

**Ten Projects
Horizon 2020 for Cultural Heritage
Pre-Kick Off Meeting**



RESILIENT EUROPE Project

Second draft, March, 2015

A.I.C. – Associazione Investire in Cultura

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B - TECHNICAL ANNEX

COVER PAGE

Title of Proposal: Hazards & Wars consequences to urban habitats

Acronym: RESILIENT EUROPE

List of Participants:

Participant No *	Participant organisation name	Country
1	X	X
2	Y	Y
3	Z	Z
4	W	W
5	K	K
6	K	K
7	K	K
8	K	K
9	K	K
10	S	S
11	L	L
12	A	A
13	O	O.

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Resilient Europe

Hazards & Wars consequences to urban habitats

1 – Excellence

1.1 – Objectives

Analysis of consequences of wars and hazard during the historic and current occurrence.

Selection of some heritage cities in Europe.

- virtual reconstructions of urban habitats under risk;
- development of reliable risk scenarios & maps (past and current);
- heritage emergency.
- resilience analysis.

1.2 – Relation to the Work programme

The work programme topic to which Resilient Europe relates is Reflective-2-2015 because the proposal fulfils the Call requirements, ie.:

Code 2 (to be written once all Work packages are ready)

1.3 – Concept and approach

Code 2 (to be written once all Work packages are ready)

(Describe the overall project starting from the activities of WP2, WP3, and WP4: their approach, methodology, etc. and any national or international research linked to this project).

1.4 Ambition

Code 3 (to be written once all Work packages are ready)

(Describe for the overall Project, i.e. for the activities reported in WP2, WP3, and WP4:

1 - the state-of-the-art

2 – the progress beyond the state-of-the-art

3 – the literature concerning the previous points)

2 – Impact

2.1 –Expected impacts

Code 4 (to be written once all Work packages are ready)

(Describe how a lasting impact of the Project will be ensured by the following strategic Project choices):

.....

(In particular, describe the following Project outcomes that will become available in a practical use):

.....

2.2 –Measures to maximize impact

Code 5 (to be written once all Work packages are ready)

a) Dissemination and exploitation of results

Preparation of a draft plan for dissemination of project results

All Partners will prepare items for publication (scientific papers, conference abstracts, website updates, etc.). Full details about how to publish Project results are outlined into the Consortium agreement.

b) Communication activities

All partners will describe, according to their opinion:

- Market impacts of the project*
- Market size and potential*
- Steps towards commercialization*
- Necessity of a European approach*

3 – IMPLEMENTATION

3.1 Work plan - work packages, deliverables and milestones

Code 6 (to be written once all Work packages are ready)

(Describe the overall Work Plan based on the activities of the five Work packages.)

Timing of the Work plan (Gantt chart)

Inter-relation of the components (Pert chart)

The following five Work Packages: WP1, WP2, WP3, WP4 and WP5 represent the structure of this Work plan

Table 3.1a: Work package WP1 description

Work package number 1	Start Date or Starting Event					
Work package title	Coordination (Indirli Maurizio) Coordination and Consortium management (Indirli Maurizio)					
Participant number	X	Y	Z	W		
Short name of participant	X	Y	Z	W		
Person/months per participant:	X	Y	Z	W		

Objectives

This WP guarantees that:

- an effective coordinating structure is created
- the research project is carried out according to the time schedule and budget established,
- meetings are organized to enable collaboration and management of consortium partners,
- the project progress of the WPs is managed and monitored against contractual deliverables,
- the WPs objectives are achieved efficiently,
- a system is created to provide a continuous evaluation feedback and a constant project monitoring.
- the project is managed according to the contract between the RESILIENT EUROPE consortium partners and the EC, maintaining a continuous link with the EC, and the overall legal, contractual, ethical, financial and administrative management activities are performed ensuring accurate and timely distribution of funds, reporting on activities, etc.).

(Indirli Maurizio)

WP1, lasting for the whole duration of the project, is aimed at the general coordination of the consortium (management of legal, financial, administrative, and technical-scientific aspects), guaranteeing: the creation of an effective coordinating structure, with coherence between the different work packages and the links with the European Commission; the respect of the time schedule and the budget established; the setting up of regular meetings among the consortium partners; the achievement of established deliverables and milestones; a continuous evaluation feedback and a constant project monitoring. The project is managed according to the contract between the consortium partners and the European Commission; the overall legal, contractual, ethical, financial, and administrative management activities are performed ensuring accurate and timely distribution of funds, reporting on activities, etc..

Description of work

WP1, coordinated by ENEA, is devoted, inter alia, to the following duties:

- consortium general coordination, agreement maintenance, and project resources administration;
- a detailed definition of the project's internal organisation, in order to address and solve efficiently potential conflicts among the partners, is established; ENEA is entrusted as Project Coordinator (PC); a Steering Committee (SC, formed by WPs leaders), and a General Assembly (GA, including all the partners) has been appointed; at least, SC will meet twice and GA once per year (through both physical and online meetings);
- for each work package, a qualified WP Leader (WPL) has been identified, in order to take technical

control of and responsibility for proper management/execution of the related technical-scientific tasks; WPL establishes (in coordination with PC) the WP detailed schedule, and is responsible for quality and correct/timely submission of WP deliverables; each WPL is appointed to chair the respective WP meetings among the participating partners;

- PC, SC, GA should guarantee elaboration/monitoring of all the project steps, verifying that all the partners share the same level of information, fostering the smooth running of the project as a whole;
- quick and effective links/exchanges will be ensured through an effective feedback towards reviewing periodic reports, post-processing outputs, and recommendations coming from European Commission and reviewers;
- preparation, organisation and minutes of meetings (project coordination, external advisory board, etc.) will be provided (agendas, invitations, location of meeting places, organization of rooms and equipment, preparation and distribution of materials, minutes, and action lists, etc.);
- follow-up of decisions and action plans will be provided in short time to project partners, reviewers, and European Commission.
- a project website, including an internal online platform (for partners' information exchange), and a public area for communication, data sharing, and library with all the project results, will be implemented;

ENEA is entrusted as PC. PC is assisted by a Project Officer (PO, selected among the UNINA' personnel), focusing on: daily management, coordination, administrative and financial aspects. PC is responsible to:

- administer the financial contribution coherently with the assigned budget, regarding its allocation between beneficiaries and activities; PC ensures that all the appropriate payments are made to each beneficiary without unjustified delay;
- keep all the records and financial accounts, making it possible to determine at any time what portion of the funding contribution has been paid to each beneficiary for the purposes of the project;
- inform the European Commission about funding distribution procedures, including the transfers date to each beneficiary;
- guarantee the achievement of all the deliverables/milestones foreseen by the contract between the consortium and the European Commission;
- organize project meetings, workshops, and conferences; receive/review reports to verify consistency with the project tasks before transmitting them to the European Commission; each partner should provide regularly an internal progress report; WPLs should provide internal progress reports (after the first four months and thereafter at four-monthly intervals); external progress reports (interim, midterm, final) will be discussed and approved by SC and/or GA, before being submitted by PC to the European Commission; in addition, also a project quality plan will be drafted;
- inform the European Commission properly about situation/progress of the work, overall budgetary situation, and (in advance) about date/subject of meetings;
- coordinate communication, dissemination and exploitation of the project results; an action plan will be defined during the kick-off meeting and regularly verified and updated;
- oversee all the procedures until the signing of the Consortium Agreement among the European Commission and the partners;

organize a project kick-off meeting immediately after the signing of the Consortium Agreement, involving all the project team.

(Indirli Maurizio)

Deliverables

- **Consortium Agreement.** A Consortium Agreement will be concluded among the project partners.
- **Kick-Off meeting minutes.**
- **Meeting/workshop minutes.**
- **General Assembly meeting minutes.**
- **Internal website with public areas for communication and data sharing**
- **Partners progress report.** Each individual partner will regularly submit a progress report to the respective Work Package leaders in order to monitor progress and to ensure the work package remains on schedule.
- **Work Package progress report.** Each WP leader is required to provide the PC regularly with a WP progress report concerning his/her WP to enable the PC to be assured that work is progressing according to plan.
- **Interim reports.** The PC will combine the WP progress reports and will constitute the interim reports.
- **Progress reports to the EC.** Annually the PC will submit progress reports to the EC.
- **Final report (technical, financial, deliverables).** The PC will submit the final report to EC.

