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

Extract of D6.3 Adaptive Governance Schemes Mapping

Ravenna Organigraphs

30.11.2021

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821282

Published in the framework of:

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

Authors:

Louis J. Durrant & Jacques Teller

Table of content

List of Figures

Glossary

Acronym	Full name
AG	Adaptive Governance
AGSF	Adaptive Governance Scheme Framework
CA	Consortium Agreement
CCA	Climate Change Adaptation
CH	Cultural Heritage
CHM	Cultural Heritage Management
D	Deliverable
DoA	Direction of Action
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
DoA	Description of Action
EC	European Commission
ICCOMS	The International Council on Monuments and Sites
ICCROM	The International Centre for the Study of the Preservation and Restoration of Cultural Property
IUCN	The International Union for Conservation of Nature
IoG	Institute of Governance
SFDRR	The Sendai Framework for Disaster Risk Reduction
T	Task
OL	Open Lab
OLC	Open Lab Co-ordinator
UN	United Nations
UNESCO	The United Nations Educational, Scientific and Cultural Organization
WHS	World Heritage Sites
WHO	World Health Organisation
WP	Work Package

1 Executive summary

Across academia, policy and practice, the perceptions and understanding of cultural heritage (CH) are changing as experts seek to manage CH more sustainably to better withstand the effects of climate change. Naturally, this has led to a mushrooming of contemporary research and practical work exploring the role of CH as a critical aspect of resilience and sustainability. One research topic within this broader paradigm shift is the integration of CH into disaster risk management (DRM) governance. Both academic and international organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and International Council on Monuments and Sites (ICOMOS) emphasize the importance of this theoretical integration through a lattice of interacting articles, reports, papers, frameworks, and guidelines. However, one key document championed at aiding in the practical integration of CH into Disaster risk reduction (DRR) and DRM is The Sendai Framework for Disaster Risk Reduction (SFDRR) (UN, 2015).

The SFDRR forms a critical global policy framework that aims to reduce disaster risk and losses in lives, livelihoods, and health. As well as the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries (UN, 2015). The SFDRR is comprised of seven targets and four priorities to prevent new and reduce existing disaster risks. Importantly within the context of this deliverable is Priority 2 of the SFDRR. Priority 2 is entitled '*Strengthening disaster risk governance to manage disaster risk'.* At its core, Priority 2 emphasizes the importance of governance in effectively and efficiently managing disaster risk. As a result, practitioners and policymakers engaging with the SFDRR are encouraged to consider contemporary DRM governance and its role in DRR. As well as proactively facilitate the integration of CH stakeholders into pre-existing DRM strategies and associated governance structures.

However, to date, the integration of CH into DRM is in its infancy. The concept of CH is inherently complex, with highly subjective and unique societal values. Making it difficult to quantify those values accurately and effectively bring all necessary stakeholders together. Furthermore, the interactions between CH stakeholders and decision-making processes are often implicit and reactive. The implicit nature of these decisions can make it challenging to develop clarity around CH governance. Highlighting this challenge within the broader paradigm shift and growing international importance pinpoints a timely and critical research opportunity. In which, there is a need for an academically robust and practical approach that can 'map' DRM governance structures within CH sites. It is within this research opportunity that this work is focused. In short, this deliverable outlines in detail supporting literature, an innovative research approach and all raw data collected in the adaption and subsequent implementation of a semi-empirical research approach to map the DRM governance structures across the five SHELTER Open Labs (OLs). Each of the SHELTER OLs included individuals from public and private organisations that have a common interest in improving the management of CH into the broader governance. However, after preliminary discussions with the coordinators of these Open labs (OLC) in December 2019, it became clear that mapping the governance within the SHELTER

OLs required a more comprehensive approach. Furthermore, very few (if any) empirical studies explicitly attempt to map governance structures across academic literature within the context of DRM and CH.

