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Invited Viewpoint

Managing disasters amid COVID-19 pandemic: Approaches of response to flood disasters

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ABSTRACT

The world faces difficulties managing disasters while making efforts to slowing the spread of COVID-19. The paper aims at proposing policies and approaches to manage dual disasters of flooding and COVID-19. It reviews on-going efforts of organizations in the humanitarian assistance, water and sanitation, disaster management and health sectors. Based on review works the policy was recommended. The objective of the policy is to protect human life, in particular, vulnerable groups, from the human security perspective. Local organizations and communities play an important role in disaster management, and risk information supported by scientific knowledge is essential. As the experience of disaster management shows, various organizations including health and water should be coordinated to conduct measures.

1. Introduction[1]

The world faces difficulties managing disasters while making efforts toslowing the spread of COVID-19. Cyclone Harold hit Pacific countries during the COVID-19 emergency in April 2020. In Canada, Manitoba Province and Ottawa City fought against flooding caused by snow melting while protecting response workers from COVID-19 [1]. In Japan, local governments suspended receiving volunteers in February 2020 who had been engaged in rehabilitation works in areas devastated by Typhoon Hagibis in 2019, delaying recovery from the disaster [2]. In Bangladesh, humanitarian assistance and government organizations prepared for cyclones as well as a COVID-19 outbreak in the densely crowded camps in Cox' Bazar, which shelter some 900,000 Rohingya refugees [3].

New approaches need to be established to respond to disasters while managing the COVID-19 pandemic. Flood disasters are happening in countries and cities even under COVID-19 pandemics [4]. Improper response to flooding would spread COVID-19 and increase disaster damage, leading to further human losses and economic damage. Response activities without social distancing may spread COVID-19 among staff members of disaster management. If COVID-19 measures are overdone, flood response may be inadequate to decrease damage. Urbanization and development activities have increased flood risks by accumulating assets and the population in at-risk areas, such as low-lying areas and steep slopes in urban areas [5,6]. The communities in these risk areas are vulnerable to COVID-19 as well [7].

The paper aims at proposing policies and approaches to manage dual disasters of flooding and COVID-19. It reviews on-going efforts of organizations in the humanitarian assistance, water and sanitation, disaster management and health sectors. Based on the review works, this paper proposes policies and approaches.

2. Efforts strengthening disaster management

Various organizations initiated to strengthen disaster management systems by applying practices and experiences to respond to COVID-19 and to modify their approaches of responding to disasters under the COVID-19 pandemic. This section reviews revised standards and procedures for humanitarian assistance, water and sanitation, disaster management, health sectors as well as practical response to disasters on the ground.

2.1. Using practices to response to COVID-19

(i) Human Security: COVID-19 threatens people's survival, well-being, or dignity; as well as human security [8–10]. Organizations concerned can increase their capacity to respond to the protection and empowerment of people by adopting the human security approach. The approach

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secures both freedom from want and freedom from fear through responses at multiple local and international levels [11,12].

(ii) Sphere Standard: Sphere and its partner standards provide the guidance of applying humanitarian standards in response to COVID-19 [13]. The Sphere Handbook and the other Humanitarian Standards Partnership initiatives are widely accepted as general guidance for humanitarian responses [14]. In the Sphere Handbook, the water, sanitation, and hygiene (WASH) and health chapters are relevant to the response to COVID-19. This handbook covers the approaches of promoting hygiene measures, establishing health systems and controlling communicable diseases. Furthermore, additional guidance sets out the following three principles:

(a) Human dignity: Respect for human dignity is fundamental to response operation. When people are afraid of being stigmatized for having COVID-19, they may hide the illness to avoid discrimination.
(b) Community engagement: Hygiene promotion with a focus on handwashing and social distancing requires full engagement of communities. Appropriate risk information is critical to avoid rumors and misinformation.
(c) Other needs: Response operations should cover other needs of the affected people and the long-term needs of the wider population.

