

## How to improve climate change adaptation in small and remote communities in Iceland



### Key recommendations

- Review of the volunteering system regarding preparedness, response, and recovery.
- Encourage regular desk exercises in the Civil Protection and Emergency Management Committees at municipal level.
- Raise local awareness of climate related hazards and the implications within remote communities.
- Increase coordination amongst first responders through regular training exercises aimed at natural hazards.
- Improve the early warning system.
- Based on risk assessments, decisions on avalanche barriers should be taken at governmental level and be fully funded.

## **Climate change adaptation in Iceland**

The fourth assessment report from the Scientific Committee on Climate Change in Iceland found that climate change has already had significant impact on nature and environment, such as receding of glaciers, hydrology, land-, and marine ecosystems. The report highlights that increased risk of natural hazards should be considered to a greater extent in planning. Adaptation and response to climate change will be challenging as it will impact both social and built infrastructure as well as culture [1]. A white paper on climate change adaptation [2] and an action plan [3] was published by the government in 2021, and a report published in 2023 by the Ministry of Environment, Energy and Climate focused on suggestions for a national plan on climate change adaptation [4]. It's therefore clear that policy making surrounding climate change adaptation is ongoing.

### **Small and remote communities**

Iceland has only two government levels, state and municipal. The municipalities are tasked with ensuring the safety of the inhabitants. The only municipality we found to have published a report on climate change adaptation in their community was Reykjavik [5]. The reality is that most municipalities in Iceland are both small in terms of population numbers and categorized as remote. Municipalities are most often coastal communities with a resource dependent economy. These factors make it especially relevant to take into consideration the context surrounding small and remote communities in Iceland when policy on climate change adaptation is being considered under increasing risk of natural related hazards.

### **Policy recommendation 1: Review of the volunteering system**

As Iceland does not have an army, the country relies on so-called search and rescue squads (ICE-SAR) for preparedness, response, and recovery, as well as the Red Cross, which are mostly based on voluntary participation.

An over-dependence on volunteers for preparedness, response, and recovery in Iceland in terms of crisis management, can have implications for security in the long run. Following back-to-back events in the country since 2019 with extreme weather events, landslides, avalanches, wildfires and volcanic eruptions on top of the covid-19 pandemic, the ICE-SAR is already publicly sounding alarms that the volunteering system is at its limits. The capacity of the current response system in Iceland could potentially be threatened if two simultaneous events occurred.

### **Policy recommendation 2: Encourage regular desk exercises in Civil Protection and Emergency Management Committees**

The Department of Civil Protection and Emergency Management should provide all relevant municipal committee members training upon appointment, in addition to a protocol for holding 'desk exercises' to increase preparedness against natural hazards.

According to law on Civil Protection and Emergency Management in Iceland, municipalities should form and appoint members to a Civil Protection and Emergency Management Committee following municipal elections. It is up to each municipality to choose the size of the committee, and many of them choose to collaborate with neighboring municipalities to form them.

Therefore, even though there are 72 municipalities in Iceland, there are 21 such committees spanning over 9 police districts [6]. The committees should hold a meeting at least twice per year, but that is not always the case. To increase support for the committees to carry out their legal duties, further training by The Department of Civil Protection and Emergency Management should be provided to appointed members, as well as a protocol for 'desk exercises'. Those exercises should be designed to allow committee members to go through the response protocols in case of a natural hazard related event, go through the list of contacts involved, and update contact information if needed. Doing so would increase coordination amongst committee members and therefore enhance preparedness.

### **Policy recommendation 3: Raise local awareness of climate change related hazards and their implications**

To raise awareness amongst inhabitants, with emphasis on newcomers and foreigners in the community, emergency plans and risk assessments need to be accessible and communicated effectively by authorities.

Civil Protection and Emergency Management Committees at the municipal level are responsible for carrying out risk assessments as well as emergency plans in cooperation with the Department of Civil Protection and Emergency Management, which provides guidelines [7,8]. Those risk assessments and emergency plans need to be regularly communicated in an efficient and structured manner to all inhabitants, with emphasis on newcomers and those of foreign origin. This needs to be done in a

thoughtful manner to avoid scaring people, but still provide inhabitants with the relevant information to raise awareness to enhance community preparedness.

### **Policy recommendation 4: Increase coordination amongst first responders through regular training exercises aimed at natural hazards**

No mandatory and large-scale training exercises aimed at response to natural hazards take place in Iceland.