As a result, the work within T6.3 went beyond mapping DRM governance for the OL and attempted to establish an innovative and collaborative methodological approach that could be replicated by other experts outside of the SHELTER Project. The innovative methodological approach had to be carefully designed, thoroughly researched, and justified to ensure that it fulfilled the requirements of the SHELTER Project and, just as importantly, provided the OLs with a platform and tool to continue exploring their DRM governance in the long term. Despite the limited amount of academic literature attempting to map DRM governance, one valuable exception was found in the European Commission-funded project entitled "Benchmarking Regional Health Management II (Ben RHM II)". In which Tiliouine *et al*. (2018) developed a toolkit designed to help experts map governance structures around medicine distribution in the context of human health and well-being using a technique called The Organigraph technique. This toolkit formed an essential inspiration and resource for adapting the Organigraph technique within the SHELTER Project.

Building upon the toolkit provided by Tiliouine *et al*. (2018), the research team at ULIEGE believed that the value of Organigraphs went beyond its ability to map governance structures. Using a semi-empirical qualitative research approach, the Organigraphs provided the basis for enhanced stakeholder engagement and collaboration, individual and group social learning, proactive self-diagnostics by local experts, and cross-national, cross-scale and cross-issue peer learning. With this in mind, an iterative four Phase methodology was created to explore, co-produce, and fine tune detailed OL specific Organigraphs within the SHELTER OLs. This report is structured around these four phases and can be briefly outlined as follows.

First, Phase 1 created a robust conceptual framework underpinning the methodological approach by exploring the relevant literature around the concept of governance. Phase 2 focused on drafting the OLs Organigraphs by consolidating the pre-existing material with each OL and involving key stakeholder groups. The draft Organigraphs created within Phase 2 were co-produced through, focused developmental meetings and iterative feedback. Phase 2 also led to the refinement of the standardized key that outlines the common 'building blocks' used in developing the Organigraphs. Phase 3 aimed to fine-tune and validate the Organigraphs through 12 collaborative stakeholder workshops. In which 94 stakeholders across the five OL were invited to critique and validate their OLs Organigraph. Finally, Phase 4 aimed to encourage peer learning between the OLs using the finetuned Organigraphs to share knowledge and expertise. This was achieved through a digital interactive workshop in collaboration with WP7. This Phase encouraged the OLCs to present their Organigraph to other experts and use the SHELTER project as a platform to illicit cross-national discussions.

Notably, because of the iterative and co-productive nature of the four Phases, a myriad of raw data was collected in various methods and platforms. These inputs contained

valuable insights into how the OLCs, and stakeholders perceived their DRM governance. This report attempts to capture this huge amount of raw data and presented it alongside the fine-tuned Organigraphs. The outputs developed through the semi-empirical approach covers a wide range of topics, including the strengths, weaknesses, opportunities, and threats of current DRM governance within CH sites across the SHELTER OLs. Practically, this deliverable provides practitioners with five detailed contemporary examples of DRM governance within CH sites. As well as a series of tailored recommendations to help enhance the resilience of these sites to the effects of climate change. However, this research had a great deal of value beyond the SHELTER Project. Throughout the research, there were several significant findings with implications beyond the SHELTER Project.

First, from a practical perspective, the Organigraph technique provided a platform to develop an innovative and collaborative tool to present the key stakeholders, responsibilities, and interactions within the DRM governance. Furthermore, the Organigraphs provided the stakeholders with a unique opportunity to perceive their position in the context of the broader DRM governance strategy. With the ability to identify the essential functions and responsibilities of both themselves and other stakeholders within the DRM response. Building upon this, the Organigraphs provided an accessible platform for self-reflection, facilitating discussions between different stakeholders (including CH stakeholders) to identify strengths, weaknesses, opportunities, and threats in their DRM before the event of a disaster. This provides an opportunity for proactive decision-making encouraging DRM experts to identify weakness in their DRM governance in the preparedness stage of the DRM cycle. In part shifting the DRM governance from 'reactive' to 'proactive' by encouraging experts to critique their own DRM governance and improve their preparedness for disasters. However, the current version of the Organigraph technique also had limitations that couldn't be fully addressed in the scope of Work Package 6 (WP6) and would require further research and development. For instance, the stakeholders pinpointed a negative correlation between the complexity of the Organigraphs and their accessibility. Essentially stating that the more detailed the Organigraphs become, the less they can be understood and used in practice. The stakeholders also lamented that the Organigraphs in their current form could oversimplify the complexity of the DRM governance structures, which can be more nuanced than those defined in a 'fixed' DRM governance map. Interestingly, the stakeholders also appeared to overlook the role of the Organigraphs as a tool for self-reflection and instead considered their contents more literally, as explicit guidelines for what they should do in the event of a disaster. Furthermore, one individual stated that the contents of the Organigraphs is what happens in theory and not necessarily an accurate representation of what happens in practice—opening a much broader debate about effective DRM governance and our ability to map it.