(iii) Sendai Framework for Disaster Risk Reduction (SFDRR) and health-emergency disaster risk management (Health-EDRM) framework: SFDRR complements the international health regulations by integrating infrastructure, climate change, and economic considerations into policies and plans to mitigate the threats to the health of the global population [15]. SFDRR was adopted by UN member states at the World Conference on Disaster Risk Reduction held in Sendai in 2015 and provides a roadmap to show how communities can become safer and more resilient to disasters [16]. To implement SFDRR, the Health-EDRM framework has emerged to bring together diverse stakeholders and strengthen health and DRR efforts. These stakeholders are engaged in emergency and disaster medicine, disaster risk reduction, humanitarian response, community health resilience, and health systems resilience [17,18].
Djlante and Shaw propose measures to strengthen responses to COVID-19 by applying SFDRR, in particular knowledge generated from the Health-EDRM framework. Current mechanisms and strategies for disaster resilience have the potential to enhance the responses to the COVID-19 pandemic by providing scientific knowledge in understanding risks, strengthening risk governance and enhancing community-based activities [19**].

(iv) Water and Sanitation: Frequent and appropriate hand hygiene is one of the most important measures to prevent infection with the COVID-19 virus. WASH experts and organizations are expected to use their capacities and experience to carry out a wide range of activities. They can (i) promote and facilitate good hygiene practices, (ii) maximize access to safe drinking water and sanitation services, (iii) ensure that vulnerable populations receive priority attention and (iv) protect water and sanitation workers [20,21].

(v) Great East Japan Earthquake and Tsunami (GEJE): The experience of infection control following GEJE in 2011 would help in the response to COVID-19. The Japanese Society for Infection Prevention and Control reviews the measures of infection control during the tsunami disaster. Sakurai emphasizes the following knowledge is needed [22]:

(a) clear objectives for infection control
(b) standard and route-specific precautions
(c) ability to identify the chain of infection
(d) roles of national and local governments
(e) transmission of diseases
(f) types of infectious diseases

2.2. Response to disasters under the pandemic

Disaster management organizations are required to take measures to control the spread of COVID-19 and need additional measures to disaster management. These measures become inefficient and costly for mitigating damage and lead to delays, compared with the current ones.

(i) Humanitarian assistance: UN organizations for humanitarian assistance recognize that an inclusive approach of protecting every individual's rights to life and health is crucial in curbing the spread of the COVID-19 virus among refugees and migrants [23]. They are disproportionately vulnerable to exclusion, stigma, and discrimination. The Inter-Agency Standing Committee provided guidance notes for operations in camps and camp-like setting in relevant areas covering mental health and psychosocial aspects, food distribution, protection from sexual exploitation and abuse, gender issues [24]. The committee is a high-level leadership committee for making decision and strategy of humanitarian response and consists of the heads of 18 UN and non-UN organizations. The member organizations of the committee estimate US$2 billion for additional funds to humanitarian response to the COVID-19 pandemic for nine months from April to December 2020 [25].

(ii) Cyclone in Pacific: International Federation of Red Cross and Red Crescent Societies developed an emergency action plan to prepare for Cyclone Harold, which hit Pacific countries in April 2020 [26]. This plan covers multiple scenarios that consider travel restriction in the Pacific and the World. In the worst-case scenario of major damage, international support would have been provided. Also, the plan assesses the risks of (i) delay in support because of travel restriction, (ii) increased demand for hygiene kits, and (iii) raised fear among the population on widespread of the COVID19 due to any incoming resources.
The logistics of relief items became complicated. The Vanuatu Government eased restrictions on cargos of international relief suppliers while still imposing COVID-19 control measures [27].

