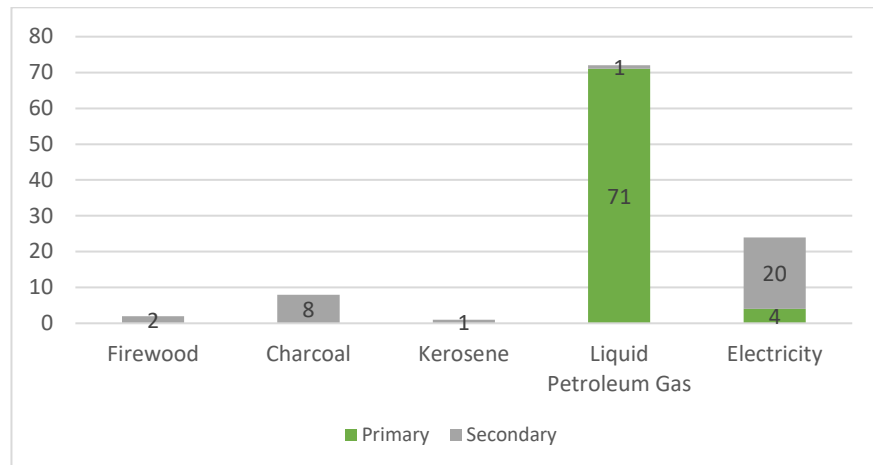
Based on the survey, 68.5% of the respondents occasionally cook 3 times a day, that includes in the morning, afternoon and evening. They usually cook according to the number of their household members which is around 3 to 5 portions. The respondents commonly eat bread, coffee and eggs for breakfast. As for the menu in the afternoon and evening, they mainly eat rice with vegetables and either fish or meat (i.e. chicken or beef) as their side dishes.

During normal condition, the cooking practice is usually done by the female member (wife or mother) of the family. Meanwhile, during disaster, the cooking practice is still the female member of the family (wife or mother of the households) main responsibility, however, the male member also took initiative to be involved in cooking practice.

4.2.3. Source of energy cooking

Based on the survey data 97% of respondents use liquefied petroleum gas (LPG) or natural gas pipeline as their primary energy cooking sources. The respondents usually pay 30 MYR (Malaysia Ringgit) or around 7 USD per month to pay their gas bills. Some of the respondents have transition to use electricity stove as their secondary sources but there are few of them that (less than 15%) still use conventional energy cooking sources (i.e. firewood, charcoal and kerosene) but they use it only as secondary sources and rarely use it, only use it during emergency or for leisure/BBQ party. Most of the respondents still use gas pipes and gas cylinders during disasters. However there are few of them that shift from gas pipe to gas cylinder, and one of the respondents stocks firewood in case of emergency.

Figure 4.6 Households Source of Energy Cooking in Miri District



Source: Survey Data (2021)

Miri became the first town with a piped gas system. In 1995, the Miri natural gas pipeline grid was privatized to Sarawak Gas Distribution Sdn Bhd and under this, pipe-laying expansion has brought some 25,000 households and 1000 commercial businesses on grid.

Figure 4.6 Stove with Gas pipeline in Red Cross Miri Branch



Source: Survey Data (2021)

Nevertheless, in some rural parts in Sarawak, LPG is still being used. LPG is a non-renewable, clean-burning liquid fuel that is stored in containers. It is a viable short to medium term “transitional” solution for communities that do not have access to natural gas pipeline supply. LPG use was seen in households who either had some financial means, as the initial purchase price for natural gas pipeline is too steep for most households to obtain. The recent cancellation of transport subsidies of fuel and LPG by the Ministry of Domestic Trade and Consumer Affairs (MDTC) to the rural areas in Sarawak has brought challenges to the people in Ulu Baram, who have no choice but to buy fuel and LPG at very high prices compared to the prices in town due to the high cost of transportation.

4.2.4. Role of Institutions in Food Provisions for Displacement Settings

In Miri District, Malaysia, there are many displaced people who lost their homes due to poverty or having unstable income due to the pandemic. They are also occasionally affected by floods, which can happen once a year or even once a month. To displaced people, access to food and cooking energy is very crucial to fulfilling their basic needs. Therefore, the institutions, which include government and non-government, play a major role in providing aid for displaced people, as they have limited access

due to their circumstances. There are 4 types of institutions in Malaysia that involve in providing aid for displaced people, that includes:

1. Government: Disaster Management Agency is responsible as coordinator in managing disaster risk and providing disaster relief. During emergency responses, the Disaster Management Agency is supported by other government institutions and one of them is the social welfare agency (*Jabatan Kebajikan Masyarakat*) to provide evacuation shelter and food aids for the victims.
2. Social/Humanitarian Organizations: non-governmental organizations that provide relief to disaster victims (i.e. MERCY Malaysia, Red Cross and Red Crescent, *Persatuan Belia Miri* (also known as Miri Youth Centre). When disasters happen, they also collaborate with the government in providing aid to fulfil the victims' basic needs and also raising awareness in disaster preparedness.
3. Community facilities: community facilities (i.e. community centre, sports hall, school) are usually used as evacuation centres for disaster victims.
4. Private sector: Profit-based organizations that allocate budget from their benefits for Corporate Social Responsibility (CSR) project, which is providing food aids for people in need.