Second, from a theoretical perspective, the semi-empirical transdisciplinary research approach was integral to the development, refinement, and subsequent publication of the Organigraphs. The four Phases of the approach provided an academically robust foundation for adapting the Organigraph technique to DRM governance. Also, the approach facilitated greater degrees of social learning amongst the stakeholders and

Open Lab Co-Ordinator's (OLCs) in each SHELTER OL. In which the experts requested to continue using the Organigraphs in their own decision making and ongoing work. The process of co-producing the Organigraphs allowed them to reflect on their governance and create their solutions with minimal intervention from the facilitators enhancing the probability of the solutions being effective.

Furthermore, upon deeper reflection of the five fine-tuned Organigraphs, several interesting findings were observed and are worthy of greater discussion in the context of the broader academic debate. First, despite the apparent differences between the five SHELTER OLs, the Organigraphs shared a great degree of similarity, especially regarding the position of different stakeholders and the types of relationships linking them, hinting at the fact that there are methods of best or established practice in DRM governance, regardless of context.

Also, stakeholders in the OL reinforced the pivotal role local stakeholders play at ALL phases of DRM. However, the DRM governance at the local spatial scale remains implicit, unclear, and often outside of the pre-existing legal frameworks. In response, the Organigraph provides a tool at the disposal of experts to begin mapping these implicit relationships and better integrate these stakeholders into the explicit DRM strategy. Furthermore, all the Organigraphs developed within the SHELTER Project demonstrated a clear pertinence towards a hierarchical governance structure. In which, critical decisions, policy, plans, resources, and solutions are developed and implemented at the national (or most relevant highest spatial scale) and then filtered down towards smaller spatial scales. On the one hand, the pertinence towards hierarchical governance structures is understandable. The consequences of a disaster event on CH can be irreparable and require precise coordinated management which must be conducted by an overarching entity. However, on the other hand, broader academic literature reiterates the critical role of local communities in shaping and implementing such DRR and response and highlighting that what we should see in the Organigraphs is a series of feedback loops between the national, regional and local spatial scales. Still, for the most part, this was not the case and based on the findings of T6.3 the establishment of such mechanisms is still a challenging and difficult issue for DRM governance in CH sites.

In part, this work highlights the persistent disconnection of stakeholders at different spatial scales and the challenges practitioners face when integrating local community groups into DRM governance. Building upon the above observations, the local communities are often perceived as stakeholders to be saved rather than resources that can be mobilized into action and guide more effective DRM responses. Importantly, in reaction to this observation through the development of the Organigraphs, the OLCs, research team, and stakeholders attempted to pinpoint specific topics of improvement within each OL which have been framed as adaptive governance proposals. These adaptive governance proposals included missing connections or stakeholders, challenging ingrained behaviors, overcoming siloed working, highlighting implicit relationships and connections, and adapting new policies and plans to facilitate the inclusion of missing stakeholders. Furthermore, as a collective of experts in T6.3 we attempted to take this one step further. We attempted to draw connections between the

tools being developed in the SHELTER project to foster more adaptive governance approaches and increase the likelihood of their long-term uptake.