(Indirli Maurizio)

- D1.1: Consortium Agreement, month 1 (PC);
 D1.2: Kick-off meeting minutes, month 2 (PC and PO);
 D1.3: Partner internal progress reports, month 3, 7, 11, 15, 19, 23, 27, 31, 35 (ALL);
 D1.4: WPs internal progress reports, months 4, 8, 12, 16, 20, 24, 28, 32, 36 (WPLs);
 D1.5: External progress reports (interim, midterm, final), months 12, 24, 36 (PC and WPLs);
 D1.6: Meeting minutes reports (SC, GA, WPs, workshops, conferences, etc., after each meeting (PC, PO, WPLs);
 D1.7: Project quality plan, months 4, 12, 24, 36 (PC and WPLs);
 D1.8: Resilient Europe Website, see also WP9, months 3, 12, 24, 36 (PC, PO, WPLs, ALL).

(Indirli Maurizio)

Table 3.1a: Work package WP2 description

Work package number 2	Start Date or Starting Event						
Work package title	(Sarris Apostolos) Virtual reconstructions of urban habitats (Sarris Apostolos) (Indirli Maurizio) Definition of multi-hazard disaster scenarios and maps (Indirli Maurizio)						
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

Analysis of consequences of wars and hazard during the historic and current occurrence.

Selection of some heritage cities in Europe.

- virtual reconstructions of urban habitats under risk;

(Sarris Apostolos)

Analysis of consequences of wars and hazard during the historic and current occurrence.

Selection of some heritage cities in Europe.

- Virtual reconstructions of urban habitats under risk;

(Sarris Apostolos)

(Verga Flaminia)

The realization of a methodological standard which takes advantage of advanced technologies to develop best practice cases-study;

The realization of a Web GIS aimed at the sharing of all information on a large scale;

The enhancement of the informatics innovative technologies by their use for exemplary cases-study.

(Verga Flaminia)

(Indirli Maurizio)

WP2 main outcomes, through the analysis of hazards (natural/anthropogenic) and wars during the historic and current occurrence, are:

- to define multi-hazard approaches and hazard space/time scenarios, with algorithms and models, of selected disaster combinations for the selected case studies;
- to obtain hazard digital maps of selected disaster combinations for the selected case studies;
- to define global hazard factors of selected disaster combinations for selected case studies.

(Indirli Maurizio)

Description of work

(Verga Flaminia)

First, I would like to propose a change in the skills table on my professional skills, inserting, in place of the current expression, the locution “ Archaeological Research Methodologies/Topographical Survey”, which seems to me more relevant. Moreover, I confirm to You my participation to the Proposal and that I will participate to the Rome meeting. Finally, I illustrate to You how I can contribute to the Proposal with my skills and the objectives which it's possible to achieve in this way.

First, it should be emphasized that, not having yet defined the subject (archaeological area, urban area, architectural manufacture, and so on) of this Proposal, it's difficult to delineate the most suitable methodology for the Proposal. In any case, a collection of all information – bibliographical, photographic, historical/archival, mappings – on the object/case Study of this Project Proposal, which shows its condition previously to its destruction, should be the first phase of this work. All these information should be cataloged and digitized to flow into a database specially dedicated. That testimonies the need of a meticulous documentation at the base of the use of virtual methodologies, i.e. the reference to the standards developed in the London Chart. An important phase of the Project Proposal will be the selection of the mapping methodology most suitable to the topographical survey of the object/case study, which will be a very important phase in the framework of the Project. Regarding to this point, I would like to mention the Dr. Cinzia Bacigalupo of the ITABC CNR, who has a lot of experience on the geometric mapping.

(Verga Flaminia)

(Indirli Maurizio)

WP2 is devoted to:

TASK 2.1

- provide state-of-the-art knowledge and methodologies about single hazards (natural/anthropogenic) considered for the selected case studies;
- compare, check and select the best procedures for single hazard assessment;

TASK 2.2

- define common languages to identify, profile, quantify and group hazards, avoiding omissions, affecting the selected case studies;

TASK 2.3

- define sharp procedures/algorithms to elaborate, cross and overlay information;

TASK 2.4

- obtain some multi-hazard emblematic past/future disaster scenarios (natural and/or anthropogenic) from a regional to a local scale for the selected case studies, namely
 - a) short period (armed conflict, earthquake, tsunami, landslide, volcanic eruption, etc.),
 - b) long period (maintenance, decay, tourism pressure, climate change effects, etc.),
 to be focused during the project;

TASK 2.5

- to implement disaster forecasting;

TASK 2.6

- to obtain multi-hazard maps/global hazard factors of selected disaster combinations for the selected case studies, implementing the Smart Inventory Database (see WP7).

UNITS will coordinate WP2 activities and issue the deliverables.

ENEA will coordinate WP2-TASK 2.1 activities.

ENEA will coordinate WP2-TASK 2.2 activities.

UNINA will coordinate WP2-TASK 2.3 activities.

UNITS will coordinate WP2-TASK 2.4 activities.

UNITS will coordinate WP2-TASK 2.5 activities.

UNITS will coordinate WP2-TASK 2.6 activities.

Other partners will contribute to review all the deliverables.

(Indirli Maurizio)

Deliverables

(Indirli Maurizio)

D2.1: WP2-TASK 2.1 outputs (ENEA, ALL), report, month 6;

D2.2: WP2-TASK 2.2 outputs (ENEA, ALL), report, month 6;

D2.3: WP2-TASK 2.3 outputs (UNINA, ALL), report, month 12;

D2.4: WP2-TASK 2.4 outputs (UNITS), report, month 12 ;

D2.5: WP2-TASK 2.5 outputs (UNITS), report, month 12;

D2.6: WP2-TASK 2.6 outputs (UNITS, ALL), report and implementation of the Smart Inventory Database, month 12.

(Indirli Maurizio)

Table 3.1a: Work package WP3 description

Work package number 3	Start Date or Starting Event
Work package title	<p>(Sarris Apostolos) Reliable risk scenarios & maps (Sarris Apostolos) (Indirli Maurizio) Selection of case studies and in situ/laboratory investigations (Indirli Maurizio)</p>

Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

Analysis of consequences of wars and hazard during the historic and current occurrence.

- development of reliable risk scenarios & maps (past and current);
- heritage emergency.

(Sarris Apostolos)

Analysis of consequences of wars and hazard during the historic and current occurrence.

- Development of reliable risk scenarios & maps (past and current);
- Heritage emergency.

(Sarris Apostolos)

(Indirli Maurizio)

WP3 is focused on the selection of representative case studies. In order to deepen the knowledge of the selected sites, also focussed in situ and laboratory investigations shall be performed during the project, in order to obtain further/lacking information and implement the Smart Inventory Database (see WP5).

(Indirli Maurizio)

Description of work

(Sarris Apostolos)

IMS-FORTH can contribute in modeling the risk assessment on cultural heritage monuments under various environmental conditions. Based on various datasets that concern environmental-meteorological data, seismological data, tsunami episodes, urban sprawl trends, agricultural fires, etc. it will try to model the environmental and anthropogenic risk assessment on cultural heritage sites. Two case studies will be studied:

The island of Crete where there are a number of settlements spanning from the Neolithic period to the more recent Ottoman and Venetian periods. The particular monuments consist of different building materials exposed under various environmental and anthropogenic risks. Depending on the status of the monuments and their proximity to the coast (risk of tsunami, sea erosion and explosion of tourist facilities), on the plains (agricultural activities, agricultural fires and flooding), within urban historical centers (seismic activity and construction sprawl), etc. there is an immense risk that is imposed to the specific monument. The project will collect information regarding the spatial distribution of the monuments, will study their conservation status and will model the various risks in a direct and interactive way. The case of the island of Crete will be used as a case study, whereas a more interactive system (WEB_GIS) will be developed so that the interested parties will be able to upload their data and based on various modeling procedures (e.g. weights of significance, AHP modeling, fuzzy analysis, etc.) will be able to set the parameters (weights) of each risk depending on his/her area of interest and obtain a risk assessment model.

In the second case study, the floodplains of Thessaly that host a number of Neolithic settlements (the earliest Neolithic habitation in Europe) will be modeled with respect to the flood incidences of the past and the future. The models will make use of flooding simulations based on specific geomorphological, meteorological and climatic models and results will create flooding risk maps that can 1) postulate the past

habitation on the floodscapes and 2) model the flooding risk that is imposed to the specific tells and flat settlements.

