Shelter

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

Extract of D.6.4. Historic area resilience co-production playbook

Strategic blueprints for the Area of Santa Croce in Ravenna

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Table of content

List of figures

Glossary

Acronym	Full name
CNH	Cultural and Natural Heritage
CHM	Cultural Heritage Management
DRM	Disaster Risk Management
HA	Historic Area
NBS	Nature-Based Solutions
OL	Open Labs
OLC	Open Lab Coordinator
UR	User Requirements

1 Strategic Blueprints

The following report is dedicated to outlining the OL specific strategic blueprints that were developed through the co-creation workshops. The strategic blueprints consist of the identified solutions which were discussed with the participating stakeholder.

The design of the strategic blueprints follows the discussed questions per topic and for each identified solution an own strategic blueprint sheet was created. Each sheet includes a suggestion for the implementation timeline as well as an assignment of the identified solution to the phases of DRM.

In addition, the results of the questionnaire for DRM and communities it was possible to receive an overview of the specific situations and the involvement of communities in the disaster risk management. With the feedback of the stakeholder information sheet, an analysis of the participating stakeholder structure was done. The structure of the strategic blueprints follows the discussed questions per topic and each identified solution is described in an own strategic blueprint sheet.

1.1 Stakeholder structure analysis

With the results of the stakeholder information sheet, an analysis of the stakeholder structure was possible. Due to COVID-19 situation, not all identified stakeholders were able to join the online meetings and contribute their specific expertise but the participation was balanced and OL case study coordinators were in contact with stakeholder which were not able to join meeting to catch their expertise.

1.1.1 Area of Santa Croce in Ravenna

In total, 36 participants joined the online workshop session in Ravenna. The stakeholder structure is visualized below in Figure 1. The 36 stakeholders who were able to participate represented a wide of disciplinary backgrounds and experiences. The participants were assigned to governmental organizations as well as public corporations. Some of the participants are involved in disaster risk management procedures. Local business and academic personnel were not involved in the discussion process so far following the defined stakeholder structure.

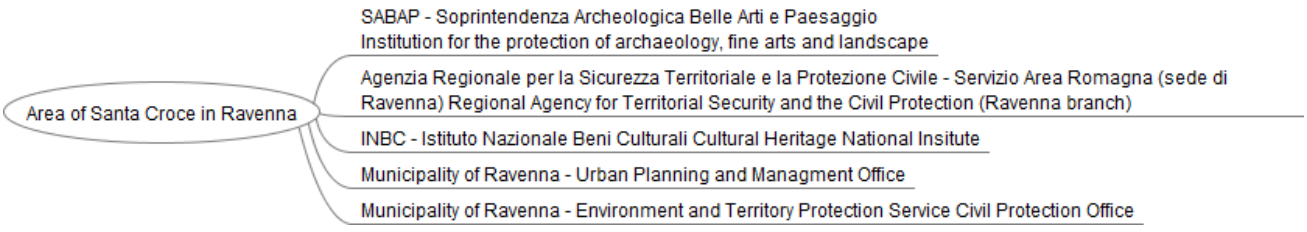

Figure 1. Stakeholder structure for Area of Santa Croce in Ravenna

1.2 Results of the questionnaire

In this subchapter, the results of the questionnaires are visualized, which were forwarded from the stakeholders to the OL case study coordinators. The answers were translated from the national language into English and summarized into the questionnaire template.

The results of the questionnaire show the situation for each OL due to the experience and evaluation of the involved stakeholders. Some results may be used for further evaluations in the sense of involvement of communities in disaster risk management in all phases. A balanced and developed DRM in the respective OL region would have resulted in a total YES to all 5 questions by the stakeholders. As the questionnaires show this is not the case. In any case, a respective need for action has to be evaluated with all care and specifically identified from OL to OL.

In the following the answers of the Ravenna OL are visualized.