In short, this deliverable consolidates all the work that went into the development, adaptation, and execution of the Organigraph technique to mapping DRM governance for five case studies. It highlights the value of the Organigraph technique in providing an innovative, collaborative, and attractive technique for mapping DRM governance structures. With the capacity of enhancing the implementation of the priorities of the SFDRR by giving practitioners a tool to develop clarity around DRM. When accompanied with a multi-phase semi-empirical research approach, it can provide a platform for self-critique, social learning and cross-issue, national and scale discussions. Ultimately leading to improved preparedness to disaster through greater clarity and the identification of weakness and bottle necks before a disaster event. Resulting in great resilience and more effective DRR response.

This report provides a precedent for using the Organigraph technique to map DRM governance structures within CH sites. And finally, it highlights the value of further research into the Organigraph technique as a tool for enhancing the resilience of CH internationally.

2 The refined Organigraphs for each SHELTER OL

The Organigraphs co-produced within T6.3 were too large and too complex to be included in this A4 document. The final versions, separated into distinct spatial scales, have been provided at the end of the document within Appendix.

2.1 Identify aspects of each OL DRM governance to strengthen and propose potential areas to enhance adaptive governance across the OL.

It essential to reflect upon the various outcomes, discussion points, comments and conversations that arose across the four Phases of the semi-empirical approach. This was done to develop a series of adaptive governance proposals that draw both on the outcomes of the Organigraphs and draw upon the wealth of raw data collected throughout the entire semi-empirical approach. The following section outlines the specific adaptive governance proposals for each of the five OL within the SHELTER Project. For ease of reading the key salient messages in each proposal is highlighted with bold text.

2.1.1 Santa Croce church and the archaeological area

The Organigraph coproduced by the stakeholders in the Raveena OL was highly detailed and demonstrated a high-level understanding and clarity by the stakeholders involved in the methodology. The experts within the Ravenna OL were very quickly able to coalesce around the DRM governance structure and used the approach to map in detail the primary governance mechanism within the Ravenna OL. As a result of the high level of detail, the discussions between the experts focused much more on the subtle nuances of the DRM governance structure rather than missing elements or critical gaps. Several strengths, weaknesses, opportunities, and threats were identified within the OLs DRM governance structure. The stakeholders and the OLC who participated in the co-production of the Organigraphs raised an array of discussion points across the four phases of the Organigraph development. The key discussion points elicited from across the four Phases have been briefly encapsulated below. They have been used to guide the development and research around adaptive governance proposals outlined in the following section.

- The experts across the SABAP, Civil Protection and Municipality of Ravenna were quite satisfied with the refined Organigraph stating that it offers an effective way to present the complexities of the DRM governance structure. However, they all found it quite complex due to the high level of details, and they appreciated the possibility of having the Organigraph de-composed according to layers that can be hidden or visualized.
- Experts from the SABAP highlighted that in some cases, the financing responsibilities are not fully respected. In which some stakeholders are required to cover some expenses, which were the responsibility of other stakeholders.

- Overall, many experts across the Ravenna OL emphasized how the Organigraphs allowed them to see each entity or stakeholder's competencies, roles, and responsibilities within the DRM governance structure. Notably, some experts may not be explicitly fulfilling their roles and responsibilities with the DRM governance structure.
- The experts emphasized how the Organigraph could establish a greater degree of clarity around the issues and relieve irrelevant burdens upon specific entities.
- Despite the complexity of stakeholders in the Organigraphs, many experts highlighted some aspects of the DRM governance structures which lack integration around specific topics.
- Experts highlighted a lack of a clear and prompt way of communicating at the local level within the OL.
- Colleagues in the Ravenna OL have invested many resources in developing a comprehensive and detailed three-dimension map of the CH site. But it may not be being used to its maximum capacity.
- Within the Organigraph, experts did not specify the internal relationships between different government entities.
- The semi-empirical approach drew out the potential lack of integration of the DRM governance across the city of Raveena. It highlighted the importance of exploring the distinct policy gaps.
- The Organigraph turned to be an essential tool also for highlighting the relation between the governance system and planning tools

2.1.1.1 Building upon the Organigraph to include competencies, roles and responsibilities.

To begin, the experts within the Ravenna OL highlighted specific challenges within the governance structure of Ravenna around the lack of clarity surrounding the roles and responsibilities of different stakeholders' groups in matters of DRM. For example, experts within SABAP encapsulated this broader governance issue by stating.

