



Residents' views of volcanic risk in southern Iceland – a preliminary analysis



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Introduction

Volcanic risk mitigation strategies have been revised by scientists, regional police and local rescue teams, in conjunction with Almannavarnir (Icelandic Civil Protection Office), for communities to the east and south of the Mýrdalsjökull ice cap. This is because the Katla volcano (Fig. 1), which underlies Mýrdalsjökull, is thought to be in an agitated state (Sturkell et al., 2008) and overdue for an eruption. In addition to catastrophic jökulhlaup, Katla eruptions produce heavy tephra fallout and lightning hazards in communities up to 30 km from the eruption site (Larsen, 2000) and have triggered small coastal tsunami during past events (Guðmundsson et al., 2008). The revised evacuation plan was tested during a full scale exercise on 25 March 2006 in the communities of Sólheimar, Vík, Álftaver and Meðalland.

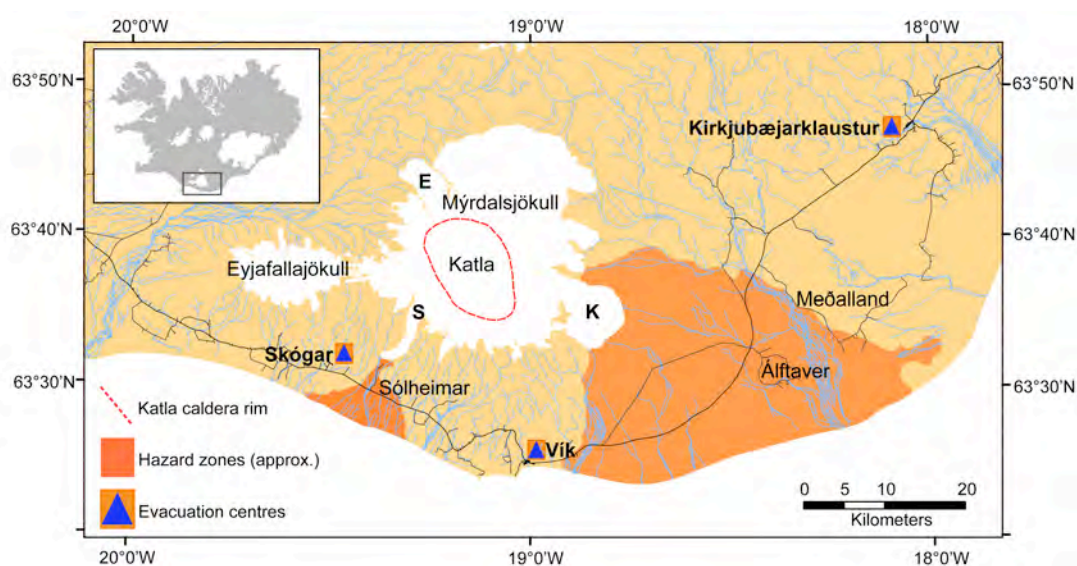


Figure 1. The jökulhlaup hazard zone to the south and east of Mýrdalsjökull. This map and the newly developed evacuation plan are based on a report by Guðmundsson and Gylfason (2005).

During a future Katla eruption houses located in Sólheimar, Álftaver and Meðalland are to be evacuated due to jökulhlaup hazard while houses in the low lying coastal area of Vík are to be evacuated due to tsunami hazard. The jökulhlaup hazard zones are determined to be the maximum flood area for a catastrophic jökulhlaup. Residents in Sólheimar are instructed they have 15 minutes to prepare before evacuating to Vík. Residents in Álftaver and Meðalland are instructed they have 30 minutes to prepare before evacuating to Kirkjubæjarklaustur. Residents in Vík are instructed they have 30 minutes to prepare before evacuating to their local evacuation centre located on higher ground. Residents will be notified of an eruption via a text message sent to their mobile phone or a recorded message called through to the landline. Members of local rescue teams have volunteered to 'sweep' their areas to ensure everybody has received the evacuation message and obeyed orders.