(Sarris Apostolos)

(Indirli Maurizio)

WP3 is devoted to carrying out the following tasks:

TASK 3.1

- select representative case studies, to be focussed and developed depending on the discussion between the partners in the framework of the project itself; the potential sites are
 - the city of Modica (Sicily, Italy) and its territory,



- gather all the multi-disciplinary state-of-the-art information about the sites;
- identify preliminary ideas about preservation/management strategies for the selected assets and actions for communication towards people, stakeholders, end-users, with the aim to enhance increasing resilience and risk mitigation;
- identify needs of investigations, to be done during the project, necessary for the study of the selected areas;

TASK 3.2

- all the Remote Sensing (RS) and cartographic available materials should be acquired or implemented (maps, plans, cadastral data, aerial and satellite photos, etc.);
- a detailed topographic survey should be carried out, including a GPS campaign, in order to verify with enough precision the geographic coordinates of the assets;
- an extensive use of innovative high-resolution aerial photogrammetric mapping, remote sensing with UAV-UAS, etc., should be foreseen;

TASK 3.3

- in situ investigations through quick procedures (architecture/urban planning, vulnerability and damage, maintenance, typology of materials, sustainability and energy saving analyses, etc.) will be performed extensively, in order to provide reliable data to assess safety/protection levels of life/assets;

TASK 3.4

- in situ diagnostics/testing with non-destructive procedures, for the characterization of materials/structures, will be performed, if necessary; various techniques, available among the partners, with sophisticated equipment (laser scanner, laser interferometry, thermo-chamber, etc.), will be used, when necessary;

TASK 3.5

- laboratory analyses through SEM (*Scanning Electron Microscope*) and/or other techniques for material identification will be performed, when necessary;
- laboratory testing through specific equipment (shaking table tests and/or other machines) on materials and mock-ups will be foreseen only if indispensable, because high-costly and time-consuming.

UNIPA will coordinate WP3-TASK 3.1 activities.

HELICAM will coordinate WP3-TASK 3.2 activities.

UNINA will coordinate WP3-TASK 3.3 activities.

UNIBU will coordinate WP3-TASK 3.3 activities.

UNICA will coordinate WP3-TASK 3.5 activities.

Other partners will contribute to review all the deliverables.

(Indirli Maurizio)

Deliverables

(Indirli Maurizio)

D3.1: WP3-TASK 3.1 outputs (UNIPA, ALL), reports and implementation of the Smart Inventory Database, month 3, 6, 12;

D3.2: WP3-TASK 3.2 outputs (HELICAM, ALL), reports and implementation of the Smart Inventory Database, month 3, 12, 18, 24;

D3.3: WP3-TASK 3.3 outputs (UNINA, ALL), reports and implementation of the Smart Inventory Database, month 3, 12, 18, 24;
D3.4: WP3-TASK 3.4 outputs (UNIBU, ALL), reports and implementation of the Smart Inventory Database, month 3, 12, 18, 24;
D3.5: WP3-TASK 3.5 outputs (UNICA, ALL), reports and implementation of the Smart Inventory Database, month 3, 12, 18, 24.
(Indirli Maurizio)

Table 3.1a: Work package WP4 description

Work package number 4	Start Date or Starting Event						
Work package title	(Sarris Apostolos) Resilience analysis (Sarris Apostolos) (Indirli Maurizio) Resilience analyses and innovative conservation/restoration solutions (Indirli Maurizio)						
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

Analysis of consequences of wars and hazard during the historic and current occurrence.
- resilience analysis.

(Sarris Apostolos)

Analysis of consequences of wars and hazard during the historic and current occurrence.
- Resilience analysis.

(Sarris Apostolos)

(Panayotis Carydis)

The main objective of this Work Package is to increase the knowledge of the behaviour of constructions in urban habitat under catastrophic events, when exposed to extreme events arising from war, earthquakes, fire, wind, impact, explosions etc.

More objectives are: advancing of the state-of-the-art in the field of structural design of constructions by adding new information about the behaviour of structures under extreme load conditions, raising awareness of industry, research centres, engineers and competent authorities of European countries on the problem of safeguard of constructions from risk arising from exceptional events, improving the awareness of the importance of using advanced technologies in the design of constructions against exceptional events, improving the average knowledge of practicing engineers about innovative systems of structural protection of new and existing buildings, so as to contribute to the development of specialised skills at the European level., allowing engineers to use simple and reliable tools for analysing and predicting the behaviour of constructions under extreme load conditions, setting out provisions for

achieving adequate levels of safety at both the design and refurbishment stage taking into account the economic consequences of the design decisions, promoting the development and the dissemination of advanced, performance-based guidelines for the practical application of innovative technologies in the field of structural protection of construction under exceptional conditions.

(Panayotis Carydis)

(Indirli Maurizio)

Resilience can be briefly defined through the combination of the following factors:

- safety, protection of life/assets;
- adaptive capacity, recover with minimal consequences after traumas;
- stability, quick return to equilibrium;
- sustainability, maintaining original natural/anthropogenic capital;
- conservation, transmitting patrimony intact to posterity.

According to these statements, WP5 is devoted to perform detailed analyses on communities/territories for selected case studies (history, society, heritage, environment, construction, infrastructure, in coherence with previous WP2/WP3), with the aim to provide:

- definition of the methodologies for overall resilience calculation for selected disaster scenarios/case studies;
- identification of global resilience factors for selected disaster scenarios/case studies.

In addition, the following specific activities should be also carried out:

- innovative restoration design for preserving landscape, urban habitat, and heritage (integrating smart techniques as nanotechnologies, bioremediation processes, smart and compatible materials, laser/radar, tomography, spectroscopy, microanalysis, digital imaging, 3D computer graphics, virtual reality, narratives techniques, smart and light structural improvement);
- identification of slow-cost and compatible techniques to reduce risk (hazard/vulnerability/exposure);
- analyses of life-cycle assessment/energy saving/sustainable development;
- sociological/anthropological inquiries, public debates, with the participation of preferential/leading subjects and/or organizations, with a special focus on cultural heritage preservation/valorization;

To this purpose, all the data gathered in WP4 should implement Smart Inventory Database, Augmented Reality Modules, Multi-Layer Digital Archives (see WP5).

During WP4, some targeted applications about resilience evaluation and innovative conservation/restoration should be identified.

A tight relationship with WP6 is also foreseen.

(Indirli Maurizio)

Description of work

(Panayotis Carydis)

This WP will focus on field analysis, treating the Old Town of Corfu, which has been inscribed on UNESCO's List of World Heritage Sites, as case study, not only for earthquakes disasters but also for further unpredictable catastrophic events. The Old Town Corfu could be an ideal case study as it is a classical medievally constructed heritage city, with relatively tall buildings (up to seven floors), dense urban structure and overpopulated. The contemporary Old Town of Corfu, although a characterised heritage city, is also a living body, with permanent residents, visitors and employees or professionals that live and enter the city in a 24/7 basis. Finally, the Old Town of Corfu has been deeply damaged in the past both by war-the bombings of 1943 destroyed a great number of buildings and some of them, after being repaired during the 50's, they remain today in a relatively deteriorating condition-, earthquake and fire and remain nowadays extremely vulnerable to the same hazards but also to flood. The combination of historical events (war, fire, earthquake), low-level of construction technology and materials and socioeconomic reality, make Corfu an excellent case to be studied as the same characteristics apply to several other heritage cities in Europe (and not only Europe). The main methodology to be applied will deal with two different possible hazards: a) war and earthquake, b) fire.

In the case of war and earthquake, the research team will propose two or three public buildings in Corfu

that have been either partially collapsed either have had localised damage. Using special techniques, such as ambient vibration measurements, inspection, high-level screening and the documentation archives of the buildings that the Municipality of Corfu owns, we will be able to identify the reconstruction and restoration methods and materials that had been used in the past, which due to the contemporary state of the buildings have been proved to be inappropriate.

After more than 50 years from the interventions, the resulted conditions are eminent, thus the need for evaluation is mature. This research will let us evaluate the current situation of the buildings, to identify the possible effects on the buildings from a new hazard and most important to prove their faults so as not to be used again. Is it highly likely that the same methods could be used again in other cities especially in Eastern Europe, since they use about the same technological techniques and elements that had been used in Corfu after the 1943 bombings and that have led to the current dangerous condition.

