IRELAND - NCP INPUT

The Common Framework was the template used to provide input to the Strategic Research Agenda (SRA) for the JPI Cultural Heritage and Global Change. These are inputs to the Common Framework from the individual participating country named above. To find out more about the process involved in the creation of the SRA, please go to www.jpi-culturalheritage.eu.

										Criteria				Ranked Priorities	
Main driver (as identified in the DoW)	**Additional drivers**	**Identifier**	**Addition? Include new identifier**	**Links**	**Research area**	**Research gaps**	**Research needs**	**Keywords**	**Activities/ instruments (for example, collaborative research; SME/industry involvement; knowledge exchange; end-user participation)**	**Benefits of the research area to cultural heritage**	**Societal**	**Economic**	**Environmental**	**Ranked priority (National Consultation Panel priorities)**	**Ranked priority in terms of European collaboration**
Use	Access; Interpretation;	**U.1**		A.2a I.9 I.6 U.2	Linking quantitative and qualitative data around cultural heritage and related areas.	• Quantified, systematic and integrated approach to information generated from all relevant fields of cultural heritage. • Development of sustained data infrastructures. • Interoperability of datasets and data storage systems.	• Pressing need for ACCESS to data. • Applying semantic and automated techniques to these data. Processing large quantities of digitized and born-digital data to give new insights and involve new users in cultural heritage. • Multidisciplinary and holistic approaches to data collection, linking and processing.	Data access. Data use. Holistic research approach. Metadata. Infrastructure. Interoperability.	In addition to those in the header: IT sector involvement. IMPLEMENTATION of digital research infrastructures. Continued collection and curation of quantitative and qualitative data. Multidisciplinary approaches.	Public access to data. Educational benefits. Development of new methodologies for linking different types of data from different heritage areas. Providing new insights on existing research questions as well as the ability to frame new questions. New insights will contribute positively to conservation of existing heritage.	Increased access to data for all sectors of society.	Potential for savings and economies of scale from efficient use of data. Avoiding research duplication.	More efficient use of resources.	**5**	**4**
Use		**U.2**			Spatial and temporal data on tangible and intangible cultural heritage	• Spatio-temporal mapping tools (including web mapping and web GIS tools) for the tele-monitoring and remote managment of cultural landscapes, including the maritime environemnt. • Spatio-temporal mapping tools (including web mapping and web GIS tools) for cultural repositories. • Spatio-temporal mapping tools (including web mapping and web GIS tools) for the recording and access of intangible cultural heritage data related to tangible cultural heritage sites, environments and repositories.	• Adaptation of existing schemes to the needs of cultural heritage field (eg. INSPIRE Directive). • Adaptation of existing technologies to the the needs of the cultural heritage field. • Linking space with place, understanding the link between tangible and intangible heritage (e.g. oral heritage landscape can be linked by spatial data, regional musical/song styles can be mapped and linked through spatial data.)	INSPIRE Directive. Spatial data infrastructure (SDI).	Collaborative and interdisciplinary approach. IT sector involvement. Consideration of new spatio-temporal mapping technologies such as cognitive maps.	User friendly inventory of cultural heritage sites, environments and repositories. Effective management of cultural heritage. Wider public appreciation and understanding of the intangible heritage associated with tangible sites, environments and repositories.	Wide public use of and access to cultural heritage. Better informed decision making, better uses of data.	Increased number of visitors. Effective use of public resources for protection of cultural heritage. Potential benefits for creative industries. Potential to enhance intangible cultural tourism through new and mobile technologies.	Neutral. (Note - this field and others below - It may not be accurate to say that computer based research and technology research have no impact on the environment - think of electrical demand for example. Need to consider environmental impact of any new technologies).	**2**	**3**
Use		**U.3**		A.11	Revitalisation of built and landscape heritage and cultural spaces.	• Sustainable strategies for built heritage and landscape use/management. • Sustainable strategies for use and managment of seascapes and maritime environments. • Sustainable strategies for use and managment of cultural spaces. • The potential benefits of intangible heritage and traditional craft knowledge as tools for revitalising tangible heritage.	• Development of policy and strategies. • Documentation - including integrated databases etc - is a key need, in order to inform policies and strategies. • Multi-disciplinary approach.	Policy. Strategies. Documentation. Intangible heritage. Craft knowledge.	Involvement of politicians and decision makers. Collaborative research. User involvement. Intergenerational knowledge transmission. International exchange of conservation of craft knowledge projects.	Active participation of cultural heritage in economic life of society.	Increased quality of life of society, increasing public support for cultural heritage. Transmission of craft knowledge will positively impact conservation of built heritage, landscape use and management. Use of spaces for intangible cultural expressions can promote social cohesion.	Increased lifetime of historic buildings/landscapes. Increased number of visitors. Revitalisation of degraded areas. Stabilise and increase employment in craft industries, not least in conservation industry.	Reduced CO2 emission due to increased lifetime of buildings. Ensure timely and cost-effective repair of cultural heritage through available specialized skill pool.	**9**	**8**