Question	YES/NO	If "Yes" please short description	additional comments for the HA if necessary	additional comments for improvements based on your expertise
Are public awareness programms executed? (Yearly frequency of execution of programs: once, sometimes, regular)	YES	Yes, we inform the population through press releases, publications in monthly magazines, distribution of information material.		
		Specific initiatives are implemented by the Municipality, which is responsible for informing the population, with the support of the Regional Agency for Territorial Security and Civil Protection (STPC Agency).		
		For what concernshe cognitive frameworks of the urban planning instruments include seismic microzonation and hydrogeological risk protection plans, which, together with all the plans, are published on the institutional website of the Municipality.	Those that exist (not on the local territory) are not easy to find for the common citizen.	
Is regular (at lest yearly) emergency response training and drills at multiple levels ongoing?	YES	Training courses for technical staff and volunteers are active, exercises are more difficult to implement		
		But not sytematically. There is a structured training programme for civil protection volunteers under the responsibility of the Regional Agency. Training sessions with the involvement of the population are sporadic due to organisational difficulties.		
Does a community risk management or emergency committee exist, that deals with prevention, mitigation, preparedness and response? (Meeting frequency: only during emergency, once in a year, at least quarterly)	NO	It exists at regional level. At municipal level sometimes yes, depending on the administration	The Municipality Urban Planning and Managment office does not receive training on joint risk management.	
Do local institutions (administration, police, fire brigade, hospitals, building sector, etc) receive training on joint risk management? (Frequency of training: once per year, every two years, other)	YES	Through the sharing of civil protection plans and their subsequent approvals, in addition to detailed meetings, exercises	No, there are no joint routes except for specific risks (e.g. forest fires). There are, **at the request of the Municipalities**, training initiatives for internal staff implemented with the participation of Regional Agency officers. In a similar way, the Agency takes care of the training of its employees.	
Is the private sector represented as member in the Management/emergency committee? (businesses, civil society, NGOs, etc.)	NO	the private sector participates (with some territorial differences related to the different local sensitivities) in the world of civil protection through voluntary activities of the members of the order of engineers, geologists, surveyors, architects, etc....	Except in case of major risk factories in hazard area for approval of external emergency plans	

Figure 2. Questionnaire results for Area of Santa Croce in Ravenna

1.3 Strategic blueprints for the Area of Santa Croce in Ravenna

The co-creation workshop conduct with the stakeholder in the Area of Santa Croce in Ravenna results into 8 specific strategic blueprints. In the following subchapters, the strategic blueprints are defined in greater detail.

1.3.1 Strategic blueprint 1

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	1
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Water pumps powered by solar energy
DESCRIPTION	
IDENTIFIED SOLUTION	Installation of water pumps powered by solar energy in addition/replacing the ones already in the area.
How can the identified tool improve the current situation?	At the moment the pumps installed in the area are adjusted and set manually based on the moment necessity and powered through electricity. Replacing them with the new pumps would allow them more easily and in more efficient ways with a more sustainable source of electricity
How should the design of this tool look like?	Remote control water pumps to allow the mangers of the area to easily set the tools.
How should the implementation of the tool look like?	An international open call for European suppliers will be disseminated. The winner will install the tools in the area at his own expense and will take care of the management. The project does not foresee costs for installing solar pumps. It is subjected to the sponsorization of SMEs/LEs providing it
What should be taken into account for the maintenance of the tool?	Periodical check-up of the pumps
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness, and Response
TIME PERSPECTIVE	Can be implemented MID TERM (1-3 years)
ADDITIONAL COMMENTS	
STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape

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	Agenzia Regionale per la Sicurezza Territoriale e la Protezione Civile - Servizio Area Romagna (sede di Ravenna) Regional Agency for Territorial Security and the Civil Protection (Ravenna branch) INBC - Istituto Nazionale Beni Cultural Cultural Heritage National Institute Municipality of Ravenna - Urban Planning and Management Office Municipality of Ravenna - Environment and Territory Protection Service Civil Protection Office

1.3.2 Strategic blueprint 2

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	2
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Preventive alarm system based on sensor network
DESCRIPTION	
IDENTIFIED SOLUTION	Clinometers
How can the identified tool improve the current situation?	The sensor will help monitor the wall rotation movements, the helping to better assess movements of the structure.
How should the design of this tool look like?	Sensors will be installed on the Church walls. The sensor will work through electric current.
How should the implementation of the tool look like?	After the approval of the local Superintendency to install the sensors in the area, they will be purchased by the UNIBO group and installed by the university experience.
What should be taken into account for the maintenance of the tool?	Always necessary electricity. Necessary periodical check-up
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness
TIME PERSPECTIVE	Can be implemented SHORT TERM (within 1 year)
ADDITIONAL COMMENTS	
STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape

	Agenzia Regionale per la Sicurezza Territoriale e la Protezione Civile - Servizio Area Romagna (sede di Ravenna) Regional Agency for Territorial Security and the Civil Protection (Ravenna branch) INBC - Istituto Nazionale Beni Cultural Cultural Heritage National Institute Municipality of Ravenna - Urban Planning and Management Office Municipality of Ravenna - Environment and Territory Protection Service Civil Protection Office

1.3.3 Strategic blueprint 3

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	3
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Preventive alarm system based on sensor network
DESCRIPTION	
IDENTIFIED SOLUTION	Heave and settlement monitoring system
How can the identified tool improve the current situation?	The sensor reacts to the heave and settlements and will therefore possible to assess the differential settlements of the Church structure.
How should the design of this tool look like?	Sensors will be installed on the Church walls. The sensor will work through electric current.
How should the implementation of the tool look like?	After the approval of the local Superintendency to install the sensors in the area, they will be purchased by the UNIBO group and installed by the university experience.
What should be taken into account for the maintenance of the tool?	Always necessary electricity. Necessary periodical check-up
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness
TIME PERSPECTIVE	Can be implemented SHORT TERM (within 1 year)
ADDITIONAL COMMENTS	
STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape

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1.3.4 Strategic blueprint 4

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	4
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Preventive alarm system based on sensor network
DESCRIPTION	
IDENTIFIED SOLUTION	Accellerometers
How can the identified tool improve the current situation?	The area is traffic road prone, the sensors will collect data on road vibrations which affect the structure.
How should the design of this tool look like?	Sensors will be installed on the Church walls. The sensor will work through electric current.
How should the implementation of the tool look like?	After the approval of the local Superintendency to install the sensors in the area, they will be purchased by the UNIBO group and installed by the university experience.
What should be taken into account for the maintenance of the tool?	Always necessary electricity. Necessary periodical check-up
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness
TIME PERSPECTIVE	Can be implemented SHORT TERM (within 1 year)

ADDITIONAL COMMENTS	
STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape Agenzia Regionale per la Sicurezza Territoriale e la Protezione Civile - Servizio Area Romagna (sede di Ravenna) Regional Agency for Territorial Security and the Civil Protection (Ravenna branch) INBC - Istituto Nazionale Beni Cultural Cultural Heritage National Institute Municipality of Ravenna - Urban Planning and Management Office Municipality of Ravenna - Environment and Territory Protection Service Civil Protection Office

1.3.5 Strategic blueprint 5

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	5
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Preventive alarm system based on sensor network
DESCRIPTION	
IDENTIFIED SOLUTION	Piezometers
How can the identified tool improve the current situation?	At the moment groundwater data are collected for a wider area, no specific data related to the site. The sensor will collect the groundwater table specifically for the area.
How should the design of this tool look like?	Tools will need small excavations to be implemented, they will be placed in the archaeological area external to the Church
How should the implementation of the tool look like?	After the approval of the local Superintendency to install the sensors in the area, they will be purchased by the UNIBO group and installed by the university experience.
What should be taken into account for the maintenance of the tool?	Piezometers will need periodical check-up
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness
TIME PERSPECTIVE	Can be implemented SHORT TERM (within 1 year)

ADDITIONAL COMMENTS	
STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape Agenzia Regionale per la Sicurezza Territoriale e la Protezione Civile - Servizio Area Romagna (sede di Ravenna) Regional Agency for Territorial Security and the Civil Protection (Ravenna branch) INBC - Istituto Nazionale Beni Cultural Cultural Heritage National Institute Municipality of Ravenna - Urban Planning and Management Office Municipality of Ravenna - Environment and Territory Protection Service Civil Protection Office