In the case of fire a different approach is to be implemented. There will be case studies based in different specially selected hazard scenarios, which reflect the some of the most crucial and critical hazard risks. Fire in a school, fire in a large building with permanent residents, fire in a hotel, during peak summer season, during winter, in the daytime or in the night, etc. Dealing with these different scenarios will let us identify the optimist methods to be applied in the case of fire hazard, for both firefighting and human rescue. One of the most important characteristics of fire is the fact that in the case of a single event the spread possibility to other nearby constructions is extremely high, due to their vulnerability.

The methodology to be applied has one main goal: To identify the weaknesses and flaws of the restoration methods that have been used in the past and have led to tremendous consequences today, so as not to be used again in other cities with similar characteristics and to propose new methods that suit best and will offer optimum results in the case of a new restoration need.

Apart from the above, and for the value of the analysis, the research team will also deal with: 1) the investigation and mapping of the characteristics specific for hazard of the location, the exposed risk elements, their vulnerability and the resulted risk and 2) the identification of the secure habitat typology with heritage identity for urban development and post-disaster reconstruction, 3) the implementation of a strategic management of protection against any risk by developing the concept of safety-bearer habitat, which presents a high risk-security level. The Ionian University has recently signed a Cooperation Agreement with the Municipality of Corfu and the Regional Fire Administration of Ionian Islands, on the fields of preventing the cultural, architectural and urban heritage of Corfu. Specifically, the common action plan of the Agreement, consists of : a) The necessity of a coordinated plan for risk management, dealing with emergencies at the Old Town of Corfu, b) the establishment of working groups for the Vulnerability and Adaptability Report of the Old Town of Corfu, towards natural and anthropogenic hazards, c) the compilation of graduated Hazard Zones, d) the study on buildings constructions techniques and material use that have been used in different historic periods as well as the consequences derived from earthquakes or/and fire. In this context, both these Institutions should participate as associate partners.

(Panayotis Carydis)

(Indirli Maurizio)

WP4 is devoted to carrying out the following tasks:

TASK 4.1

- to develop appropriated methodologies/procedures for overall resilience calculation for selected disaster scenarios/case studies;

TASK 4.2

- to perform structural calculations and set up analytical models of collapse/damage/decay impacts due to selected scenarios/case studies;

TASK 4.3

- to identify global resilience factors(univocal, punctual and quantitative) for the above said scenarios/case studies;

TASK 4.4

- to classify, overlay, elaborate all the obtained information in the Smart Inventory Database (see WP5).

UNINA will coordinate WP4 activities and issue the deliverables.

ITABC will coordinate WP4-TASK 4.1 activities.

ENEA will coordinate WP4-TASK 4.2 activities.

FORTH will coordinate WP4-TASK 4.3 activities.

UNIBO will coordinate WP4-TASK 4.4 activities.

Other partners will contribute to review all the deliverables.

(Indirli Maurizio)

Deliverables

(Panayotis Carydis)

The deliverables deriving from the above will be:

- 1) The setting up of a list of categorised damages due to different hazards
- 2) The classification of methods and materials used in the past
- 3) The evaluation of the resulted vulnerability existing today
- 4) The proposal of new methods to be applied, in a sustainable perspective
- 5) The compilation of a **War Damage Intensity Scale**, similar to the European Intensity Scale for Earthquakes
- 6) The proposal of the **"Fluorescent Box"**. This Box will be located in public buildings and the Municipality, and will contain all the necessary information in digital and printed versions that could be used in case of human rescue or restoration of a building. The detailed content of the Box will be dully analysed.

(Panayotis Carydis)

(Indirli Maurizio)

D4.1: WP4-TASK 4.1 outputs (ITABC, ALL), report, month 6;

D4.2: WP4-TASK 4.2 outputs (UNINA, ALL), report, month 12;

D4.3: WP4-TASK 4.3 outputs (FORTH, ALL), report, month 18;

D4.4: WP4-TASK 4.4 outputs (UNIBO, ALL), report and implementation of the Smart Inventory Database, Part IV, month 18.

(Indirli Maurizio)

Code 7 (All Partners received empty templates for Work packages WP2, WP3, and WP4; please, any Partner should return these templates to each2014@gmail.com compiled as a first draft).

Table 3.1a: Work package WP5 description

Work package number 5	Start Date						
Work package title	Project results diffusion (Indirli Maurizio) Smart Inventory Database, Augmented Reality Modules, Multi-Layer Digital Archives (Indirli Maurizio)						
Participants number							

Short name						
Pearson/months per Participant:						

Objectives

Objectives if this Work package are

1 - Dissemination and exploitation of results

Definition of a work plan for dissemination and exploitation of the project results;
implementation of a social platform

2- Communication activities

Organization of events concerning the partners of the Consortium; preparation of a website;
organization of mid term workshops and final conference open to EU Commission experts

(Indirli Maurizio)

WP5is devoted to the creation of the *Smart Inventory Database*, i.e. an innovative digitised geospatial inventory of the selected sites affected by hazardous events.

Furthermore, WP5 is focussed on the set up of:

-4D space-time simulations (*Augmented Reality Modules*) of real hazardous events through innovative/interactive interfaces, on the existent case studies;

- *Multi-Layer Digital Archives* regarding the sites of interest, providing information about resilience and risk.

All the inputs coming from WPs 2-4, in order to provide the indispensable platform for the implementation of risk assessment simulations, should converge here.

(Indirli Maurizio)

Description of work

This Work package aim is to improve the dissemination of information about the project results and deliverables: it is a core measure of the project's success. According to this preliminary consideration, different promotion and dissemination actions are foreseen and addressed to both experts in the field and any other Stakeholders.

1 - Dissemination of project results through scientific journals and through participation in Congresses, conferences and workshops

All project results will be shared and disseminated among the project Partners. In order to ensure high visibility of the project within the scientific community, publication in high impact factor scientific journals will be encouraged, as will be presentation at relevant workshops and conferences. Each research institution in this proposal will contribute to this dissemination as participants in WP 5.

2 - Organization of a workshop and a conference

In particular, within six months from the starting of the project a workshop will be held open to specific stakeholders.

3 - Demonstration event. In close collaboration with the WP2, WP3 and WP4 teams a demonstration event will be arranged in order to show how the newly developed techniques work.

This will exhibit the validity and usefulness of the new tools to a competent audience, able to

comment and discuss the results obtained.

4 - RESILIENT EUROPE Website. Promotion of the demonstration event will be made through this website.

Other activities:

1 – Organization of the partners consortium meeting before and throughout the project activity according to the Coordinator suggestions (for 24 months); application of tools and methodologies of risk management to the governance of single parts of the project according to the suggestions of the project coordinator.

2 - Dissemination and exploitation of results deliverables, elaboration of a website concerning the activities of the project; maintenance and adjournments of the website during and after the project preparation; organization of events.

3– Project internal communication of documents and deliverables among the project partners

(Indirli Maurizio)

WP5 is devoted to:

TASK 5.1

- implement the layers of the Smart Inventory Database, describing the multi-hazard scenarios and maps, i.e. combinations and global hazard factors obtained in WP2, with their evolution in the time domain and depending on their impact, occurrence, relationship, hierarchy and combination;
- implement the layers of the Smart Inventory Database obtained from state-of-the-art information/surveys of the sites (WP3);
- implement the layers of the Smart Inventory Database with resilience analyses and innovative conservation/restoration solutions (WP4).

TASK 5.2

- set up relationships between real hazardous events and virtual architectures through innovative/interactive 4D space-time interfaces (Augmented Reality Modules);
- set up evolution models of the considered case studies (environment and structural parts) until damage/collapse, in order to provide reconstructions regarding the impact of the selected multi-hazard combinations (Augmented Reality Modules);
- provide algorithms/mathematical frameworks capable to represent iterative analyses, taking into account decisions regarding mitigation options about safe/sustainable management (Augmented Reality Modules);

TASK 5.3

- organize information layers regarding the sites of interest (Multi-Layer Digital Archives);

ENEA will coordinate WP5 activities and issue the deliverables.

UNITS will coordinate WP5-TASK 5.1 activities.

UNINA will coordinate WP5-TASK 5.2 activities.

UNICA will coordinate WP5-TASK 5.3 activities.

Other partners will contribute to review all the deliverables.

(Indirli Maurizio)

Deliverables

- ~ *Workshop and conference in and related information & dissemination material*
- ~ *Papers in scientific journals*
- ~ *Launch of fully functional Knowledge Base*
- ~ *Demonstration even*
- *Commercial service development*
- *Business Plan for exploitation of products and services*

(Indirli Maurizio)

D5.1: WP5-TASK 5.1 outputs (UNITS, ALL), implementation of the Smart Inventory Database, month 24.

