



## Coping with storm surges on the Icelandic south coast: A case study of the Stokkseyri village



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### ABSTRACT

The low-lying village Stokkseyri is open to the North Atlantic Ocean and subjected to storm surges. The last surge experienced by the residents was in January 1990. Stokkseyri, as many villages in Iceland, has experienced extensive socio-economic changes during the past decades. Adopting a qualitative approach based on a focus group and in-depth interviews, the study investigates residents' perception of the communities' vulnerability, resilience and adaptation to the recurring natural hazards of the area and the impact of socio-economic changes in Stokkseyri thereon. The inhabitants were more resilient in the past during an era of strong community cohesion when the economy was thriving and network ties between the villagers were strong. They were able to use their own mitigation measures to adapt to the hazards. Despite the physical mitigation measures in the form of a breakwater and along with the residents trust in pre-warnings from the Icelandic Meteorological Office (IMO) and the Icelandic Civil Protection and Emergency Management (ICP), the changed socio-economic condition of Stokkseyri has undermined community coherence and thus increased vulnerability and reduced community resilience. The recent sign of diversified occupation, improved economy and individual residents' initiatives to facilitate sense of community will work towards reducing vulnerability and increasing resilience. Nonetheless, specific evacuation and emergency plans for the community is needed and appropriate hazard education must be applied. In order to develop successful mitigation strategies it must be placed in context of the specific society it aims to protect and incorporate both social and physical aspects of the hazard.

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### 1. Introduction

Being situated in the low pressure centre of the North Atlantic Oscillation the low lying coast of South Iceland is recurrently hit by storm surges. These floods are anticipated to increase in the future given predicted climate change scenarios of the IPCC (2007) and concurrent sea-level rise. Out of 54 coastal floods that caused damage in the 20th century in Iceland, 37 took place in the south (Imsland, 1992). Among the exposed coastal settlements is the low-lying village Stokkseyri in South Iceland, which is open to the North Atlantic Ocean (Figs. 1 and 2) and has experienced severe storm surges during the 20th century (Table 1). This village of ca. 500 inhabitants (Statistic Iceland, 2013) has moved away from being a thriving fishing village with its own service providers, to becoming dependent on the town Selfoss (15 km away) and the capital

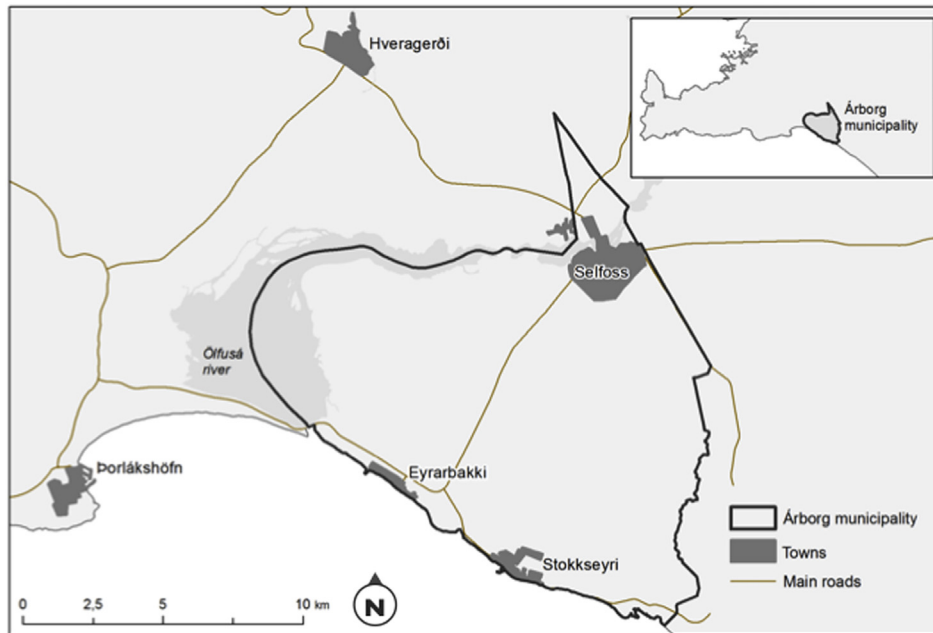
Reykjavík (65 km away) for both services and employment. Despite the relatively high risk of storm surges, mitigation strategies, such as evacuation and communication plans, are not in place for the village (Jóhannesdóttir personal communication, February 2011; Ríkislögreglustjórn Almannaþingardeild, 2011a). The vulnerability, coupled with the socio-economic changes that have occurred in the village during the past decades increases the importance of effective mitigation strategies, namely evacuation and communication plans, in order to increase community resilience. A key component of the latter concerns ensuring communities and their members are well prepared.