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Use		**U.4**		A.11	New uses for cultural heritage.	• Influence of new uses of landscapes (for example management techniques) and built heritage on their tangible, intangible and digital cultural heritage values. • Influences of new uses of intangible heritage on its cultural heritage values. • Influence of new uses of digital heritage on its cultural heritage values (particularly digitised data).	• Development and exploration with new management techniques of built heritage, sites and landscapes; in consultation with all stakeholders (local, communities, national, international, etc). • Identify key elements (such as indigenous knowledge) of intangible cultural heritage that underscore the tangible expressions. • Identify user perceptions of newly-purposed intangible heritage and digitised heritage relative to perceptions of the same heritage in its original form.	Management. Values. Perception. Intangible cultural heritage. Indigenous knowledge. Digital heritage. Digitised heritage.	Exchange of knowledge and good practices working in partnership with all stakeholders. Recording local memories of site usage and relevance.	Maintenance of cultural heritage values of built and landscape heritage. Maintenance of cultural heritage values of intangible heritage. Maintenance of cultural heritage values of digitised heritage. Greater knowledge of changing values and perceptions related to all areas of heritage. Allows for management techniques taking into account both traditional and new values.	Informs contemporary culture and imagination. Continuity. Active citizenship. Educational value.	Sustainable economic value of cultural heritage. Enhanced tourist experience.	Regeneration of degenerated landscapes. Efficient use of finite resources.	**4**	**6**
Use	Change	**U.5**		A.12 I.2	Business development, finding new ways to engage with target groups and donors	• Understanding the position of cultural heritage in society and the benefits of cultural heritage institutions to society. • Definition/Identification of sustainable development models for heritage institutions, repositories, sites and spaces. • Definition/Identification of specialised business models for running heritage institutions, repositories, sites and spaces. • Citizen engagement/Community engagment. • Working with donors/sponsors. Managing philantropy/sponsorship.	• Defining what makes cultural heritage institutions different from other institutions and determining whether this requires a specialised management approach. • Foresight planning for the identification of sustainable developement models. • Stakeholder identification. Models for engagement.	Optimum efficient management;	Business development strategies. Impact measurements. Sharing best practice and expertise.	Exploring new types of ownership and stakeholdership. Learn from approaches in other fields and perhaps in the past - look at the way museums and concert halls started as initiatives of citizens for example.	Changing societal role of cultural heritage institutions. Generation of new values and models.	Cultural institutions will offer better value for money.	Neutral		
Use	Protection	**U.6**			Wear and tear	• Understanding of mechanisms and processes causing wear and tear on movable, immovable, digital and intangible heritage.	• Development of models and theoretical concepts - including in cases where physical access may be detrimental to heritage - so as to aid in management. • Research into the validation of remote access vs physical access.	Access. Management.	Collaborative research.	Improved management and preservation.	Managing access.	Resource conservation	Resource conservation		
Use			**U.7**	A.1 I.1	Comparative assessment of national policies and best practice on cultural heritage.	• Lack of comparative analysis. • The need to identify models of best practice, including digital best practice. • Comparative road maps for cultural heritage. • Comparative assessment of existing research infrastructures. • Comparative assessment of existing body of knowledge.	• The need to identify models of best practice, including the identification of commond standards and formats for digital content. • The need to put road maps in place for future development in all areas of cultural heritage. • The need for greater interoperability of national policies. • The need for a thorough understanding of the existing 'state of play' before moving to create new research and/or new policies.	Policy. Strategy. Best Practice. Road map. Assessment. Standards. Interoperability.	Collaborative research. Cross-national involvement. Policy-makers involvement.	Increased co-operation between individual countries. Common standards. Common agreement on best practice. More efficient policies. Forward planning.	Increased cooperation. Increased clarity of purpose on cultural heritage ('singing from same hymn sheet').	More efficient use of resources. Lack of duplication between respective national efforts.	Potential environmental benefits, depending on policies implemented.		