D5.2: WP5-TASK 5.2 outputs (UNINA, ALL), implementation of the Augmented Reality Modules, month 30.

D5.3: WP5-TASK 5.3 outputs (UNICA, ALL), implementation of the Multi-Layer Digital Archives, month 30.

(Indirli Maurizio)

Table 3.1a: Work package WP6 description

Work package number 5				Start Date			
Work package title	(Indirli Maurizio) Risk mitigation, communication, dissemination, and exploitation (Indirli Maurizio)						
Participants number							
Short name							
Pearson/months per Participant:							

Objectives

Objectives if this Work package are

1 - Dissemination and exploitation of results

Definition of a work plan for dissemination and exploitation of the project results; implementation of a social platform

2- Communication activities

Organization of events concerning the partners of the Consortium; preparation of a website; organization of mid term workshops and final conference open to EU Commission experts

(Indirli Maurizio)

WP6is a core measurement of the project's success; each partner will contribute, sharing/disseminating all the project results. Inputs coming from previous WPsshould converge here.Throughthe use of both ICT technologies as well as conventional tools,WP6is aimed at increasing consciousness about disasters striking selected areas (WP2/WP3/WP4) in stakeholders/end-users/citizens,for a wide range of different organisations, from experts in risk

management and preservation of built environment/heritage to concerned people (young generations of scientists, students from primary schools to university courses, tourists, etc.). The Smart Inventory Database and the virtual tools (WP5), should be available in dissemination/communication activities about the sites of interest, underlying the effectiveness of risk assessment/mitigation options against a disaster in comparison with unprotected situations. A wide use of digital technologies, coming from creative sectors, should be foreseen, to encourage the best conditions for creation/diffusion of cultural assets through digitized resources with easy access points; to this purpose, Augmented Reality Modules and Multi-Layer Digital Archives (WP5) shall provide disaster evolution narrative storytelling, in addition to the information about resilience and risk, very helpful in case of restoration/reuse/recovery. Particular attention should be devoted to carry out guidelines for risk assessment/mitigation options, capacity analysis to anticipate/cope, evaluation/improvement of risk governance, enhancement/development strategies, site/asset valorization, balancing the well-being of the involved communities with sustainable levels of tourism pressure; to this aim, it is necessary to involve all the interested actors, setting up a Resilient Europe Forum. A specific Resilient Europe Website will contain all the project outputs and guarantee links inside/outside the project. Of course, conventional dissemination activities are also foreseen.

(Indirli Maurizio)

Description of work

This Work package aim is to improve the dissemination of information about the project results and deliverables: it is a core measure of the project's success. According to this preliminary consideration, different promotion and dissemination actions are foreseen and addressed to both experts in the field and any other Stakeholders.

1 - Dissemination of project results through scientific journals and through participation in Congresses, conferences and workshops

All project results will be shared and disseminated among the project Partners. In order to ensure high visibility of the project within the scientific community, publication in high impact factor scientific journals will be encouraged, as will be presentation at relevant workshops and conferences. Each research institution in this proposal will contribute to this dissemination as participants in WP 5.

2 - Organization of a workshop and a conference

In particular, within six months from the starting of the project a workshop will be held open to specific stakeholders.

3 - Demonstration event. In close collaboration with the WP2, WP3 and WP4 teams a demonstration event will be arranged in order to show how the newly developed techniques work.

This will exhibit the validity and usefulness of the new tools to a competent audience, able to comment and discuss the results obtained.

4 - RESILIENT EUROPE Website. Promotion of the demonstration event will be made through this website.

Other activities:

1 – Organization of the partners consortium meeting before and throughout the project activity according to the Coordinator suggestions (for 24 months); application of tools and methodologies of risk management to the governance of single parts of the project according to the suggestions of the project coordinator.

2 - Dissemination and exploitation of results deliverables, elaboration of a website concerning the activities of the project; maintenance and adjournments of the website during and after the project preparation; organization of events.

3– Project internal communication of documents and deliverables among the project

partners

(Indirli Maurizio)

The following tasks are foreseen by WP6:

TASK 6.1

Applications of *Augmented Reality Modules* for narrative storytelling and *Multi-Layer Digital Archives* focused on the sites of interest,

- providing information about resilience and risk;
- comparing situations with/without mitigation for built environment and heritage, including emergency scenarios;

TASK 6.2

Resilient Europe Forum

- setting up a multi-disciplinary community in order to share the project results/information among stakeholders/end-users/citizens, encouraging an interaction with public/private bodies in order to improve risk mitigation strategies;
- exploiting guidelines/requirements for risk assessment/mitigation options in the selected areas;
- arranging demonstration events in order to show the newly developed techniques obtained;

TASK 6.3

Resilient Europe Website with a double level,

- internal website (restricted area), a platform indispensable for documentation/information to be shared among the consortium partners;
- external website (public), describing objectives, structures and outcomes of the project, but also an interactive connection/open source access with the public and a space of discussion among specialists;

TASK 6.4

Knowledge Communication/Dissemination through conventional tools are also foreseen, namely

- a periodic (twice a year) electronic newsletter, with a large circulation towards the public, will be set up, identifying an editorial board;
- a communication toolkit (project presentation, logo & graphical chart, slideshow, brochure, etc.) will be elaborated;
- project interim/midterm workshops, among partners and European Commission representatives, will be appointed;
- an international conference is arranged at the end of the project, to provide an active information exchange/feed-back among European Commission experts, researchers, engineers, suppliers, stakeholders, end-users, schools and people communities; the conference will last at least 3 days, foreseeing an open session with invited lectures, technical sessions of open presentations, demonstration events for the public;
- publications of results in high impact factor scientific journals, in order to ensure high visibility of the project within the scientific community;
- a Business Plan for products/services exploitation and a Commercial Service Development will be carried out.

AIC will coordinate WP6 activities and issue the deliverables. All the partners are involved in WP6 activities/deliverables.

UNINA will coordinate WP6-TASK 6.1 activities.

UNIPA will coordinate WP6-TASK 6.2 activities.

ENEA will coordinate WP6-TASK 6.3 activities.

AIC will coordinate WP6-TASK 6.4 activities.

(Indirli Maurizio)

Deliverables

- *Workshop and conference in and related information & dissemination material*
- *Papers in scientific journals*
- *Launch of fully functional Knowledge Base*
- *Demonstration even*
- *Commercial service development*
- *Business Plan for exploitation of products and services*

(Indirli Maurizio)

D6.1: WP9-TASK 6.1 outputs (ENEA, ALL), applications of *Augmented Reality Modules* and *Multi-Layer Digital Archives*, month 30;
 D6.2: WP9-TASK 6.2 outputs (UNIPA, ALL), set up of the *Resilient Europe Forum*, month 36;
 D6.3a: WP9-TASK 6.3a outputs (ENEA, ALL), *Resilient Europe Website*, internal level, month 2;
 D6.3b: WP9-TASK 6.3b outputs (ENEA, ALL), *Resilient Europe Website*, external intermediate level, month 24;
 D6.3c: WP9-TASK 6.3c outputs (ENEA, ALL), *Resilient Europe Website*, external final level, month 36;
 D6.4a: Electronic newsletter (AIC, ALL), months 6, 12, 18, 24, 30, 36;
 D6.4b: communication toolkit (AIC, ALL), months 2, 12, 24, 36;
 D6.4c: project interim/midterm workshops minutes and reports (AIC, ALL), months 12, 24, 36;
 D6.4d: Final Conference/Final Conference Proceedings/Final Conference demonstration virtual tools (AIC, ALL), month 36;
 D9.4e: journals publications (AIC, ALL), month 36 and later;
 D9.4f: Business Plan and Commercial Service Development, (AIC, ALL), month 36 and later.

(Indirli Maurizio)

Next Table 31b shows the list of work packages:

Code 8 (to be written once Work packages are ready)

TABLE 3.1b – List of Work packages

Work Package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End Month
One						
Two						
Three						
Four						
Five						
				Total months		

Next Table 3.1c shows the list of Deliverables for each Work package:

Code 9 (to be written once Work packages are ready)

TABLE 3.1c – List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date
		One				
		Two				
		Three				
		Four				
		Five				

3.2–Management structure and procedures

In order to efficiently manage the project, a specific WP dedicated to coordination and management has been foreseen in the project work plan, to ensure that suitable priority and attention will be given to project management. Within this WP 1 all the aspects related to administrative and quality management of the project will be included. The responsibility of the project coordination will be taken by XXX that will supply the Project Coordinator (PC) and a Project Officer (PO).