In 2004 Jóhannesdóttir (2005) investigated risk perception, preparedness and views on mitigation strategies with respect to the previous plans which were developed in 1973. Open, in-depth interviews were conducted with residents from Álftaver and Vík and the results showed that all residents demonstrated some knowledge of past Katla

eruptions but many believed that Katla was no longer active. Despite having knowledge of the existing plan residents had not adopted personal preparedness measures. Residents in Vík were more confident in the plan than those in Álftaver. This was because residents living in Álftaver did not consider the plan or communication strategies suitable for the farming region (Johannesdottir and Gísladóttir, 2008). Similarly, results from a questionnaire survey which focused on the newly developed plan showed that residents living in farming communities located in the hazard zone to the west of Mýrdalsjökull were also dissatisfied with evacuation and communication strategies (Bird et al., 2009).

Due to the revised risk mitigation strategies for the hazard zones to the south and east of Mýrdalsjökull we believed it was necessary to reassess residents' knowledge and perception of Katla, volcanic hazards and their views of the evacuation plan and exercise. The aim of this report is to present the preliminary results of our investigation. A full analysis of the results is in preparation.

Methods

Face-to-face survey interviews were conducted with local residents from April to September 2008. We endeavoured to sample one key decision maker from every permanent household located in the hazard zone. Initial contact was established by phone or by direct approach (i.e. door knocking). A total of 66 interviews were conducted with residents. This involved 9 of 10 permanent households in Álftaver, 5 of 8 permanent households in Meðalland, 5 of 6 permanent households in Sólheimar and 47 of 62 permanent households in Vík. A 77% response rate was achieved. Reasons for not participating in the survey were due to health issues, unavailability at the time of interviewing or lack of interest.

Based on the questionnaire used by Bird et al. (2009), our instrument consisted of five sections with a total of 53 open and closed format questions. Section topics were as follows:

1. Participant demographics
2. Knowledge and perception on Katla, jökulhlaup (for Álftaver, Meðalland and Sólheimar residents) or tsunami hazard (for Vík residents) and emergency procedures
3. Perception of emergency communication and the evacuation plan
4. Personal use of media sources for acquiring hazard information
5. Perception of preparedness for a future Katla eruption, perception of the possibility of a future Katla eruption and its effects and, level of trust in information from various sources about a future Katla eruption.

An electronic copy of the questionnaire is available from the lead author on request.

Results

Preliminary results for sections 1 to 4 of the questionnaire are presented in Tables 1 to 4 respectively. Results from section 5 of the questionnaire are presented in Figures 2 and 3. Comments recorded verbatim are bulleted and in italics.

Table 1. Participant responses to demographic questions. All data are given as a percentage. Some sections do not equal 100% due to rounding.

Participant Age	18 < 30 yrs 8	31 < 50 yrs 24	51+ yrs 68	
Region	Álftaver 14	Meðalland 8	Sólheimar 8	Vík 71
Number of generations lived in region	1st 26	2nd 8	3rd 21	4 th + 45

Table 2. Participant responses to knowledge and perception questions on Katla, jökulhlaup or tsunami hazard and emergency procedures. All data are given as a percentage. Some sections do not equal 100% due to rounding.

Can you tell me a brief history of Katla?	Correct 82	Incorrect 8	Don't know 11
Do you think your region can be affected by a jökulhlaup or tsunami?	Yes	No	Don't know
• Álftaver	100	0	0
• Meðalland	60	20	20
• Sólheimar	40	40	20
• Vík	53	34	13
Are you aware of the emergency procedures you need to follow if an eruption warning is issued?	Yes	No	
• Álftaver	100	0	
• Meðalland	100	0	
• Sólheimar	100	0	
• Vík	89	11	
What would you do if a warning is issued?	Obey	Other	Don't know
• Álftaver	33	66	0
• Meðalland	100	0	0
• Sólheimar	60	40	0
• Vík	91	6	2

Resident comments about Katla included:

- *I never think of Katla*
- *It is never a question of if Katla will come; it is a question of when*
- *We recognise Katla as a person - she is an unfriendly woman who is not welcome but we just have to deal with her when she arrives*

Table 3. Participant response to questions on emergency communication and the evacuation plan. All data are given as a percentage. Some sections do not equal 100% due to rounding.

