



# Adaptive governance of disaster preparedness? The case of regional networks in Finland

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## ABSTRACT

Adaptive governance (AG) has emerged as a theoretical alternative to traditional forms of governance, which often fail to address complexity and rapid changes in socioecological systems. Frequently recognized attributes of AG include learning and experimentation, collaboration and networks, polycentric institutions and multilevel governance at multiple appropriate scales, as well as reflexivity, flexibility and adaptive capacity. To provide more examples of the practical implementation of AG, we examine whether a Finnish regional preparedness network model could be an example of a tangible way to implement AG. According to our results, the regional networks embody many features of AG: they facilitate person- and organization-level networking and peer learning, and thus help their members to grasp the overall picture of preparedness and safety in the region, and reveal ambiguities concerning the division of responsibilities. The networks also support nestedness and polycentricity through cross-sector and multilevel cooperation. At the same time, the voluntary nature of the networks is perceived as problematic considering the overall preparedness of society. Notably, although networks often include non-state actors, citizens remain outside of them, which may reduce the effectiveness of a network.

## 1. Introduction

Complexity and uncertainty associated with rapid environmental and social changes place new demands on governance systems. It has been proposed that a shift from a traditional predict-and-control regime toward more polycentric and flexible approaches would be more successful amidst the global environmental crisis. One such approach is adaptive governance, which has emerged as a theoretical proposition in recent decades, especially in environmental governance and natural resource management scholarship [1,2].

There are numerous slightly differing definitions of adaptive governance. Chaffin et al. [2], 7) define it as “a range of interactions between actors, networks, organizations, and institutions emerging in pursuit of a desired state for social-ecological systems,” while Hurlbert and Gupta [3], 341) describe AG as “a range of political, social, economic, and administrative systems that develop, manage, and distribute a resource in a manner that promotes resilience through collaborative, flexible, and learning-based issue management across different scales.” Characteristically, adaptive governance addresses linkages between social and ecological systems, and recognizes complexity and uncertainty [4].

The literature suggests multiple features that define adaptive governance. These can be grouped into four main categories: collaboration and networks, nestedness and polycentricity, learning and experimentation, and flexibility and adaptive capacity.

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Collaboration and networking among various actors improve and diversify the knowledge base for decision-making and strengthen its public support [2,5–7]. In a nested and polycentric governance system, governing authorities exist at different governance scales, and decision-making authority is decentralized [5–8]. Learning and experimentation refers to keeping up with change and uncertainty [6, 7], changing practice [5], and the ability to change mental models [9]. Flexible and adaptive systems are necessary to deal with disturbance, and to reduce vulnerability and enhance resilience [4,7,10].

In general, there are many positive examples of applying AG in practice. A literature review conducted by Sharma-Wallace et al. [11] concluded that most of the examined cases were successful or promising. However, the authors also acknowledge the difficulty of measuring and sustaining the results, particularly over the long term. As Cleaver and Whaley [12] point out, AG is only a theoretical approach to governing socioecological systems, and it tends to be fundamentally optimistic about reaching consensus between different interests and not paying attention to power structures. Furthermore, the complexity arising from polycentric institutions may also reduce democratic accountability [13]. The practical implementation of AG is complicated by path dependency: changing established practices fundamentally is difficult, and especially, public participation requires plenty of resources and is tricky to implement in an equal way [13]. Successful implementation of AG is linked to factors such as trust, equality, good governance, and adequate resources, which are seldomly readily available [11,13].

It has been widely recognized that AG has much to contribute to disaster risk reduction, as during the recent past, the emphasis has shifted from centralized disaster management to anticipatory and networked governance [13–15]. AG is already applied to disaster risk reduction around the world, but practices and concepts used differ [13]. AG has also been proposed as a framework especially for governing compound hazards and complex industrial disasters [16,17]. In addition, it has been noted that the decision to adopt AG is often triggered by a shock, such as a disaster.

It should also be noted that governance models akin to AG have also been developed in other governance and research traditions, and these models are not always referred to as AG [18]. Governing complexity through a plurality of actors and wide-ranging collaboration is also the main premise of Finnish comprehensive security approach to safety, security and preparedness [19]. It focuses on maintaining the vital functions of society through cross-sectoral collaboration [20]. One of the ways in which comprehensive security is operationalized involves regional preparedness and safety-focused networks, which bring together organizations ranging from rescue departments and municipalities to energy companies and NGOs [21].

Despite the extensive literature on AG, it has been argued that more examples of how to advance AG in practice are needed, especially on how to operationalize AG within the barriers within existing institutions and governance frameworks [11]. Exploring relevant case studies and gathering information of AG in practice provides also new material and perspectives for research. We argue that the preparedness networks could be a forum for implementing adaptive governance but there is a lack of empirical research on the networks. Therefore, our aim is to contribute to AG literature by examining a potentially corresponding practical example of networked governance dealing with complexity and uncertainty in a real-life context. We view AG as a theoretical and conceptual tool for analyzing and framing real-world phenomena, and comprehensive security as a model describing a collaborative governance concept aimed at achieving a desired outcome—safety and security.

