

# ADAPTIVE GOVERNANCE SOLUTIONS.

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## Summary

We know that there is an increase in the severity and frequency of disaster events because of climate change. This increase puts our natural and built cultural heritage at risk because of a lack of resilience. Significant research efforts are being directed to enhance resilience and safeguard our tangible and intangible cultural heritage for future generations. One avenue of these research efforts revolves around governance. In particular, there is a need for cultural heritage stakeholders to be better integrated into disaster risk management governance. As well as the recognition that adaptive governance can play a crucial role in helping to enhance the resilience of cultural heritage in both the long and short term.

Considering this overarching context, this report aims to provide a robust platform for cataloguing adaptive governance solutions. As well as compile a series of reliable and replicable ready-to-use adaptive governance solutions. Solutions that cultural heritage stakeholders can implement in their unique contexts. The report outlines a preliminary series of 19 transferable Adaptive Governance Solutions (AGSs). These AGS are created using a transferred and easily recognizable common language called the standardised key. **The AGSs serve as recognizable and replicable tools, good practices and solutions that stakeholders could implement.**

First, the University of Liege (ULg) developed a conceptual framework to achieve this. The conceptual framework provides a clear theoretical basis for the research and ensures that the work and its outputs are robust. Building a conceptual basis is even more important for a concept like governance since it lacks a unified definition. Therefore, it is paramount that the researchers define what they mean by governance from the outset of any research. Defining governance ensures clarity and allows other experts to appreciate the context of the research work.

The researcher used the definition of governance provided by UNESCO because it was recognised by the CH stakeholders and included many of the characteristics of governance emphasised by the wider academic community. However, in practice, UNESCO's definition was too inclusive and cumbersome. As a result, the researchers at ULg used a simple mantra to explore governance with the RescueME case studies (the so-called Resilience Labscapes or R-LABs) based on the operation definition of governance defined by Dutra (2019). Briefly: *who does what, how do they do it and why?*

This mantra allowed the researchers to quickly highlight the key stakeholders, governance mechanisms and motivations that reinforce decision-making processes with the R-LAB stakeholders. The conceptual framework also served as a springboard for empirical evidence of adaptive governance solutions.

Researchers at ULg utilised a three-part mixed methodology to identify adaptive governance solutions from various sources—first, Part 1 co-created governance maps with the stakeholders from the five RescueMe project R-LABs. The mixed methods approach also yielded valuable raw data in stakeholder mapping, context setting and scoping exercises, which inform other parts of the RescueMe Project.

Part 2 of the mixed methodology distilled AGSs from a Horizon Europe-funded initiative, The Shelter Project (Shelter, 2023). Crucially, researchers at ULg employed the same technique to map the governance structures in both the RescueMe and The Shelter Project. This consistency made the research comparable and provided a valuable database for exploring empirical evidence supporting adaptive governance solutions.

Finally, Part 3 of the mixed method approach consolidates potential empirical evidence of AGSs from broader academic literature. Part 3

achieves this by exploring previous raw data collected by ULg after the 2021 Vesdre Valley flooding in Belgium and a snowball literature review methodology to pinpoint potential research articles with empirical evidence of adaptive governance in practice.

The mixed methodology approach yielded a preliminary set of 19 AGS. These AGS span various countries, scales, contexts, disasters and stakeholders. These deliverable details these 19 AGS and the research that facilitates them. However, the final AGSs were transferred to the meta-repository, a database of resilience solutions developed and filled in RescueME. Transferring the AGS into the meta-repository was considered crucial to the accessibility of these AGS. Instead of packaging them as a solitary outcome, the separate searchable categories were defined in the meta-repository. This allows end-users to find AGS alongside heritage-based solutions, nature-based solutions, creative industries strategies, financing and business model strategies, lessons learnt and policy recommendations. Ultimately, by including these solutions as part of the meta-repository, they receive the same attention/weight as the other solutions and feed into the 'one-stop-shop' philosophy of the RescueMe Project.

Finally, context is a criticism the research community emphasises around replicable adaptive governance solutions. Researchers such as Pahl-Wostl (2009) and Wyborn (2015) caution the over-emphasis on replicable AGS. Pahl-Wostl (2009) and Wyborn (2015) state that context specificity is crucial to the function of adaptive governance solutions to circumnavigate this issue. The ULg researchers based the AGS on the Organigraph technique. More specifically, the researchers at ULg utilised the 'standardized key' developed by Durrant et al. (2019). The standardised key provided a framework to extract the stakeholders, relationships and governance mechanisms within AGSs without totally losing the 'context' that is so important to the function of AGS.

Mapping the AGSs from various case studies presented theoretical and practical challenges to the researcher. However, the researchers successfully navigated these challenges, such as the lack of empirical evidence and the need for context-specific information, by building on a solid conceptual framework and leveraging innovations from previous research projects. The key outcome of the report is the compilation of 19 AGSs from various sources, which hold significant value for academics, experts, and practitioners.

Beyond this, the report establishes a robust and replicable approach for mapping AGSs. Other experts can immediately apply this methodology and integrate their findings into the meta-repository. Additionally, the development of Organigraphs further enhances the value of this approach. We encourage other governance experts to adopt similar methods and contribute to the meta-repository in the long term.

*For more information*

[www.resilientculturallandscapes.eu](http://www.resilientculturallandscapes.eu)

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## List of Acronyms

AGS – Adaptive Governance Solution

AGSs – Adaptive Governance Solutions

CH – Cultural Heritage

DoA – Description of Action

D – Deliverables

DRM – Disaster Risk Management

FhG – Fraunhofer Gesellschaft

R-LAB – Resilience Labscape

SFDRR - Sendai Framework for Disaster Risk Reduction

SHELTER - Sustainable Historic Environments hoListic reconstruction through Technological Enhancement and community-based Resilience

T – Task

ULg - The University of Liege

UNIBO – University of Bologna

WP – Work Package





























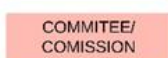

















# 1 Introduction

Climate change increases the severity and frequency of disaster events (Van Aalst 2006; Sabbioni et al. 2009; Banholzer et al. 2014). The increase in disasters affects all aspects of modern civilization, including cultural heritage (CH) (Sabbioni et al., 2009; Garcia, 2019; Sensa et al., 2021). Experts worldwide have identified that cultural heritage is not resilient to climate change (Sabbioni et al., 2009; Brimblecombe, 2010; Crowley et al., 2022). Furthermore, there is evidence that the disconnect between the two topics is theoretical and practical. Researchers such as Durrant et al. (2023) have demonstrated that many world heritage managers likely cannot access a meaningful disaster risk management (DRM) strategy. Furthermore, Durrant et al. (2023) showed that there wasn't consistency in how cultural heritage site managers perceived the stages of the Disaster risk management (DRM) cycle.

With issues like this in mind, there has been an increase in international momentum to enhance cultural heritage resilience (O'Brien et al., 2015; Sensa et al., 2018; Santangelo et al., 2022) and explicit research efforts by experts worldwide to better integrate CH into DRM (Durrant et al., 2022; Durrant et al., 2023). By way of example, an essential document for enhancing disaster risk reduction is the Sendai Framework for Disaster Risk Reduction (SFDRR). The SFDRR explicitly references heritage and the importance of integrating it into disaster risk reduction strategies. Of relevance to the contents of this report Priority 2. Priority 2 is entitled "Strengthening disaster risk governance to manage disaster risk." (SFDRR). In short, this priority in the SFDRR explicitly refers to governance. It is the need for experts, policymakers, and practitioners to focus on strengthening governance structures in response to disasters.

For this reason, governance has become an increasingly important aspect of broader research. This includes our previous Horizon 2020 work with case studies (so-called Open Labs) across Europe called The Shelter Project (Shelter, 2023). The preliminary research on DRM governance conducted within this project bloomed into a broader research topic which has been published and presented (Durrant 2019; Durrant et al., 2022; Durrant et al., 2023b; Durrant et al., 2023c)

This research topic included the potential of the Organigraph as a co-creative methodology to design and critique pre-existing DRM governance at CH sites. The research led to the development of a standardized key which defines critical stakeholder groups, governance mechanisms and relationships between them. All culminate to form a replicable and recognizable platform for academics, policymakers and practitioners to create and explore their DRM governance. The refined version of this standardized key can be seen in Figure 1.

Stakeholder Type	Connectors	Governance Mechanisms	Axis, Labels & Signposting
   	<u>CO-ORDINATES/LEAD</u> <u>ACCOUNTABLE</u> <u>APPOINTS/ NOMINATES</u>	 	<hr/> AXIS LINES <hr/> INTERNAL AXIS LINES <hr/>
   	<u>INFORMS</u> <u>FUNDS</u> <u>COLLABORATION</u>	 	<p><b>RED</b> - The colour is used to highlight a lack of clarity or an issue for further discussion. This is used across the stakeholders, connectors or elements within the Organigraphs to need to be explored in greater detail.</p> <p><b>PURPLE</b> - The colour is used to highlights specific aspects of the Organigraphs related to Cultral Heritage.</p> <p><b>GOLD</b> - The colour is used to identify specific elements of the organigraph related to the SHELTER project.</p> <p><b>GREEN</b> - The colour is used to identify connectors which are used to highlight funding or financial resources.</p> <p><b>BLUE</b> - The colour was used to pinpoint the proposed aspects to enhance the adaptive governance within each OL.</p>
   	<u>ADVISES</u> <u>DEVELOPS</u> <u>EDUCATES</u> <u>ENFORCES</u>	 	
   	<u>FORMALLY RECOMMENDS</u> <u>ADOPTS &amp; IMPLEMENTS</u> <u>INVITES</u> <u>LOBBIES</u> <u>MOBILISES</u>	 	
   	<u>MONITORS/MEASURES/COLLECTS</u> <u>REQUESTS/ASKS</u> <u>OTHER</u>	 	
   		 	
   		<b>Stages of the Disaster risk management cycle</b>  	
 		 	

**Figure 1: The standardized key is used as the basis for all the Organigraph research across the different EU projects. Column 1 - stakeholder types (shapes), Column 2 - relationships (connectors), and Column 3 - governance mechanisms (colours).**

The original work in the Shelter Project had mushroomed into various avenues of research within the RescueMe Project and beyond. By way of example, as part of D1.3 in the RescueMe project, researchers at ULg explored the idea of governance typologies within CH. The term governance typologies refer to the idea that there are standard governance blueprints that can be found across DRM governance. If these standard governance blueprints could be mapped, they would serve as a valuable framework for experts dealing with DRM governance. Four theoretical governance typologies were distilled from literature as part of the Shelter Project. These governance typologies were hierarchical, networking or collaboration, participatory, and community-led and published in a deliverable entitled D2.3 - Anatomy of Historic Areas (Shelter, 2020). Furthermore, the implications and supporting literature around this research have been included in a research article published in Geographies for the Anthropocene (Durrant et al., 2023c).

Furthermore, another essential aspect of research focuses on identifying and developing, that has been encapsulated within this deliverable. This research pulls evidence from these

two projects to develop robust data on adaptive governance schemes. It is then used to 1) validate the four governance typologies and 2) to set up a portfolio of ready-to-use tools. The report quickly explores the conceptual boundaries and literature supporting the research. This is followed by the methodology approach used to develop the Organigraphs and the finalized five Organigraphs co-created with the R-LABs in the RescueMe Project. Finally, the report outlines all the adaptive governance solutions that have been identified so far. The outcomes of this report align with the overarching aim of the RescueMe project by identifying key stakeholders and facilitates more adaptive decision making in decision making in cultural heritage. This includes built and natural cultural heritage and coastal landscapes. Adaptive governance in costal heritage landscapes is particularly important. These areas are not only extremely fragile to disaster events (Haran 2020), but they have fluctuating stakeholder mix that can change depending on the time of year. This report can provide a replicable platform to not only understand these stakeholder groups but, reallocate resources, empower stakeholders who do not move, identify new relationships and highlight potential opportunities. In their own way, helping to enhance the resilience of coastal areas.

## 1.1 Aims and objectives

### 1.1.1 Aim

Task 2.1 aims to collect and make available ready-to-use tools that cultural landscapes can apply to develop their adaptive governance schemes. The outcomes of this research can be summarised into two key outputs.

1. **A set of European Cultural landscapes governance typologies.**
2. **A collection of tools highlighting different adaptive governance solutions.**

The first aim is encapsulated in WP1, T1.2, in the ATLAS and reported in deliverable 1.3. As a result, reference to governance typologies may appear in this deliverable. However, the methodology and development of the governance typologies are recorded there. The European Cultural landscape typologies were developed by addressing the following variables: i) Type of coordination between different tiers of government. ii) The Nature of coordination between local actors and transversal communications between actors/domains. iii) Evolution of those structures over time considering pre/post-crisis contexts.

This deliverable focuses on the second outcome - a collection of tools highlighting different adaptive governance solutions. This work aimed to identify and capture different adaptive governance solutions used within cultural heritage governance. The aim was to make these tools accessible and available to cultural heritage and landscapes experts. The report outlined the methodology in which the adaptive governance solutions were captured. The collection of different adaptive governance solutions has been stored online. The solutions have been integrated as a searchable output within the meta-repository (T2.1). ULg will employ the semi-empirical research approach in the SHELTER Project (Durrant et al. 2022). As well as enhance the Organigraph technique used to map disaster risk management (DRM) governance (Durrant et al. 2022)

The idea is that the research around DRM developed by ULg can be further enhanced for transformational adaptation pathways and coastal landscapes and applied in R-LABs (T4.4). The research will be enhanced by outlining common governance typologies that can be observed in CH sites and capturing ready-to-use tools that R-LABs can use in T4.2 to understand better the limits and constraints they will likely face.

## 1.1.2 Objectives

- Utilise the semi-empirical qualitative research methodology developed in the Shelter project to co-create organigraphs for the five RescueMe Project R-LABs.
- Consolidate the Organigraphs created across projects to establish a baseline of raw data to identify adaptive governance tools and validate the four governance typologies.
- Develop an accessible portfolio of adaptive governance tools with practical examples from the SHELTER and RescueMe projects.

## 1.2 Relation with other project activities

The work on the AGS has not been developed in isolation. It has been informed by and informs various aspects of the Rescue project. Including but not limited to aspects of work within WP1, WP2, WP3 and WP4.

**WP1** 'Assessment and monitoring of heritage values and resilience' – First, the Work within T2.3 links directly to WP1. Especially, Task (T)1.2, entitled 'The ATLAS of European coastal heritage landscapes typologies and climate change impact'. As well as D1.3. Within this task, ULg was responsible for defining a series of governance typologies for Cultural Heritage

Landscapes. The governance typologies were developed in collaboration with the overarching research on Organigraphs produced by ULg. As a result, the governance typologies cocreated were informed by the research produced within T2.3. Finally, the research work that reinforced the notion of governance typologies was also published externally as a book chapter (Durrant et al., 2023).

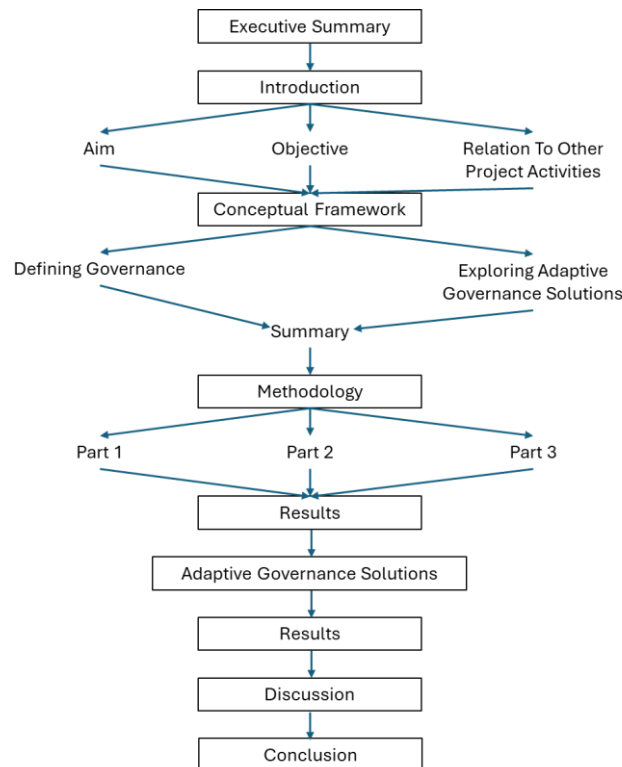
**WP2** ‘Transformative resilience strategies’ – The research on AGS was developed as part of WP2. Naturally, this work was completed in collaboration with the ongoing tasks within WP2. The T2.1, named ‘meta-repository of resilience solutions for cultural landscape’, will serve as the database in which all of the AGS will be collected and housed. Furthermore, the AGS work can also help inform T2.4 of the development of a serious game as a social innovation and co-creation tool for resilience strategy development.

**WP4** ‘Co-creation of local solutions with communities’ – Exploring the AGSs within RescueMe was crucial to developing an Organigraph for each RescueMe R-LABs. To co-create these Organigraphs, the researcher must understand the mixture of stakeholders and the key issues that bind those stakeholders together. As a result, the research at ULg undertook some of the project’s earliest stakeholder mapping and scoping exercises. These exercises’ results informed many other researchers who work in the other work packages, especially WP4, including T4.1, entitled the ‘Co-creation framework and Engagement and T4.2, Co-creation of resilience baseline and Impact Chains’.

Finally, this report details the exploration of stakeholders and governance within the experts from the R-LABs. As a result, the research and its outcomes are valuable to the project consortium. All the research conducted within this report remains fully accessible and transparent to all the project partners throughout the project’s timeline.

## 1.3 Report structure

The report is separated into eight sections. These sections have been outlined in Figure 2 and explored in greater detail on the following page.



**Figure 2: The Structure of the report.**

Section 1 introduces the broader research context and fundamental concepts which underpin the report’s findings. By way of example, the concept of governance, The Organigraph technique, and the idea of transferable adaptive governance solutions. The introduction identifies the research aim outlined in the DoA, the research objectives and the report's structure.

Section 2 provides an overview of contemporary literature and a conceptual framework for the report’s contents. This conceptual framework is necessary because the concept of governance lacks a unified definition. The lack of clarity can often cause issues with the reliability and validity of research that deals with governance. As a result, researchers working with governance must clearly define how they perceive governance from the outset.

Section 3 outlines the three-part mixed methodology the researchers used to explore and identify the adaptive governance solutions from three interrelated research sources. In short, the three parts methodology attempts to capitalize on raw data that researchers at ULg had already collected and developed. First, researchers at ULg wanted to co-create new Organigraphs and explore adaptive governance solutions with the RescueME project research R-LABs. Secondly, the researchers looked at previously developed Organigraphs within past EU projects to elicit other adaptive governance solutions. Finally, the researchers wanted to explore potential adaptive governance solutions within well-researched case studies internationally.