Therefore, the main aim of this study is to explore the views of the inhabitants in Stokkseyri to storm surges and to investigate, in a non-representative qualitative manner, residents' perception of the communities' vulnerability, resilience and adaptation to storm surges, and the impact of socio-economic changes thereon.

Hazard mitigation strategies typically focus on the physical attributes (e.g. the magnitude, frequency and on engineering and building design), but do less extensively consider the meaning this

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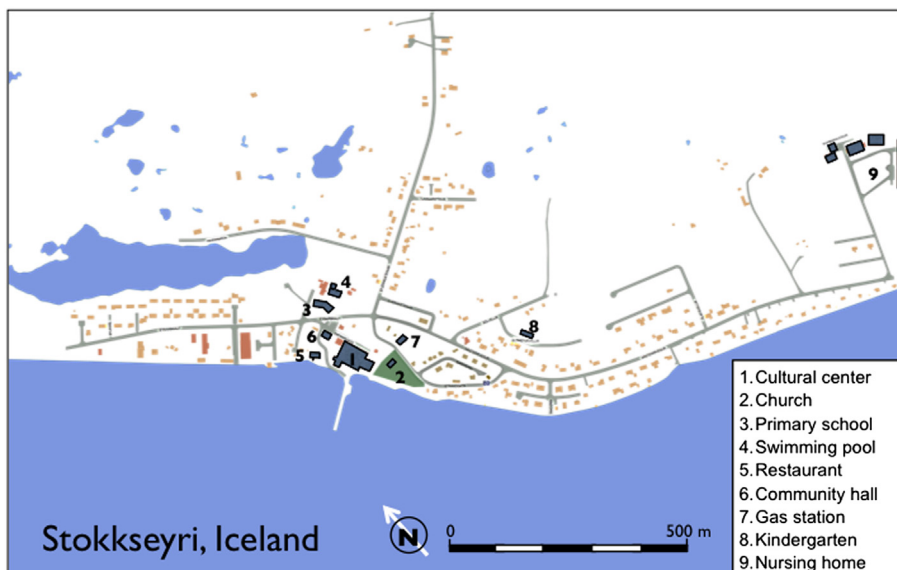


**Fig. 1.** The municipality of Árborg and the nearby town/village of Hveragerði and Þorlákshöfn. The position of the municipality within south–west Iceland is shown on the inserted map.

has for people and its relationship to risk reduction behaviour. Incomplete understanding of the factors that influence individual and societal preparedness, and of how they react to outreach activities prior and during the crises, may therefore be a barrier to hazard readiness. The importance of this relationship is reinforced by the fact that technological mitigation measures that increase perceived safety may lead to overconfidence and risky behaviour (Adams, 1995). Equally, the dissemination of scientific information by experts within evacuation and mitigation outreach programmes that concentrate on delivering accurate information to the public without considering how the recipients will react to the information or whether they will adapt to it in the future (Bird et al., 2011; Jóhannesdóttir and Gísladóttir, 2010), may reduce the perceived

need for preparedness. To reduce risk associated with disaster a thorough approach in which social investigations complement physical assessment has therefore been recommended (Barclay et al., 2008; Bird and Gísladóttir, 2012; Bird et al., 2011; Chester et al., 2002; Cronin et al., 2004; Dibben and Chester, 1999; McFadden et al., 2009; Mileti et al., 2004; Paton et al., 2008; Tobin, 1999).

Community structure and community coherence may impact on communities' vulnerability and resilience to hazards and risks. Instead of reducing vulnerability and increasing resilience, social, economic and cultural disparity of people and communities may have opposite impacts (Bird et al., 2011; Blaikie et al., 1994; Cutter, 1996; Cutter et al., 2003; Murphy, 2007; Paton and Johnston, 2001;



**Fig. 2.** The village of Stokkseyri. Adapted map from Sveitarfélagið Árborg, 2008.

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