In this paper, we view the Finnish preparedness networks through the adaptive governance framework, and empirically investigate whether a governance structure that draws on comprehensive security also exhibits features of AG. To answer this question, we collected data through interviews with professionals from several regional preparedness networks.

## 2. Materials and methods

### 2.1. Case study

Finnish security and preparedness governance is based on a whole systems approach to societal security known as comprehensive security [20,22], which resembles the other Nordic countries' holistic approaches to societal security, as they all originate from the concept of total defense. Comprehensive security focuses on the vital functions of society, from international activities to economic infrastructure and psychological resilience [23, 47]. These vital functions are meant to be maintained through collaboration between the public and private sectors, and civil society. In other words, every actor in society is responsible for their own preparedness – and in that way, for maintaining societal security as well. Finland lacks a single coordinating organization for disaster management, although the Ministry of the Interior is in charge of the national-level response [24]. The comprehensive security model has been criticized for not fully incorporating the long-term, cross-sectoral, and cascading aspects of environmental threats, limiting society's capacity to adapt to climate change [25].

In recent decades, several cross-sectoral networks have been established to support regional preparedness and safety. In 2020, 11 out of 21 rescue departments reported that a regional preparedness network is operating in their area [26]. One of the pioneers is EKTURVA, which has been in operation in South Karelia since 2011. EKTURVA is presented as a cooperation model for improving regional preparedness, safety, and security. Meuronen ([21], 57) calls it “a scalable model of comprehensive security” and a way to operationalize the idea of cross-sector cooperation, while simultaneously supporting informal networking and building trust. Members of the network include a wide range of organizations, from the rescue department and the police to municipalities in the region, the healthcare sector, local chamber of commerce, and NGOs like the Red Cross. The network itself has no leading partner nor formal decision-making power, and its operation is based on mutual agreement and the responsibilities of each member organization. However, the network organizes emergency preparedness exercises: scenarios have included power outages, floods, and local defense [21].

**Table 1**  
Coding of the interview data.

Category	Rationale and references	Code/feature
Collaboration & networks	Collaboration is associated with identification of common interests and goals [2,9], and the collective search for solutions to common problems [7,8]. This may include exchanging information, working jointly, sharing resources for a common purpose, and sometimes consensus-oriented decision-making [5].	Common problems and goals
	Networking and interaction between individuals, organizations, agencies and institutions are integral to AG [7,8,41]. A network is typically an informal governance system of diverse actors, often realized through boundary and bridging organizations [7,9]. Networks also allow drawing upon different knowledge systems and facilitate integration of scientific and local knowledge [2, 5–7].	Networks
	Inclusivity stands for the inclusion of a diverse set of stakeholders, including citizens and the private sector [7,10,31,41], in both formal and informal ways [5]. Stakeholder input can improve the knowledge base for decision-making, strengthen public support and increase the effectiveness of governance [6]. Collaboration between governmental and non-governmental stakeholders can take different forms from information supply to consultation and decision-making [31] – preferably at many stages, not only when the agenda is finished [9].	Inclusivity
	As AG requires organizations to accept different forms of coordination beyond their mandates, problems may arise with determining accountability – identifying who is responsible for what [7, 33,41]. According to an empirical analysis by Fournier et al. [10], a clear division of responsibilities in a legal sense can ease multilevel governance, but excessively divided responsibilities may cause confusion. In addition to practical difficulties, a system where responsibilities are very dispersed may lead to a loss of democratic accountability [31].	Accountability
Nestedness & polycentricity	Multilevel governance balances centralized and decentralized control [6,17] and top-down and bottom-up decision-making, while a comprehensive overview of the strategy still exists at the higher institutional levels [10]. In our data, this manifests as vertical interaction between governance levels: international, national, regional, etc.	Multilevel governance
	In polycentric governance systems, authority is divided between multiple formally independent actors, including non-state actors, rather than a monocentric unit [2,7,31,42]. This kind of redundancy is said to be beneficial for managing uncertainty and improving resilience <sup>a</sup> , as it helps organizations to function flexibly even in disturbances [5–7,9,31].	Cross-scale and cross-jurisdictional interactions
	AG also strives to acknowledge multiple relevant scales. In particular, literature on AG in ecosystem governance emphasizes matching governance to an operational scale where ecosystems and institutional arrangements are compatible [7,8,31]. The concept of scale is viewed broadly in the adaptive governance literature: spatial, jurisdictional, temporal, institutional, management, network, and knowledge scales are considered. AG recognizes both cross-scale issues (e.g., the existence of multiple relevant scales) and cross-level issues (e.g., short-term solutions can aggregate into long-term problems) [4,43]. In our data, this trait manifests as horizontal cross-jurisdictional interactions (between parallel administrative areas, like neighboring regions), and cross-sector interactions (between rescue, environment, and the health sector, etc., and the public, private, and third sectors).	
	Polycentric and multilayered institutions typically heighten transaction costs — the costs of coordination, consultations and reaching an agreement — and therefore decrease efficiency [4,7, 31]. Higher transaction costs stem from overlapping coordination and administrative responsibilities, and duplication of effort [7,31]. However, transaction costs tend to decrease over time as actors learn to cooperate [31], and some level of inefficiency is beneficial from the resilience point of view, as redundancy & diversity across levels absorb disturbance [9]. Still, especially regarding urgent matters and crises, needing to reach consensus in a highly fragmented system seems disadvantageous, and acceleration of decision-making processes and reduction of complexity may seem preferable [4].	Reduced efficiency
Learning & experimentation	Peer learning refers to learning from others through mutual interaction and sharing perspectives, as well as through deliberative processes [5,7]. It is associated with integrating various knowledge systems and different types of knowledge [6,8,9,17], and allows new forms of knowledge to be co-created [5]. Networks that enable interaction and collaboration between individuals, organizations and institutions stimulate peer learning [6,9].	Peer learning
	Another type of learning is associated with learning from experience, which stands for learning by doing [8] and lessons from previous policies and past events [10]. As governing socio-ecological systems is always based on incomplete and uncertain information, it can be seen as a kind of hypothesis testing [31].	Learning from experience
	Learning is also connected to policy experiments and innovation [5,8,10,31]. Innovations such as new practices and partnerships have the potential to enhance resilience [7,9].	Experimentation & innovation
Flexibility & adaptive capacity	In this paper, adaptive capacity refers to a quality of system or actor: the potential to adapt to changing conditions, disturbances and surprises [8–10,44], dealing with uncertainty [8,33], as well as shifts in political interests and objectives [10].	Adaptive capacity
	Flexibility is connected to finding or tailoring solutions to local contexts [9,10]. According to Chaffin et al. [2], 10), “AG is never the same in two places.” Some give flexibility a broader meaning: non-governmental organizations and civil society have flexibility, i.e., no heavy bureaucracy [7].	Flexibility