> "[There is] *Non-compliance with the pre-established tasks by some entities in terms of ordinary and extraordinary maintenance of the Santa Croce site."*

Through the analysis of the results from the other OL, this sentiment was shared by the other expert groups who participated in the workshops outlining various issues around the roles and competencies of stakeholders in matters of DRM. Examples of which have been included below;

> *"The superintendency supervises and directs the work of the Diocese on the church, but in the archaeological area it intervenes directly with ministerial funds"* [Expert from SABAP]

> "[There is] *Coordination of the municipality on interventions* [for disaster risk] *on Santa Croce only in case of emergency"* [Expert from SABAP]

As a result, **the first potential adaptive governance proposal to enhance the Organigraphs and potentially enhance DRM governance within the Ravenna OL focuses on the exact definition and delineation of roles and responsibilities of different stakeholders at all phases of the DRM cycle. This includes a variety of aspects, including but not limited to data collection, implementation, monitoring, maintenance and critically in the case of the Ravenna OL funding.** This topic links directly to the importance of accountability and transparency as a characteristic of good governance (see figure 8) and a fundamental cornerstone of governance within DRM governance (Amaratunga *et al*., 2019). Interestingly, to address this observation and provide a basis for exploring and defining each stakeholders' roles and responsibilities, the experts from SABAP highlighted that initially, the Organigraphs may be used as a platform to begin this process, stating that.

> "[The Organigraph] *Identify and set the competencies for each body involved so that the non-competent body does not have to burden itself with irrelevant burdens or tasks."*

The Organigraph could potentially provide a mechanism for the experts within the OL to identify their essential functions and responsibilities within the DRM governance structures at different phases of the DRM cycle. Notably, experts within SABAP were not the only stakeholders to highlight the value of the Organigraphs to do this; experts in the Dordrecht OL also highlighted this aspect (see section 3.6.3). The research team and OLC decide to explore this aspect in greater detail. However, the inclusion of detailed roles and responsibilities of each stakeholder within the Organigraph was not initially an aspect of the Organigraphs development. The Organigraphs was attempted to show the governance mechanisms, relationships, and key stakeholders, not directly roles and responsibilities of each of those stakeholders.

In response to this overarching topic and in line with the issue highlighted by the experts in SABAP, the financing responsibilities are not fully respected in the implementation and management of DRM. In which some stakeholders are required to cover some expenses, which were the responsibility of other stakeholders. Specific activity in Phase 3 of the semi-empirical approach encouraged each key stakeholder group to explicitly define their perceived roles and responsibilities at different Phases of DRM in a simple MIRO board. See Figure 28 for an example.