Section 4 presents the results. Following the structure of the methodology, the results section is divided into three subsections. Subsection 5.1. outlines the ‘final’ iteration of five Organigraphs co-created by the R-LABs experts. Subsection 5.2 outlines other examples of Organigraphs developed by the research at ULg within other EU-funded projects. This subsection draws upon the five Organigraphs the SHELTER Project Open labs co-created. Finally, Subsection 5.3 explores well-researched case studies to identify unique or interesting adaptive governance solutions that could be integrated into the report and become part of the Meta repository developed in T2.1. It is essential for readers of the report who are only interested in the adaptive governance solutions see Table 1.

Section 5 discusses the critical outputs from across the research. This includes the overarching theoretical implications. As well as the exciting outputs from the R-LABS governance maps. Finally, section 6 briefly concludes the report and the key findings.

## 2 Conceptual Framework

When conducting research within hard-to-define concepts spanning multiple disciplines, such as governance, it is crucial to establish a conceptual framework first. A conceptual framework outlines the different concepts, theories, and ideas the work draws upon. In essence, it outlines the foundational knowledge which guides the research outputs. Doing this also identifies where the research will be added to the broader body of knowledge. Defining a robust conceptual framework is not only crucial for the reliability of research but it also allows other experts to see how and where the researchers are pulling their knowledge from. To achieve the aim outlined in the DoA namely, ‘to collect and make available ready-to-use tools that cultural landscapes can apply to develop their adaptive governance schemes’. The researchers identified two thematic areas which made up the conceptual framework, these are.

1. **Establish a defining governance and adaptive governance.**
2. **Explore ready-to-use adaptive governance solutions.**

The first part of the conceptual framework attempts to define governance within the research context. Governance needs a unified definition, and researchers such as Fukuyama (2013) emphasize the importance of defining governance before researching it. The second aspect of the conceptual framework builds up the definition of governance. It explores the notion of adaptive governance and the development of adaptive governance solutions. This section briefly defines the concept of adaptive governance. It outlines contemporary research already conducted into defining adaptive governance solutions. The part of the conceptual framework is essential for two reasons. First, it defines adaptive governance and provides a framework for the researchers to find adaptive governance solutions. Second, it consolidates critical research around adaptive governance solutions and explores contemporary attempts to create them. The conceptual framework begins by exploring the term governance.

### 2.1 Defining Governance

Governance lacks an agreed definition (Kjaer, 2004; McGrath & Whitty, 2015; Fukuyama, 2016). Contemporary scholars have highlighted that adhering strictly to one definition of governance can have negative consequences (Rosenau, 2021). Forcing us to discount the emergence of new social structures, power arrangements and mechanisms if they do not fit our predefined view of governance. Researchers have emphasized that much of this problem with defining governance is conceptual rather than practical (Fukuyama, 2013). Stating that difficulties in defining governance are not because we don't know what governance is but

because we cannot define neat conceptual boundaries. There are myriad definitions of governance across academic literature and within the policy documents of large organizations. By way of example, there are several broader cited and used definitions of governance provided by large institutions. Historically, one of the most widely cited definitions of governance is a definition provided by the World Bank (1992). They state that:

*“Governance is defined as the manner in which power is exercised in the management of a country’s economic and social resources for development.”* World Bank (1992)

Similarly, another widely cited definition of governance from a large institution is the one provided by UNDP. UNDP define governance as:

*“The system of values, policies and institutions by which a society manages its economic, political and social affairs through interactions within and among the state, civil society and private sector.”* UNDP

Finally, another definition of governance provided by a large institution is the definition of governance provided by UNESCO. UNESCO defines governance as:

*“In its broadest sense, governance is concerned with holding the balance between economic and social goals and between individual and communal goals. The governance framework is there to encourage the efficient use of resources and equally to require accountability for the stewardship of those resources. The aim is to align as nearly as possible the interests of individuals, of cultural heritage, and society.”* UNESCO (2013)

The definition of governance provided by UNESCO is not as widely cited as that provided by The World Bank and UNDP. Furthermore, this definition was developed specifically within the context of the (cultural) heritage sector, which can potentially limit its applicability outside the CH discipline. However, the definition provided by UNESCO proved helpful for the researcher as ULg is a springboard for research into governance for two reasons. First, this definition of governance is comprehensive. It captures a wide variety of the different elements of governance cited across academic literature.

**Holding the balance – The balance between the different goals and stakeholders is fundamental to governance and has also been highlighted across academic literature by Bevir (2009; 2012) and Levi-Faur (2014). The need to balance different disciplinary lenses, such as social and economic, is critical in ‘good’ governance. Another definition feature that appears across academic literature related to the notion of balance is equality.**

- **Stewardship** – Stewardship refers to the responsible management of natural and built CH. Responsible management of the environment is a fundamental aspect of many avenues of research. It is a core aspect of sustainability, and, unsurprisingly, it is included in a definition for governance—scholars such as Saner & Wilson (2003) and Kakabadse and Morley (2021).
- **Use of resources and equality** – The term equality also appears regularly in various definitions of ‘good’ governance. By way of example, scholars such as Ott (2013) have referenced the importance of equality between different stakeholder groups in good governance. Most recently, discussions across academic literature have moved to the importance of gender equality in governance. UNESCO refers more generally to resource equality.
- **Accountability** – Accountability refers to the condition of being responsible for something. Within UNESCO's definition, accountability refers to stewardship and resources. The wider academic community has also referred to the importance of accountability within governance (Pierre & Peters, 2000; Bevir, 2012). Furthermore, my research combines the reference to accountability with the importance of Transparency.
- **Align the interests** – Governance is about compromise, and contemporary sources have emphasized the importance of collaboration and participation in governance.

Secondly, this definition is from UNESCO and, as a result, is immediately recognizable to the experts working with CH. Primarily because of their work, they will likely be familiar with this definition and ultimately trust it. This definition provides the conceptual definition of governance within the report and when we refer to governance in the report. This definition of what is provided by UNESCO is what we mean. However, like the other work around building Organigraphs, this conceptual definition can be cumbersome when working with stakeholders on the ground. Therefore, the researcher will often refer to a practical definition of governance when working within governance. Namely, the definition of governance systems provided by Dutra (2019). Dutra defines governance systems as:

*“Governance systems determine ‘who’ makes decisions, ‘what’ are their powers and ‘how’ they are exercised” (Dutra et al., 2019)*

This practical definition of governance has proved extremely valuable in developing the Organigraphs in past EU Projects. By way of example, see the previous research on the Shelter Project (Durrant et al., 2021). The definition of governance systems outlined by Dutra

(2019) could be divided into three questions. 1. Who does what? 2. How do they do it? 3. What do they do?

These three questions would stimulate simple discussion around stakeholders and governance structures with the stakeholders. They allow the researcher and the experts to get to the critical aspects of their governance structures without getting bogged down in conceptual clarity. The conceptual definition serves as the researcher's foundation to ensure that all work discussed and developed between stakeholders aligns with the broader theoretical framework.

## 2.2 Adaptive governance

Before unpacking the idea of adaptive governance solutions, it is first essential to reflect on the broader concept of adaptive governance. Adaptive governance is a popular concept in socio-ecological system research (Chaffin et al., 2014; Karpouzoglou et al., 2016). Adaptive governance has been popularized because it allows practitioners to coordinate management and response during the complexity and uncertainty of rapid environmental change or disturbance (Chaffin et al., 2014) and the increasing organization's ability to enhance its adaptive capacities. (Jassen & Van der Voort, 2016). Unlike the term governance, there is a consensus on adaptive governance. Chaffin et al. (2014) is one of the most widely cited contemporary sources. They build upon the historic works of Dietz et al. (2003) and Folke (2005, 2006) and define adaptive governance.

*"...We define adaptive governance as a range of interactions between actors, networks, organizations, and institutions emerging in pursuit of a desired state for social-ecological systems." Chaffin et al., (2014)*

More contemporary researchers have criticized the concept for its applicability in real-world contexts (Sharma-Wallace et al., 2018). They stated in the literature review it is essential to reflect on the issues raised by Pahl-Wostl (2009), Wyborn (2015) and Sharma-Wallace et al., (2018). Namely, the cautioned researchers in exploring empirical examples of adaptive governance. Both Pahl-Wostl (2009) and Wyborn (2015) attempted to develop conceptual frameworks to help analyses governance. Still, they emphasised that you cannot overlook the importance of context-specific information in developing these adaptive governance approaches. This reflection is essential when we start to explore the aim of this deliverable.

As a reminder, the deliverable aims to identify and develop replicable AGS from practice. However, this requires us to identify and explore adaptive governance tools so that they can be lifted from a specific practical application and used in another. In short, our work contradicts the cautions Pahl-Wostl (2009) and Wyborn (2015) highlighted. It is something

that the research team at ULg considered carefully. The following part of the literature review explores specifically work that considered the notion of adaptive governance solutions.

## 2.2.1 Defining Adaptive Governance

Before unpacking the idea of adaptive governance solutions, it is first essential to reflect on the broader concept of adaptive governance. Adaptive governance is a popular concept in socio-ecological system research (Chaffin et al., 2014; Karpouzoglou et al., 2016). Adaptive governance has been popularized because it allows practitioners to coordinate management and response during the complexity and uncertainty of rapid environmental change or disturbance (Chaffin et al., 2014). As well as the increasing organization's ability to enhance its adaptive capacities. (Jassen & Van der Voort, 2016). Unlike the term governance, there is a consensus on adaptive governance. Chaffin et al. (2014) is one of the most widely cited contemporary sources. They build upon the historic works of Dietz et al. (2003) and Folke (2005, 2006) and define adaptive governance.

*"...We define adaptive governance as a range of interactions between actors, networks, organizations, and institutions emerging in pursuit of a desired state for social-ecological systems." Chaffin et al., (2014)*

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## 2.2.2 The notion of Adaptive Governance Solutions

At its core, the deliverable aimed to define reliable and replicable adaptive governance solutions. Before exploring potential solutions, it is crucial to review the contemporary literature on adaptive governance solutions to understand what researchers have already done. As stated in Section 2.2.1, much theoretical research underpins what adaptive governance is. However, there is seemingly less research into how adaptive governance manifests in practice. Therefore, identifying reliable and replicable adaptive governance solutions from practice can be understandable and challenging.

Research on the replicability of adaptive governance solutions, strategies and tools is a relatively novel field of inquiry. However, several core articles served as essential touchstones that informed the approach of the researchers at Ulg.

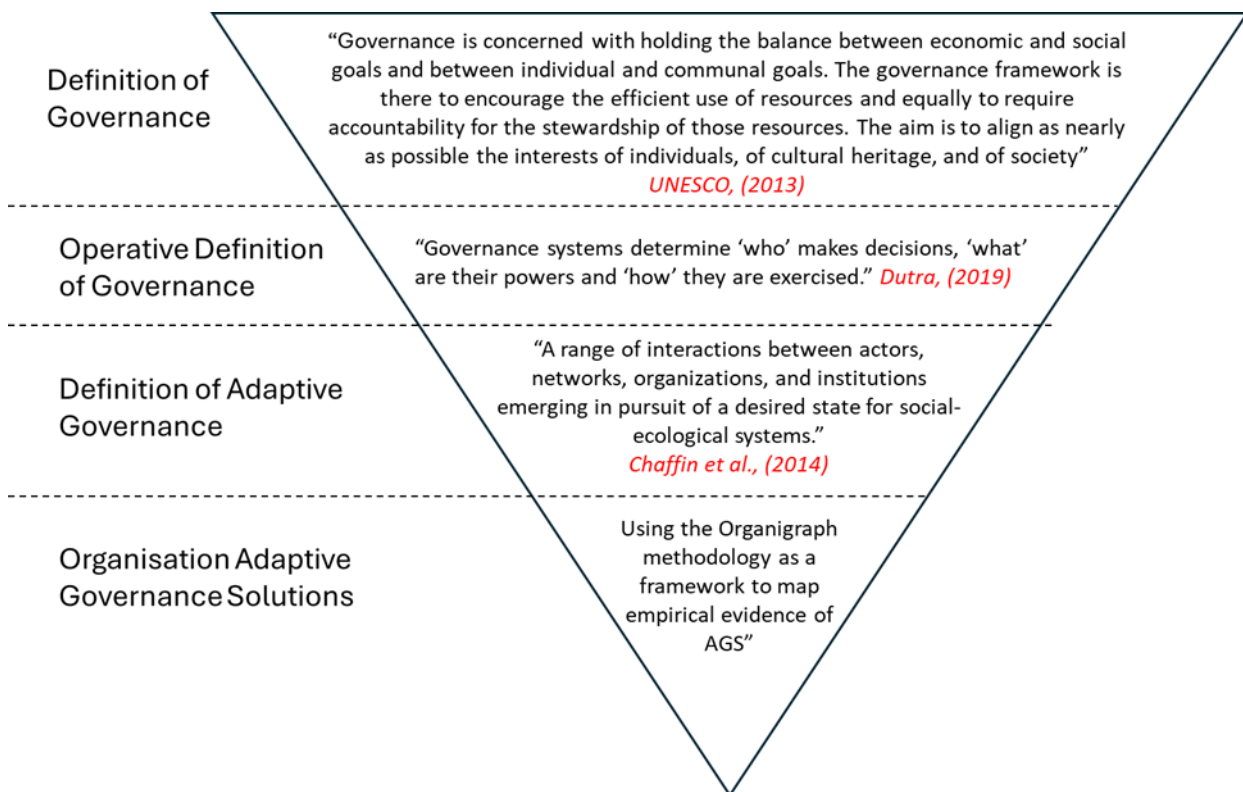
First, a core piece of research on which the researchers at ULG focused was published by Armitage et al. (2009) who present the core feature in the adaptive co-management of social-ecological spaces. This article was important as it demonstrated the types of innovative governance arrangements, learning styles, interventions, power dynamics and policy interventions that would occur with governance structure around social ecological spaces. The findings of Armitage et al. (2009) refined the notion that replicable features can be identified within different governance arrangements.

Finally, the researchers at Ulg would also like to highlight the recent EU-funded project INTERLACE (Interlace, 2024). Within the INTERLACE project, researchers created an urban government atlas. This tool mirrors a similar approach developed as part of the Meta-Repository by UNIBO in D2.3. Within urban governance, no specific category deals with ‘adaptive governance solutions’ per se. This tool gives a powerful example of how tools such as the meta-repository could function in practice. However, the tools included in the INTERLACE Atlas do not provide an Organigraph of the Governance solution. Each tool is accompanied by a detailed description of the actors, challenges addressed, good practice characteristics, benefits, etc. However, the tools do not have an associated governance map. This governance map can be extremely useful in extracting the governance solutions from the context-specific application so that practitioners can tailor it to suit their mix of stakeholders, governance mechanisms and policy instruments. This emphasised to the researchers at ULg the importance of taking the AGS within The RescueMe project one step further.

## 2.3 Conceptual Framework – Summary

In summary, the researchers at Ulg use the definition provided by UNESCO as the conceptual basis for governance within the report. This is not necessarily because it is the most widely cited definition across academic literature. Instead, it will hold creditability with the CH stakeholders within the R-LABs while still adhering to the core elements of governance from across academic literature. While the definition of governance provided by UNESCO provides a recognizable conceptual basis for the report, the research found it cumbersome in practice and, as a result, would rely on a practical shorthand definition. Dutra (2019) provided this practice shorthand definition and allowed the researcher to drill down specific into who, what and how contributes towards a governance structure. Second, the researchers at Ulg briefly explored core academic material around adaptive governance to define a working

definition. We learn here that adaptive governance is a popular concept to enhance resilience and sustainability. This is achieved by allowing stakeholders to react to perturbations through greater flexibility in the decision-making processes. However, with that in mind, literature has highlighted little empirical evidence of adaptive governance in practice. Some scholars have emphasized that it can be challenging to over-emphasise empirical examples of adaptive governance as they are often highly context-specific. This directs us to the final part of the conceptual framework regarding the Organigraph Methodology. Researchers at ULg are leveraging their research on Organigraphs to establish a framework for mapping AGS.



**Figure 3: The conceptual framework that underpins the research within the report. Consolidate the guiding conceptual and practical definitions and critical research themes from AGSs**

## 3 Methodology

Researchers at the University of Liege employed a 3-part mixed methods methodology to develop a series of adaptive governance solutions. The three parts have been outlined below and explored in greater detail in the following subsections. The methodology's first part focuses on eliciting adaptive governance typologies using a semi-empirical qualitative methodology with five RescueMe R-LABs. Part 1 consisted of various co-creative phases designed to build Organigraphs and identified unique AGS within the five R-LABs, which are:

**Psiloritis in Crete (Greece)**

**Island of Neuwerk in Hamburg (Germany)**

**Portovenere, Cinque Terre & the Islands (Italy)**

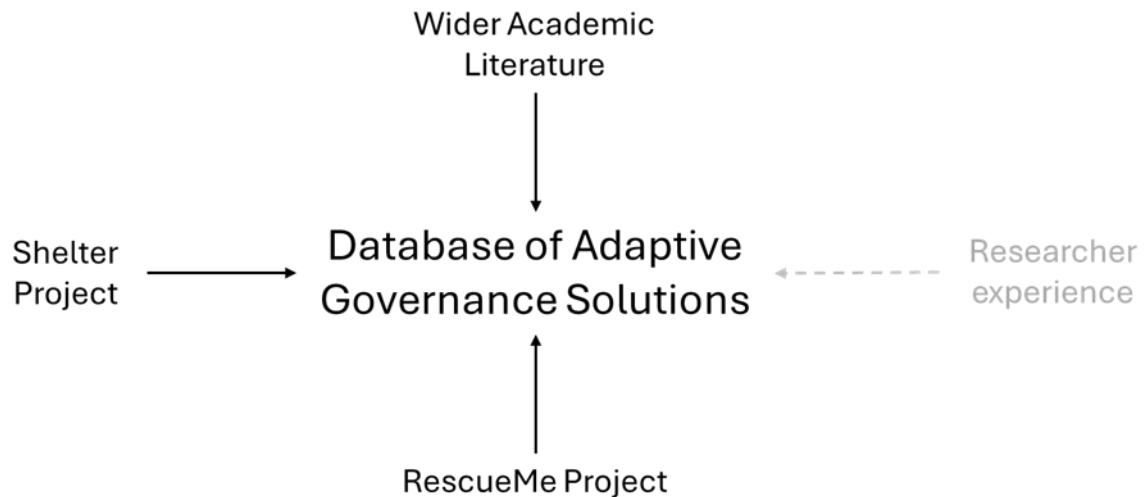
**Historical Irrigation System at l'Horta de València (Spain)**

**Defensive System of Zadar (Croatia)**

Part 2 of the methodological approach attempts to maximize the extensive background of raw data collected in the Shelter Project. The Shelter project was a Horizon 2020-funded project that focused on developing a data-driven and community-based knowledge framework to bring together the scientific community and heritage managers (Shelter, 2020). Within this project, researchers at the ULg and stakeholders from across five case studies co-created a series of adaptive governance maps (Durrant et al., 2021, 2022). These Organigraphs and the plethora of raw data formed a valuable resource to map adaptive governance schemes.