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Table 1 (continued)

Category	Rationale and references	Code/feature
	Reflexivity embodies assessing assumptions, framings, decisions and current practices critically, and monitoring unexpected interconnections and interdependencies in the system [5]. Non-rigid institutional arrangements encourage reflection and enable self-organization [6,17]. Reflexivity can be improved by public participation processes, which take into account a diversity of perspectives and alternative solutions [5,31].	Reflexivity

<sup>a</sup> According to Bixler et al. [13], the concept of resilience is an essential link between disaster risk reduction and AG. There are different ways to conceptualise resilience [45]. The AG literature typically emphasizes the importance of the socio-ecological system's capacity to absorb disturbance and reorganize, learn and adapt while retaining its function and identity [9,15]. In the Finnish tradition of safety and security governance, resilience is conceived in a similar way, as "crisis tolerance" [20], and more specifically, "the ability of individuals and communities - to cope with and recover from shocks and crises" [46].

## 2.2. Data collection and analysis

We conducted semi-structured interviews with 15 professionals from 6 regional preparedness networks located in eastern and central Finland (South Karelia, Kainuu, Central Finland, Kymenlaakso, and two different networks from North Savo). Some interviewees were selected by collecting information from public information sources such as press releases, while snowball sampling was used to find the rest. The interviews were carried out remotely in 2021 and 2022, with the help of video conferencing tools (Zoom or Microsoft Teams), and their duration varied from 32 min to 1 h and 44 min.

Semi-structured interviews were used as they enable the interview structure to be adjusted to suit interviewees representing different networks and roles [27]. Themes discussed in the interviews included the network's operation, and how it has changed the region's preparedness for disruptions, such as storm-related power outages – namely, has the network changed how risk assessments, information sharing or emergency preparedness exercises are carried out? In addition, we included questions on which organizations have been involved, how they have been selected, and what kind of experiences and lessons have been drawn through cooperation. Furthermore, the interviews touched on how the cooperation between different sectors, governance levels, and neighboring regions works in practice. Finally, we discussed how and why the network itself has changed in recent years, and how it should be developed further.

During the interviews, an extensive storm-related power outage was used as an example of a disruption scenario that would necessitate society-wide cooperation. If an extensive failure in the production or distribution of electricity were to occur, it could stop rail transport, disrupt telecommunications, impede the water supply, and bring commerce to a halt on a much larger scale, even paralyzing society as a whole [28]. Other disaster and disruption situations raised by the interviewees were discussed as well.

Thematic analysis was carried out using qualitative analysis software Atlas.ti [29]. In the coding, we used 13 adaptive governance features originating from a literature review (i.e., directed content analysis; [30]), presented in Table 1. During the first reading of the interview transcripts, we coded excerpts that referred to adaptive governance features. Afterwards, we reviewed the excerpts under each code to ensure uniformity and made any necessary corrections. At the same time, we labelled in more detail what exactly the excerpt was referring to – for example, considering the code 'Accountability', whether the interviewee talked about responsibility being clearly allocated, or whether they mentioned problems connected with it. The structure of the Results chapter also follows the structure of the literature review presented in Table 1.

## 3. Results

### 3.1. Collaboration and networks

#### 3.1.1. Networks

The opportunity for networking and getting to know essential people is a recurring benefit of the networks. They lower the threshold for asking for support or benchmarking, and coherent practices developed or tested in the networks ease practical cooperation. For example, the networks have prepared communication templates for various crises, developed their regional risk assessments, and adopted the regional preparedness centre model AVAK. Interviewees emphasized that developing practices has to be anticipatory – during a crisis, it is better to have familiar structures and processes in place.