Do you always carry your mobile phone with you?	Yes	No	
• Álftaver	56	44	
• Meðalland	20	80	
• Sólheimar	20	80	
• Vík	64	36	
Did you take part in the evacuation exercise?	Yes	No	Don't know
• Álftaver	78	22	0
• Meðalland	100	0	0
• Sólheimar	20	80	0
• Vík	64	32	4
If you did take part, how did you feel about the exercise?	Positive	Negative	Mixed
• Álftaver	50	0	50
• Meðalland	60	0	40
• Sólheimar	100	0	0
• Vík	90	0	10
Do you think the evacuation plan is appropriate?	Yes	No	Mixed
• Álftaver	11	89	0
• Meðalland	60	40	0
• Sólheimar	80	0	20
• Vík	91	4	4

Table 4. Participant responses to questions of personal use of media sources for acquiring hazard information. All data are given as a percentage.

Have you followed discussions in the media about natural hazards connected to a Katla eruption?	Yes	No
	92	8
From what forms of media do you access this information?		
• Newspaper	57	
• Radio	87	
• Television	82	
• Internet	26	
• Information brochures	21	
• Books	31	

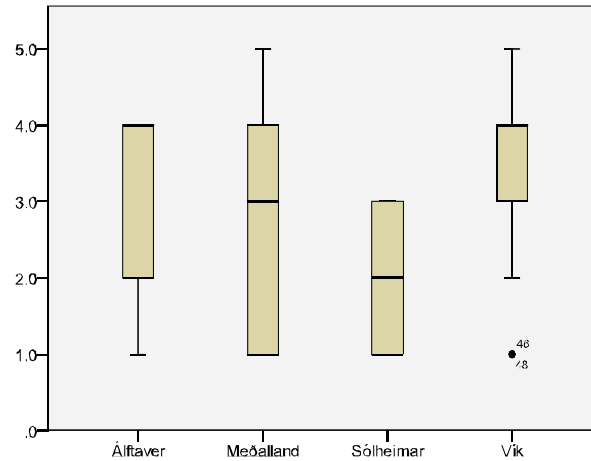


Figure 2. Resident responses to the question ‘How prepared do you think you or your family are to deal with a future Katla eruption?’ Answers are given on a scale ranging from 1 (not at all prepared) to 5 (completely prepared). Outliers are marked by a circle.

Resident comments regarding their personal preparedness included:

- *Nobody can be completely prepared and it would be false to say not at all*
- *Even though we have descriptions from previous eruptions we cannot say what will happen in a future eruption*
- *I never think about it*

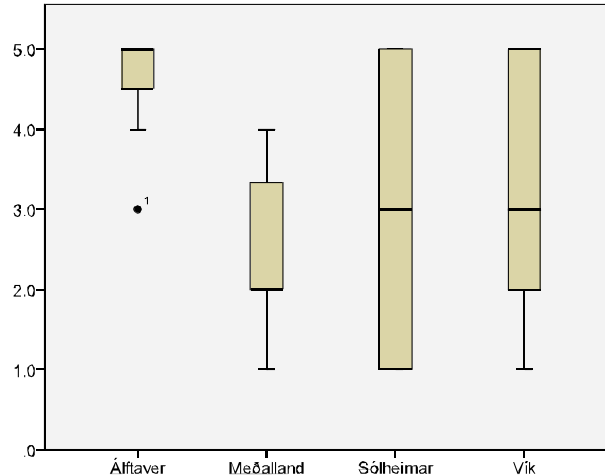


Figure 3. Resident responses to the question ‘How likely do you think your community will be adversely affected by the next eruption?’ Answers are given on a scale ranging from 1 (extremely unlikely) to 5 (extremely likely). Outliers are marked by a circle.

Resident comments regarding the possibility of a future Katla eruption and its effects included:

- *Katla, I never think about it*
- *It all depends how forceful the lady [Katla] will be*
- *It hardly needs a Katla eruption for this society to be adversely affected*

Further developments

To discuss the current state of Katla, a town hall meeting was held on 16 August 2008. Scientific presentations were given by members of VOLUME, Icelandic Meteorological Office, University of Iceland and the regional Chief of Police. The meeting was organised in conjunction with Almannavarnir and was attended by members of the local rescue teams, Red Cross, hut wardens working in the tourist region of Þórsörk and local residents.

Kötlusetur was organized to commemorate the 90th anniversary of Katla's last confirmed eruption. Held on 4 October 2008, presentations were given by the Mayor of Vík, University of Iceland, regional Chief of Police and Almannavarnir and Icelandic Maritime Administration.

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