Finally, Part 3 of the methodology explored the explicit examples and core conceptual framework recorded in the broader literature. This part of the methodology attempts to take advantage of detailed work by other researchers.

The methodology was designed to maximize the knowledge and experience of the R-LABs and consolidate the plethora of pre-existing research conducted by ULg and beyond. Approaching the development of adaptive governance solutions in this way provides a myriad of benefits. First, it allowed the researchers to draw from the extensive research they had already conducted with similar case studies and broader academic literature. Maximize the impact of the researcher with the time allotted to complete it. Figure 3 demonstrates how the different parts of the methodology contribute to the database of adaptive governance solutions.



**Figure 4: The three parts of the methodology and how they all contribute to the database of adaptive governance solutions by drawing from different material sources.**

Finally, as a final note, it is also essential to highlight the researchers’ experience within the methodology. Researchers at the ULg have been tailoring the research of Organigraphs to map governance structures in many research projects. This experience and knowledge are crucial in shaping the AGS that were highlighted as part of the research.

### 3.1 Part 1 - Co-creation of governance Maps with the RescueMe R-LABS.

Part 1 of the methodology used a semi-empirical qualitative methodological approach to co-create five Organigraphs with the RescueME R-LABS. This methodology was a simplified version of the approach used in Durrant et al (2021) in the SHELTER Project. Figure 5 demonstrates the different phases of the approach and outlines how the Organigraphs within the RescueME project were derived.

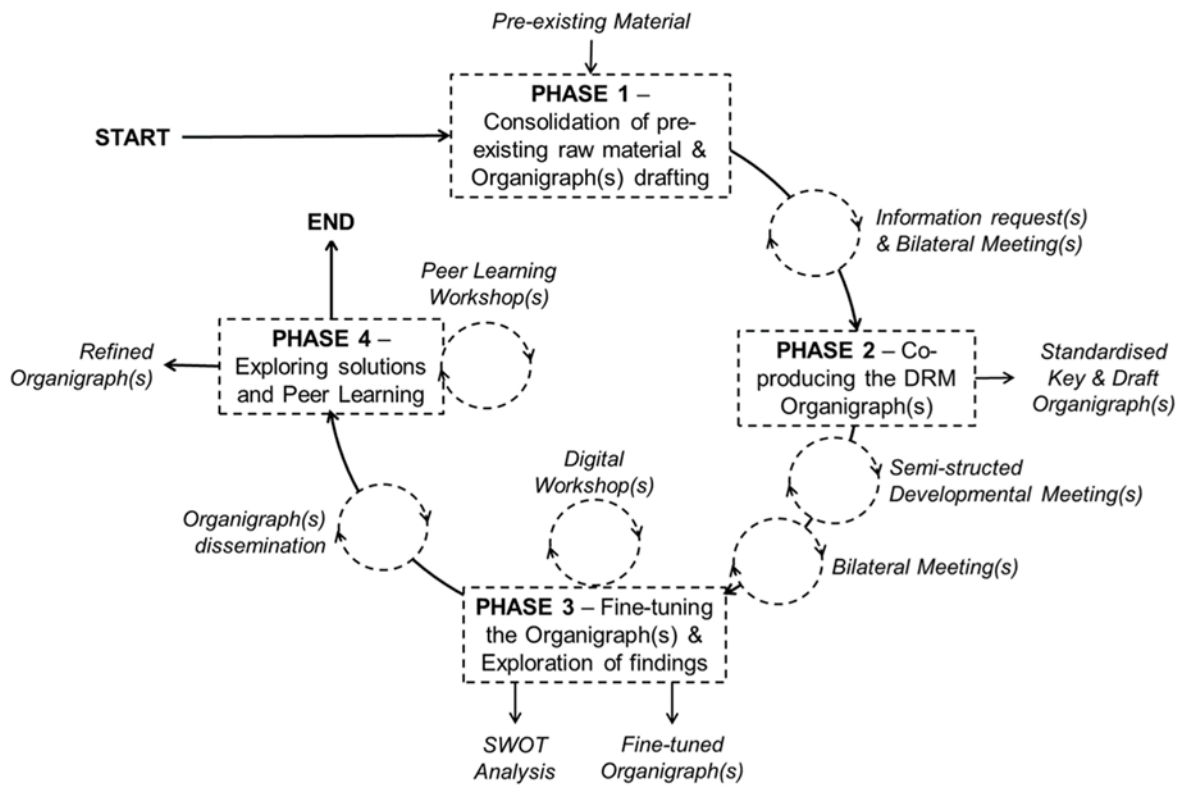


Figure 5: The semi-empirical research approach to co-create the Organigraphs with the five R-LABS.



Each of the Five R-LABs completed these MIRO boards. Following this, the researcher at ULg started to enhance raw data collected in the activities by searching for alternative documents or previous work that the R-LABs had already conducted around the concept of stakeholders and governance. These sources varied in their breadth and depth of information and have been listed in detail in the reference. The consolidation phase is finalized when a first draft of Organigraph has been created on the digital whiteboard Lucidcharts. Phase 2 of the semi-empirical approach is entitled “Drafting” This phase focuses primarily on developing and drafting the Organigraph with the experts from the R-LABs. The phase consists of developmental meetings focusing on digital Organigraph on the Lucidcahrt software. The contents of each meeting are tailored to suit the R-LABs depending on the specific contents of their Organigraph. However, typically each meeting consists of a back-and-forth discussion around questions designed to enhance the Organigraph or stimulate discussions. This phase concludes when significant changes no longer occur in the Organigraph. Instead, the discussions shift towards strengths, weaknesses, opportunities, and threats that the R-LABs experts observe in their Organigraphs. Phase 3 is entitled the review phase. In this Phase, the Organigraphs are ‘finalised’. No more significant changes occur in the governance maps. Instead, this phase focuses on the AGS's development and discusses how these solutions manifested in practice. This discussion was recorded in minute meetings and captured within the Organigraphs.

## 3.2 Part 2 - Revisiting Organigraphs from other EU Projects

Part 2 of the Method requires the researcher at ULg to revisit Organigraphs created in a previous EU Project. Specifically, the Organigraphs created within the Horizon 2020 funded SHELTER Project. The shelter project took place over four years, from 2019 to 2023. As part of this project, the ULg was responsible for the ‘community-based approach’ work pack. This work package explicitly focused on understanding and building relationships with the five case studies communities and how to engage with them. In short, co-creating the Organigraphs within the Shelter project utilized the same semi-empirical quantitative approach outlined in Figure 1 for a more in-depth analysis of this methodology and how these Organigraphs work. Please see.

Deliverable 6.3 - Adaptive Governance Schemes Mapping - <https://shelter-project.com/documents/deliverables/>

Alongside these deliverables, the research at ULg had a large amount of raw data around those Organigraphs in the form of research notes, meeting minutes and recorded

development phases of the Organigraph constructed. This raw data was invaluable when returning to the thoughts on adaptive governance. In fact, in some unique cases the researchers could contact the case studies coordinator directly and further explore some of the topics within the context of this research.

### 3.3 Part 3 – Exploring External Case Studies

Finally, part of the methodological approach outlines the exploration of existing case studies and empirical examples of AGS that already exist. First, the Researchers at ULg maximized extensive desktop research already conducted by the University on the Flooding of the Vesdre Vally in July 2021. The desk-top analysis focused on Consultation citoyenne (citizen consultations) requested by a Parliamentary Commission after the July 2021 flood. From January 29th, 2022, to February 8th 2022, researchers interviewed 13 citizen groups impacted by the flood to explore their experience, perceptions and crucial disaster response. The results of these interviews were translated from French (the primary spoken language in Verviers) to English using Google Translate before analysis. This analysis manifested in a comprehensive DRM Organigraph for the Vesdre Valley region.

A form of snowballing or citation chain methodology accompanied this analysis. The findings of the literature review inspired this methodology. Namely, empirical evidence of Adaptive governance is hard to find. Based on the literature review findings, this was the case of the research around AGS in which specific empirical evidence can be challenging to find and easy to miss because of the vast array of contexts in which it is applied (Naderifar et al., 2017). A snowballing literature review allows the researcher to use a high piece of research as a springboard to see whom that research article references and in what context. The research can then follow the chain of articles to identify similar research or avenues of research related to the research question or topic. A type of snowballing methodology was used in Part 3 of the methodology to identify external case studies. By way of example, the research searched for “examples of adaptive governance”. The search query highlighted several articles which were considered relevant to the work.

# 4 Results

## 4.1 Results from Part 1 - Co-creation of governance Maps with the RescueMe R-LABS

This section outlines the five Organigraphs co-created by ULg and the R-LABS from May 2023 until May 2024. These Organigraphs went through four phases of development, refinement and reflection, culminating in highly detailed and validated governance maps representing each of the Five R-LABS. The true power of these Organigraphs lies in the online dynamic versions which can be found on the URL links below. These dynamic versions allow the reader to manipulate them using an inbuilt layering function. The layering function is controlled but buttons on the Lucidchart documents that allow the reader to manipulate the visible layers of each Organigraph. As a result, it is recommended that readers access and explore the digital version of the Lucidchart documents on the URL links below.

### 1. Psiloritis in Crete (Greece)

[https://lucid.app/lucidchart/8ee6e01d-35ee-4423-af52-133580c7dc55/edit?invitationId=inv\\_0a954273-774a-4faf-a41a-152731fe5376](https://lucid.app/lucidchart/8ee6e01d-35ee-4423-af52-133580c7dc55/edit?invitationId=inv_0a954273-774a-4faf-a41a-152731fe5376)

### 2. Island of Neuwerk in Hamburg (Germany)

[https://lucid.app/lucidchart/223fde66-60c5-43c8-834c-c6a59d268e1f/edit?invitationId=inv\\_29694fd4-c9dd-43ca-97c7-c0c623f39a08](https://lucid.app/lucidchart/223fde66-60c5-43c8-834c-c6a59d268e1f/edit?invitationId=inv_29694fd4-c9dd-43ca-97c7-c0c623f39a08)

### 3. Portovenere, Cinque Terre & the Islands (Italy)

[https://lucid.app/lucidchart/9839523f-0f4f-44dc-bbec-883b0d7b0fe8/edit?invitationId=inv\\_796a91ae-b2bf-4f33-9a04-5cef4699b53d](https://lucid.app/lucidchart/9839523f-0f4f-44dc-bbec-883b0d7b0fe8/edit?invitationId=inv_796a91ae-b2bf-4f33-9a04-5cef4699b53d)

### 4. Historical Irrigation System at l'Horta de València (Spain)

[https://lucid.app/lucidchart/e2099b20-4759-4858-a6c4-09be91fbfe4e/edit?invitationId=inv\\_8dcf7939-ddeb-49f8-81b9-fc6b6f301d11](https://lucid.app/lucidchart/e2099b20-4759-4858-a6c4-09be91fbfe4e/edit?invitationId=inv_8dcf7939-ddeb-49f8-81b9-fc6b6f301d11)

### 5. Defensive System of Zadar (Croatia)

[https://lucid.app/lucidchart/8708dd7a-cb3b-4056-bbca-55baa724fffb/edit?invitationId=inv\\_a0167117-ad8f-4b75-aea3-3a8e5baedc38](https://lucid.app/lucidchart/8708dd7a-cb3b-4056-bbca-55baa724fffb/edit?invitationId=inv_a0167117-ad8f-4b75-aea3-3a8e5baedc38)

## 4.2 Results from Part 2 - Revisiting Organigraphs from the SHELTER Project

This section of the results outlines the previous Organigraphs published in the SHELTER Project. The Organigraphs went through the same phases of development, refinement and reflection between JAN 2020- JAN 2022 as part of the shelter project. A detailed account of the research can be found in Shelter Project (2022), and the results were also published by Durrant et al. (2022).

**1. Santa Croce Church, Raveena (Italy)**

[https://lucid.app/lucidchart/invitations/accept/inv\\_70cee264-3c73-4239-998d-0637c02c9c55](https://lucid.app/lucidchart/invitations/accept/inv_70cee264-3c73-4239-998d-0637c02c9c55)

**2. Isle of Dordrecht (Netherlands)**

[https://lucid.app/lucidchart/invitations/accept/inv\\_6551cc84-14e4-4b87-af8b-e7984ba9ac63](https://lucid.app/lucidchart/invitations/accept/inv_6551cc84-14e4-4b87-af8b-e7984ba9ac63)

**3. District of Seferihisar (Turkey)**

[https://lucid.app/lucidchart/invitations/accept/inv\\_8fc332b9-3e46-4c86-8926-5dcf51dfc361](https://lucid.app/lucidchart/invitations/accept/inv_8fc332b9-3e46-4c86-8926-5dcf51dfc361)

**4. Serra Do Xurés Natural Park in Galicia (Spain)**

[https://lucid.app/lucidchart/invitations/accept/inv\\_6868fe50-7430-4820-bef5-9be5013bbda1](https://lucid.app/lucidchart/invitations/accept/inv_6868fe50-7430-4820-bef5-9be5013bbda1)

**5. International Sava River Basin**

[https://lucid.app/lucidchart/invitations/accept/inv\\_7f70e7c2-8025-4b19-9b7e-c327ecd0b1ff](https://lucid.app/lucidchart/invitations/accept/inv_7f70e7c2-8025-4b19-9b7e-c327ecd0b1ff)

## 4.3 Results from Part 3 - Exploring External Case Studies

Finally, this section of the results details the results from Part 3 of the methodological approach. The section details the sources of AGS from external sources. The external sources varied and included results from other research work conducted by ULg. As well as the analysis and development of recorded case studies from broader literature. First, researchers drew data from an Organigraph created.

### 1. Vesdre Valley, Liege, Belgium

[https://lucid.app/lucidchart/invitations/accept/inv\\_2be64b1e-a3d2-408c-9b2c-ca0894c83210](https://lucid.app/lucidchart/invitations/accept/inv_2be64b1e-a3d2-408c-9b2c-ca0894c83210)

Secondly, the researchers also draw raw data from research articles. Specifically, the research searched for articles detailing an example of adaptive governance in practice. However, researchers at the university also chose to define some non-specific AGS. These solutions were not defined in a particular case -study. Instead, they outlined a practical framework or operative model which could be used to enhance adaptive governance solutions. In this way, they are still classed as AGS.

## 4.4 The Adaptive Governance Solutions

### 4.4.1 Table of Adaptive Governance Solutions

The following section outlines the 19 AGSs identified through the four-phase methodological approach. Table 1 provides an overview of the AGSs. This table allows the researcher to navigate directly to the AGS within the document and follow a hyperlink to the digital AGS created for RescueME meta-repository. For researchers who are new to the work of Durrant et al., 2022; 2024. It is recommended first to explore the standardized key ([URL LINK](#)). The standardized key is the key that outlines the building blocks used by the AGSs listed here, and The Organigraphs co-created with the R-LABs and the governance typologies within WP1 - T1.2 and D1.3.

**Table 1** Table 1 outlines all the Adaptive governance solutions that were defined and encapsulated into the meta-repository.

AGS CODE	AGS TITLE/ PAGE LINK	AGS URL LINK
AGS – LS1	Neighbourhood Scale Empowerment of local communities through pre-existing associations.	<a href="#">LINK</a>
AGS – LS2	The Creation of Neighbourhood Scale Community Associations.	<a href="#">LINK</a>
AGS – LS3	Reaching/ empowering isolated community groups through their meeting spaces.	<a href="#">LINK</a>
AGS – LS4	Integration of experts into the local context to help in the response and knowledge extraction.	<a href="#">LINK</a>
AGS – LS5	Turning tourism into a potential DRM response using mainland firefighters as 'volunteer' firefighters in isolated areas.	<a href="#">LINK</a>
AGS – LS6	The importance of education in disaster events for empowering young boys and girls.	<a href="#">LINK</a>
AGS – LS7	Community Resilience Initiatives within Informal Dwellings.	<a href="#">LINK</a>
AGS – RS1	Independent digital communication pathway to enhance response in the event of disasters.	<a href="#">LINK</a>
AGS – RS2	Informal collaboration between regional entities on policy, governance and decisions.	<a href="#">LINK</a>

AGS CODE	AGS TITLE/ PAGE LINK	AGS URL LINK
AGS – RS3	Local Communities using Social Media as a digital notice board and 'Check in'.	<a href="#">LINK</a>
AGS – RS4	One-stop information Application for Smartphones.	<a href="#">LINK</a>
AGS – NS1	A fortified place to protect to house invaluable Cultural heritage items in the event of a disaster.	<a href="#">LINK</a>
AGS – NS2	Enhancing community-led disaster risk management response through engagement and communication.	<a href="#">LINK</a>
AGS – NS3	Adaptive governance and community resilience to cyclones in coastal Bangladesh: Addressing the problem of fit, social learning, and institutional collaboration.	<a href="#">LINK</a>
AGS – SNS1	A mechanism for cross-national collaboration between neighbouring countries.	<a href="#">LINK</a>

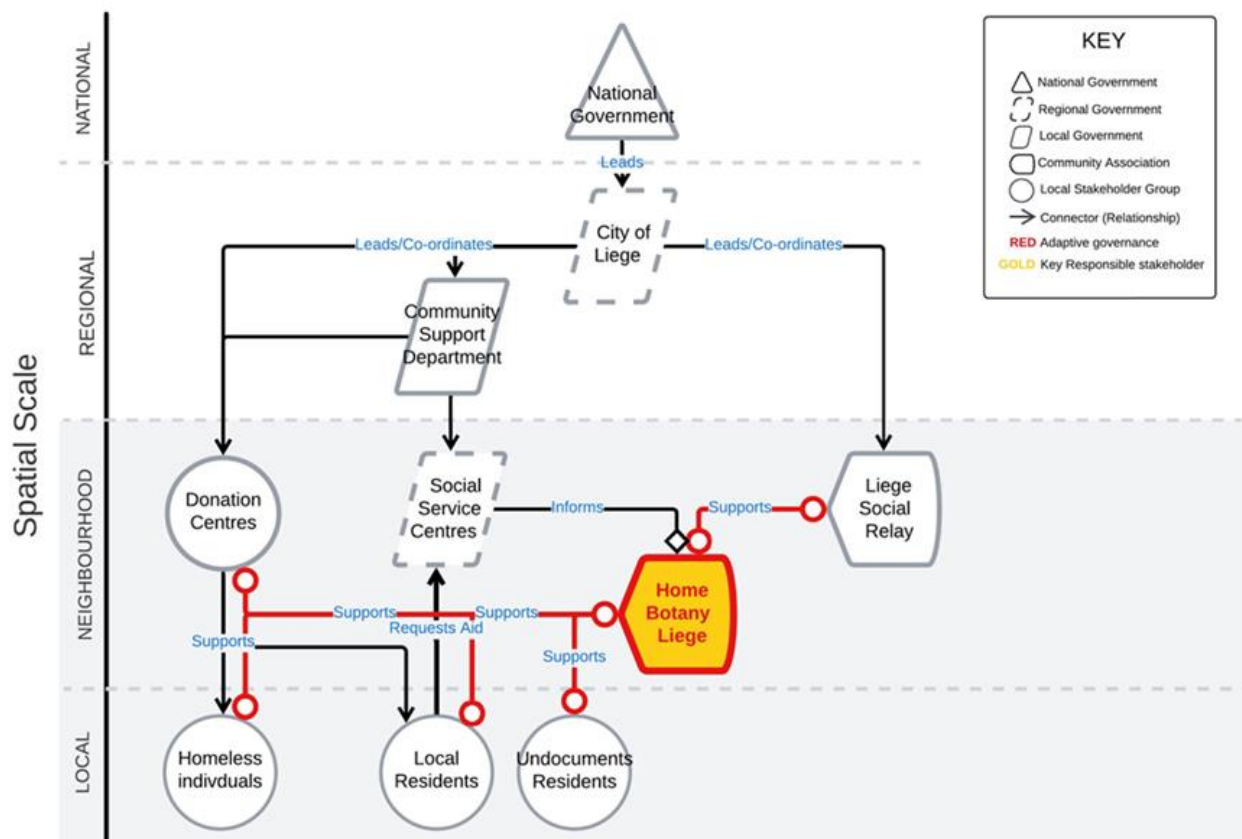
## 4.4.2 AGS – LS1

**Title** - Neighborhood Scale Empowerment of local communities through pre-existing associations

**Case study/ Location**- City of Liege, Belgium

**Summary** – This AGS details how a pre-existing community support organisation took responsibility in the response phase of the DRM. The AGS demonstrates how community organisations can leverage resources to support vulnerable community members. This AGS is helpful for regional governments to understand better the role of these organisations in times of disaster. As well as serving as a precedent to explore potential organisations before a disaster occurs.