The project partners are fully committed and agree to work together with the utmost cooperation for the timely fulfilment of their responsibilities. Previous experiences and participations in European framework programs have led to the decision to keep this management structure as simple as possible. The **overall organizational structure** proposed for the RESILIENT EUROPE project is presented in Figure 1. It is aimed at ensuring the fulfilment of the project objectives, by allowing clear and continuous communication among the project partners.

a) Project Coordinator

The overall management of the project will be the responsibility of XXX as coordinating partner. Key to this is the role of the Project Coordinator, which will be carried out by

The **Project Coordinator (PC)** will be responsible for the **overall coordination** of the **technical and scientific activities, and all other aspects of the project** including **management of potential conflicts** and compromise negotiation in the unlikely event of conflict and will also be the primary contact person for the European Commission. Hence he/she will be responsible for all communication with - and reporting to - the EC.

The **Project Officer (PO)** will be responsible for day-to-day **legal and contractual management** of the project and **administrative and financial activities**. The PO will report to the PC.

In particular, according to the Consortium Agreement, the Coordinator shall be responsible for:

- Monitoring compliance by the Parties with their obligations
- Keeping the address list of Members and other contact persons updated and available
- Collecting, reviewing and submitting information on the progress of the project and reports and other deliverables (including financial statements and related certification) to the Funding

Authority

- Preparing the meetings, proposing decisions and preparing the agenda of General Assembly meetings, chairing the meetings, preparing the minutes of the meetings and monitoring the implementation of decisions taken at meetings
- Transmitting promptly documents and information connected with the project
- Administering the financial contribution of the Funding Authority and fulfilling the financial tasks
- Providing, upon request, the Parties with official copies or originals of documents which are in the sole possession of the Coordinator when such copies or originals are necessary for the Parties to present claims.

The following Table 3.2a gives a list of milestones.

Code 10 (to be written once Work packages are ready)

TABLE 3.2a – List of milestones

Milestone number	Milestone name	Related work package(s)	Estimated date	Mean of verification

The following Table 3.2b gives the critical risks identified and the possible mitigating actions.

Code 11 (to be written once Work packages are ready)

TABLE 3.2b – Critical risks for implementation

Description of risk	Work package(s) involved	Proposed risk-mitigation measures

b) The General Assembly

The General Assembly is the decision making body of the Consortium.

The General Assembly shall consist of one representative of each Party (hereinafter referred to as “Member”).

Each Member shall be duly authorised to deliberate, negotiate and decide on all matters listed in the Consortium Agreement.

The Coordinator shall chair all meetings of the General Assembly, unless decided otherwise by the General Assembly.

The Parties agree to abide by all decisions of the General Assembly.

This does not prevent the Parties from submitting a dispute for resolution in accordance with the provisions of settlement of disputes.

Operational procedures for the General Assembly representation in meetings

Any Member:

- should be present or represented at any meeting;
- may appoint a substitute or a proxy to attend and vote at any meeting;
- shall participate in a cooperative manner in the meetings.

c) The Work Package leaders

All technical and scientific issues of the project, in particular relating to the interdependence between and coherence of the different WPs - will be managed and consolidated by **the Work Package leaders** who will **report to the PC directly**. To achieve the R&D objectives of the project, the experimental, scientific and technical work has been organized into 3 R&D WPs (WP2, WP3, and WP4).

For each of them, a WP leader will be appointed to take primary technical control of and responsibility for the proper management and execution of the tasks related to the particular WP. In particular, he/she establishes (in coordination with the PC) the detailed schedule of his/her WP and the work in progress. Each WP leader is also responsible for identification of risks and for proposing solutions to the PC in respect of his/her WP. Taking into account that any of these R&D WPs will be the responsibility of three/four partners, WP leaders will be rotated among partners any four months.

Each WP leader is required to provide the PC at four monthly intervals with a progress report concerning his/her WP and containing sufficient technical information to enable the PC to be assured that work is progressing according to plan.

d) Means for governance and control

The means for governance and control (quality assurance, consortium agreement and communication plan) will be tailored to the scale of the RESILIENT EUROPE project. A correctly empowered governance and control for the overall project management will be guaranteed by following means:

The Consortium Agreement: All the RESILIENT EUROPE rules will be included and described in detail in the **Consortium Agreement**.

This document will define:

- the responsibilities, mutual obligations and roles of the partners;
- the division of the budget;
- the strategy for the exploitation of results;
- the rules for the settlement of disputes

The Consortium Agreement will be signed within the first month of the project and will define in a very clear and detailed way: roles of each partner, formal rules of participation, voting mechanisms, criteria for evaluation of activities realized by each partner, rules for budget re-allocation, etc.

The Quality Plan: A **quality plan** will be agreed by the General Assembly at the Kick-off meeting, and will ensure that appropriate quality assurance is undertaken. It will include:

- persons responsible for quality assurance, quality standards, methodologies and procedures;
- procedures for identification, distribution, collection, filing, maintenance and disposal of quality records

Quality control will represent a key issue in the overall management of the project, since it plays a critical role in keeping the action aligned towards its final objectives.

d) Project Meetings

An initial „launch/kick-off“ meeting will be organized at the start of the RESILIENT EUROPE project for all the personnel involved in the project. The purpose of the kick-off meeting is to:

- ~ Present to all involved an overview of the project;
- ~ Enable each participant to obtain a better perspective of his/her role in the RESILIENT EUROPE project and set this in context with the roles and skills of other project members;
- ~ Define the main outline of the Consortium Agreement;
- ~ Establish procedures for Quality Assurance and formalize policies for publication, intellectual property rights and any arbitration procedures.

3.3 – Consortium as a whole

Partners of the Consortium will be all the partners working on the five Work packages. Each partner will designate a member to participate to the meetings of the Consortium.

All the rules reported in the EU suggested Consortium Agreement must be followed.

The Consortium partners belong to very different scientific disciplines, from IT engineers to archaeologists, from robotics and mechanical experts and they have to complement one another in order to create a Robotic System suitable for this project.

Analogously, the presence inside the Consortium of Enterprises is fundamental for building and experimenting the products of project.

The RESILIENT EUROPE project is proposed by a consortium of xx **partners** from **X EU Member States** and comprises all the appropriate key players to ensure the availability of resources, capacities, technologies, capabilities, technical and operational knowledge required for the timely achievement of the goal of the project.

The consortium will bring together European efforts and methodological/technological developments and has therefore a high potential for developing and validation of innovative non-destructive diagnosis techniques to assess and monitor the state of preservation of the European heritage.

The partners to the RESILIENT EUROPE project have the following areas of interest and activity, Table 3.3.

Code 12 Any Partner should send these data by mail to each2014@gmail.com; please only one sentence!

Table 3.3 Areas of interest/activity for Resilient Europe project partners

P	Area of interest / activity
	(Sarris Apostolos) IMS-FORTH. Cultural Heritage Risk maps creation. Web GIS. Satellite Remote Sensing. Geophysical Prospection. (Sarris Apostolos)

3.4 – Resources to be committed

Code 13 (Section 3.4 to be written only after all other points and sections are ready)

According to costs as stated in the budget table in Part A of the Proposal, the following Table 3.4.1 shows the costs distribution.

Table 3.4.1 Total Costs

	WP 1	WP 2	WP 3	WP 4	WP 5	Total
Personnel costs						
Other costs						
Total direct costs						
Indirect costs						
Subcontracting						
Total costs						
Requested subsidy	2					

In order to achieve the objectives of RESILIENT EUROPE, duration of 24 months has been foreseen for the project. The overall project cost is € xxx.xxxx and **the overall EU contribution requested is € xxxx.xxx**, both reasonable and necessary considering the number of partners, the ambitious objectives and the duration of the project.

In the following, more details are provided about the costs in the main cost categories of the project.

3.4.1 - Personnel Costs

Personnel costs represent a significant part of the project budget, in total € xxxx.xxx. For each work package, the personnel costs have been calculated considering the appropriate man-power (see Table 3.4 a – Summary of staff effort) needed to complete the proposed activities.

