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Emergency toilets for the people affected by the Mount Sinabung eruptions

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Mount Sinabung erupted in September 2013, causing the mass evacuation of more than 30,000 people. Evacuees were placed in public buildings such as churches, mosques, schools and universities, as well as tent camps. Pour-flush toilets were provided by the government. However, the level of provision was generally inadequate. The continuity of water was a major concern, with the people relying on water trucks for the supply of water. Toilets were not properly maintained and rubbish was found around toilets, which could clog drainage channels. Insufficient cleaning tools were provided. Coverage far exceeded generally accepted targets of twenty people per toilet. To address these issues, water supply should be closely monitored, additional toilets installed, adequate cleaning tools should be provided and people should be better organised to maintain toilets.

About the disaster

Mount Sinabung is a volcano located in the administrative district of Karo in the province of North Sumatera, Indonesia. On 15 September 2013, Mount Sinabung started experiencing a violent eruption of smoke and ash, causing mass evacuations of villages surrounding the volcano (Lutheran World Relief, 2014). As of 24 March 2014, Mount Sinabung's alert level remained at level four, corresponding to an increase of volcanic activities with a high tendency to develop into eruptions within a short period of time.

As of 2 March 2014, 62 fatalities had been recorded (Karo District Government, 2014). More than 30,000 people from 34 villages in four sub-districts surrounding the volcano were forced to be temporarily relocated. The maximum number of evacuees at one point (12 February 2014) stood at 33,210 people sheltering in 43 locations. (Karo District Government, 2014).

Emergency shelters

Buildings such as mosques, churches, schools, universities were prioritized for temporary shelters. These structures are located in nearby cities such as Kabanjahe and Berastagi. Emergency tents were also set up for locations without large buildings such as in villages where the nearest town was too far away or already full.

According to the Karo district government (2014), as of March 1st, 2014 the number of displaced were spread in 33 locations, amounting to 15,873 people (5,002 households). A research team from the Bandung Institute of Technology visited and interviewed men and women from eight camps. Most were located in Kabanjahe, in the form of churches, a mosque, and a school. The site visited in Berastagi is a school, and the site in sub-district Tigandreket is in the form of tents (Table 1).

Toilets provided in locations

The toilets that were installed in the sites water-based pour-flush emergency toilets. In Indonesia, water is vital to be used in defecation for anal-cleansing. Evacuees stated that they would not want to use toilet facilities if no water is available.

Table 1. Locations of camps visited February 27-28 and March 1. 2014

Locations visited	Village of origins	Number of households	Number of people	Type of settlement
Gudang Jagung Konco (Tiganderket)	Selandi	188	543	Tents
Klasis GBKP Kabanjahe	Sibintun, Berastepu	186	443	Church
GBKP Kota Kabanjahe	Sibintun, Berastepu	398	1123	Church
UKA Kabanjahe 1	Bekerah, Simacem, Kuta Tonggal	306	990	School
UKA Kabanjahe 2	Sigarang-garang, Kuta Gugung, Kuta Rayat, Kuta Tengah	344	1227	School
GBKP Simpang VI (Kabanjahe)	Gurukinayan, Kuta Tengah, Kuta Rayat	166	533	Church
Mesjid Agung Kabanjahe	Gurukinayan, Kuta Tengah, Gamber, Kuta Gugung, Berastepu, Sukanalu	226	765	Mosque
KWK Berastagi	Kebayaken, Kutarayat, Sukanalu, Sigarang-garang	181	684	School

Source: Government of Kabupaten Karo

Table 2. Types of excreta disposal system in camps visited

Locations visited	Toilet types	Toilet materials	Superstructure materials	Treatment system
Gudang Jagung Konco (Tiganderket)	Temporary knock-down toilets	Prefabricated Plastic slab	Board and plastic sheeting	Septic tank
Klasis GBKP Kabanjahe	Permanent pour-flush toilets	Prefabricated concrete slab	Concrete walls	Septic tank
GBKP Kota Kabanjahe	Permanent pour-flush toilets; Temporary pour-flush toilets	Prefabricated concrete slab; Prefabricated plastic slab	Concrete walls; Fiberboard	Septic tank
UKA Kabanjahe 1	Temporary pour-flush toilets	Prefabricated concrete slab	Wooden boards; Plastic tarps and bamboos	Septic tank
UKA Kabanjahe 2	Temporary pour-flush toilets	Prefabricated concrete slab	Wooden boards; Woods and iron sheeting	Septic tank

GBKP Simpang VI (Kabanjahe)	Permanent pour-flush toilets	Prefabricated concrete slab	Concrete walls	Septic tank
Mesjid Agung Kabanjahe	Permanent pour-flush toilets	Prefabricated concrete slab	Concrete walls	Septic tank
KWK Berastagi	Permanent pour-flush toilets; Temporary pour-flush toilets	Prefabricated concrete slab; Prefabricated plastic slab	Concrete walls; Fiberboard	Septic tank

Source: Observations, Camp Coordinators

Some institutions such as the Public Works Department and PT. Angkasa Pura (a state enterprise of the Indonesian Department of Transport responsible for the management of airports and air traffic services) provided supplies such as cooking utensils, tents, and bathing and toilet facilities to name a few. The Indonesian National Board for Disaster Management (BNPB) then determined the locations to deploy the supplies. The installation of toilets was done by the evacuees, assisted by the local army. In locations where the toilets provided may not be enough, additional toilets were built with walls made out of bamboos and tarps or wood and iron sheeting.