**Organigraph** –



**Figure 7: The AGS Organigraph for AGS – LS1 entitled Neighborhood Scale Empowerment of Local Communities through Pre-existing Associations.**

**Source** – This AGS was sourced from Part 3 of the methodological approach. It outlines some of ULGs ongoing work on the governance mapping of the community association after the July 2021 Verde Valley Flooding.

**Hazard Type** - Flood. But has applicability to many other hazards.

**Responsible Stakeholder** – Local Community Organisation

**Description of AGS** - This adaptive governance solution was identified in Liege after the 2021 Vesdre Valley Flooding. The adaptive governance solution details the role and increased responsibility of a neighbourhood-scale community association called Accueil-Botanique-Liège. This translates to 'Home Botany Liege' in English. On a day-to-day basis, Home Botany Liege is an organization that provides social support to the local communities of Liege. By way of example, food, legislative assistance, and local integration classes. Ultimately helping isolated immigrants become better integrated into local life. Their work aligns with the city's social service centre on various projects.

However, In the response phase of the July 2021 flood, Home Botany Liege had to take on a significant increase of responsibilities. Preliminarily, Home Botany Liege became a centralized aid point for isolated community members. The organization supported the homeless or undocumented members of the community who could not go through traditional assistance means. Furthermore, the volunteers at Home Botany Liege used their connections to distribute aid in food, emergency supplies and medicine to those isolated community members. The community members were arguably some of the people who needed the help the most. In short, the AGT provides an example of a pre-existing community organization redirecting its connections and limited resources to flood response, which is not part of its original remit.

**Implementation Conditions** –

- This adaptive governance solution **assumes that there are indeed community associations of some form already** in place within the area.
- It also **assumes that these associations have the social, human, and financial capital to take on additional responsibilities** during a disaster.
- It may **require experts within the association to have the foresight and motivation to go above their traditional job role** and support people in need.
- This responsibility comes with **additional legal and insurance ramifications** that traditional means may not cover.

### Benefits Of the AGS –

- The established community association already has pre-existing networks and channels of communication with community members. These can be **leveraged to speed up response time and distribute first aid.**
- Furthermore, researchers have shown that **shared experiences like a disaster can strengthen community ties** in the long term. This is a rich source of social capital. (Walsh, 2007; Aldrich, 2011)
- These **community associations have the ability or capacity to provide additional support** in the event of a disaster.
- The local **community association may have context specific local knowledge, experience and skills** that can be useful in the local disaster response.

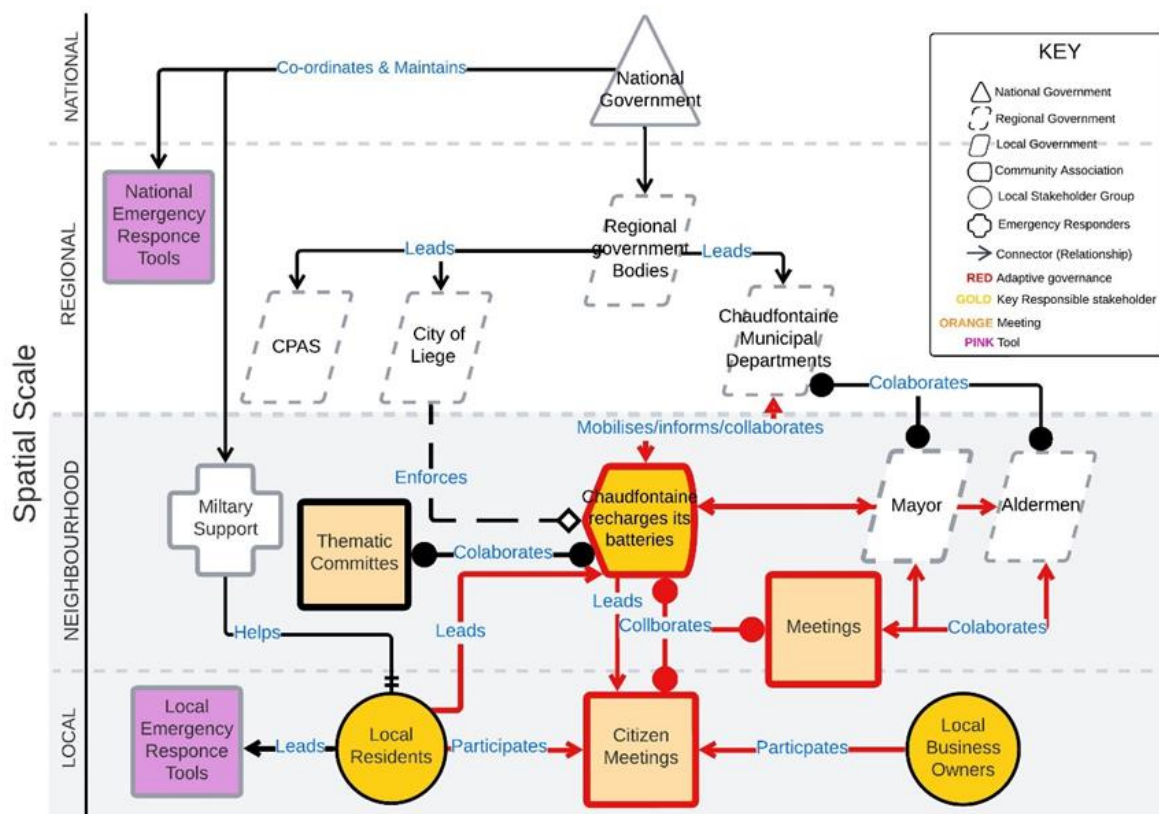
### 4.4.3 AGS – LS2

**Title** - The Creation of Neighborhood Scale Community Associations

**Case study/ Location**- City of Liege, Belgium

**Summary** – This AGS details the development of an independent community association after a disaster event on the neighbourhood scale. This community association developed due to the frustration of local community groups at national and regional government bodies. Communities associations such as this provide a unified voice for the local people. This AGS interests all stakeholders at the local spatial scale as it provides an example of how they can organize to facilitate change.

**Organigraph** –



**Figure 8: The AGS Organigraph for AGS – LS2 entitled – ‘The Creation of Neighborhood Scale Community Associations.’**

**Source** – This AGS was sourced from Part 3 of the methodological approach. It outlines some of ULGs ongoing work on the governance mapping of the community association after the July 2021 Verde Valley Flooding.

**Hazard Type** - Flood. But has applicability to many other hazards.

**Responsible Stakeholder** – Local stakeholders – Local community groups, Local

**Description of AGS** - This adaptive governance solution was identified in Liege after the 2021 Vesdre Valley Flooding. The adaptive governance solutions detail the emergence of an entirely new community association at the Neighborhood scale as a direct response to the flooding event. The neighbourhood association appeared to be born out of local people's frustration at the slow and mismatched response of the regional and national government departments in the days, weeks, and months of the event. By way of example Chaudfontaine Recharges its batteries is a new community association that developed due to the Vesdre Valley flooding. Chaudfontaine Recharges its Batteries is a collection of residents that formed an independent collective after the flooding. Their goal is to give the local people a unified voice and facilitate open exchange between the local people and the administrative bodies on rebuilding and restoration projects of the town after the flood. The residents in this circumstance should have utilized social media to spread their voices. But instead communicated through word of mouth and designated meeting points in the village. Associations such as Chaudfontaine Recharges its Batteries provided a focal point for local stakeholders to develop a unified voice for change.

**Implementation Conditions** –

- This adaptive governance solution can take **time to predict and implement because, in practice, these associations arise unpredictably and develop due to local frustration.** They are built on the local communities' motivations to enhance their community's response.
- These **organizations can develop without funding or resources.** However, for their long-term integration, they will need funding sources or, at the very least, a stream of resources. Within this example, the organization formally works with the government as an independent, non-profit organization.
- **Developing community associations in the event of a disaster is complicated to predict. It highly depends on each case study's area and context.**
- However, other stakeholder groups can foster these community groups' successful implementation and empowerment. Efforts can and should be made to identify these community groups and their development spaces.

### Benefits Of the AGS –

- Research has highlighted that facilitating and **empowering the development of associations at the local can lead to enhanced disaster response and a reduction in the costs of damages and loss of life** (Walsh, 2019).
- These community groups can serve as **centralized neighbourhood-scale communication points to liaison with local communities**, collect data and feed into broader solutions and policy documents.
- It can even be argued that empowering AGS such as this can **foster more excellent democratic processes in local communities and strength community ties**.

### 4.4.4 AGS – LS3

**Title** - Reaching/ empowering isolated community groups through their meeting spaces

**Case study/ Location**- Town of Seferihisar, Turkey

**Summary** – This AGS demonstrates how the regional government could set up a series of communication channels to local stakeholders without the need for digital technologies using spaces those stakeholders recognize. This AGS is helpful for regional governments/municipalities or NGOs wishing to enhance community collaboration or information dissemination.

**Organigraph** –

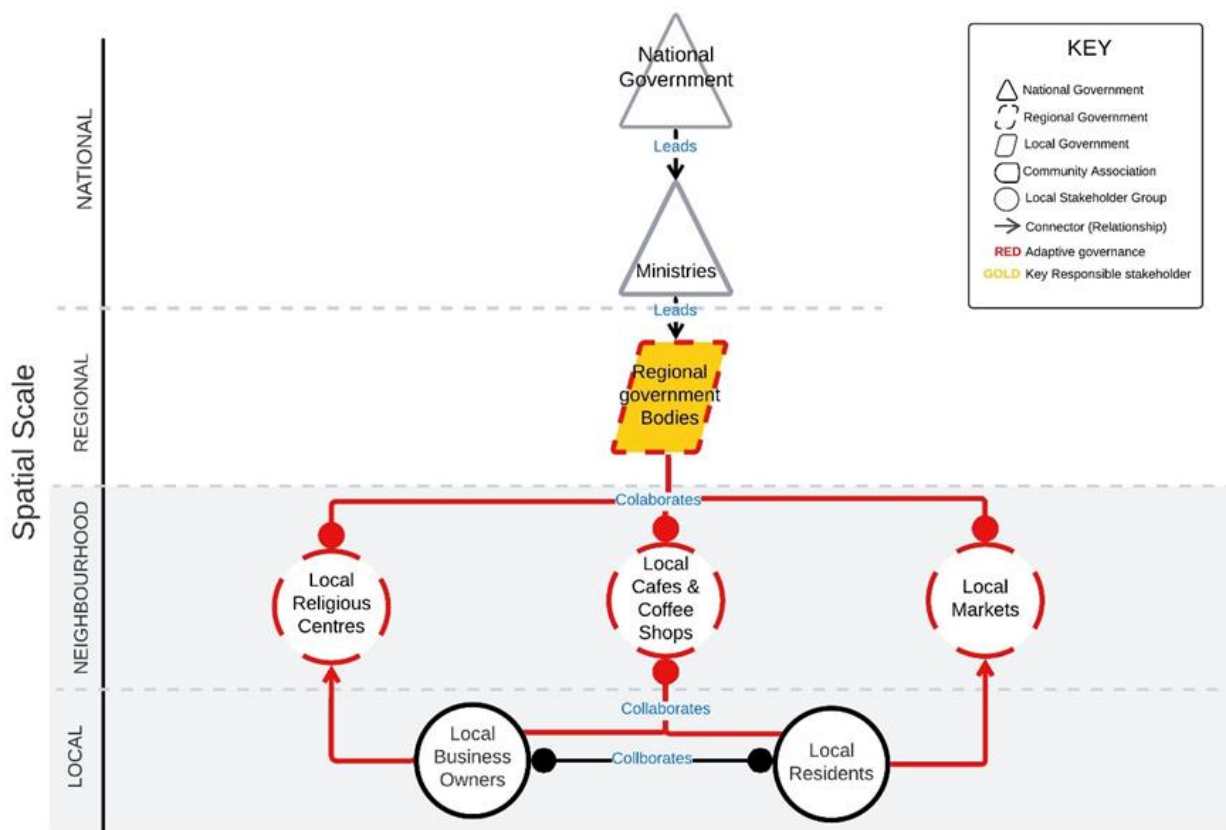


Figure 9: The AGS Organigraph for AGS – LS3 entitled – ‘Reaching/ empowering isolated community groups through their meeting spaces.’

## Responsible Stakeholder – Regional Government

**Description of AGS** – This adaptive governance tool was proposed as a potential solution by the open lab coordinator within the port town of Seferihisar in Turkey. Seferihisar is a famous tourist town with many hazards, including floods, earthquakes, tsunamis and wildfires. The hazards can happen quickly, and the local communities and businesses often serve as emergency responders. As part of a Horizon 2020 project, experts suggested that the local stakeholders, including the communities, businesses, and religious centres, could be trained and better equipped to serve as more effective emergency responders. However, this training was most effective when delivered through pre-existing communication channels and in terms of the local people. Within this adaptive governance solution, regional experts would reach the local communities through three key areas: 1) Religious centres and mosques. 2) Coffee shops and Cafes. 3) the weekly markets. Not only would this maximize the exposure, but it would also reach different community demographics.

### Implementation Conditions –

- This adaptive governance tool **requires that the regional government or experts know the meeting spaces of the local community**. This includes physical spaces, as in the case of the AGS or alternative digital online spaces.
- There can be **resources that need to be invested in meeting and training the local stakeholders to be effective first responders**. These resources can vary dramatically depending on the specifics of the case studies. This can include financial support, training, and equipment such as hi-vis vests fire extinguished.
- The adaptive governance solution may **require the responsible stakeholder to have a pre-existing relationship or credibility with the local community**. Without this, the information, resources and advice will not be trusted or implemented.
- The responsible stakeholder may need to **invest time in stakeholder Engagement strategies to foster relationships**. These relationships can aid in integrating, monitoring, and delivery of solutions across all phases of DRM.
- **Solutions should be created on the terms of the local stakeholders**, not imposed.

### Benefits Of the AGS –

- The residents are often the first responders in the event of a disaster. **Coordinated training and equipment can ensure that the aid rather than hinder the response phase of DRM**.
- Establishing AGS like this can **offset some of the responsibilities and resources of civil protection and emergency responders**. Local stakeholders often want to aid recovery and will do so voluntarily.

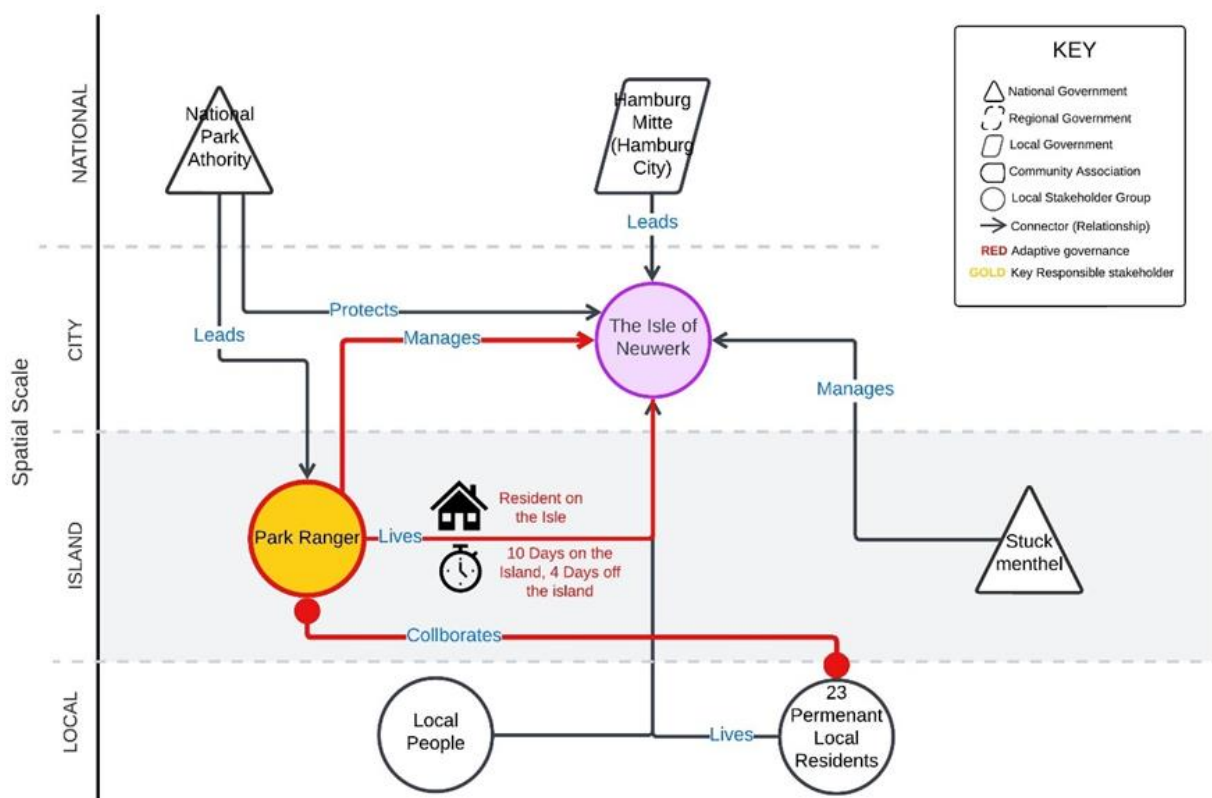
- AGS like this can **encourage local stakeholders to feel included in the DRM cycle**. This can mitigate unwanted or harmful community responses born from anger and frustration.
- This AGS can **foster democratic processes and community ties**. This will have significant knock-on effects in all manner of ways.