There are 3 ways of providing food aid that is usually done by the institutions, such as:

1. Food Basket: distribute dry food supplies for free (i.e. a pack of rice, cooking oil, instant noodles, canned foods, sugar, etc.)
2. Cooked Food: distribute cooked food in styrofoam containers.
3. Cash-based transfer: distribute an amount of cash for basic needs (i.e. food, cooking fuel, and electricity). Humanitarian Organisations rarely distributed cash-based transfer, it is usually provided by the government.
4. Soup kitchen: establish a temporary public kitchen (including the cooking tools and cooking fuel) for areas that are impacted by disaster.

Soup Kitchen is usually established by humanitarian organizations to provide cooked food in large portions for the victims. For example, Red Cross and Red Crescent in Miri Branch has their own mobile soup kitchen that carries all the cooking necessities including the cooking tools and LPG gas cylinder. As for *Persatuan Belia Miri*, they collaborate with the local communities in rural areas to gather firewood for cooking due to limited accessibility to bring LPG gas cylinders to rural areas.

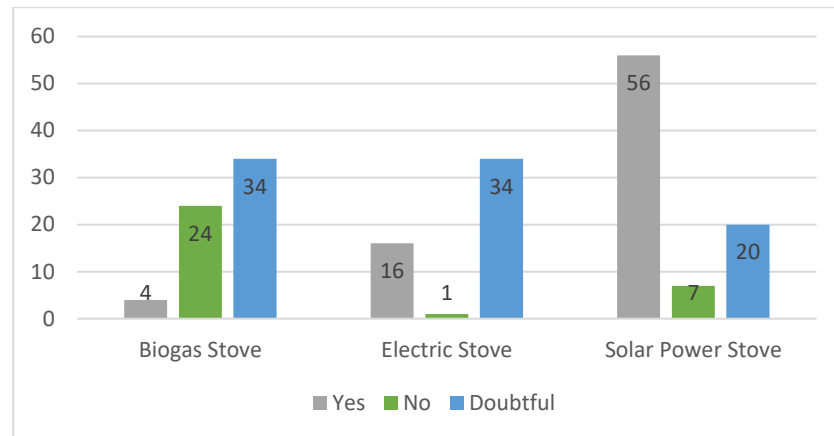
4.2.5. Opportunity and Challenges in Modern Cooking Adoption

Based on UN-ESCAP and ASEAN Centre for Energy (2020)^[10], Malaysia's rate of access to clean cooking has reached up to 97% to 98%, where the majority of population relies primarily on LPG or natural gas pipeline. It aligns with the data we collected from the survey, where 97% of respondents use LPG or natural gas pipeline as their primary energy cooking sources.

The usage of gas as energy cooking in Malaysia shows great potential, especially in Miri District that has many gas supplier companies. Therefore, the gas supply in Miri District is more accessible and cheaper than any other district in Malaysia. In December 2021, Petroleum Nasional Bhd (Petronas) has inked a memorandum of understanding (MoU) with Petroleum Sarawak Bhd (PETROS) to gradually increase natural gas supply to Sarawak to up to 1,200 million standard cubic feet per day (MMSCFD) by 2030^[8].

The transition to modern energy cooking alternatives is already achieved in Malaysia as the majority of the population already use gas pipelines and some of them have used electric stove and rice cooker for cleaner energy cooking alternatives. The use of electric stoves in Miri District, Malaysia is also supported with the availability and reliability of electricity supply. However, for other modern energy cooking alternatives like biogas stove, the respondents are less interested because they are not familiar with this technology and unsure with the availability of biogas supply in Malaysia.

Figure 4.6 Households Preferences and Interest in using Modern Energy Cooking Alternatives in Miri District



Source: Survey Data (2021)

The Miri households are particularly more interested in using solar power stoves as cleaner energy cooking alternatives, with 80% of respondents showing interest in solar power stoves. The main reasons why the Miri household prefer to use a solar power stove for cooking is because it is cleaner energy and saves electricity. However, the price remains too expensive to be used daily for households.

5. Conclusion

Both Karo Regency and Miri District face different kinds of disasters. The households in Karo Regency had lost their homes and agricultural land due to the Mount Sinabung eruption in 2010, which caused them to evacuate to temporary settlement. As for households in Miri District, they commonly faced floods due to the Monsoon season (Southwest Monsoon and Northeast Monsoon). However, even in different settings, the majority of households in both locations, have used the same modern energy cooking alternatives which are gas (i.e. LPG in Indonesia and natural gas pipeline in Malaysia) as their primary energy cooking sources. In both countries, the usage of gas as energy cooking sources receives support from their governments by providing subsidies in order to pursue a transition to clean energy cooking. Therefore, gas supplies are very accessible and cheaper. However, there are some households and institutions that would still use firewood as their secondary cooking sources in Karo Regency and also during the occurrence of natural disasters which depends on the severity of the floods in Miri District.

Most of the households in displacement settings are not aware of other modern energy cooking alternatives (i.e. biogas stove, electric stove, and solar power stove) and do not show interest in the appliances due to insufficient supply and expensive price. Some of them are showing interest in solar

power stoves because it's a cleaner energy cooking alternative and can save electricity supply. However, they are still doubtful to use it as the price remains too expensive and not readily available.

Most institutions that provide food aids in displacement settings have their own standard operating procedures (SOP) to follow in their cooking practices to ensure they are able to cater balanced nutrition for the people in need including the Muslims, where the food prepared would require Halal certifications.

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