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Sense-making for anticipatory adaptation to heavy snowstorms in urban areas

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ABSTRACT

This paper takes a case of Xavier snowstorm of March 15–16, 2013 in two Belarusian cities of Minsk and Mahilioŭ, and uses it to demonstrate how failures in communication in organisation hamper adaptation to an extreme weather event even in such a snow-proof society as Belarus. Highly hierarchical governance by the state causes a number of institutional misfits and interplays resulting in major implementation and decision making deficits; for the same reason governmental organisations have limited capacity to learn and prepare for future adaptations. Non-state actors were reluctant to take pro-active approach on the phase of post-disaster sense-making, although they demonstrated strong leadership and selforganisation during the storm. Except generic governance issues in Belarus, this also can be due to mal-resilient institutional legacies lasting from USSR times.

1. Introduction

Cyclone Xavier, of March 15–16, 2013, will be memorable in Belarus for its impact on the country's infrastructure. Although Belarus and its cities are generally well prepared for snowfall, failures of communication during this powerful snowstorm shut down traffic within two of the country's most important cities, Minsk and Mahilioŭ. The forecast for the storm was issued on time and it was correct, however, the broader public and other parties concerned did not take this communication as a signal to change their usual routines and prepare. As a result, hundreds of thousands of people could not get back home for hours and often had to walk, not properly dressed, kilometres through a snowstorm. Thousands of car and bus drivers suddenly found themselves (and their vehicles) stuck in snow piles 1–2.5 m high. Those driving through open spaces on the outskirts of the city and peri-urban areas often could not even abandon their cars. Depending on their luck, patience and survival skills, many of them spent several hours or the whole night on crowded roads, side by side with other stuck vehicles.

Although the national economy and local communities did not suffer any major losses, and adverse events with greater salience regularly occur in Belarus (e.g., catastrophic floods in the southern part of the country) (Areshka, 2013), this was the first time that major cities, including the capital district, were affected. As a result, every single move of the state emergency response services was recorded, discussed and judged in the media and social networks, while the snowstorm, post-disaster recovery and follow-up remained a headline issue in the national media until the end of 2013. Judgements varied from

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relatively kind remarks that the state emergency response services could do much better, to harsher criticisms that they were almost paralysed. Positive assessments came only from government officials and from spokespersons of the services.

In Belarus, with its highly hierarchical governance, the national government is self-marketed and generally seen as able to guarantee security and stability with no help needed from non-governmental agencies. In this situation, the capacity of the government to provide security was seriously questioned by the public, while informal networks and self-organisation were recognised as extremely successful. This is an idea usually promoted by the international literature on local adaptation and resilience (Olsson et al., 2004; Folke et al., 2005), but highly atypical for Belarusian society. In response to this, government representatives, including the president, promised to take seriously the lessons of Xavier, and indeed, by the end of 2013, all the governmental bodies and agencies concerned issued press releases about meetings, extra drills and many other preparations being made to address heavy snowfall and snowstorms.

We are examining this case for the following reasons: (1) it clearly demonstrates the weaknesses and strengths of a top-down governance system (although a well-functioning one) in the face of an extreme weather event, and (2) it portrays vulnerability and adaptation issues that remain relatively unexamined, such as post-disaster sense-making for future adaptations (Linnenluecke et al., 2012) and the cultural and political factors of anticipatory adaptation in general (Adger et al., 2012; Granderson, 2014).

Aiming to explore the limits to anticipatory adaptation under the governance model existing in Belarus, this paper explores how disaster response governmental agencies and the broader society in Belarus took the lessons from Xavier, and whether the adaptive capacity of the affected communities was actually strengthened as a result. Our paper is guided by the following questions:

- What was the weakest component of the governance system that caused the failure of government agencies during the snowstorm?
- What was the actual learning impact of Xavier and how well was the sense-making process organised and supported?
- Given the reportedly good performance of non-state actors during the snowstorm, how does it compare with governmental agencies during the recovery and post-disaster sense-making stages (with implications for the anticipatory adaptations and adaptive capacity)?

To address these questions, we begin with a brief introduction into the research context, and offer an overview of the concepts and approaches used to understand and analyse adaptive capacity and governance for resilience and adaptation. Building on this context, we explain the methodology developed for this study, and describe the data and methods used for data collection. In the next section we analyse the governance infrastructure that is in place, the emergency response by the government and non-state actors and the flaws and successes of post-disaster sense-making. These findings are used to discuss key determinants of adaptive capacity, and to articulate the need for better interfaces between governmental agencies and open society organisations. The last section provides conclusions.

2. Research context and methodology

2.1. Adaptation, adaptive capacity and resilience of social–ecological systems

The methodology used in this paper is based on the concepts and some methods of *anticipatory adaptation*, *adaptive capacity* and *resilience of social–ecological systems*, and also refers to the literature on *sense-making* for future adaptations. In the Third Assessment report of IPCC (IPCC TAR) (IPCC, 2001) *adaptation* is any 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.'

Adaptations can be *autonomous* and *planned*. Metzger and Schröter (2006) defined *autonomous adaptations* as 'a part of the internal feedbacks in the human–environment system and its subsystems like ecosystems and markets, such as when forest tree species extend their bioclimatic range due to evolutionary adaptation, or the slowing of demand after price increase resulting from supply shortages.' In contrast, *planned adaptation* can 'take place locally, as adaptive management decisions by individuals or small planning groups, such as planting a drought resistant crop type' (Metzger and Schröter, 2006). *Anticipatory adaptations* are designed to react on information about future vulnerability, while *reactive adaptations* occur in response to an experienced hazard. Any planned adaptation is anticipatory, as it results from deliberate decisions based on information about expected impacts, whereas autonomous adaptations can be either reactive or anticipatory, but they do not directly address climate change and occur in relation to other processes in society or to expected risks (Füssel and Klein, 2006). As an example of an anticipatory adaptation, Howe (2011) analysed the preparedness of business organisations for hurricanes; he found that in large companies anticipatory adaptations were more likely to occur than in smaller companies, because large organisations usually create many processes that eventually result in autonomous adaptations.

IPCC TAR (2001) defines *adaptive capacity* as the 'potential, capability, or ability of a system to adapt to climate change stimuli or their effects or impacts.' The Millennium Ecosystem Assessment (2005) further specifies who is involved in the process and in its definition this is the 'general ability of institutions, systems, and individuals to adjust to potential damage, to take advantage of opportunities, or to cope with the consequences.' While adaptive capacity depends crucially on the time