"In a way, they [others in the regional preparedness network] are a bit like colleagues, a similar network. Even though they work in different organizations, communication and approaching them is as easy as in your own organization. I don't have to think about whether I can ask or whether I dare to ask – it's such a natural channel of communication." — Interviewee 4

However, as this kind of regional networking is voluntary, maintenance of the networks often falls on the shoulders of the most motivated key individuals. The same key people often participate in many working groups and network at different levels of governance, from national-level bodies to sectoral networks. This may facilitate conveying information, but when a key person leaves the network, much tacit knowledge is lost. Since there are many networks and bodies at different levels, the workload of an individual person can become heavy, which in turn accelerates the turnover of personnel.

#### 3.1.2. Inclusivity

All of the six networks included in this study have the regional rescue department as a member. Most also include Regional State Administrative Agencies (AVI), Centers for Economic Development, Transport and the Environment (ELY), the police, defense forces, social and healthcare services, various representatives from private companies (most often from the energy sector), as well as

representatives from municipalities in the region, the Red Cross, and the National Emergency Supply Agency. Less common members include, for example, the Border Guard, research and education institutions, the immigration service, and environmental services.

“Just for the love of it, so to speak. We want to promote the safety of the region and we’ve included those actors who feel that they should be involved. This is how we’ve expanded as a network.”—Interviewee 1

Even though a broad representation of various actors in society is seen as important, the mandatory AVI-led preparedness exercises are often aimed at security and safety authorities and municipalities. The regional networks are helping to fill this gap, but not all possible actors are included in them either. Earlier experiences and social networks in the region determine which organizations are involved in the regional networks, and which are seen as important contacts.

Among others, municipal infrastructure, the energy sector and the private sector in general were mentioned as missing pieces of the current networks. Good experiences have been gained from involving the church and social services. Instead, the participation of citizens was hardly mentioned. It should be noted that some networks even lack third sector representation altogether.

Exclusivity of the networks was justified by the limitations set by confidential information. Closed information systems and classified information limit the possible range of participants, which has sometimes led to the total exclusion of the private and third sectors.

### 3.1.3. Common problems and goals

The threats that are being prepared for and used as scenarios for emergency preparedness exercises are often derived from regional risk assessment reports. However, the method of producing these highly significant documents varies. Sometimes the risk assessments were described as the results of cooperation, as the participants in the work were allowed to define priority areas, but they were also described as being too focused on the public authorities and rescue sector, and as lacking multidisciplinary. Nonetheless, regional risk assessments were expected to be improved round by round.

Although the views on the probabilities of different risks may differ somewhat, balancing different values or types of information was hardly mentioned. Comprehensive security, human security, and the overall safety of the region were mentioned as broader goals common to all. In other words, there is a perception, or at least a satisfactory degree of consensus, about the kind of threats that the networks should prepare for. One interviewee mentioned natural disasters being non-political, and therefore not causing disagreements, unlike issues such as school violence or immigration. One of the networks has used a mediation procedure to mediate viewpoints in complex matters.

### 3.1.4. Accountability

Despite the complex network of preparedness and security actors, the allocation of responsibilities was thought to be mostly well defined and functional. The relatively strong mandate of the regional authorities (i.e., not having to wait for a national-level decision) was perceived as easing many matters.

Cross-sector cooperation has also highlighted some ambiguities regarding the division of responsibilities. Among other things, the limits of help that one organization could receive from others have become more concrete: for instance, the equipment used by the rescue department is not suitable for distributing drinking water, and there is not enough reserve power for sharing it among all who might need it. Clear deficiencies, such as unfinished contingency plans, have also surfaced, and management responsibilities for external communication have been clarified.

Still, some ambiguities remain, and in some scenarios it is difficult to define the competent authority. Responsibilities are particularly difficult to figure out in environmental accidents and disasters with wide-ranging and cascading impacts. In addition, some of the disaster-related legislation is outdated or incomplete.

“I can say that the situation has not really been clear all the time, with regard to who is doing what. It’s partly due to the fact that there are shortcomings in the legislation – for example, the Emergency Powers Act was in no way made for a pandemic, it was made with wartime in mind. The pandemic was only added later as one possibility, so that law has been difficult to apply.” — Interviewee 6

Currently, the networks have no formal mandate, and their operation is based on their members’ – and especially their management’s – motivation and determination. The voluntary nature of cooperation was often mentioned as a problem. Many had hoped that the regional reform would make regional preparedness work more formalized and coherent, but those hopes were not realized for the most part. The private sector in particular cannot realistically be expected to participate in voluntary, time-consuming activities.