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Use			**U.8**		Understanding the nature and significance of intangible cultural heritage (including traditional crafts and skills).	• Understanding the role of intangible cultural heritage - and its uses - in shaping cultural identity. • Identifying key intangible asociations with tangible and digital cultural heritage. • Identifying inter-culture/cross-national links and associations within various areas of intangible heritage.	• Urgent need to identify and highlight core elements of intangible cultural heritage and their intrinsic value. • Establish importance and impact of intangible cultural heritage on tangible heritage. • Examine change in intangible cultural heritage in contemporary global context.	Intangible cultural heritage. Intrinsic value. Change.	Collaborative research involving practitioners and researchers diverse areas (eg. oral history; belief systems; traditional cultivation practices; traditional performance: theatre, story/narrative, dance, instrumental, song, language; the knowledge systems of traditional craft practitioners). Knowledge exchange on methodological approaches to oral history and memory research, documentation and archiving.	Increase awareness of significance. Contribute to conservation. Consolidation of local and regional cultural identities. Favourable impact on tangible cultural heritage. Intergenerational transmission of cultural knowledge.	Increase continuity in common cultural knowledge transmission. Enhanced societal cohesiveness and identity though shared cultural knowledge and expressions.	Specialist skills in cultural heritage knowledge systems and practices. Increase employment opportunities. Increases appeal and interest in re-use of historic spaces, including buildings and open spaces.	Understanding and appreciation of community value system may impact favourably on environmental management.		
Access		**A.1**		A.2a A.2b A.3 A.12	Dissemination of cultural heritage knowledge.	• (Interactive) methods and education/research tools to increase the legibility and accessibility of sites, repositories, and landscapes, including urban and rural cultural spaces. • (Interactive) methods and education/research tools to increase the legibility and acessibility of intangible and digital heritage. • Raising awareness of the imprtance of cultural memory/public memory and the role of commemoration. • (Interactive) methods and education/research tools to explore the origins and development of community knowledge and its use in understanding heritage sites. • Semantic linking of cultural heritage information. • Visualisation of heritage.	• Development of (interactive) methods and education tools for broader public engagement with cultural heritage. • Tools for innovative interaction with digital content. • Tools for innovative interaction with intangible heritage. • Tools and methodologies for public/community involvement in commemoration projects. • Tools and methodologies for public/community involvement in the dissemination of cultural herritage knowledge. • Cultural heritage-specific studies into human-machine interraction. • Develop understanding of how to visualise complex, unstructured and semantically rich data.	Knowledge sharing. Public engagment. Interaction. Visualisation. Linked data. Accessibility.	Interdisciplinary approach. Visualisation. Liaison between academic institutions and local/community groups. Involvement of creative industries. Involvement of IT industry. Collaborative research.	Raising public awareness. Innovative disclosure. Educative tools. Usability. Placing cultural heritage in a meaningful and broader context.	Increasing public support, positive attitudes and curiosity for cultural heritage. Expansion of professional understanding on the public reaction to interpretation of heritage sites.	Increased number of visitors. Benefits to creative industries. Development of new products and services. Content creation.	Increased dissemination of awareness on cultural herirtage may have envrionmental benefits - particularly where built, landscape or maritime sites are involved.	**1**	**1**
Access		**A.2a**		A.1 A.2b A.3 A.12	Semantic linking of cultural heritage information	• Development of the concept of hybrid collections: materials and their digital representations, development of digital platforms promoting creative processes. • Linked Data.	Automated application of domain or object specific knowledge.	Tourism. Mobility. Digital. Visualisation. Semantics. Security. Linked data.	Collaborative and interdisciplinary research. Industry involvement. Creative industry involvement.	Usability. Placing cultural heritage in a meaningful and broader context.	Increased access to cultural heritage.	Increased number of visitors. Benefits to creative industries. Content creation. Development of new services and products.	Reduction of environmental impact. Potential reduction in footfall to exhibitions, sites etc		
Access		**A.2b**		A.1 A.2a A.3 A.12		• Improving the intellectual, sensory and physical access to heritage through human-machine interactions.	Development and evaluation of human-machine interactions.	Interaction.	Collaborate with and learn from the instruments for linking data and working together in 'hard' sciences.	Expansion of stakeholder community. Increased interaction with heritage resources.	Increased access to cultural heritage. Expansion of stakeholder community. Increased interaction with heritage resources.	Increased number of visitors. Benefits to creative/IT industries. Development of new services and products.	Potential reduction of environmental impact.		