Photograph 1. Toilets provided by Public Works installed in Tiganderket

Photograph 2. Additional Temporary Toilets in KWK Berastagi

Photograph 3. Permanent Toilet Facility in Church (Klasis GBKP Kabanjahe)

Photograph 4. Temporary Toilets in UKA Kabanjahe 1

Key issues of toilets faced

The toilets that were installed in the camps generally did not meet the minimum standards for excreta disposal in disaster areas. Table 3 shows the minimum standard to the facilities available in each camp. The Sphere Guidelines has several indicators for assessing emergency excreta disposal (Reed, 2013):

1. Coverage
2. Locations of the Toilets
3. Privacy and Security
4. Hygiene
5. Vulnerable Groups

Table 3. Minimum service levels for excreta disposal in camps

Coverage	Toilet locations	Privacy and security	Hygiene	Vulnerable groups
20 people per cubicle 3:1 female to male cubicle ratio	Less than 25m one way walking distance At least 6m from a dwelling	Doors lockable from inside Latrines to be illuminated at night where necessary Provision made for the washing and drying of menstruation cloths where necessary	Handwashing facilities with soap supplied near to all toilets Appropriate materials for anal cleansing to be provided	Adequate latrines should be accessible to disabled people, the elderly, the chronically sick and children

Source: Reed, 2013

The coverage or number of people per toilet in all the locations visited did not meet the minimum requirement of 20 people per toilet. Queues could be observed, especially in locations where coverage far exceeded 50 people per toilet. There was only 1:1 female to male cubicle ratio for all camps, which did not meet the requirement of 3:1 female to male minimum standard ratio. In most cases, people chose to try to avoid long queues by using toilets at different times of the day or at night. Another option—especially in cities—was to use toilet facilities in nearby shops or restaurants.

Generally the toilets are fairly close to the dwelling, most within the distance of less than 25 meters. In huge camps such as UKA Kabanjahe 1 and UKA Kabanjahe 2, the distance was further. In UKA Kabanjahe 1, interviewees stated that the nearest toilet was within 50-100 meters from dwellings. In UKA Kabanjahe 2, the nearest toilet was within 25-50 meters from dwellings. Due to the huge population of the camps, the space for toilets were limited.

Most toilets in the camps had doors that could be locked from the inside. For some temporary toilets, no lighting was provided. Therefore, toilet usage became problematic at night. Handwashing facilities were not observed, although soap may have been provided personally by toilet users. Toilets were generally accessible to children and elderly, although some had steps, making it difficult for disabled people to use them.

Water plays a vital role in sanitation in Indonesia. Where people were staying in public buildings, water was generally already available. Where existing water supply facilities were insufficient, distribution was also typically assisted by water trucks. Water trucks would arrive every few days, depending on the location of shelters and the population in the settlement.

Lack of continuity of water supply was a concern. Water is important for bathing, washing, and anal cleansing. Interviewees stated they refused to use the toilet if no water was available. People would put extra effort in order to secure the water supply. For instance, a few villagers from a site in Kabanjahe had no option but to travel to a nearby location in order to wash their clothes, since water supply was prioritized for cooking, bathing, and anal cleansing. They considered this inconvenient, time-consuming and expensive because money had to be spent on public transport. In a tent settlement in Tiganderket sub-district, evacuees relied heavily on water trucks for water. In the event of water shortage, evacuees were forced collect water from the irrigations channels of the nearby fields. This did not amount to a lot of water, and its water quality was also inadequate. The water was usually used for cleaning the toilets, so that the limited clean water could be allocated for consumption. Some camps visited suggested that installing water pumps would be very helpful in providing a dependable water source that did not rely on water trucks. Since water is important for cleansing, monitoring water supply should be a priority in order to promote hygiene among the people in camps.

Toilets were not properly maintained. Some evacuees claimed that in their camp, the residents worked together to maintain the toilets. However, it was observed that the toilets were generally not cleaned properly. People also seemed to have little consideration toward cleanliness, since rubbish could be found around toilet areas. The rubbish could potentially clog drainage channels, causing flooding and odour. The cleaning tools necessary for proper toilet maintenance were not adequately provided.

Conclusions

Observations and interviews conducted in the camps highlighted a series of issues, particularly with toilet coverage, cleanliness, and water supply. The need to use water for anal cleansing brings additional challenges for excreta disposal, especially with respect to the supply of water and maintaining cleanliness. Toilet designs for such situations should focus on being compatible with water-based systems. Monitoring water supply should be a priority for hygiene promotion. Additional toilets should be installed if feasible in order to prevent long queues. Cleaning tools should be provided and regularly supplied to the camps. The people residing in the camps should be better organized so that maintenance of toilets will be more effective and efficient.

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