“In my opinion, there’s no other way than legislation. Capitalism or the market economy does not allow for thinking like ‘Let’s get excited about this unpaid work that brings you nothing. Hey, would you all like to join?’ I don’t believe in that.” — Interviewee 6

“So far, this [cooperation] has included participating in exercises and, to put it bluntly, eating pastries during meetings ...” — Interviewee 2

## 3.2. Nestedness and polycentricity

### 3.2.1. Multilevel governance

Several members of the regional networks have participated in, or have contact with, other preparedness-related activities and networks operating at different levels of governance. Most often mentioned were the national level and the higher regional level, both

of which were mentioned in 11 out of 15 interviews. International cooperation came up less frequently, but took many forms: the interviewees mentioned the EU Civil Protection Mechanism, the Red Cross networks, international oil spill drills in the Baltic Sea, and the rescue sector's cooperation with Russia, for example in relation to wildfires and Saimaa Canal accidents (until 2022). At the national level, the Security Committee, the defence forces' local defence exercises, and various ministries (e.g., the Prime Minister's Office, the Ministry of the Interior) were mentioned. During the pandemic, state-level guidance was sometimes perceived as lacking or belated, while at other times, it was seen as beneficial.

"Because the pandemic was a national crisis – or you could clearly see right away that it's not just a crisis in Finland, but throughout the whole world – the centralized leadership benefited us greatly. Fortunately, they took on a role very quickly, information started coming to us from there, and we shared it in our own municipality." – Interviewee 13

The higher regional level is another central level in governing preparedness. This means the public sector-centric regional committees and mandatory emergency exercises led by the six Regional State Administrative Agencies (AVI), and the five regional preparedness cooperation committees of businesses (ELVAR) that function as a valued link to companies. Furthermore, parallel regional networks were mentioned occasionally: these included the regional pandemic coordination group determined by the Ministry of Social Affairs and Health, an official mailing list that is more exclusive than the regional network, and the regional network's thematic working groups. In addition, there are local networks within cities and municipalities, since a large proportion of the practical preparedness work takes place in municipalities (conducted by civil servants or as purchased private services).

### 3.2.2. Cross-scale and cross-jurisdictional interactions

In cross-jurisdictional cooperation, networking among the rescue departments plays an important role. Their collaboration includes joint planning and procurement. Administrative boundaries are not defined for the third sector either, as training and operations are carried out flexibly across geographical and chapter borders. Otherwise, cooperation across jurisdictional borders is not particularly well-established. Municipalities can support each other with external communication for example, but practices could be clearer. During the pandemic, there was cooperation between well-being services counties, and electricity network companies maintained contact with their peers. Although there is relatively little cooperation between the regional preparedness networks themselves, practices related to the operation of networks and the preparation of a regional risk assessment have spread from one region to another.

Cooperation between sectors works well in everyday situations, in the event of fires and accidents, for example. In particular, cooperation between security and safety authorities (police, rescue departments, and the border guard) has been routine for a long time. In larger disruptions, such as power outages caused by storms, the defence forces have provided equipment-related assistance to local authorities when needed. Additionally, there are existing structures that make it possible to receive support from the third sector and the local parishes. However, regional networks have made it easier for boundaries to be crossed between sectors, and have improved the situation even more, as members can now request expertise and help from a wider group than before. Practical cooperation and joint exercises have increased, and there are projects that require cooperation between several parties, regarding the supply of fuel and water, and communication in the event of a disruption, for example. The third sector has been able to establish contacts and organize exercises with local authorities. In the cooperation between sectors, the rescue department often acts as a "central node," a link or the glue between other actors.

Sometimes the mismatch of jurisdictional borders between different authorities makes cooperation difficult: the geographical borders of Regional State Administrative Agencies, police, rescue departments and well-being services counties differ from each other. On top of this, when each organization prepares its own contingency plans, operations become fragmented. This is not an insurmountable obstacle, but it complicates the practical work of third sector organizations, for example, which operate in many regions, as the authorities' modes of operation have regional differences.

"There's no unified national model. And there's no communication mechanism between the regions: it's based on knowing the people personally. These structures are a bit different in every region. ... The Uusimaa region doesn't have a similar network we could contact. There are just individual organizations." — Interviewee 14

The incompatible scales of ecosystems and governance came up a couple of times: for example, forest fires spreading across national borders could trigger cross-border rescue operations. In addition, the backward-looking and short-sighted temporal scale of preparedness work was lamented as a persistent weakness.

### 3.2.3. Reduced efficiency

Regional networking is largely considered useful despite the time it requires. Meetings are held when needed and occurred more frequently at the beginning of the pandemic, for example. Despite the benefits, organizing the collaboration is tedious, and the calendars of the people involved are often full. Each municipality has its own contingency plan to prepare, so there is a lot to coordinate.

Difficulties typical of the entire preparedness field also emerged. Preparedness is something that is easily postponed, and is never the top priority: Will there be a tangible benefit for the organization if we participate in the exercise, and how much time is available for contingency planning? Plans must be regularly updated as well, which absorbs resources.

Some interviewees brought up the large number of, and overlap between, different networks. Different systems have been built on top of one another, resulting in the fragmentation of the whole field of preparedness. In addition to regional networks, the AVI-led preparedness committees at a higher regional level and the rescue departments' partnership network are significant structures of preparedness, complemented by other sector- or region-specific networks. At times, the interviewees brought up the superficial nature of the cooperation, which was perceived as frustrating: items are reported at the meetings, but there is no time to develop them further.

Openness about vulnerabilities was called for, so that they could be resolved.