Access		**A.3**		A.1 A.2a A.2b A.4	Visualisation of heritage	Increase in amount and complexity of data used on smaller interfaces.	Develop understanding of how to visualise complex, unstructured and semantically rich data.	Data visualisation.	Evaluation tools; study in the computer use of cultural heritage; measuring instruments like eye and hand moving detectors; interaction design	Better understanding of how people interact in a digital environment.	Increased access to cultural heritage	Benefits to creative industries (e.g. Interactin9o design, 3D techniques, augmented reality, gaming).	Neutral		
Access		**A.4**		A.3 A.5 A.1 P.3	Interaction with digital cultural heritage	The ways users interact with digital cultural heritage	Acquiring knowledge of the changing behaviour with digital cultural heritage compared to physical digital heritage.	Digital.	Log analyses (text mining); statistical methods	Better knowledge of the interaction between people and cultural heritage; building better interfaces.	Increased access to cultural heritage; potential to influence behaviour.	Benefits to creative industries (e.g. Interactin9o design, 3D techniques, augmented reality, gaming).	Neutral		

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Access		**A.5**		A.4	Technical recognition of moving and still images.	Moving and still images are not searchable	Development of techniques that identify images rather than textual representations.	Moving images. Technical recognition.	Pattern recognition; new search technologies for images; artificla intelligence and evaluation methods.	Improved accessibility to large amounts of still and moving images	Increased access to cultural heritage	Benefits to creative industries and other commercial uses	Neutral		
Access		**A.6**			Technical recognition of handwritten text	Images of handwriting are not searchable	Development of algorithms applicable over wider ranges of text.	Manuscript text. Handwriting. Technical recognition.	Pattern recognition; methods to convert shapes into ASCII; new search technologies for images.	Better access to handwritten text	Better access to handwritten text	Potential commercial uses	Neutral		
Access		**A.7**		A.12 I.2	User interaction. (User Generated Content and Annotation).	Value proposition of user Generated Content and Annotation.	Automated and non-automated evaluation techniques. Reconsideration of authority. Reconsideration of "authorship" and "ownership".	User Generated Content and Annotation. Social tagging. Crowd sourcing.	IT industry involvement. Collaborative research. Involvement of stakeholder groups/End-user participation.	Curators at a distance; more freedom for the users. Source of new data.	User involvement; better use of wisdom of the crowd	Added value of cultural heritage; less intervention by curators.	Neutral		
Access		**A.8a**			Tele-survey of tangible cultural heritage	Advanced systems for the tele-survey, remote sensing and laser techniques to investigate terrestrial and underwater cultural heritage	Development of systems for underwater investigation.	Tele-survey; remote sensing; laser; underwater;	Collaborative and interdisciplinary research; industry involvement;	Underwater cultural heritage revealed, documented and better protected	Hidden heritage returned to society; increased knowledge of common history	Increased number of visitors at the coastline;	Reduced threat caused by underwater waste and chemical weapons		
Access		**A.8b**				Innovative devices for the tele-survey of movable artefacts	Development of systems for distant survey.	Moveable artefacts; remote survey;	Collaborative and interdisciplinary research; industry involvement;	Effective use of highly skilled professionals;	Easy access to distant cultural heritage, especially for students and young researchers	Reduced cost of students education as well as cultural heritage protection	Reduced carbon footprint		
Access		**A.9a**			Management strategies for secure access to objects	Materials and techniques for safe exhibition, storage, handling, packing and transport of the artefacts, with related monitoring systems and guidelines	Development of better materials, techniques and systems.	Artefact security;	Collaborative and interdisciplinary research, industry involvement	Reduced risk related to extensive public access; mobility of collections	Wide and easy public access to cultural heritage	Increased competitiveness of European industry; increased number of visitors	Reduced carbon footprint		
Access		**A.9b**				Strategies and techniques for using the new media complex	Development of recommendations and guidelines related to safe use of new media.	New media;	Collaborative and interdisciplinary research, industry involvement	Better visibility of cultural heritage	Better understanding of cultural heritage by the public	Increased number of visitors	Neutral		
Access		**A.10a**		A.11 A.17	Security technologies and systems in museums, libraries, archives and historic buildings	Integrated systems for effective detection, prevention and reaction to risk situations such as fire, theft, vandal attacks	Development of systems for effective protection.	Secure risk detection systems;	Collaborative and interdisciplinary research; industry involvement	Reduced risk related to fire, theft and vandal attack	Treasures of society better protected	Increased competitiveness of European industry; increased number of visitors; reduced cost of insurance of cultural heritage objects	Neutral		