1.3.6 Strategic blueprint 6

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	6
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Consolidation & monitoring techniques
DESCRIPTION	
IDENTIFIED SOLUTION	Datalogger
How can the identified tool improve the current situation?	Currently, no sensors are installed inside the Church, no data available. These sensors will be installed indoor to monitor RU and temperature and differential measures near and far from walls.
How should the design of this tool look like?	The sensor will work through electric current. Data will be transferred through Wi-Fi connection
How should the implementation of the tool look like?	The local Superintendency approved the installation of the sensors, they will be purchased by the UNIBO group and installed by the university experience.
What should be taken into account for the maintenance of the tool?	Necessary always Wi-Fi connection, data are automatically downloaded in a cloud
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness
TIME PERSPECTIVE	Can be implemented SHORT TERM (within 1 year)

ADDITIONAL COMMENTS	
STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape Agenzia Regionale per la Sicurezza Territoriale e la Protezione Civile - Servizio Area Romagna (sede di Ravenna) Regional Agency for Territorial Security and the Civil Protection (Ravenna branch) INBC - Istituto Nazionale Beni Cultural Cultural Heritage National Institute Municipality of Ravenna - Urban Planning and Management Office Municipality of Ravenna - Environment and Territory Protection Service Civil Protection Office

1.3.7 Strategic blueprint 7

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	7
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Consolidation & monitoring techniques
DESCRIPTION	
IDENTIFIED SOLUTION	Chromatographic column
How can the identified tool improve the current situation?	The sensor will monitor the presence of salts in masonries allowing ro to assess the phenomenon of climbing dampness and humidity.
How should the design of this tool look like?	The sensor will be placed inside the Church close to the walls.
How should the implementation of the tool look like?	The local Superintendency approved the installation of the sensors, they will be purchased by the UNIBO group and installed by the university experience.
What should be taken into account for the maintenance of the tool?	
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness
TIME PERSPECTIVE	Can be implemented SHORT TERM (within 1 year)
ADDITIONAL COMMENTS	

STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape Agenzia Regionale per la Sicurezza Territoriale e la Protezione Civile - Servizio Area Romagna (sede di Ravenna) Regional Agency for Territorial Security and the Civil Protection (Ravenna branch) INBC - Istituto Nazionale Beni Cultural Cultural Heritage National Institute Municipality of Ravenna - Urban Planning and Management Office Municipality of Ravenna - Environment and Territory Protection Service Civil Protection Office

1.3.8 Strategic blueprint 8

STRATEGIC BLUEPRINT – SHELTER PROJECT	
ID	8
OL ASSIGNMENT	Area of Santa Croce in Ravenna
TOPIC	Consolidation & monitoring techniques
DESCRIPTION	
IDENTIFIED SOLUTION	Weather station
How can the identified tool improve the current situation?	At the moment all the meteorological data are collected for the whole area of Ravenna, therefore the data are not very specific to the site; the weather station will monitor meteorological and thermohygrometrical data and collect information specifically related to the site (temperature, wind strength and direction, relative humidity).
How should the design of this tool look like?	The station, if possible, will be installed above the Church roof. Data will be transferred through Wi-Fi connection
How should the implementation of the tool look like?	After the approval of the local Superintendency to install the sensors in the area, they will be purchased by the UNIBO group and installed by the university experience.
What should be taken into account for the maintenance of the tool?	Necessary always Wi-Fi connection, data are automatically downloaded in a cloud
ASSIGNMENTS/COMMENTS	
DRM PHASE	Prevention, preparedness
TIME PERSPECTIVE	Can be implemented SHORT TERM (within 1 year)
ADDITIONAL COMMENTS	

STAKEHOLDER STRUCTURE	
ORGANISATIONS	SABAP - Soprintendenza Archeologica Belle Arti e Paesaggio Institution for the protection of archaeology, fine arts and landscape Agenzia Regionale per la Sicurezza Territoriale e la Protezione Civile - Servizio Area Romagna (sede di Ravenna) Regional Agency for Territorial Security and the Civil Protection (Ravenna branch) INBC - Istituto Nazionale Beni Cultural Cultural Heritage National Institute Municipality of Ravenna - Urban Planning and Management Office Municipality of Ravenna - Environment and Territory Protection Service Civil Protection Office