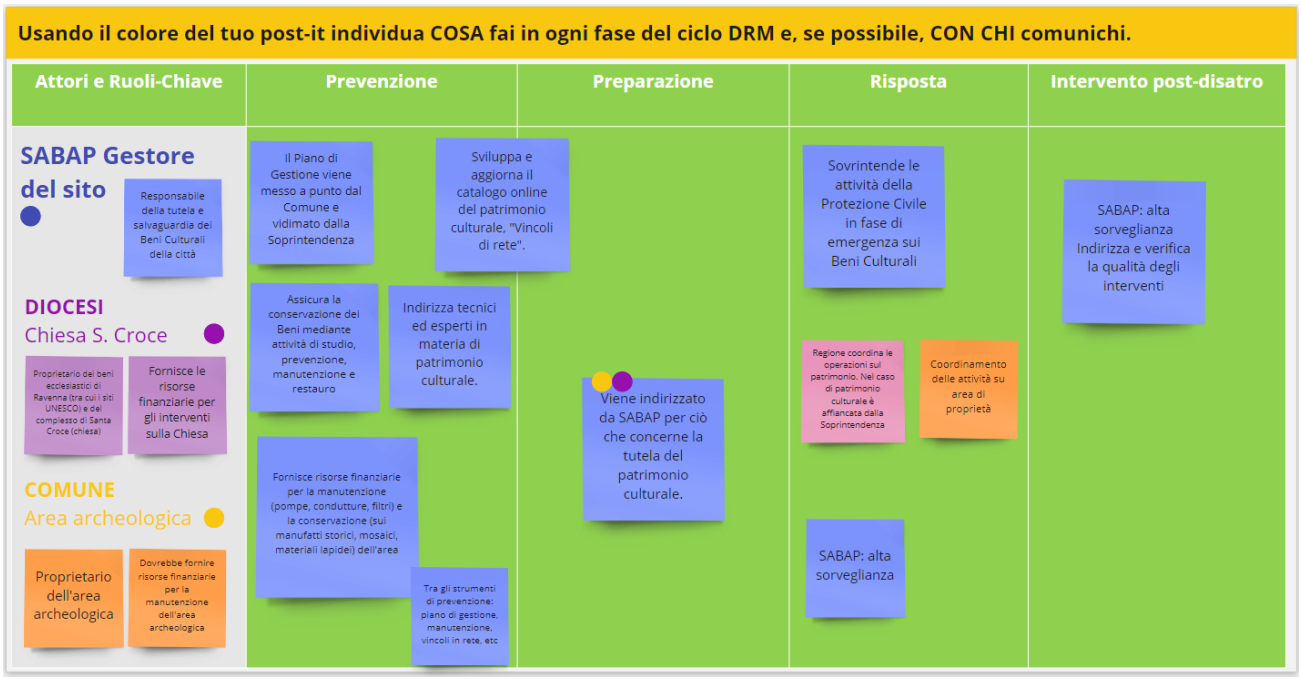

Figure 1 - An example of different stakeholders' roles at different stages of Ravenna collected as part of an activity within Phase 3.

In short, while a detailed exploration of the roles and responsibilities of each stakeholder was not conducted as part T6.3. A critical next step for the Raveena OL to enhance adaptive governance would be to consolidate and explore each stakeholder's perceived roles responsibilities in conjunction with the current version of the Organigraphs. An exploration of this raw data would facilitate the identification of overlaps and gaps in the roles and responsibilities of the DRM governance. Finally, these observations will facilitate the negotiation between the key stakeholders to define and delineate explicit roles and responsibilities. And finally, it could potentially ensure the equitable distribution of funding and financial responsibilities. This topic will be explored in greater detail in the OL specific Policy Briefs planned WP7.

2.1.1.2 Governance and policy instruments, exploring potential gaps in the current urban policy framework.

This theme draws directly from the recent article published Rosa *et al*., (2021) which explores the current integration of CH within the policy instruments within the Santa Croce Church and Archaeological area. This adaptive proposal draws on this paper and uses contemporary results elicited from the semi-empirical approach to support this work with empirical evidence and if possible, enhance the findings. The experts from SABAP highlighted the lack of integration in DRM.

> "[The Organigraph] *highlights a non-integrated management of emergency situations and a confusion in the tasks pertaining to each entity."* [Expert from SABAP].

First, in an attempt to better understand the context of this issue in the Raveena OL Rosa *et al*., (2021) identified key policy instruments reinforcing the DRM governance

structures in the OL. Of these 20 instruments, four were highlighted as the most relevant for tackling CH, which were;

- The new Urban plan (PUG—Piano Urbanistico Generale);
- The Management Plan of the UNESCO Early Christian Monuments serial site in Ravenna (PdG—Piano di Gestione dei monumenti paleocristiani di Ravenna patrimonio dell'umanità)
- The Sustainable Energy and Climate Action Plan (PAESC—Piano di Azione per l'Energia Sostenibile e il Clima)
- The Municipal Civil Protection Plan (PPCC—Piano di Protezione Civile Comunale).