### 4.4.5 AGS – LS4

**Title** - Integrating experts into local context to help respond and extract knowledge.

**Case study/ Location**- Isle of Neuwerk, Germany

**Summary** – This AGS highlights a unique example of how to integrate knowledge experts into the local community. This AGS not only facilitates trust building between local stakeholders and larger organizations through a ‘mediator’. But this AGS can also help coordinate and train local communities as the first response coordinated by a trained expert. This AGS is helpful in regional municipalities and Regional environmental departments seeking to improve local DRM or build trust between local stakeholders.



**Figure 10: The AGS Organigraph for AGS – LS4 entitled – ‘Integration of experts into local context to help in the response and knowledge extraction.**

**Source** – This AGS was sourced from Part 1 of the methodological approach. The AGS was identified and unpacked with experts for the RescueMe Project Rlab.

**Hazard Type** – Flood. But has applicability to many other hazards.

**Responsible Stakeholder** – Park Ranger/Authority.

**Description of AGS** – This AGS was identified within the RLabs of the Isle of Neuwerk within the RescueMe Project. This AGS outlines how local ‘external’ stakeholders can be integrated into an area or community to enhance the DRM response and provide a valuable communication channel between the local community and overarching municipal and DRR organisations. With this AGS, the regional municipality relocates the park ranger to the island's physical location. Relocating such an expert ensures they become temporary residents on the Neuwerk island. According to the expert this occurs on a rotation of 10 days on the island and four days off the island. By physically occupying the island, there is a myriad of benefits. First, the experts are already on the island and can react immediately to issues and problems. Furthermore, the experts become active members of the community. Naturally, they are increasingly trusted by being active community members and providing a conduit for local knowledge extraction and communication.

#### **Implementation Conditions –**

- **The stakeholder must be willing to relocate for extended/short-term stays.**
- To implement this AGS, space and resources must be **available to host the specific stakeholder**. This can be an empty dwelling owned by the responsible stakeholder, rented accommodation or with another stakeholder currently in the place.
- **The Park Ranger must have the necessary experience to implement solutions and manage the workload independently.**
- **There are always several implementation conditions related to the stakeholders themselves—**by way of example spoken language and personality type. The stakeholder (which in this case is the Park Ranger) will need to attempt to integrate themselves with the local community. The more successful they ingrate, the more the local community will trust them.

#### **Benefits of the AGS -**

- It is implementing experts directly into a location for more extended periods. This **builds trust with the local community group and encourages them to implement long-term solutions and goals.**
- The responsible stakeholder will be **able to gather knowledge and experience directly from the local stakeholder groups**. This knowledge can be leveraged to help resilience and planning or used to inform policy.
- Having a trained and experienced stakeholder on the ground can be an invaluable ally in integrating and delivering solutions, tools or policies

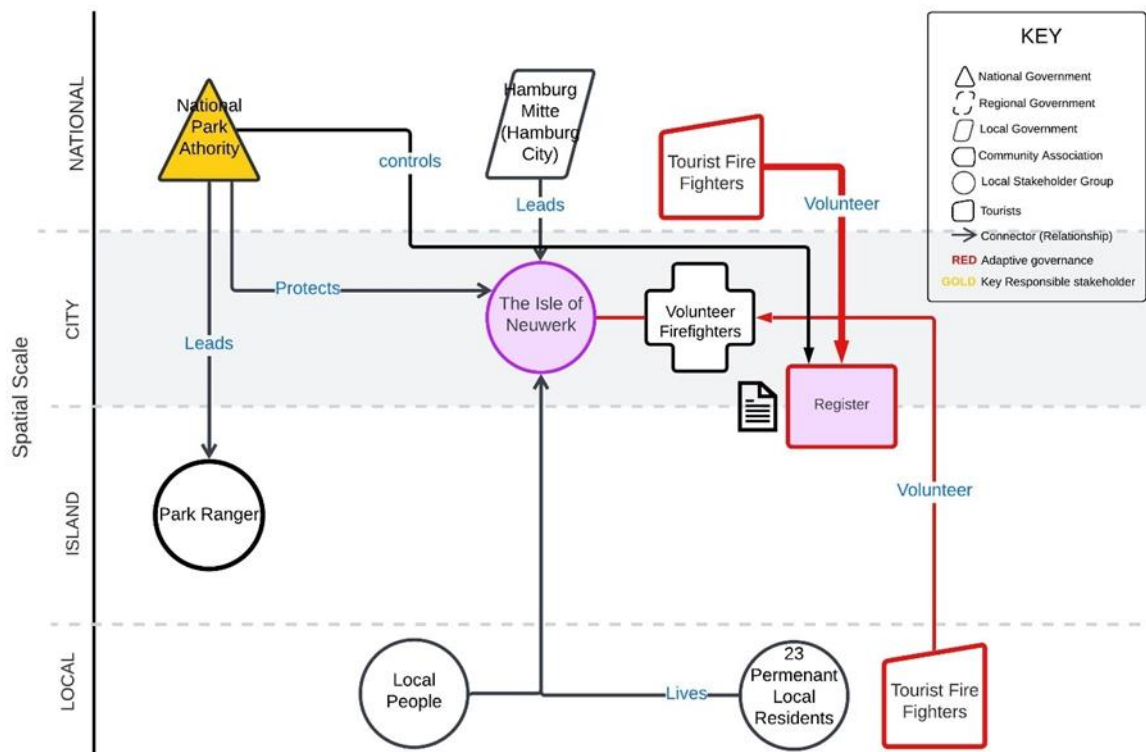
### 4.4.6 AGS – LS5

**Title** - Turning tourism into potential DRM response using mainland firefighters as 'volunteer' firefighters in isolated areas.

**Case study/ Location**- Isle of Neuwerk, Germany

**Summary** – This AGS details the use of mainland firefighters as volunteer firefighters in an isolated and resource community. The local municipality has developed a register in which firefighters can register with their families to visit an isolated island for a paid vacation, understanding that if a disaster occurs, they will provide support. This AGS is helpful for local municipalities and civil protection authorities who would like to increase the presence of emergency services in isolated or under-resourced CH sites.

**Organigraph** –



**Figure 11: The AGS Organigraph for AGS – LS5 entitled – ‘Turning Tourists Firefighters into ‘Volunteer’ fire fighters’**

**Source** – This AGS was sourced from Part 1 of the methodological approach. The AGS was identified and unpacked with experts for the RescueMe Project Rlab.

**Hazard Type** – Flood. But has applicability to many other hazards.

**Responsible Stakeholder** – Local Community Organisation

**Description of AGS** – This AGS details the use of tourists who are trained firefighters as volunteer firefighters on the island of Neuwerk. The Isle of Neuwerk is a popular tourist attraction on the north coast of Germany. As a result, there are a lot of people who wish to visit the island on vacation and enjoy the cultural landscape. The local government offers firefighters who wish to visit the island a place to stay with their families if they are willing to serve as volunteer firefighters in the event of a fire on the island. The rotation of the volunteer firefighters is managed using a registry and waiting list that the local government maintains. In the case of Neuwerk, this AGS has proven to be very popular with the waiting lists extending several months. The AGS provides a win-win for the volunteers and the local government. On the one hand, the volunteers receive a place to stay for a vacation on the island. The local government has a volunteer firefighter who is already trained and can provide first response and support in the unlikely event of a fire.

**Implementation Conditions** –

- **The stakeholders that visit the idea already have training and experience;** they do not require additional training to volunteer their services.
- First, a crucial part of the implementation conditions is the **need for a Register. This register catalogues the order and number of firefighters who would like to visit the CH site or area.** It not only catalogues the details of the interested firefighters but also helps to organize the order in which the stakeholders can visit.
- This register must be maintained by a stakeholder group that requires time and resources.
- Finally, the **CH or area needs to be a place that can be visited or that stakeholders will want to visit.** In the case of Isle of Neuwerk, it is a popular tourist destination. As a result, volunteer fire fighters can take their families whilst remaining ‘on call’. This is a crucial implementation condition for this specific AGS.

**Benefits Of the AGS** –

- The AGS already **utilizes the expertise and training of the current population or stakeholder group.** This minimizes the need for additional resources or training.
- These solutions place stakeholders with **experience in the heart of areas where that experience can be most valuable.**
- The **experts can coordinate the DRM response immediately after a disaster event.** This can reduce the loss of life and other resources.
- The expert can **educate and train the local community groups proactively in the preparedness and prevention phases of the DRM cycle.**

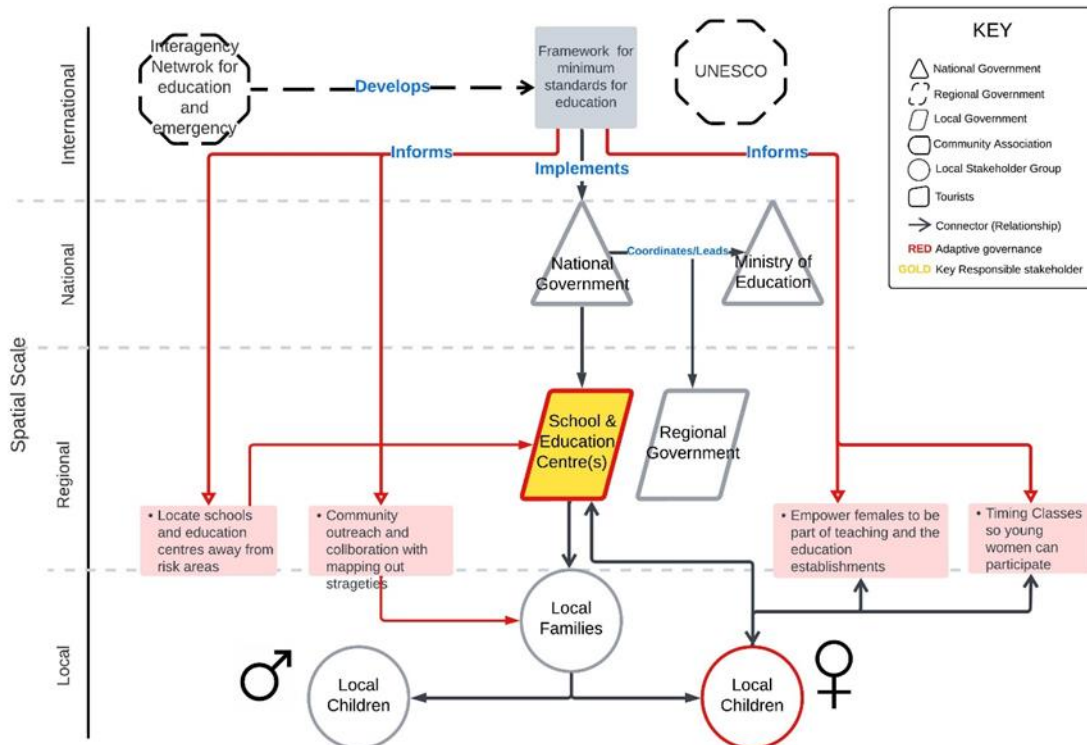
### 4.4.7 AGS – LS6

**Title** - The importance of maintaining education in disaster events for empowering young boys and girls.

**Case study/ Location**- UNESCO presented this AGS solution as a working example, rather than a specific case study. Therefore, it does not have a location.

**Summary** – This AGS details the importance of education for young children (especially young girls and women) in a disaster. UNESCO defined this AGS and details a series of community-scale approaches that can enhance the resilience of education in times of crisis. This AGS is helpful for national and regional governments/stakeholders involved in education and local stakeholders.

**Organigraph** -



**Figure 12: The AGS Organigraph for AGS – LS6 entitled – ‘The importance of education in disaster events for empowering young boys’ and girls’.**

**Source** – This AGS was sourced from Part 3 of the methodological approach. The AGs were distilled and mapped from a UNESCO workbook - <https://unesdoc.unesco.org/ark:/48223/pf0000148908>

**Hazard Type** – This AGS is not hazard-specific.

**Responsible Stakeholder** – Government Agency & Education centers

**Description of AGS** – At times of disaster, young children are displaced and significantly affected at crucial times in their development and lives. One of the critical areas in which they suffered is their education. Disturbances in a child's education and development for long periods have long-term adverse effects on their future and society. In particular, UNESCO emphasizes that this effect is also disproportionate. Girls are significantly more affected than boys in the event of a disaster. Girls are particularly vulnerable due to a myriad of compounding effects. This is not necessarily an adaptive governance solution per se. It is an overarching strategy that combines the coordinated efforts of many solutions. However, it has been included as an AGS solution because elements of the strategies empower women to be more involved in education. This snowballs into a more equal society. In short, the AGS encapsulates the development of an education framework created by the Interagency network for education and emergencies. This framework establishes uniform guidelines to enhance education's resilience in disasters and mitigate the disproportionate effects against girls and women in these situations. The 'adaptive' aspects of this solution include

- (Re)locating schools and learning spaces closer to communities and being aware of risk areas.
- We involve community members in the transport to these areas.
- We provide school feeding and support programs that establish the learning areas as crucial community locations.
- Empower women as teachers and education staff from an early age.

This AGS emphasizes the importance of education within gender equality and the economic stability of the countries affected by disaster events. Within the AGS, UNESCO outlines a series of strategies that can help maintain communication during a disaster.

*\*Finally, this AGS has been quantified as a local scale solution rather than a national or supra-national solution even though the framework to establish the change is implemented at the national spatial scale by supranational organisations. This is because the adaptive governance solution is implemented at the local spatial scale*

**Implementation Conditions** –

- This AGS does not have any specific implementation conditions per se. This is because the AGS focuses on maintaining education frameworks with young girls and boys during disasters. AGS is neither case study specific nor tailored to a particular solution. Several implementation conditions could facilitate the development and maintenance of education strategies.

### **Benefits Of the AGS –**

- This adaptive governance solution ensures the resilience of education facilitates in times of disasters. This benefits the children who can continue with their personal development. As well as long-term economic and society benefits.
- The AGS specifically targets gender qualities and aims to support girls and young women at risk during disasters.
- It enhances community ties and can help develop long-term community education hubs.

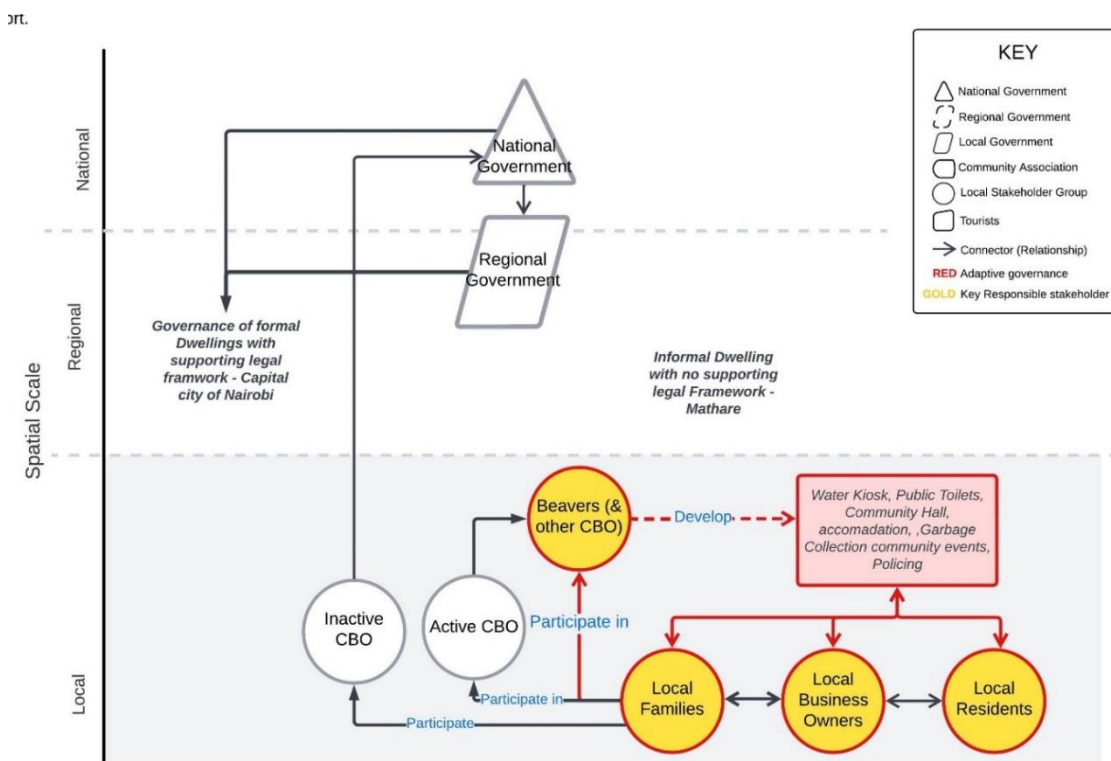
### 4.4.8 AGS – LS7

**Title** – Self-Organizing Community Associations within Informal Dwellings and their Role in enhancing adaptive capacities and providing community support.

**Case study/ Location**- Mathare, Africa.

**Summary** – This AGS details the importance of self-organising community associations in DRM within communities outside formal governance arrangements. This AGS highlights how these associations can provide a huge variety of support to local stakeholders that have long-term effects on society and the economy. This AGS is helpful for Local stakeholders who live within informal dwellings.

#### Organigraph –



**Figure 13: The AGS Organigraph for AGS – LS7 entitled - Self-Organising Community Associations within Informal Dwellings and their Role in enhancing adaptive capacities and providing community support.**

**Source** – This AGS was sourced from Part 3 of the methodological approach. This AGS's contents were recorded in a research article – by Fransen et al. (2022).

**Hazard Type** – COVID-19 epidemic but has broader applicability.

**Responsible Stakeholder** - Local Community Members.

**Description of AGS** – This AGS details the importance of self-organizing community-based organization(s) to build disaster resilience. However, this AGS details the distribution of community-based associations within an informal dwelling rather than traditional research around formal dwellings. This AGS explores the role of community-based associations (CBO) in Mathare, Nairobi. At the same time, this research focuses on the role of the CBOs during the COVID-19 epidemic. According to Fransen et al. (2022), 3000 self-organized community associations exist within the informal dwelling of Mathare on the outskirts of Nairobi. Many of these CBOs are only active during political campaigns. However, some remain active all year round and serve crucial functions in the community. They are including but not limited to community support, food distribution, communication and policing. This adaptive governance solution aims to outline the different forms of these community-based associations and provide an overview of how they can enhance community resilience in informal dwellings. Informal dwellings refer to slums traditionally heavily impacted by disaster events and do not receive support and help from traditional means. This adaptive governance solution details the importance of self-defined community-based organization, which details the distribution of community-based associations in an informal dwelling. While there are several active CBOs, this AGS focuses specifically on a CBO called ‘Beavers’.