“We meet, catch up and discuss. But where is the actual work done? The real cooperation and preparedness. It’s remained very unclear to me and, in fact, I’ve been left with the feeling that it’s not even done properly. ... I thought that the idea of conducting exercises meant that the contingency plans would be tested and vulnerabilities would be found, but it mostly involved catching up with each other.” — Interviewee 10

### 3.3. Learning and experimentation

#### 3.3.1. Peer learning

One of the main benefits of networking is to create an overall picture in the middle of a crisis and while preparing for it. Participating in the network leads to a clearer understanding of what others are doing: municipal authorities get to know what kind of support they could receive from third sector organizations, and the private sector gains understanding of the authorities’ management practices. One example of a function that requires coordination between multiple sectors is the management of the deceased in disasters, where the related tasks are shared, for example, between the healthcare sector, the rescue sector and local parishes.

Furthermore, the network supports the exchange of information among members. Members monitor the situation in their own sector and convey it to others: as one interviewee put it, the network functions like an antenna receiving signals from every direction. Some networks use a shared mailing list, while in some regions the rescue department would compile and synthesize information from other members. This information sharing is particularly useful for those who do not participate in AVI-led preparedness exercises. Confidential discussions are also possible within the somewhat closed networks. At the same time, sharing information among the network supports each member’s external communication. In disruptions, the network helps the members to track the development of the situation and anticipate the need for help. However, the pandemic highlighted the need for a common and clearly defined model for communicating with municipalities in the region about a rapidly developing situation.

“The third sector has even more practical knowledge of local conditions, local people, and individuals in need of help. And through this network, the knowledge can perhaps reach the social authorities or rescue department faster.” — Interviewee 12

#### 3.3.2. Learning from experience

Emergency preparedness exercises enable learning through experience without the need for actual disasters to occur. In many regions, the networks have broadened the range of organizations participating in exercises: the private sector may have joined the local defense exercises, or deeper inclusion of the social and health sector has resulted in new and useful exercise types. As a result, exercises have become more varied and more tailored to local needs. Exercises including a broad spectrum of actors were found to be particularly useful, as organizations gain insights into how others operate, and identify the obstacles hampering communication. Members also gain a more comprehensive and tangible understanding of structures, interdependencies and cascading effects, such as the far-reaching consequences of power outages. For instance, even if a gas station is equipped with back-up power, the disruption of payment traffic prevents fuel distribution, which in turn affects home care work, for example. However, the interviewees noted that emergencies are usually more complicated in reality than in exercises.

“What are the service hours of service providers and what if a disruption happens at 2 o’clock in the morning? Who do we call then? ... Who is our contact person in various matters? At least those kinds of things always come up during exercises.” — Interviewee 15

“You can write a bible on preparedness and take everything into account, but that doesn’t mean that it would work in the regions. If you don’t practice, and if you don’t actively have contact with those actors.” — Interviewee 2

In addition, the network enables sharing experiences and good practices across administrative boundaries: for example, the water crisis in the town of Nokia in 2007 led to developing preparedness measures for water supply plants elsewhere. However, learning from experience ultimately entails looking back. Lessons learnt from disasters that happened several decades ago lose their relevance.

#### 3.3.3. Innovation and experimentation

Examples of experiments and innovations were mentioned in several interviews. These included the regional preparedness center model (AVAK), municipality- and region-specific preparedness cards, weekly situation reporting during the pandemic, the network’s own communication workgroup, communication templates for various crises and disasters, a comprehensive plan regarding fuel storage and distribution, as well as the regional risk assessment in general. Individual mentions included municipalities’ preparedness working groups, an observer from another area following regional exercises, a Human Security cluster in Savo, a work-in-progress application that visualizes interdependencies, using forecasting workshop methods, and a plan for prioritizing mobile network base stations.

### 3.4. Reflexivity, flexibility and adaptive capacity

#### 3.4.1. Flexibility by context

The networks’ regional focus supports adjusting to regional conditions: for instance, activities can be tailored to consider a vulnerable electricity network, certain industrial plants, a sparse or elderly population, or a state border. Developing oil spill management is more relevant in coastal areas, while regions in the eastern part of the country focus more on defense issues. Regional networks are altogether more prominent in the east and north compared to western and southern regions, where preparedness



cooperation is often based on higher-level AVI committees. Structures and networking practices differ too: while some regions arrange themed seminars, others prefer a tight-knit assembly of authorities. Naturally, differences between regional networks also stem from their participants, as members bring their own perspective. Regional risk assessments have made preparedness more context-relevant, and exercises are no longer based on cut-and-paste scenarios from Ministry of the Interior publications.

### 3.4.2. Adaptive capacity

The experiences of recent years have led to the development and shaping of practices. In particular, the wide-ranging effects of the COVID-19 pandemic were mentioned in 9 out of 15 interviews. Other “changing circumstances” included the refugee crisis starting in 2015, the Russian invasion of Ukraine, technology such as GIS and digitalization in general, cyber threats, and changes in legislation such as the regional reform.