While the research article by Rosa et al., (2021) provide an in-depth analysis of the strengths and weaknesses of these policy instruments independently, based on their contents. This topic highlights the perception of the stakeholders and draws upon their inputs to see how these policy instruments could be improved from their perspective. **In short, this adaptive governance explores how the perception of the stakeholders charged within the implementation of DRM strategies and tools etc. could help improve these four policy instruments. With a focus on adaptive governance structures and if possible, assisting in overcoming the non-integrated management of the OL.**

To start 'The Management Plan of the UNESCO Early Christian Monuments' was directly referred to by the experts from SABAP who stated that

> *"The collaboration between the Municipality and SABAP in the drafting of the Management Plan of the UNESCO site took place only in the initial phase and did not continue over time and with the updates of the plan."* [Expert from SABAP]

What this comment from the SABAP stakeholders' highlights is that this polciy instrument was not develop through ongoing collaboration between local and international experts. Furthermore, it suggests that there is currently no long-term governance mechanism to continually review and update these overarching policy instruments after the install development phase. This is a cause for concern when considering that according to Rosa *et al*. (2021) the UNESCO management plan was one of two key policy instruments identified as those most relevant for integrating climate change and DRM into heritage management. Which can enhance the resilience of historical areas and should be the one to include a strategic approach for the management of the UNESCO site against the identified risks, which is hereafter described as a six-phase CH risk management protocol**. Critically, therefore it is a key proposal to enhance the adaptive capacity of the DRM governance that OL experts from SABAP, the municipality and the Civil protection are included in all stage of policy development and implementation, not just in the development stage.**

Furthermore, the perception of the stakeholders appears to call for a greater reflection upon the mechanisms by which current policy instruments are reviewed and ensure that all relevant stakeholders are involved in the reflection of such policy instruments in at all stages of the DRM governance.

Building upon the need for greater reflection on the development of these policy instruments some experts provide explicit recommendations or suggestions in which they felt would help them to overcome some of the lack of integration in policy instruments in particular, the experts from SABAP who suggested.

> *"It would be useful to undertake a training course that makes the associations linked to civil protection more aware of cultural heritage issues. Structuring training courses that give basic knowledge about the risks to which specific areas are subject."* [Experts from SABAP].

Even going further to emphasises some of the key stakeholder's group that should participant in such training courses and how the DRM response could benefit.

> *"Important damage to the cultural heritage also occurs following a seismic event in the displacement of the rubble. Coordination between conservation experts and firefighters would be useful to obtain a broader emergency management system."* [Experts from SABAP].

Alternatively, experts from the Civil Protection did not feel as though explicit training courses were necessary as they felt that in the event of a disaster SABAP would always be there to advice in matters of CH. In short, highlighting two very different perceptions, on one hand, SABAP pinpoint the need for greater education around CH issues to improve the DRM response but on the other hand other experts' groups seeing that as the responsibility of SABAP and they will provide support.

To address this lack of integration, enhancing the core policy instruments will only for part of the solution. In some cases, such as within the Galicia OL, the lack of integration between different experts was achieved through implicit communication rather than legal framework. experts at the regional ministry level would freely exchange information, knowledge and experiences between different departments to develop holistic solutions. **As a result, another potential proposal to enhance the adaptive capacity of the Raveena OL is to explore in pinpoint the potential for enhancing the pre-exiting implicit communication between experts.**

2.1.1.3 Exploration of some of the more nuanced issues within the Ravenna Governance structures.

As stated previously, the Ravenna OL coproduced a comprehensive Organigraph, including a high degree of detail at all spatial scales. As a result, **this proposal does not focus on the need to enhance the clarity and detail of the Organigraph as in many of the other OL. But instead focuses specifically on some of the more subtle aspects of the relationships, lack of interactions and potential opportunities that could be enhanced.**

During the initial discussion with the OLC and the experts within the Ravenna OL it quickly became apparent that the CH site in the form of the Santa Croce Church and surrounding archaeological area faced several challenges as a result of the ownership of the different

aspects of the CH site. These challenges were somewhat highlighted in the Organigraph and have ben indicated in Figure 29.