**Implementation Conditions** –

- **Informal dwellings such as the one in Mathare exist outside traditional governance regimes.** As a result, they do not always receive traditional support and resources from overarching governing bodies. As a result, the local communities often have to self-organize. In the case of Mathare this is what appears to have happened. **The local people responded out of necessity.**

**Benefits Of the AGS** –

- This AGS provides a unique perspective into the development of Community-based associations that do not necessarily receive support from governing bodies.
- Interestingly, the organization referred to as Beavers within this adaptive governance solution was set up by residents involved in drug dealing. The CBO provided a positive outlet to deter future generations from engaging in illegal activities. CBO such as this one has many short-term and long-term positive effects.

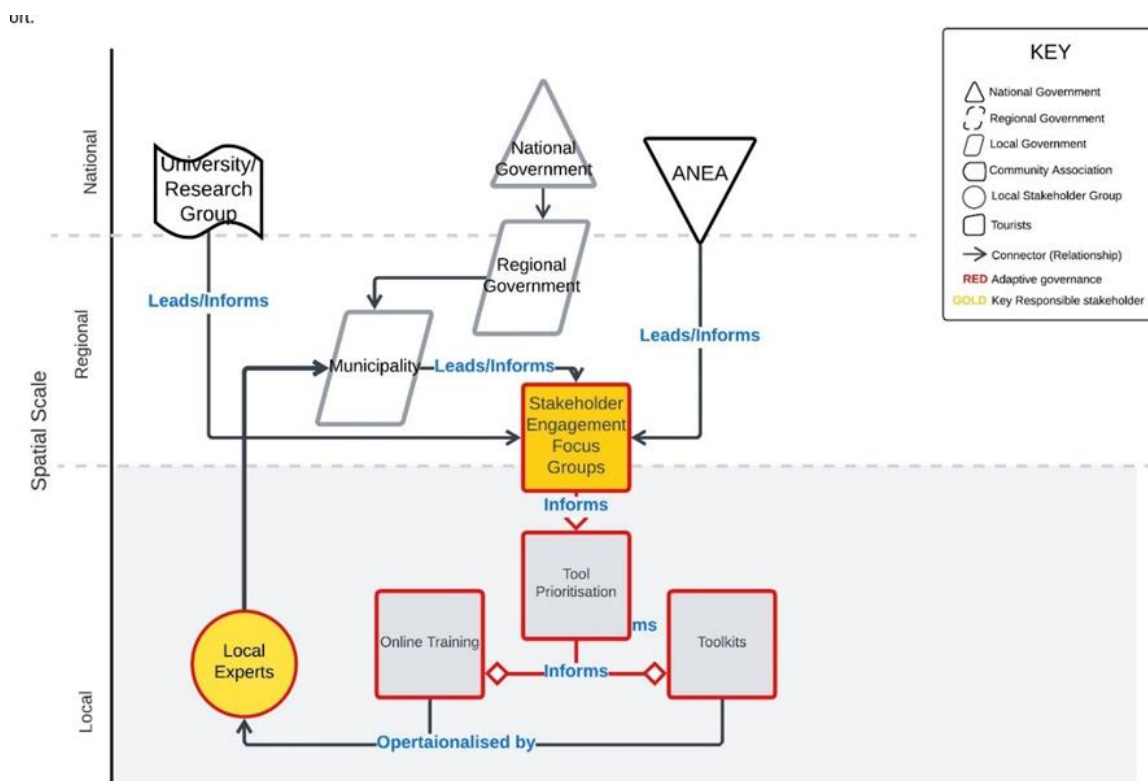
### 4.4.9 AGS – LS8

**Title** - Local Governance Support Tools implemented through training sessions with key local stakeholders – An AGS solution for researchers and experts to operationalize tools better.

**Case study/ Location**- Naples, Italy

**Summary** – The AGS details a collaborative community engagement approach within an EU project. This approach encourages local stakeholders and experts to actively select and explore a series of tools for operation in their Living lab. This AGS is reminiscent of many EU-funded projects and is helpful for University groups, regional municipalities and local experts participating in an EU project.

**Organigraph** –



**Figure 14: The AGS Organigraph for AGS – LS8 entitled – ‘Local Governance Support Tools for Disaster Risk Reduction and Climate Adaptation Strategies’**

**Source** – This AGS was sourced from Part 3 of the methodological approach. This research was distilled from the research conducted by Perney, M.E.P. and D’angelo, G. (2023).

**Hazard Type** – Any

**Responsible Stakeholder** – In this Adaptive governance Solution, the responsible stakeholder coordinates the stakeholder engagement strategy.

**Description of AGS** – This AGS captures research conducted with the municipality of Naples in Italy as part of the SECAP4 project. Within this project, the municipality of Naples served as a living lab to implement a series of tools that would aid with a multi-beneficial systemic approach. The approach aimed to incentivize climate adaptation and help design strategies for sustainability and low emissions. Researchers emphasize that implementing solutions into this living lab required a “comprehensive, integrated and across-scales governance approach”. This approach is reminiscent of many EU projects and living labs worldwide in which experts attempt to implement tools into the operational day-to-day of experts on the ground. Notably, the researchers within the project designed a series of tailored training sessions with key stakeholders in the Living Lab. The AGS aims to demonstrate how these training sessions are implemented in practice and how they influence governance. Documenting these training sessions offers excellent value to other EU projects and stakeholders attempting to implement climate adaptation tools. The critical part of this AGS is not in the outputs or tools themselves but rather in the approach that the researchers used to define, test and integrate the tools within the City of Naples.

As researchers, we have seen various attempts to do so within many projects. We hope these solutions provide experts with a potential approach to aid them going forward. At its core, the researchers utilized well-established methods for engaging with stakeholders, including workshops, interviews and focus groups to identify the key challenges. In these sessions, three key stakeholders identified the tools most effective in the Living lab. These stakeholders were the municipality of Naples, the PLINIVS-LUPT Study Centre of the University of Naples Federico II and finally, an organization called Neapolitan Energy and Environment Agency (ANEA) and an independent non-profit working in the energy sector. These stakeholders were supported directly by local experts. They were heavily involved in the selection, refinement and subsequent train of the solutions over several months.

**Implementation Conditions** –

- This AGS was developed as part of an EU-funded project called SECAP4. As a result, **the researcher and processes within the adaptive governance solution were funded by an external source of capital.** Conducting qualitative research is expensive and time-consuming. This is an essential factor to consider for the implementation of this AGS.
- This AGS requires the ‘buy-in’ of a diverse set of stakeholders. Both in the form of stakeholders who can facilitate and manage engagement strategies and the motivation from local experts on the ground.

### **Benefits Of the AGS –**

- Advanced levels of long-term stakeholder engagement are crucial for the longevity and uptake of tools. This provides a myriad of benefits.
- The process leads to tools that are fit for purpose and ‘owned’ by the stakeholders.

### 4.4.10 AGS – RS1

**Title** - Independent Digital Communication Pathway to enhance response during disasters.

**Case study/ Location**- Xunta Galicia, Spain

**Summary** – This AGS details an online communication tool between key response stakeholders during the disaster. This tool bypasses traditional bureaucratic communication channels and allows the general director departments to co-ordinate fire prevention on the groups. This AGS is useful for Regional Ministries responsible for disaster prevention and response.

**Organigraph** –

TITLE – Independent digital communication pathway to enhance response in the event of disasters

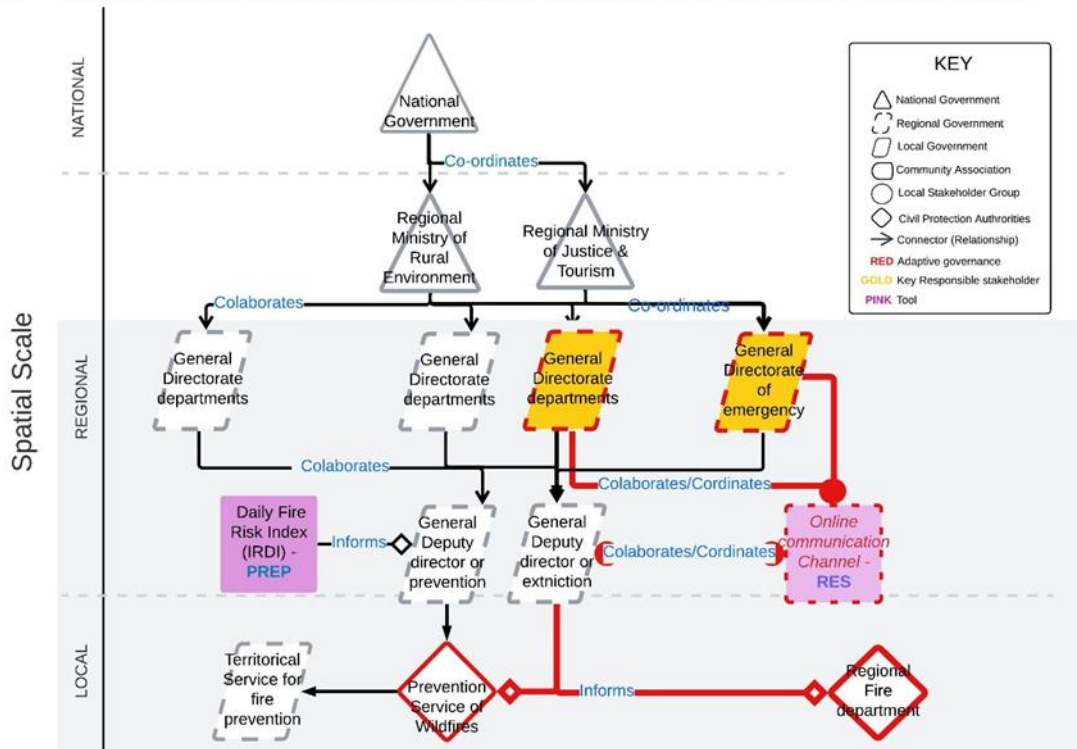


Figure 15: The AGS Organigraph for AGS – RS1 entitled – ‘The Creation of Neighborhood Scale Community Associations.’

**Source** – This AGS was sourced from Part 2 of the methodological approach. The AGS was distilled from previous Organigraphs developed within the Horizon 2020 project called Shelter. This research was also published online as part of Durrant et al. (2021; 2022).

**Hazard Type** – Wildfires But has Applicability in other hazards.

**Description of AGS** – This AGS was identified in the Xunta of Galicia around the issue of wildfires. In this adaptive governance tool, the General Directorate departments and the General Directorate of Emergency can communicate directly with the General Deputy Director of Extinction. During the response phase of the DRM cycle, the stakeholders would communicate on a dedicated online chat group rather than using the typical forms of communication, i.e. emails and phone calls. Within this example, the online communication tool was a WhatsApp app group. However, any form of online communication tool would suffice. The tool allowed the stakeholders to communicate with one another in real-time, allowing General Directorate departments and the General Directorate of Emergency to communicate directly with the General Deputy Director of Extinction and coordinate the response. The online chat facilitates the increased communication rate between critical stakeholders on a dedicated platform. The tool allows experts to bypass traditionally slow or more bureaucratic communication, which can be overloaded daily.

**Implementation Conditions** –

- The function of an online communication channel **requires a stable Internet Connection.**
- Furthermore, the participation of stakeholders in the online communication channel **requires an active device such as a Mobile Phone.**
- Stakeholders require access to a mechanism or application to share group messages (i.e. WhatsApp, telegram or messenger). **The stakeholders may already have access to an application,** and it can be best to use one they are already using and familiar with.
- The **participants of the communication channel must limit the use of the channel to work issues only.** The communication channel can become overloaded and no longer helpful in times of disaster when clarity and direction can be vital.

**Benefits Of the AGS** –

- Mobile phone applications and other digital communication methods have proved extremely useful in coordinating and communicating resources during disasters. **They can speed up response between core stakeholder groups and streamline DRM response.**

- These online digital communication channels **can be used to bypass traditional methods of communication**, which can be heavily bureaucratic or slow.
- Very often, the methods are **freely available and do not have any additional cost**.

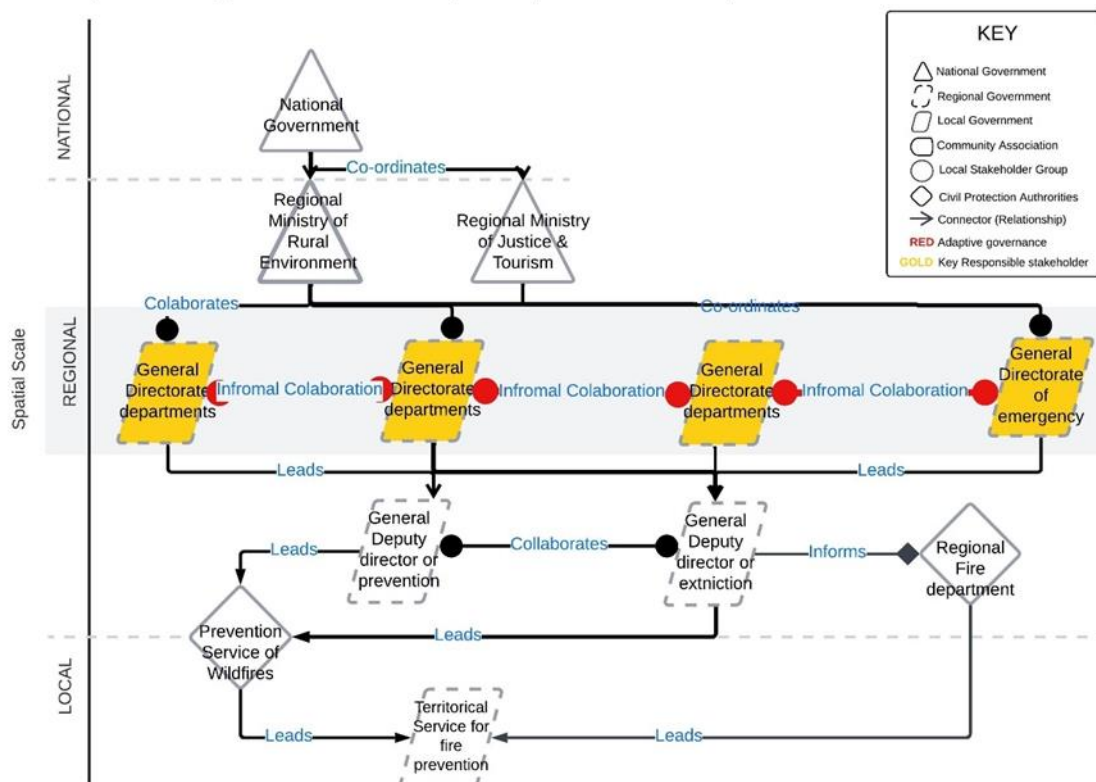
## 4.4.11 AGS – RS2

**Title** - Informal collaboration between regional entities on policy, governance and decisions.

**Case study/ Location**- Xunta Galicia, Spain

**Summary** – This AGS details the informal collaboration between different regional government departments at a regional government level. This informal collaboration is facilitated by the experts working in the same building and informally sharing ideas, experience and knowledge. This AGS is helpful for regional governments who are attempting to encourage their departments to break disciplinary silos.

**Organigraph** –



**Figure 16: The AGS Organigraph for AGS – RS2 entitled – ‘Informal collaboration between regional entities on policy, governance and decisions.’**

**Source** – This AGS was sourced from Part 2 of the methodological approach. The AGS was distilled from previous Organigraphs developed within the Horizon 2020 project called Shelter. This research was also published online as part of Durrant et al. (2021; 2022).

**Hazard Type** – Wildfires, But has Applicability in other hazards.

**Description of AGS** – This AGS was identified in the Xunta of Galicia around the issue of wildfires. In this adaptive governance tool, experts within the General Directorate departments collaborate informally on various issues within Galicia. The communication channels are maintained and used because the different departments are located within the same physical space, a building. Occupying the same physical space allows the experts to visit and collaborate on a rapid, ad hoc basis. These collaborations are informal and allow the experts in the different departments to quickly exchange information, opinions and ideas on other departments' work. These exchanges can make outcomes more significant than the sum of their parts. By way of example; experts in the biodiversity and conservation department can provide informal input on policy related to prevention and preparedness. The solution defines an informal verbal communication path between different stakeholders. While it does not have resources, it does have some crucial implementation conditions. First, stakeholders from different departments must be in the same physical space or very close proximate. The experts must be able to have a short verbal conversation with one another. Secondly, The adaptive governance solution requires a professional atmosphere that encourages experts to openly share ideas and thoughts quickly in a working environment.

**Implementation Conditions** –

- The solution defines an informal verbal communication path between different stakeholders. While it does not have resources, it does have some crucial implementation conditions.
- The stakeholders from **different departments must be in the same physical space or very close proximate**. Within this AGS, the stakeholders from the different departments worked in the same municipal building. The close proximate facilitates informal exchanges and encourages stakeholders to randomly discuss topics with their co-workers.
- The experts must be able to have a **short verbal conversation with one another**.
- The adaptive governance solution requires a **professional atmosphere that encourages experts to openly share ideas and thoughts quickly** in a working environment.

**Benefits Of the AGS** –

- These forms of verbal communication can be **invaluable in the knowledge sharing between experts from different disciplines** can be greater than the sum of its parts. By way of example, experts from climate adaptation departments can have an open

discussion with experts from other disciplines' lenses, such as Planning or sustainability.

- This AGS can lead to more **robust outcomes as experts can seek advice from colleagues across disciplines.**
- This AGS can **foster a more collaborative and inclusive working environment** where experts are encouraged to share ideas and voice concerns.
- This AGS can lead to **proactive troubleshooting** between interdisciplinary experts.