TABLE 3.4a – Summary of staff effort

	W P n	W P n +1	WPn+2	Total Pearson/ Months per Participant
Participant Number/Short Name				
Participant Number/Short Name				
Participant Number/Short Name				
Total Person/Months				

The weighted average monthly rate costs of the personnel that will be working in the work package are provided in Table 3.4.2

Table 3.4.2 – Weighted average monthly personnel costs in € per partner and work package

Partner	W	W	W	W	W

Next Table 3.4b shows “other direct costs” for participants where those costs exceed 15% of the personnel costs.

TABLE 3.4b – “Other direct cost” items

Participant Number/Short Name	Cost (€)	Justification
Travel		
Equipment		
Other goods and services		
Total		

3.4.2 - Travel costs (other direct costs)

The total travel costs are € xxxx and refer to meeting, working session and other issues related to the coordination of participants’ contributions, as well as to the attendance of conferences and events for dissemination purposes. In more detail, the following travels have been foreseen, so far, for calculating the travel costs:

Project meetings: technical and management meetings where all participants will be present, and where technical issues as well as management issues will be discussed. 6 project meetings are foreseen for the project duration (one meeting each 6 months of project).

Technical meetings: meetings needed among two or more partners collaborating on the same tasks. The twice yearly Project meetings will form a significant venue for inter WP discussions, and will make provision for specific subsets of WP managers to meet outside the main workshop on request, e.g. for inter- and intra-WP decision-making purposes.

Dissemination meetings: participation to international conferences/workshops to present the RESILIENT EUROPE results, and for attendance to the RESILIENT EUROPE workshop. Each participant involved in WP5, will receive travel costs.

3.4.3 - Consumables (other direct costs)

The total costs for consumables amount to € xxxxx.

The consumables with RESILIENT EUROPE are mostly related to preparation, analysis, characterisation, validation, process optimisation, pre-prototype development and tests and are summarized in table 3.4.3

Table 3.4.3.a – Consumables per work package

	Consumables description

A total of € xxx has been included for the purchase of durable equipment by the project partners. The equipment costs were calculated on depreciation basis, considering the duration of usage of the equipment within the project. The table 3.4.3.b provides an overview of the planned equipment purchases

Table 3.4.3.b – Equipment purchase per participant

Partner short name	Value	Eligible	Description	WP

3.4.4 - Other costs (other direct costs)

The other remaining costs amount to € xxxx. These are listed in Table 3.4.4

Table 3.4.4 – Other direct costs per Work package

	Other costs

4 – Members of the Consortium

Code 14 (All Partners, starting from now, should write at least about three pages plus the relevant publications lists, concerning both the Organizations they belong to and the persons who will carry out the proposed activities)

4.1 – Participants

- A description of the legal entity and its main tasks, with an explanation of how its profile matches the tasks in the proposal;

(Sarris Apostolos)

The **Institute for Mediterranean Studies (IMS)** (www.ims.forth.gr) is among the scientific research units of the **Foundation for Research and Technology (FORTH)** (www.forth.gr), which is one of the two largest research foundations in Greece. Since 1996, the **Laboratory of Geophysical - Satellite Remote Sensing & Archaeo-environment** of I.M.S./F.O.R.T.H. is active in basic and applied research in the fields of **geophysical prospection, satellite remote sensing, Geographical Information Systems (GIS), 3D reconstructions and VR and archaeo-environment** and has been widely and internationally recognized due to the quality of the services provided, the results of the research projects carried out and the training of students and professional archaeologists.

(Sarris Apostolos)

- a curriculum vitae or description of the profile of the persons, including their gender, who will be primarily responsible for carrying out the proposed research and/or innovation activities;

(Sarris Apostolos)

Apostolos Sarris (Male) holds a B.A. in Astronomy & Physics (1985) and an M.A. in Physics (1988) from Boston University and a M.Sc. (1990) and a Ph.D. in Physics/Geophysics (1992) from the University of Nebraska-Lincoln. He is Research Director & Deputy Director of IMS-FORTH and Head of the Laboratory of Geophysical-Satellite Remote Sensing and Archaeo-environment (GeoSat ReSeArch Lab) of IMS-FORTH and at the same time a contracted lecturer of the Aristotle University of Thessaloniki and a Research Associate of the Dept. of Anthropology, The Field Museum of Natural History of Chicago, Illinois, USA. Apostolos Sarris acted also as a vice-president of the European Section of the Archaeological Remote Sensing Consortium (A.R.S.C.), as an assistant Greek representative in the scientific committee for Peace and Security of NATO and as Vice-Chair of the International Society of Archaeological Prospection (ISAP). He is currently president of CAA-GR, member of UISPP Commission IV, and associate editor of the Society for Archaeological Sciences Bulletin, Archaeological and Anthropological Sciences Journal and of Archaeological Prospection Journal. Dr Sarris has more than 190 publications (including 1 Ph.D. dissertation, 14 chapters in books, 1 Proceedings Volume, 60 refereed journal papers, and 90 refereed papers in books of proceedings), 99 technical reports and 3 technical guides/notes, and more than 188 Oral & 80 Poster communications in 85 international and 40 national conferences). His teaching experience include contracted Lectureships at various institutions (Graduate: 1995-2008 Dept. of Geology, Aristotle Univ. of Thessaloniki; 2002-2004 Dept. of History & Archaeology, Univ. of Crete; 2002-2003 Dept. of Philosophy & Social Sciences, Univ. of Crete; 1998-2000 Dept. of History & Archaeology, Univ. of Crete. Undergraduate: 2001-2006 Dept. of Natural Resources & Environment, TEI Chania; 1994-1999 National Air-force Academy; 1995-1996 Univ. of Maryland – European Division). Dr. Sarris has organized, planned and participated in more than 170 geophysical/satellite remote sensing/GIS/GPS projects in Greece, U.S.A., Cyprus, Hungary, Albania, Italy, Turkey and Egypt & participated in than 73 Greek and international large scale projects (European Space Agency, Wenner-Gren, NSF-USA, ISPRS WG VI/5, ARISTEIA/EXCELLENCE, KRIPIS, Information Society, LIFE, Instap, GGET, Interreg III/Archimed, PENED, EU CULTURE 2008-2013, EU Marie Curie, e-Content, GGET bilateral programs (Cyprus, Bulgaria, China), Interreg III/Archimed, PENED, Instap, EPEAEK-Archimedis, Information Society, EMERIC-CRINNO, Leverhulme Trust, Thales, a.o). He has supervised 15 PostDoc, 8 PhD, 14 MA and 13 BA dissertations and ha has provided practical training of more than 500 students from Greek and foreign universities (Univ. of Crete, Technical Univ. of Crete, Univ. of Thessaly, TEI of Crete and Athens, Univ. of Birmingham, Université Catholique de Louvain, Chicago Field Museum of Natural History, Univ. of Cyprus, a.o.). His Lab is part of the Association of Geographic Information Laboratories of Europe (AGILE), European Association of Remote Sensing Laboratories (EARSEL) and of EPOCH consortium.

Gianluca Cantoro obtained his Ph.D. (2010) in Landscape Archaeology by the Università degli Studi di Foggia, Italy, M.A. and B.A. (2006) in Archaeology by the Università di Pisa, Pisa, Italy. Specialist in Aerial Archaeology and

Remote Sensing, Computer Applications in Archaeology, Aerial Photographic Interpretation, Remote Controlled Airborne Imaging, GIS in Archaeology, Digital Photogrammetry, Orthophoto and Digital Elevation Model (DEM) Production. Currently (since 2011) a Postdoctoral Researcher at GeoSat ReSeArch Lab, FORTH-IMS. Dr Cantoro has 11 conference publications, 8 Journal and Book Publications, 17 invited lectures and workshop's tutoring. He participated in a number of research projects in Greece and abroad. To name a few of them: Raw Materials project [University of Pisa, Italy]; Choiromandres [Hellenic Ministry of Culture, Greece]; Mochlos [INSTAP-SCEC, Greece]; Papadiokampos [INSTAP-SCEC, Greece]; Aerial Survey in Crete [INSTAP-SCEC, Greece & IMS-FORTH]; Hvar [University of Ljubljana, Slovenia]; Aerial Survey in Greece [Univ. of Ljubljana and Leiden]; "Boeotia Project" [Leiden Univ. and Ljubljana Univ.]; Toirano Cave [University of Pisa, Italy]; ArchaeoLandscape [Europe]; AncientCity Project, POLITEIA and IGEAN [GeoSat ReSearch Lab IMS-FORTH].