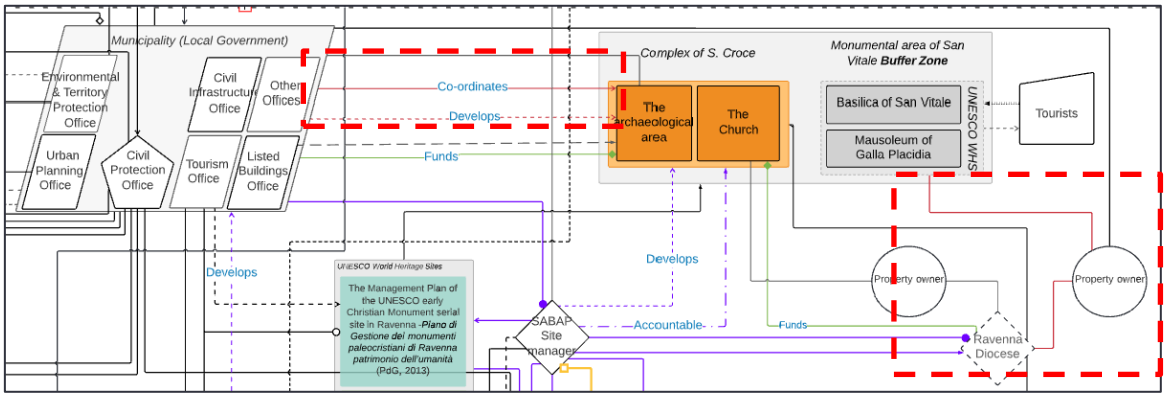

Figure 2 – The section of the Ravenna OL which highlights the 'red' connectors that identify challenging relationships.

The ownership and management of the different aspects of CH within the Ravenna OL are extremely challenging to represent in the Organigraph. But the experts within the workshops provided greater insight into the nature and challenges of these relationships. A key proposal for the Ravenna OL revolves around the exploration of these relationships and developing potential solutions to enhance them. As depicted in the Organigraph, the Municipality is owner of the archaeological site, while the Diocese is owner of the church. However, the wider monument area is managed by SABAP, the authority responsible of the CNH of Ravenna and other surrounding municipalities.

2.1.1.4 Operationalizing the 3-D model into a tool for adaptive governance.

As part of the tools already created within the Raveena OL the experts have developed a comprehensive three-dimension model of the CH site. However, based on the feedback from the experts this model may not have value beyond its current application as a mapping tool. As a result, in the early phases of the Organigraphs development the experts were encouraged to reflect upon the three-dimensional model that had been created to depict the Santa Croce Church and how it could be used as a tool to enhance the DRM governance structures within the Raveena OL. **The researcher at the University of Liege prompted the experts within the OL to consider the wider implications of the three-dimensional model and how it could be used to enhance the governance structures within the Ravenna OL. Within this proposal the experts within Phase 3 provide detailed feedback and responses.** Notably.

> *"The 3d model can certainly be used in a preventive manner and to support the modelling of risk scenarios. Furthermore, the information contained therein can be used as a starting point for the conservation and maintenance of the site. Monitoring is also an action that could be connected to the 3d model as long as there is a sufficient level of detail of the information. Finally, 3D modelling can provide information on the pumps' withdrawal and filtering, which in reality risk accelerating the phenomenon of anthropogenic subsidence."*

> *"This shows that the model could be extremely useful when there are correspondences between critical points/areas of the sewage and water distribution system and location of UNESCO sites. Safeguard actions could arise in relation to UNESCO sites to be structured based on the development of scenarios obtained from 3D modelling."*

What the experts highlighted in their feedback is that the three-dimensional model may have potential value in both the preparedness mitigation phases of the DRM cycle. According to the experts the three-dimension model may help to conduct simulations and stimulate discussions around correspondence between different experts' groups on how to react in the event of rising water levels and subsidence. However, this would depend on the accuracy of the model and the amount of data that it can provide. Building upon this, the Research at ULIEGE emphasizes the potential of the model as an engagement tool allowing tourist and local people to 'visit' the site all year round despite not actually being able to enter the building. However, This idea was not adopted by the stakeholders.

3 Appendices

The refined Versions of All OL Organigraphs as printable PDF Documents split by 'Layers' According to the OL specifications (Phase 4)

The Following Appendix includes all fine-tuned Organigraphs after the completion of the semi-empirical research approach.

Santa Croce Church and archaeological Area (Raveena OL)