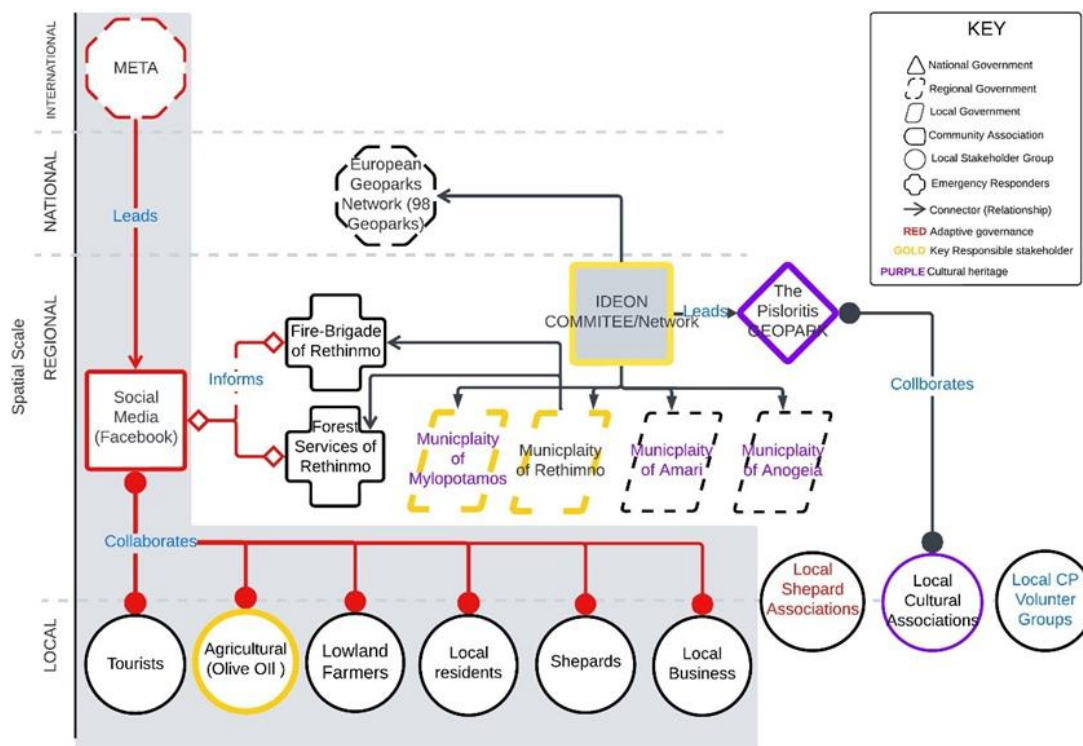
## 4.4.12 AGS – RS3

**Title** - Local Communities using social media as a digital notice board and 'Check-in'

**Case study/ Location**- Psiloritis, Crete, Greece

**Summary** – This AGS details the use of social media as a communication platform between local stakeholders during times of Disaster. This AGS highlights how powerful social media such as Facebook can be in updating local communities, identifying missing people and sharing real-time updates. This AGS is particularly useful for regional governments, civil protection agencies and local experts.

**Organigraph** –



**Figure 17: The AGS Organigraph for AGS – RS3 entitled – ‘Local Communities Using Social Media as a Digital Notice Board and 'Check-in'’**

**Source** – This AGS was sourced from Part 1 of the methodological approach. The AGS was identified and unpacked with experts for the RescueMe Project Rlab.

**Hazard Type** – Wildfires & Heatwaves but also

**Description of AGS** – This AGS was highlighted in the Rlab of the RescueME project by the experts within Psiloritis. This AGS details how crucial social media platforms can be in the response phases of the DRM cycle after a disaster event. According to the experts within the Rlab, the stakeholders at the local spatial scale, such as residents, local farmers and local business owners, often chose to use social media such as Facebook, as a digital notice board during wildfires and other disaster events. In this example, Facebook served as a space for the local community to check their location and the location of their loved ones. As well as rapidly sharing news of the developing wildfire in a space where the local communities already had access and were familiar with the platform.

#### **Implementation Conditions –**

- This AGS **requires that the stakeholders in the RLAB actively use a form of social media**. This can vary depending on the case study and epistemology of an area.
- The use of social media requires **a stable internet connection**.
- It is the responsibility of the stakeholders to ensure that the groups or **'walls' used as check-in mechanisms remain free of other social media 'noise'**. The effectiveness and clarity of these mechanisms rely on the highly focused social media account.
- An admin often manages the account and acts as the administrator. This stakeholder holds **a key place in implementing, managing, and applying these kinds of adaptive governance tools**.
- AGS tools such as these can be prone to issues with longevity. Very often, these types of groups function in the response phase of a disaster but are not maintained in the prevention and preparedness phases of the DRM cycle. As a result, emphasis should be placed on the effectiveness of these tools.

#### **Benefits Of the AGS –**

- Social media platforms are **robust and constantly maintained platforms** with external funding sources. **These platforms are not reliant on the resources and funding of the local stakeholder groups**. They are, therefore, instrumental in the event of a disaster.
- Stakeholders often **already have the naturally ingrained behaviours in place** to use these types of platforms. Therefore, adapting them to use in times of DRM is relatively easy.

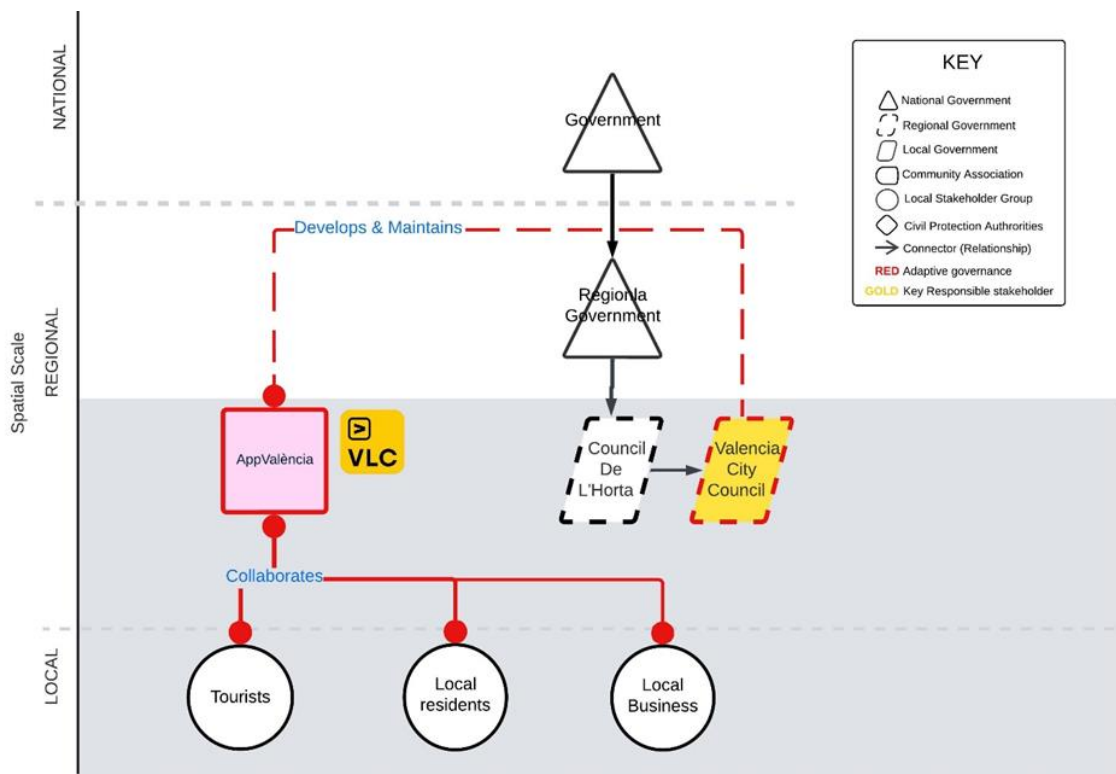
### 4.4.13 AGS – RS4

**Title** - One-stop information Application for Smartphones

**Case study/ Location**- City of Valencia, Spain

**Summary** – This AGS details developing and establishing an independent mobile application. Various stakeholders use this mobile application at the regional scale to communicate with all stakeholders who use the application on various topics. The AGS is helpful for regional governments who wish to set up communication channels with local people and take advantage of information communication technology.

**Organigraph** –



**Figure 18: The AGS Organigraph for AGS – RS4 entitled – ‘One-stop information Application for Smartphones’**

**Source** – This AGS was sourced from Part 1 of the methodological approach. The AGS was identified and unpacked with experts for the RescueMe Project R-LAB.

**Hazard Type** – Heatwaves but also useful for other solutions.

**Description of AGS** – This AGS details the use of an online mobile application. The mobile application is a centralised information service for the Valencia residents, tourists and visitors. The city of Valencia created and maintained the mobile applications at the regional or city scale. By way of example, the application provides a variety of information on the nearest EMT stop with upcoming bus arrivals, the location of EMT cars in real-time, availability of free places in public car parks, bicycles or free terminals at Valencia's stations (public bicycles), nearest taxi ranks and containers for solid waste, containers, glass, containers for used batteries and domestic oil, as well as the official containers for used clothing. Crucially, the Application can also be used in disaster to indicate challenges and issues before people encounter them in person. This AGS details the use of an application.

**Implementation Conditions** –

- Unlike the previous adaptive governance solution, which builds upon pre-existing social media platforms, this solution details the development of an independent application. **The development of such an application requires significant resources to create. This includes time, money and the expertise to develop.**
- A key stakeholder is responsible for hosting and maintaining **the application in the long term.**
- **The success of these applications requires them to be used by end users such as local community groups,** stakeholders, and residents. If the end user does not use them, they are not viable.
- A tool such as this one requires the investment of multi-stakeholders.

**Benefits Of the AGS** –

- Target applications can be tailored to suit the specific demands of the case study.
- The application can help share information at all stages of the DRM cycle at times of disaster or event used to share other related information when there is no disaster.
- The critically responsible stakeholder will control the applications and what it is sued for. As a result, the app is unlikely to be overcrowded or misused, ultimately undermining its effectiveness.
- The look of the application can be controlled by the stakeholder and tailored to suit the specific demands of the specific area, heritage site or city. This can be extremely useful for sharing local news or encouraging people to use the application.

## 4.4.14 AGS – NS1

**Title** - A fortified place to protect to house invaluable Cultural heritage items in the event of a disaster.

**Case study/ Location**- Covra nuclear waste Storage Facility - Nieuwdor. Spanjeweg 1, 4455 TW Nieuwdorp, Netherlands

**Summary** – This AGS details a unique and innovative relationship between a nuclear waste facility and CH stakeholders. This AGS provides an example of how CH stakeholders can collaborate with non-traditional stakeholders to yield a mutually beneficial relationship. By way of example, within this AGS, a nuclear waste facility provides unparalleled storage and security for inviable CH assets.

**Organigraph** –

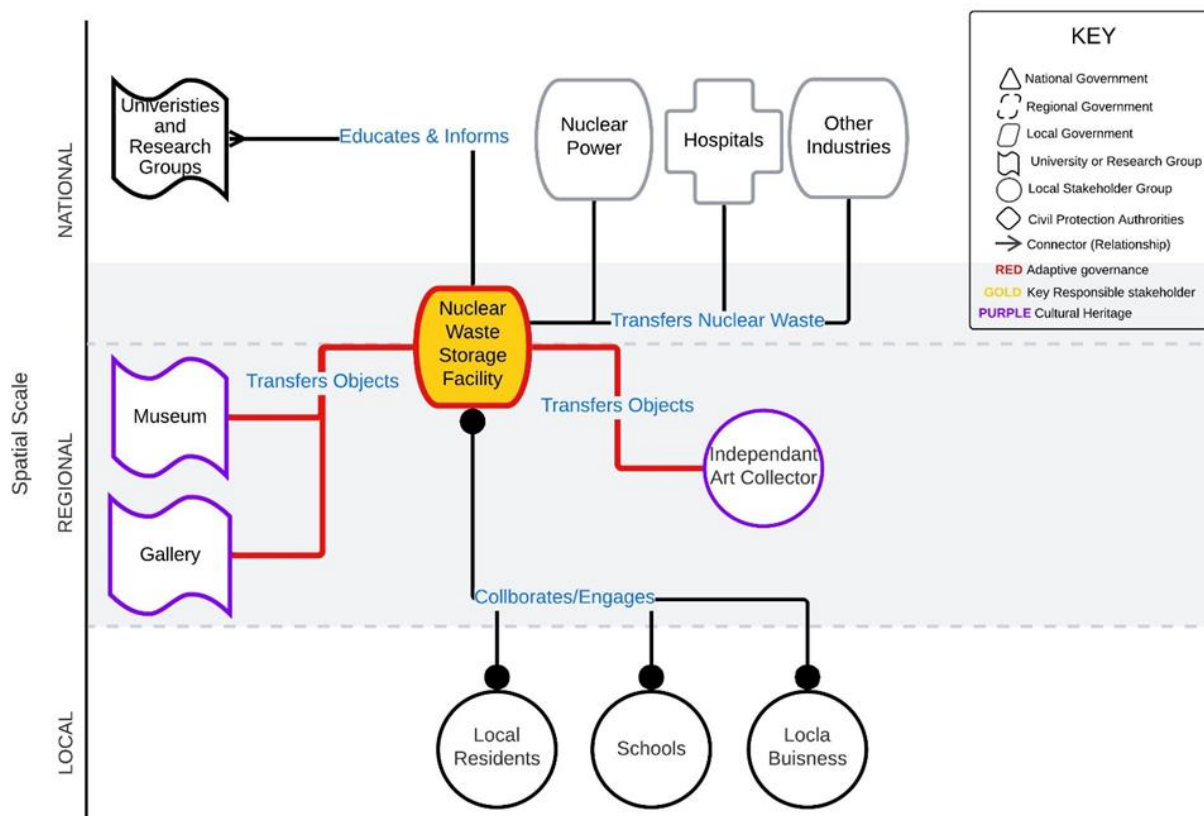


Figure 19: The AGS Organigraph for AGS – NS1 entitled – ‘A fortified place to protect to house invaluable Cultural heritage items in the event of a disaster.’

**Source** – This AGS was sourced from Part 3 of the methodological approach. The AGS was identified and unpacked with experts for the RescueMe Project Rlab.

**Hazard Type** – Flooding

**Description of AGS** – A peer-learning workshop identified this adaptive governance solution with experts at Nieuwdorp in the Netherlands. This adaptive governance solution defines a relationship between the Museum of the Zeeland region in the Netherlands and the COVRA nuclear waste storage facility. The museum across the Zeeland region has an extensive catalogue of invaluable cultural heritage in artwork, tapestries, and artefacts. First, the museums cannot house all the pieces and are at risk of flooding. To provide a solution, the COVRA nuclear waste management organisation provides storage services to the Museum free of charge. Due to its core responsibility as a nuclear waste management organisation, the COVRA building is built to withstand significant floods and natural disasters. As a result, the invaluable heritage inside is completely protected in the event of a disaster.

**Implementation Conditions** – This was a unique and innovative AGS identified during a field trip in the Netherlands. This AGS has a unique but replicable set of implementation conditions.

- This AGS requires a relationship between the CH sector (particular museums) and nuclear waste management organizations or stakeholders with access to safe, highly protected storage facilities.
- The stakeholders with access to highly protected storage facilities must be willing and able to share that space with the CH stakeholders. This may also come with additional implementation conditions other than space, such as security reasons.
- The stakeholders need the means to safely transport the CH assets from an area to the safe storage facility.
- Within this AGS proximate can also be an issue. A CH stakeholder is often not close to a facilitator such as Kovra.

**Benefits Of the AGS** –

- This AGS has a myriad of benefits. First, it utilizes pre-existing resources rather than creating a purpose-built facility or secure storage space. This saves a considerable number of resources in terms of money built, complex building materials, and land.
- This type of AGS can enhance the public perception of a stakeholder. This is particularly useful for a facilitator like Covra, who deals with nuclear waste as nuclear waste often has a severe negative public perspective. By housing CH assets and inviting local communities to events

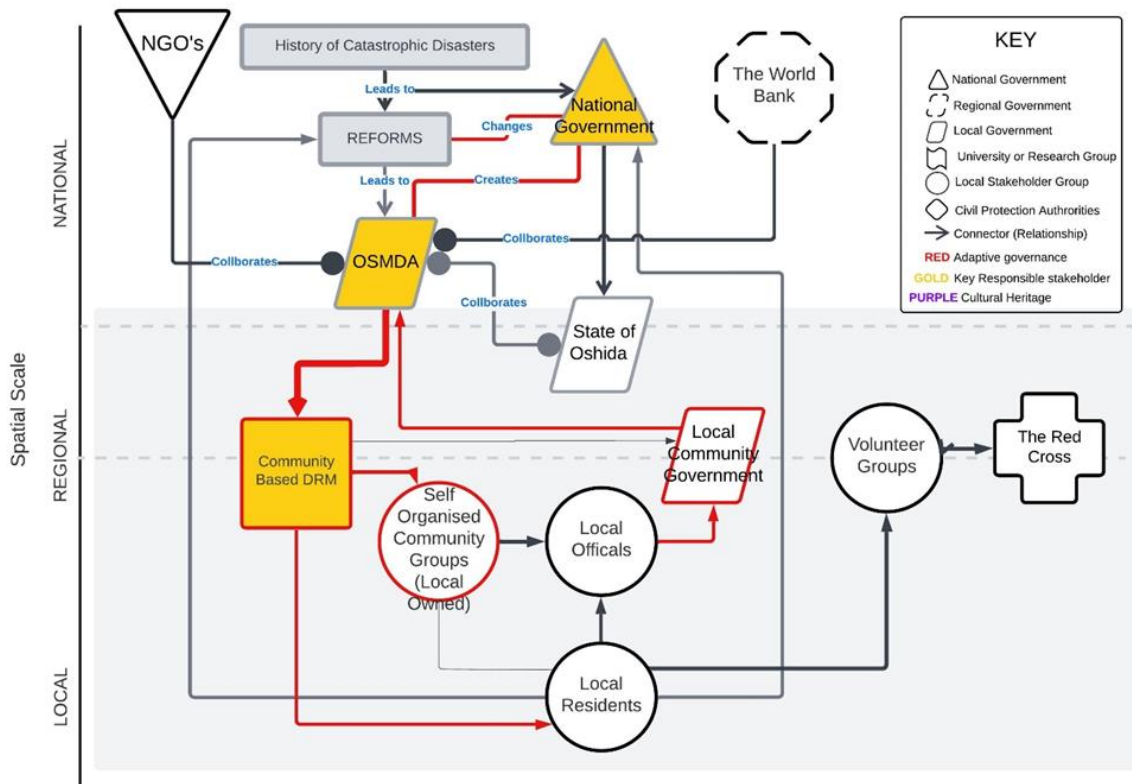
### 4.4.15 AGS – NS2

**Title** - Enhancing community-led disaster risk management response through engagement and communication

**Summary** – This AGS details national-scale reforms after a traumatic disaster and the failure of the national government to respond to the disaster. The AGS details the development of a new state-level DRM organization collaborating with local communities on DRM, riding a wave of diplomatic interest. This collaboration facilitated and empowered community-scale adaptive governance processes that facilitated one of the world's most effective predicate evacuation procedures. **This AGS is helpful for national government agencies/NGOs/Civil Protection authorities who want to empower local DRM and maximize the resources of local experts.**

**Case study/ Location-** Oshida, India

**Organigraph** –



**Figure 20: The AGS Organigraph for AGS – NS2 entitled Enhancing Community-led Disaster Risk Management Response Through Engagement and Communication.**

**Source** – This AGS was sourced from Part 3 of the methodological approach. This research was distilled from the research conducted by Walch (2019)

**Hazard Type** – Cyclones and other associated Hazards.

**Description of AGS** – Ohisda is an area in India exposed to regular catastrophic cyclones. This AGS details national-scale reforms by the national government in the wake of repeated catastrophic cyclones over the last few decades. This AGS attempts to encapsulate how the national-scale reforms made by the national government empowered local-scale adaptive governance solutions. These solutions lead to significant and measured benefits in all phases of the DRM. This adaptive governance solution shows how effective reform and empowerment of local communities can improve DRM response rather than hinder it. One of these critical reforms was establishing a new state-level organisation called OSMDA. This key stakeholder became solely responsible for the DRR and DRM for the state of Oshida. Now, a state-level DRM organisation is not innovative in and of itself. Many countries worldwide have key defined stakeholders at national and state scales to manage the DRM. However, because of the previous traumatic shock, the change in political power and the interest of local communities in DRM, OSMDA seemed to have a unique perspective. The organisation collaborated directly with the Local community, extremely motivated to understand where the mistakes were made and how those mistakes could be rectified.