“There have been a lot of changes. 2015 was quite instructive from the point of view of preparedness when a huge number of asylum seekers arrived, but they didn’t come from the direction which has always been talked about. Maybe things like this have become clearly visible – meaning that anything is possible, and you don’t know what’s going to happen.” – Interviewee 3

Several interviewees mentioned how preparedness is more omnipresent and topical than before, and that practices are constantly evolving. The new nature of crises and a broader idea of security were mentioned too, touching on environmental and climate security and the increasing vulnerability of society. Even the grassroots level of preparedness is affected by what is happening in the world at any given time: one interviewee described the network as “an amoeba that can expand as needed,” while another emphasized that flexibility is always an integral part of crisis management.

“We have to adapt to a constant state of change and be able to anticipate – anticipation has now become a key concept. This crisis won’t just disappear, this new security, the biggest threat, namely climate change. It’s no longer just a target of crisis management. Understanding this still requires a lot of work, also among the authorities. This is not a controllable thing.” — Interviewee 9

Preparing for a state of emergency and military threats have been emphasized in recent years, while in the past there was more focus on disruptions in normal conditions, such as storm-related power outages. On the other hand, some networks mainly focus on pressing local issues.

### 3.4.3. Reflexivity

The networks themselves received many positive evaluations. According to the interviewees, practices are being improved continuously, and cooperation has taken on new forms when needed. However, some hoped for more in-depth collaboration, and progressing from discussions and the exchange of information to developing practical solutions, sharing good practices, and more joint emergency preparedness exercises. Interviewees’ ideas were often connected to developing and testing basic protocols – above all, it should be ensured that “normal” disruptions can be overcome. This ties in with the critical assessments of regional preparedness already mentioned earlier: emergency exercises and other experiences have revealed weaknesses in current practices, which indicates that certain types of disruptions would be very difficult to manage.

“Well, I got the idea that this is still not working properly. It seemed to me that not all authorities know what the other is doing, or what the other should do in any given situation. It’s a bit scary and nerve-racking that there’s still work to do on this.” — Interviewee 13

Joint scenario work or forecasting is not part of the basic activities of the networks, and a few interviewees expressed a wish for more of that. “Learning the hard way” is a typical feature of preparedness, but dealing with crises as they occur is not the only or most desirable way to operate. Even assessing the current risk landscape may not be enough: instead, some hoped for anticipatory planning, assessing trends and future developments.

“It’s not enough to imagine possible events and futures. We also have to address those possible chains of events with an anticipatory assessment of the kind of effects they can have.” — Interviewee 9

Individual mentions included the need for more consistent development and monitoring of new research, developing external communication, and drafting a uniform procedure for transferring information to municipalities. Developing leadership practices was deemed important to keep participants interested and feeling that their contributions have an impact.

## 4. Discussion

In this study, we investigated the ways in which the attributes of adaptive governance (AG) are visible in Finnish regional preparedness networks, which have emerged to operationalize comprehensive security. Network members include a range of organizations from multiple sectors, state and non-state actors alike. While the networks have no formal decision-making power, they organize emergency preparedness exercises and support networking among preparedness and safety actors.

Out of the most defining features of AG, the networks seem to embody nestedness and polycentricity through cross-sector and multilevel cooperation (Table 2). One of their main benefits is that they facilitate person- and organization-level networking and peer learning, which improve understanding of the whole field of preparedness. However, the networks focus on the public sector and fall short when it comes to society-wide inclusivity. A summary of the results is presented in Table 2.

Earlier research on AG has noted that polycentric and multilayered institutions may have high transaction costs and reduce the



efficiency of governance [4,7,31]. This also applies to the Finnish comprehensive security tradition, which is characterized by relatively strong decentralization and the allocation of responsibility to multiple actors [24,32]. According to our results, the large number of different actors and networks can be viewed as fragmentation, reducing the efficiency of the entire field of preparedness. For example, it is difficult to say whether polycentricity improved the system's functioning and resilience during the pandemic, or whether it has resulted in unnecessary ambiguity. Nevertheless, regional preparedness networks can help alleviate fragmentation issues by providing opportunities for networking with relevant people and organizations to gain a comprehensive picture of preparedness in the region. Joint preparedness exercises in particular have revealed ambiguities concerning the division of responsibilities and have highlighted shortcomings in overall regional preparedness, some of which have been addressed through cooperation and establishing new practices. Yet some interviewees expressed a wish for more in-depth collaboration and anticipatory action, duly indicating that networks could play a larger role in regional preparedness.

Earlier AG literature emphasizes that sharing responsibility and accountability may become a problem in networked and polycentric governance systems if allocation of responsibility is difficult to determine [7,31,33]. Although informal collaboration has its strengths, the voluntary nature of the regional preparedness networks is considered problematic. Right now, preparedness has momentum, but motivation may wane in the long run: as the effectiveness of collaboration is difficult to measure, investing resources in joint long-term efforts can be hard to justify [34]. Another observation on sharing responsibility concerns the handful of key people that play major roles at multiple levels of the nested preparedness system. While this may support the flow of information between levels of governance, a single person having an irreplaceable role is also likely to be risky, as proven by the problems that emerged in Finland's nuclear waste disposal project after a key expert passed away [35].