(iii) Flooding in Canada: Manitoba Province, which fought against flooding caused by snow melting in April 2020, recommended methods for safe sandbagging and installing emergency barriers to ensure the safety of response workers. For example, workers repeatedly put soil into sandbags, carry and place them on the dike, while securing social distancing with two meters in the form of a carousel [1].
Ottawa City established a separate team to deal with flooding as the city responded to the COVID-19 pandemic. The city government asked organizations concerned and the public to follow COVID-19 restrictions by practicing physical distancing and conducting any work with five people or fewer [28].

(iv) Flood disasters in Japan: Typhoon Hagibis damaged throughout the country in October 2019, but a shortage of volunteers affected the early recovery process. Local governments suspended receiving volunteers as a measure to prevent spreading COVID-19 in February 2020 [2]. Volunteers, who usually came from unaffected areas using their weekends and paid leaves, assisted local communities in rehabilitating their lives affected [29]. Some 200,000 volunteers were, in total, engaged in rehabilitation works, such as cleaning debris from local communities and repairing houses [30]. The typhoon killed some 100 people, damaged more than 60,000 houses and inundated some 30,000 houses [31].
Kamogawa City in Chiba Prefecture requested residents to prepare for heavy rains while also taking COVID-19 measures in April 2020. These requests cover (1) to stay at friends' houses instead of evacuation centers, (2) to stay home as long as they can secure safety to avoid crowding evacuees at evacuation centers, and (3) take measures against COVID-19, such as wearing masks, at evacuation centers [32].

3. Policies and approaches needed to manage flood disasters amid the pandemic

Based on review works in the previous section, this section recommends a policy for flood disaster management amid the COVID-19 pandemic (Fig. 1).

(i) Integrate the concept of human security into new policy: New policy aims to strengthen the protection and empowerment of all people and leave no one behind. People have a right to live with dignity even in crises, and must always be involved in disaster management as Sphere Standard stresses [14]. This crisis is threatening human security, covering human life, livelihoods, and well-being.

(ii) Put a priority on protecting human life at evacuation centers and of disaster management staff: Government organizations, disaster management staff and local communities would face a trade-off between saving people from flooding and curbing the spread of COVID-19 [26,28].
Local governments should compare the risks of flooding with ones of COVID-19 to prepare evacuation. Against disasters on the scale of cyclones in Bangladesh or tsunamis in Japan, the governments should lift requirements of social distancing and encourage people to take shelter to avoid direct threats to human life on a large scale. Against inland urban flooding, however, the governments would be better to require people to stay home, since inland flooding unnecessarily threatens human life immediately. For evacuation for several weeks, if there were a risk of spreading COVID-19 at an evacuation center, the mortality ratio of evacuees would reach several percents under the worst-case scenario of crowded environment and limited health services.
Disaster managers should allocate resources to priority areas. New approaches require more resources of financing, human, material than ones before the COVID-19 era [3].
Local governments should ensure the safety of their disaster management staff. As Canada and Japan conducted, the governments should require staff and volunteers to secure social distancing during flood fighting and disaster management works to avoid exposing them to the risk of COVID-19 infection [1,2].

(iii) Focus on the vulnerable groups: Vulnerable groups require specific attention through a tailored approach in disaster management. They experience disproportionately the negative effects of disasters [24,33,34]. The elderly people suffer more from COVID-19 than younger generations. Informal settlers in densely populated urban slums are also vulnerable, since they live in crowded and poor houses and can access little service of WASH and waste management [7]. Local governments should enhance disaster management measures in health care facilities where patients or infected persons stay.

(iv) Engage local organizations and communities:
Local organizations' capacities for disaster management should be enhanced. This is because support from outside affected areas cannot be expected on the same scale as before the COVID-19 era, considering travel restriction and overstretching response operations throughout the world [26].
Local communities play key roles in fighting against disasters in the front line as SFDRR emphasizes [7,13,16]. They are engaged in sandbagging, supporting and managing evacuation, conducting search and rescue, etc. Also, hygiene promotion and social distancing in local communities are the most fundamental measures in reducing transmission of COVID-19 [21*].
Government organizations should support operations at the community level and strengthen the capacities of local communities. They should provide financial and technical support and necessary information [35].