**Implementation Conditions** –

- The shift to more adaptive forms of governance and the effective collaboration between multiscale stakeholders within the evacuation were attributed to two district factors by Walch (2019): traumatic shock and committed political leadership.
- **Traumatic shock**- in 1999, the local people of Ohisda suffered one of the worst cyclones in their record history. In this event, 11 million people were affected by the disaster. The number of affected people, coupled with the ‘chaotic’ DRM response and poor preparedness, led to a change in politics, resulting in reform changes to ensure that this scale of disaster did not happen again. This **traumatic shock** facilitated a cascade of changes, including empowering adaptive governance. Without this traumatic event, the reforms would not have happened.
- **New Committed political leadership** – the change in politics after the 1999 cyclone event was also a key implementation factor in this AGS. The local people of Oshida lost faith in the current diplomatic leadership, and DRM became vital to the political agenda. As a result, any political party that came into power would have to make dedicated efforts to ensure that the events of the 1999 cyclone would not happen again.

**Benefits Of the AGS** –

- This AGS solution provides a prime example of how proactive and integrated community-based DRM can facilitate DRM rather than hinder it. The Local stakeholders, government agencies and community-based associations were actively involved in the DRR and DRM at all phases of the DRM cycle – ultimately leading to a more efficient evacuation, better response and less economic disasters.

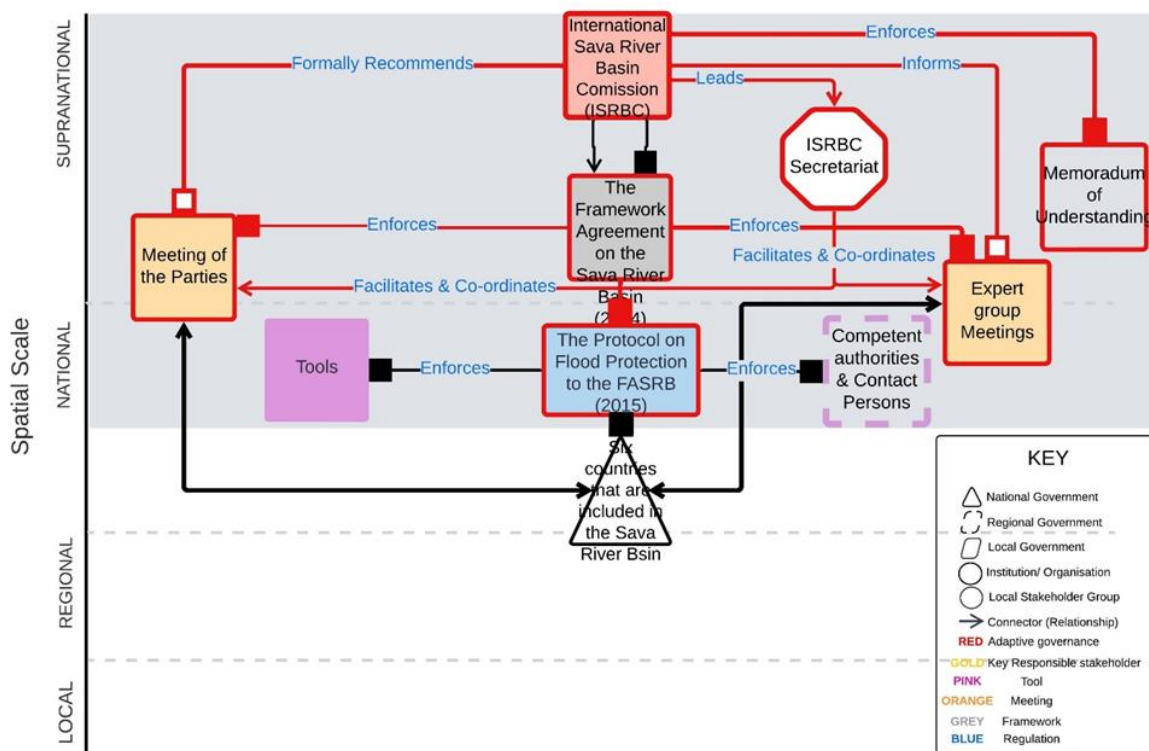
## 4.4.16 AGS – SNS1

**Title** - A mechanism for cross-national collaboration between neighbouring countries

**Case study/ Location**- The Sava River Basin

**Summary** – This AGS provides an example of a functional supra national Organization that helps to facilitate and co-co-ordinate cross-national collaboration. This AGS would be helpful in an expert, national government or international Organisation interested in establishing cross country collaborations on a large CH landscape.

**Organigraph** –



**Figure 21: The AGS Organigraph for AGS – SNS2 entitled; A mechanism for cross-national collaboration between neighbouring countries.**

**Source** – Sava River Basin - <https://www.savacommission.org/>

**Hazard Type** – Flooding

**Description of AGS** – This adaptive governance solution encapsulates some of the core structural elements of the International Sava River Basin Commission (ISRBC). The ISRBC is an organisation that operates at the supranational spatial scale. The ISRBC facilitates strategic collaboration of the different countries within the Sava River Basin—namely, Croatia, Slovenia, Serbia, Montenegro, Bosnia and Herzegovina, and Albania. Four of the above countries' commitments to the ISRBC are defined through a centralized document called the Framework Agreement for the Sava River Basin. Montenegro contributes to the ISRBC through a memorandum of understanding. Finally, Albania has no formal commitment to the ISRBC but has worked with the organization on an ADHOC basis. The ISRBC provides a platform for collaboration, tool and policy development that works across traditional anthropogenic boundaries. It provides an excellent case study for experts wishing to set up a supra-national or cross-country governance mechanism.

**Implementation Conditions** – The implementation conditions of this AGS are comprehensive. This AGS is significant on the spatial scale and involves many stakeholders across country boundaries. Furthermore, in the case of the Sava River basin, the ISRBC facilitates the supranational collaboration developed out of a pre-existing organizational structure focused on navigation. This is crucial when considering this adaptive governance solution.

- This AGS relies heavily on cross-country collaboration between experts. Within this AGS collaboration, a legal and regulatory framework is in place that facilitates this collaboration. In the case of this AGS, it is referred to as the Framework for The Sava River Basin. This is a legally binding document which establishes the management of the Sava River basin.
- This form of AGS requires an independent organization that will facilitate, manage and coordinate collaboration across the different country boundaries. This position often requires highly skilled, organized, and experienced.
- In the case of the Sava River basin, the ISRBC was established.

**Benefits Of the AGS –**

- This AGS is a unique example of **transboundary collaboration between countries that fosters long-term supranational collaboration between countries that extends** across traditionally defined anthropogenic boundaries. This offers the potential for solutions and projects that are genuinely landscape scale.
- The AGS can lead to greater collaboration across country boundaries. **Fostering a broader comradery on topics other than CH.** This can have a myriad of knock-on benefits.
- The AGS can co-create solutions and policies greater than the some of their parts. The solutions e

## 5 Discussion

This Report outlines in detail all the research work that went into developing the 19 AGSs within T2.1, the RescueME meta-repository of solutions. The research pools data from a wide array of practical and academic sources due to the three-part methodological approach. Furthermore, the research builds directly upon the ongoing work around governance, governance typologies and adaptive governance that the ULg has undertaken. By way of example, see Durrant et al. (2021), Durrant et al., (2022), and Durrant et al. (2024). The following sections discuss some critical outcomes from the research work and outline potential next steps for researchers and practitioners.

### 5.1 Implications

Overall, the report does not help to provide additional clarity on governance. Throughout the research the researcher has relied on the overarching definition of governance provided by UNESCO as a common theoretical touchstone. This was accompanied by a more ‘operative’ definition of governance. Folke (2006) agrees that any researcher or practitioner working in governance must define what they mean by governance before being any work. This clarity is fundamental to the reliability and validity of any produced outcomes. We would also encourage researchers to consider the context of their work when aligning with a suitable definition of governance. When discussing governance with the practitioners, the researcher at ULg utilized an operative definition of governance. In short, there is not necessarily a ‘correct’ definition of governance. The flexibility of the concept is essential for people applying it. We concluded that researchers should be able to align with a definition of governance that will be most suitable in their given research context and tailored to the aims and depends on their work. However, this does not mean to suggest that a definition should be selected (or created) at random. There is abundant, robust academic research outlining good governance and adaptive governance. While these sources do not always agree, there is more than enough overlapping consensus to ensure a robust definition.

Importantly, exploring research this way can put increased pressure on the researcher. Ultimately, the reliability of the project and its outcomes rely on the researcher to establish a cohesive, recognizable, and theoretically sound definition of governance to guide the work. In the context of the research around AGS, the reward far outweighs the risk. It allowed the research to explore new and innovative forms of governance with practices within an informed framework that the practitioners will recognize.

As outlined in the literature review, Adaptive governance also lacks a unified definition. However, we aligned with the definition of adaptive governance defined by Chaffin et al. (2014), who referred to “*adaptive governance as a range of interactions between actors, networks, organizations, and institutions emerging in pursuit of a desired state for social-ecological systems.*”. This definition of adaptive governance uses the term interaction. The term ‘interaction’ defines a reciprocal action between two distinct things. As a result, the word interaction can include a vast variety of different things and allowed the researcher at ULg to explore a wide variety of potential adaptive governance solutions without limitation. Very quickly, researchers at ULg realized that AGS can be identified anywhere when guided by this definition. Furthermore, when supported by a flexible (but consistent) methodological approach, then can be extracted from many sources.

To ensure consistency, the researchers used a methodological approach designed by Durrant et al., 2021 to map governance structures. The work by Durrant et al., 2021 defines a common ‘language’ to extract adaptive governance solutions into replicable organigraphs that different stakeholder groups can understand. The standardised Key worked exceptionally well to create organigraphs of the AGS with some minor additions. By way of example, the AGSs require that the responsible stakeholder be identified in every solution. This addition was highlighted by our analysis of the INTERLACE project (INTERLACE) and the feedback from the R-LABS stakeholders in the February 2024 General assembly workshop discussions. Secondly, due to the context-specific nature of the AGSs, the stakeholders from the February 2024 GA workshop discussions emphasised that each AGS organography should have its integrated key. The key would not only help with the accessibility of the tools but encourage the experts on the ground to see how it would be translated into their real-world scenarios.

The 19 AGS extracted by the research appeared to align with the perceived forms of adaptive governance emphasised within academic literature. By way of example, Sharma-Wallace (2018) conducted a systematic review of adaptive governance literature to explore empirical evidence for adaptive governance in real-world practical applications. They found that adaptive governance is supposed to manifest in several ways across academic literature.

- 1) Through meaningful collaboration across actors and scales
- 2) Effective coordination between stakeholders and levels
- 3) Building social capital
- 4) Community empowerment and engagement
- 5) Capacity development
- 6) They link knowledge and decision-making through data collection and monitoring, promoting leadership capacity.
- 7) They are exploiting or creating governance opportunities.

We cannot deny that the 19 AGS identified within this delivery are well represented in the categories that Sharma-Wallace (2018) defined, with one exception: the reference to digital technologies. However, it may be the case that using digital technologies is not a stand-alone form of adaptive governance. Instead, a mechanism fulfils one of the above seven criteria. An excellent example would be AGS – RS4, in which the city of Valencia developed an application that helped decision-making processes and shared knowledge amongst different stakeholder groups.

Working from that perspective, the AGS highlighted in this Deliverable do not contribute to any ‘new’ forms of adaptive governance. When compared with the categories outlined by Sharma-Wallace (2018). There is one aspect that the researchers would like to discuss in greater detail. This aspect is the importance of social capital in sustainability as a whole and what it means (Serageldin and Grootaert, 1997). Social capital is a complex concept broadly centred on social relationships (Bhandari and Yasunobu, 2009). At the same time, a consensus around its definition is still debated (Bhandari and Yasunobu, 2009). Scholars agree that there is a profound relationship between social capital and governance (Serageldin and Grootaert, 1997; McDougall & Banjade, 2015), and understanding and measuring social capital as a part of modern society has been an active avenue of research for decades. There is no one thing which encapsulates social capital. For brevity, we ally with the conceptualised defined social capital provided by Fukuyama (2003).

*“Social capital is what permits individuals to band together to defend their interests and organize to support collective needs; authoritarian governance, on the other hand, thrives on social atomization.”* Fukuyama (2003)

Many scholars have emphasised the importance of social capital in adaptive governance our research with the AGS as part of this deliverable wholeheartedly supports this. Social capital was integral to the AGS's creation, maintenance or longevity. In our search to visualise and understand this link, the researchers encountered a small piece of research by Conrad (2007). Conrad (2007) offers an elegant metaphor to describe the function of social capital, stating that;

*“At a community level, social capital is like a battery that everyone charges up to be there whenever one needs to plug something in. No one keeps a formal account of who added what and how much they may withdraw – some, of course, will never add their charge but will plug in regardless, whereas others will add far more than they ever take.”* Conrad, (2007).

The notion of perceiving social capital as a ‘battery’ is an exciting starting point to unpick how AGS could be implemented from one case study to another. Building upon this metaphor, to implement an AGS, experts would need to understand the type and amount of power within a ‘social capital battery’ needed to make an AGS work in practice. Alternatively, experts could include alongside the AGS a capital battery indicator. This battery indicator could highlight how much power a particular AGS solution would require during its inception.

Alternatively, more contemporary research by McDougall & Banjade (2015). Explores the so-called dark side of social capital. Their research with forestry communities in Nepal highlights that collaboration between different stakeholders can change the social capital rather than enhance it. When we apply this to the notion of a social capital battery, it could be the case that applying AGS may reduce the social capital available in an area rather than improve it. In short, this discussion point highlights the critical link between social capital and adaptive governance. This relationship is not only essential but inherently complicated.

## 5.2 Overcoming the challenge of context

The biggest challenges faced by the researchers revolved around context. As stated in the literature review, scholars such as Pahl-Wostl (2009) and Wyborn (2015) have highlighted the importance of context when attempting to extract and replicate adaptive governance solutions. Adaptive governance solutions are often developed due to a unique blend of epistemological context-specific variables. As a result, it is difficult, if not impossible, to translate an adaptive governance tool directly into another area. This almost contradicts the deliverable's aim: to create robust and replicable AGS that other case studies can use.

As a result, this was a challenge the researchers had to overcome. The researchers leveraged their approach by mapping governance structures using Organigraphs to achieve this. To co-create Organigraphs, the stakeholders must use a standardized key. This key distils complex governance structures into distinct building blocks, namely, stakeholder types (shapes), relationships (connectors), and governance mechanisms (colours). Not only does this allow the Organigraphs to be understood by stakeholders with access to the standardized key, but it also naturally generalizes the governance structure into its core elements. This process of generalizing the governance structures can aid in addressing the challenging context. This process maintains a governance structure's core characteristics but presents it in a standardized format. Standardizing the governance structures is a valuable tool in presenting replicable governance structures.

External stakeholders can see how the AGS works—by exploring the key stakeholders, relationships and governance mechanisms. They can use this method to apply the AGS to their contexts. The researchers at ULg must not diminish the importance of context. We

agree wholeheartedly with Pahl-Wostl (2009) and Wyborn (2015). Context is profoundly important in the creation of AGS.

## 5.3 What did we learn from the AGS?

Some AGS were particularly interesting and should be explored in greater detail in the discussion. The first is to explore AGS-LS1 and AGS-LS2. These adaptive governance solutions provided examples of community-based disaster risk management responses from two perspectives. AGS-LS1 refers to the response of a pre-existing community organisation in the response phase of DRM. AGS-LS2 outlines the development of an ultimately 'new' community organisation. During preliminary research into governance typologies within WP1 and Durrant et al. (2024), researchers at Ulg questioned the real-world existence of actual community-based governance. Academic literature demonstrated several examples of a community responding to disaster out of frustration. Still, very few contain examples of proactive and planned community-based disaster risk management.

In both cases, the community-based DRM appears to operate at a particular spatial scale. The neighbourhood scale. This scale appears to exist between the local and municipal spatial scales. The neighbourhood spatial scale is not unique, and many scholars discuss the neighbourhood spatial scale across academic literature. Within the AGS, we mapped the organizations within this scale to serve specific and essential functions. The organisations serve as a point of unification for communication, resources, legislative issues, funding and much more. These organisations provide a mechanism for local communities to have a united front to communicate with government, municipalities and other stakeholders at high spatial scales.

Conversely these organisations serve as a centralised point of contact towards the local community groups. The issue is why these organisations appear as in the case of AGS-LS2 or are filled by a pre-existing organisation in AGS-LS1 rather than remaining functional independently. The organisation of this scale is crucial for DRM but must appear in adhoc.

The second AGS solution that is worthy of further discussion is AGS-NS1. This AGS discusses the collaboration between a nuclear water storage facility called Covra and a museum in the Netherlands. This highly innovative AGS depicts a unique, mutually beneficial relationship between two unlikely stakeholders. With this AGS, Covra benefits from an improved public perception, and the museums have a fortified storage facility to store invaluable CH assets, which can withstand significant flooding. It raises the question of how many unique mutually beneficial relationships could be uncovered across different governance regimes and the potential benefits of establishing them.

## 6 Conclusion

In conclusion, this deliverable aimed to identify and develop a series of reliable and essential replicable AGS. The researcher at the Ulg built upon previous research and their experience to establish an approach that could mitigate against some of the practical and theoretical challenges highlighted in the conceptual framework. The research identified a preliminary set of 19 AGS spanning various spatial scales, countries, hazards, contexts, and the gap between theory and practice. Despite the differences and context-specific nature of the AGS, the Standardised Key provides a framework to extract and map its core elements while preserving essential contextual data. These preliminary AGS solutions offer practitioners and policymakers actionable real-world solutions. Beyond these 19 solutions, the deliverable establishes a foundation for other academics, policymakers, and practitioners to enhance their AGS using the Standardised Key and the framework outlined in the meta-repository (RescueME T2.1).

We hope future research will continue using the standardised key to map AGS. We believe this offers a unique framework to map AGS so that the 'context' of them is not lost. Still, they appear as an accessible and importantly reliable solution that can be tailored to suit the demands of different living labs, case studies, and research landscapes.

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