AG also strives for the inclusion of a diverse set of actors and public participation [7,31]. The fact that the third sector remains on the fringes of the regional networks, and that citizens are completely excluded, suggests that this element of adaptive governance is only partially realized in the preparedness networks. This is not surprising, as high quality and inclusive participation is notoriously hard to achieve [13], while poor participation can lead to unfulfilled expectations, reducing trust in local government and exacerbating conflicts [6,36]. Likewise, Raisio et al. [19] note that Finnish preparedness planning is exclusive by nature: citizens may participate in the functions of producing safety and security by assisting authorities as volunteers, but they are not included in planning. Virta and Branders ([22], 1161) note that despite the whole-of-society approach of comprehensive security, the policymaking process itself is not particularly inclusive or deliberative – citizens are considered a “source for legitimacy and support for existing policy.” This raises a question about the extent to which the overall security model actually steers practice – especially the policy on the role of citizens in the Security Strategy for Society [20]. In addition, the occasional lack of third sector representation is unexpected given Finland's strong integration of the third sector into public sector-led security and preparedness work. However, it has previously been observed that the third sector hopes for more diverse and extensive cooperation [37].

It is also noteworthy that when asked how the common problems and goals of the networks were defined, interviewees did not describe disagreements or negotiations that had resolved them, but often referred to regional risk assessments or broader objectives such as comprehensive security. AG has been criticized for the naive idea that it is possible to find truly common solutions and resolve conflicts of interest [12], and the same mindset is reflected in the regional preparedness networks: different actors working for the indisputable common goods of safety and security. Integrating wider public participation could diversify perspectives and challenge the consensus, as well as contribute to the goal of whole-of-society vision of comprehensive security. In addition, strengthening the role of citizens could also boost their perception of responsibility regarding preparedness, and thus contribute to household preparedness [38].

Flexibility and adapting to changing conditions and uncertainty are integral to AG [8,9]. The regional networks showed adaptive

**Table 2**

Summary of the ways in which the attributes of adaptive governance (AG) are visible in regional preparedness networks.

Categories	AG feature	Main result
Collaboration & networks	Common problems and goals Networks Inclusivity Accountability	Regional risk assessments central when defining common problems. Networks strongly support person- and organization-level networking. Public sector-centric, citizens not involved. Networks help to clarify responsibilities, but ambiguities remain; voluntary nature of networking problematic.
Nestedness & polycentricity	Multilevel governance Cross-scale and cross-jurisdictional interactions Reduced efficiency	Networks as a part of a significantly geographically nested system. Cross-sector cooperation already routine, further enhanced by regional networks.  Polycentricity and a large number of actors lead to fragmentation, but regional networks also alleviate this.
Learning & experimentation	Peer learning Learning from experience Experimentation and innovation	Improved understanding of the big picture, sharing good practices. Joint preparedness exercises highlight areas for improvement. New practices introduced and developed.
Reflexivity, flexibility & adaptive capacity	Adaptive capacity Flexibility Reflexivity	Networks adapt to changes when necessary, but focus on familiar threats. Regional risk assessments support tailoring to regional context. Cooperation has revealed shortcomings in regional preparedness; more anticipatory and less reactive approaches are called for, as well as more in-depth collaboration to resolve existing issues.

capacity during the pandemic by mapping the COVID-19 situation and its ripple effects, forming situation rooms of sorts for the region, and thus demonstrating their ability to respond to a threat emanating from outside the region. In addition, flexibility by context is realized in the threat scenarios used by the networks: they often originate from regional risk assessments, which highlight regionally relevant issues. On the other hand, the way the regional risk assessments are drafted varies between regions, and they tend to focus on the rescue services' perspective.

It is important to note that the results of this study are shaped by the methods used. The number of interviewees was small, but as the networks operate largely along the same principles, a saturation point in the information obtained in the interviews was reached [39]. However, the selection of interviewees may have skewed the data: it is possible that especially those who felt positively about the networks were willing to participate in the interviews. Members of inactive networks and those excluded from the networks altogether were not approached, as the interviewees were selected using a snowballing technique [40]. It should also be noted that the networks have limited experience of large-scale, disastrous disruptions, and therefore it is difficult to say how they would perform in such situations.

## 5. Conclusion

Finnish regional preparedness networks have emerged to operationalize comprehensive security, but our findings show that they are one possible solution for implementing adaptive governance (AG) as well. The networks facilitate cross-sector networking, collaboration and learning. Joint emergency preparedness exercises in particular have proved useful in revealing interdependencies and highlighting areas for improvement. The networks also support polycentric and nested governance. On the other hand, their voluntary nature is deemed problematic, considering how much they benefit regional preparedness.

To further align these networks with AG ideals, improving their inclusivity and developing multidisciplinary in regional risk assessments would be recommended courses of action – while acknowledging that pursuing openness in this field presents its own set of challenges. It would also be beneficial to develop practices that are more anticipatory: currently, the time frame for preparedness thinking remains quite limited, and there is little consideration of long-term changes brought by climate change, for example.

## CRediT authorship contribution statement

**Maija Nikkanen:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Aleksi Räsänen:** Writing – review & editing, Writing – original draft, Supervision, Conceptualization. **Sirkku Juhola:** Writing – review & editing, Writing – original draft, Supervision, Conceptualization.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

The data that has been used is confidential.

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