(v) Risk communication with scientific knowledge: Risk information should be shared with local communities to engage them in response operation [36**]. Since knowledge of COVID-19 is limited, information sharing is crucial to avoid rumors and misinformation. Once the trust with local communities lost, engaging communities could become difficult.
Information shared must be supported by scientific evidence [37]. Scientists in health, water, and disaster management should be involved in policy and decision- making processes [19**].
Raising public awareness is the key to promoting community-based activities, such as hygiene promotion and social distancing. The experience of WASH experts would be useful for the implementation of public awareness campaigns [20].

(vi) Coordinate with multiple sectors, in particular, water and health: As Sphere emphasizes, water and health sectors are crucial in controlling the spread of COVID-19 while managing disasters [13*]. Disaster management mechanisms can be useful to coordinate various sectors [19**]. The platforms of coordinating various organizations have been established to manage disasters at the national and local levels [38].

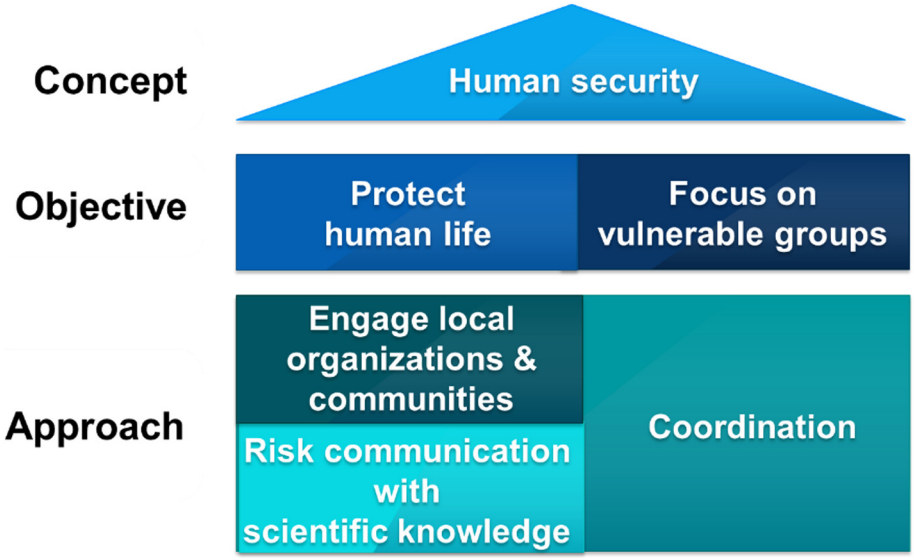

Fig. 1. Policy of managing flood disaster amid COVID-19 pandemic Source: Author.

4. Conclusion

Spreading COVID-19 started disrupting flood response in Japan, Canada, and Pacific countries. Organizations concerned in disaster management, water, humanitarian assistance, and health have provided guidelines and approaches to respond to COVID-19. This paper reviews these and recommends a new policy for managing flood disasters in the face of the COVID-19 pandemic. The policy was developed by restructuring and enhancing existing measures and practices identified by the review works in sectors concerned. The policy aims to protect human life, in particular, vulnerable groups, from the human security perspective. Local organizations and communities play an important role in disaster management, and risk information supported by scientific knowledge is essential. As the experience of disaster management shows, various organizations including health and water should be coordinated to conduct measures.

Further works are expected to examine detailed actions according to local conditions. Also, research works are needed to prepare for other disasters, such as droughts, heatwaves, and earthquakes, in the mid of the COVID-19 pandemic.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Mikio Ishiwatari is a Section-Editor on Progress in Disaster Science. This manuscript was handled by a different Editor, with Mikio Ishiwatari blinded from the paper handling and peer-review process.

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