Tuna Kalayci (Male) holds a BSc in Statistics (2003), MSc in Settlement Archaeology (2006) from the Middle East Technical University (Ankara, Turkey) and PhD. (2013) in Archaeology from the University of Fayetteville-Arkansas (USA). He combines his research interest in landscape archaeology with geospatial and information technologies. Currently, he is a post-doctoral researcher in the Laboratory of Geophysical--Satellite Remote Sensing & Archaeoenvironment of IMS-FORTH. He has participated in numerous archaeological missions in Turkey, Iraq, Syria, Greece, and the USA. He has conducted geophysical prospection in various projects. He also has extensive experience as an excavating/survey archaeologist in different landscapes. He was a team member in two large-scale satellite remote sensing projects (NASA funded Settlement Systems and Environmental Change in the Northern Fertile Crescent and NEH funded CORONA Digital Atlas of the Middle East Project). He has been also a participating member in various research programs (e.g. Archaeo-FORMOSAT, ARISTEIA I & II, KRIPIs POLITEIA). He has presented in more than 20 international conferences. He is contracted for two book chapters and published in journals, such as Internet Archaeology and Remote Sensing. He is an occasional reviewer for the journal "Remote Sensing". He is also a lecturer at the Iraqi Institute for the Conservation of Antiquities and Heritage.

(Sarris Apostolos)

- a list of up to 5 relevant publications, and/or products, services (including widely-used datasets or software), or other achievements relevant to the call content;

(Sarris Apostolos)

1. **Sarris, A., Loupasakis, C., Soupios, P., Trigkas, V., Vallianatos F.**, 2010. Earthquake vulnerability and Seismic risk assessment of urban areas in high seismic regions: Application to Chania City, Crete Island, Greece, Natural Hazards, Springer Co., 54, pp. 395-412, 2010 (DOI 10.1007/s11069-009-9475-z).
2. **Alexakis, D. & Sarris, A.**, Environmental and Human Risk Assessment of the Prehistoric and Historic Archaeological Sites of Western Crete (Greece) with the Use of GIS, Remote Sensing, Fuzzy Logic and Neural Networks, In Lecture Notes in Computer Science No. 6436: Digital Heritage (Third International Conference, EuroMed 2010, Lemessos, Cyprus, November 8-13, 2010 Proceedings) - Remote Sensing for Archaeology and Cultural Heritage Management and Monitoring, ed. by. Marinos Ioannides Dieter Fellner, Andreas Georgopoulos & Diofantos G. Hadjimitsis, Springer, 2010, pp. 332-342.
3. **Cantoro, G. & Sarris, A.**, Fundamental tools for photo-interpretation in mountainous rocky areas: photogrammetry and ground-truthing, 32nd EARSeL Annual Symposium "Advances in Geosciences", 21 - 24 May 2012, Mykonos Island, Greece.
4. **Hadjimitsis, D., Agapiou, A., Alexakis, D. & Sarris, A.**, Exploring Natural and Anthropogenic Hazard Risk for Cultural Heritage in Cyprus Using Remote Sensing and GIS, International Journal of Digital Earth, DOI:10.1080/17538947.2011.602119, <http://dx.doi.org/10.1080/17538947.2011.602119>, v.4, issue 5, pp. 264-291, 2011. EDITOR's CHOICE 2013.
5. **Alexakis, D. D., Agapiou, A., Hadjimitsis, D.G., Lysandrou, V., Themistocleous, K. & Sarris, A.**, Natural and human risk assessment of the archaeological sites of Paphos area (Cyprus) with the use of Remote Sensing and GIS, Bulletin of the Geological Society of Greece, vol. XL VII 2013, Proceedings of the 13th International Congress, Chania, Sept. 2013, No 3 – pp. 1448-1457.

(Sarris Apostolos)

- a list of up to 5 relevant previous projects or activities, connected to the subject of this proposal;

(Sarris Apostolos)

1. **KRIPIs – POLITEIA**: Culture-Technology: New technologies in research, study, documentation and accessibility in the information of items and monuments of cultural heritage. 2013-2015
2. **Managing Cultural Heritage Sites through Space and ground Technologies using Geographical Information Systems: A Pilot application at the archaeological sites of Paphos**, Program Sustainable

Development under the Framework Program for Research, Technological Development and Innovation 2009-2010 of the Research Promotion Foundation of the Republic of Cyprus. Collaboration with the Cyprus University of Technology. ΑΕΙΦΟΡΙΑ/ΦΥΣΗ/0311(BIE)/06

ArchaeoLandscapes Europe European multiannual project (2010-2015) - European Commission - Directorate General Education and Culture, Programme « Culture » (2007-2013)

(Sarris Apostolos)

- a description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work;
-
- any other supporting documents specified in the work programme for this call.

(Carydis)

2. ADMINISTRATIVE DATA OF PARTICIPATING ORGANISATIONS:

PIC: 998243394

LEGAL NAME: IONIAN UNIVERSITY

ADDRESS: IANNOU THEOTOKI 72, CORFU, 49100, GREECE

WEBPAGE: WWW.IONIO.GR

LEGAL PERSON: ANASTASIA SALI –PAPASALI, RECTOR AND PRESIDENT OF THE RESEARCH COMMITTEE

PERSON IN CHARGE OF THE PROPOSAL:

MRS ANASTASIA SALI PAPASALI-RECTOR AND PRESIDENT OF THE RESEARCH COMMITTEE

The address of the Organization is as above.

Other Contact person

Prof. Panayotis Carydis

e-mail: pkary@tee.gr

tel: +30 6932244446

(Carydis)

(Sarris Apostolos)

Explanation on how your profile matches the tasks in the proposal

Among the various milestones of the Lab, we can include the following:

- ✚ Participation in more than 73 large-scale national and international research programs (Dragon3 European Space Agency, Aristeia/Excellence I and II, Thalís (General Secretary of Research and Technology), EU Marie Curie, USA-NSF, Stavros Niarchos, Research Promotion Foundation (CY) of the Republic of Cyprus, Wenner-Gren, EU Culture 2008-2013, Leverhulme Trust, University of Cyprus, LIFE, e-Content, INTERREG, ARCHIMED, ETPA, PENED, EPEAEK, INSTAP, NERC, Region of Crete, 3rd Community Support Framework and Cohesion Fund, Innovative actions ΕΤΠΑ, Bilateral research programs with Cyprus, China and Bulgaria. International Training workshops (RESTAR), Training through Erasmus, Wenner Gren Foundation, USA-NSF, Leonardo Da Vinci, a.o)
- ✚ International collaborations with research and educational institutions from Greece, Australia, Belgium, Germany, Great Britain, France, Italy, Spain, U.S.A, Canada, China, Cyprus, Sweden, Iceland, Hungary, Bulgaria, Lithuania, S. Korea, a.o.
- ✚ Scientific supervision and partnership of more than 170 projects of applied and basic research on geophysical prospection of archaeological sites in Greece, Cyprus, Egypt, Hungary, Italy, a.o.
- ✚ More than 45 databases and 80 GIS/WEB_GIS applications for natural resources and cultural heritage.
- ✚ More than 350 publications in international journals/books and Proceeding Volumes (188), conferences (188 oral and 80 poster communications) and 99 technical reports.
- ✚ Co-organization of CAA2002 and participation in the scientific and organizing committees of Int. conferences and symposia.
- ✚ Practical training of more than 500 students from Greek and foreign universities
- ✚ Research supervising of postgraduate and undergraduate dissertations (15 Post-Docs, 12 PhD, 15 MA/MSc, 13 BA) from national and European universities (Italy, Belgium, Cyprus, USA, Spain, Turkey, France).
- ✚ Bilateral and Technological Research Programs with Cyprus, Bulgaria and China.

- ✚ Member of International organizations, such as AGILE (Association Geographic Information Laboratories Europe), EPOCH - Excellence in Processing Open Cultural Heritage, EARSEL – European Association of Remote Sensing Laboratories
- ✚ Contribution in teaching graduate and undergraduate seminars at the U. of Crete, Thessaloniki and the Technological Educational Institute of Crete.

(Sarris Apostolos)

4.2 – Third parties involved in the Project

No third parties involved in this project

5 – Ethics and Security

5.1 – Ethics

There is no ethics issue in the ethical issue table in the Administrative Proposal Form of RESILIENT EUROPE, Part A.

5.2 – Security

The activities or results of this project do not raise security issues.