Icelanders often refer to their systems being reactive rather than proactive. The same applies to the emergency management system. The only regular and large-scale training exercises for first responders are held every four years and are related to airplane crashes, which are a mandatory requirement for maintaining operating licences for all airports in the country. Considering the increased risk of natural hazards, regular training exercises aimed at such risks need to be held with local and regional first response teams, with support from the Department of Civil Protection and Emergency Management. That would enhance community preparedness, as it provides a platform for first responders to meet in person, train response efforts and coordination.



## Policy recommendation 6: Improve the early warning system

With increased infrastructure for cell phone service and 5G in Iceland, an early warning system for natural hazards should be developed and made a standard for preparedness.

With increased coverage of cell phone reception and 5G access point in Iceland, the country should be making better use of text messaging to alert those nearby a location with a raised hazard level. This has been done to a certain extent, for example to alert about increased likelihood of a volcanic eruption in the Reykjanes peninsula, as text messages are sent to all cell phones in the area. Making this part a standardized part of preparedness against increased risk of a natural hazard would raise awareness of the risk, not only among the inhabitants in the area in discussion, but also towards other groups in the area, such as tourists. In addition, it might be advisable to consider the use of artificial intelligence for early warning systems, modelling, and the identification of risk areas. International examples for such applications exist in flood forecasting.

## Policy recommendation 6: Based on risk assessments, decisions on avalanche barriers should be taken at governmental level and be fully funded.

Today municipalities can request avalanche barriers followed a risk assessment carried out by the MET office and funding is mostly covered by government funds.

As the MET office carries out avalanche risk assessments in municipalities, the

need for avalanche barriers to protect residential housing might be identified. Following that, the municipality in question must then send an official request for avalanche barriers to the government, that has a special fund for such projects. However, the government funds do not cover the full costs of the construction and the fund is limited. Therefore, considering the growing financial difficulties experienced by municipalities in Iceland, there is a chance that they will refrain from requesting the construction if they deem that they do not have financial capacity to take it on. Therefore, it is advisable that both the decision and funds for building avalanche barriers come from the government.

### References

- [1] Vísindanefnd (2023) Ágrip. Í skýrslu nefndarinnar: Halldór Björnsson, Anna Hulda Ólafsdóttir, Bjarni Diðrik Sigurðsson, Borgný Katrínardóttir, Brynhildur Davíðsdóttir, Gígja Gunnarsdóttir, Guðfinna Th. Aðalgeirsdóttir, Guðjón Már Sigurðsson, Helga Ögmundardóttir, Hildur Pétursdóttir, Hlynur Bárðarson, Starri Heiðmarsson og Theódóra Matthíasdóttir. (2023). Umfang og afleiðingar hnattræna loftslagsbreytinga á Íslandi. Fjórða samantektarskýrsla vísindanefndar um loftslagsbreytingar. Veðurstofa Íslands
- [2] Stjórnarráð Íslands (2021). Hvítbók um aðlögun að loftslagsbreytingum: Drög að stefnu. Accessed 05.03.2024 via [Hvítbók um aðlögun að loftslagsbreytingum.pdf](#) (stjornarradid.is)
- [3] Stjórnarráð Íslands (2021). Í ljósi loftslagsvárs: Stefna um aðlögun að loftslagsbreytingum Accessed 05.03.2024 via [Í ljósi loftslagsvárs.pdf](#) (stjornarradid.is)
- [4] Stjórnarráð Íslands (2023). Loftslagsþolið Ísland: Tillögur fyrir gerð landsáætlunar um aðlögun að loftslagsbreytingum. Accessed 05.03.2024 via [Loftslagstholid\\_Island\\_rafraen\\_skyrsla.pdf](#) (stjornarradid.is)
- [5] Reykjavíkurborg (2015). Skýrsla starfshóps um aðlögun vegna loftslagsbreytinga. Accessed 05.03.2024 via [Skýrsla starfshóps um aðlögun vegna loftslagsbreytinga](#) (reykjavik.is)
- [6] Almannavarnarnefndir | Almannavarnir
- [7] Almannavarnardeild Ríkislögreglustjóra (2021). Leiðbeiningar fyrir greiningu á áhættu og áfallaþoli í sveitarfélagi. Accessed 09.03.2024 via [Leiðbeiningar-fyrir-greiningu-á-áhaettu-og-áfallatholi-í-sveitarfélaginu\\_051121\\_lokaútgáfa.pdf](#) (almannavarnir.is)
- [8] Almannavarnardeild Ríkislögreglustjóra (2019). Greining hættusviðsmynda 2019: Dæmi um greiningar. Accessed 09.03.2024 via [Microsoft Word - Greining hættusviðsmynda\\_loka\\_okt\\_2022](#) (almannavarnir.is)