Access		**A.10b**				Techniques to support the identification of fakes or stolen artefacts, as well as the related data bases, with special reference to the insurance issues	Development of adequate techniques and databases.		Collaborative research; knowledge exchange	Art market better controlled	Society better protected against fraud	Reduced cost of insurance of cultural heritage objects	Neutral		
Access		**A.11**		A.10a A.17 U.3 U.4	Management strategies for secure access to heritage sites and cultural landscapes	Techniques/approaches for sustainable management, mechanisms for public presentations and access of sites and landscapes	Development and exploration of access policy of built heritage, sites and landscapes.		Knowledge and experience exchange, best practices	Reduced risks related to extensive public access	Public access of cultural heritage	Increased number of visitors	Improved sustainability		
Access		**A.12**		A.1 A.7 I.1	Deinstitutionalisation of cultural heritage	What is the role of cultural heritage institutions in a digital world?	Defining where cultural heritage sits in a digital world and determining whether there is a need for a new kind of institution, and new kinds of competencies.	Deinstitutionalisation. Digital.	Policy development. User generated content and annotation. Community involvment.	Increased public ownership of heritage. Increased community participation.	New societal role of cultural heritage institutions	New economic role of cultural heritage institutions	Neutral	**10**	
Access		**A.13**		I.2 A.11 A.17	Tagging and tracking	Wireless micro tagging solutions for real-time tracking	Technology development.	Security	Collaborative research; industry and policy involvement	Safety and prevention of illicit trafficking	Safety	Prevention of misappropriation	Neutral		
Access		**A.14**			Haptics	Development of haptic systems for remote tactile access to heritage	Technology development.	Remote access	Collaborative research; industry and policy involvement	Improved access to heritage	Improved access to heritage	Development of new services and products	Lower environmental impact of new products and services		
Access		**A.15**			Lighting	Development and understanding of new lighting solutions, including the effect of light on materials		Lighting							

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Access		**A.16**		I.1	IP rights and copyright issues.	• Legal studies in public domain for digital cultural heritage in Irish and European contexts (Links to I.1) • IP and copyright issues relating to new media. • Copyright issues in the context of revenue generation for heritage institutions and organisations.	• Adjusting legislation to a digital environment. • Legislation to respond to new forms of 'ownership'. Development of protocol for dealint with the digitisation of sensitive intangible expresssions (ritual, for example).	Legislation. Digital.	Collaborative research - legal studies, creative industry and heritage specialists.	Protection of contributors (to community/oral heritage research programmes for example). Safeguards against exploitation of heritage resources.	Development of new products.	Revenue from digital content for cultural institutions and organisations.			
Access			**A.17**	A.11 A.13	Illegal trafficking of cultural artifacts.										
Access			**A.18**	U.7 A.1	Knowledge creation from pre-development archaeological fieldwork	The generation of knowledge from 'grey literature' generated by archaeological research associated with infrastructure development, its synthesis and dissemination.	Determining the best means to manage archaeological heritage to ensure maximum public value, and mechanisms to synthesise and add value to large volumes of archaeological, palaeo-environmental and digital data collected during the course of fieldwork	Knowledge creation, archaeological management, dissemination	Collaborative and transdisciplinary approach	Opportunity for Europe to lead on management of archaeological heritage	Greater knowledge output on historic landscapes, towns, cities, development of past communities	Efficiencies in archaeological heritage management	Knowledge of past environments and human impact on same		
Interpretation		**I.1**		U.7 A.1 A.3 A.12 I.13	Cultural interpretations of heritage	• Understanding factors that shape our understanding of cultural heritage - with a recognition of the intangible, including: music, sport, literature, oral traditions, 'public' & 'private' memory etc. • Consideration of the diversity of 'new' communities compared with 'traditional' communities. (Links to A.16). • Focus on interaction/conflict between different cultural heritages (eg. local and 'newcomer'). • Cultural interpretations of digitised and born digital heritage.	• Determining how local communities and tourists (as well as immigrating groups and other agents) shape the questions asked about cultural heritage. • Determining how the digitisation of our cultural heritage mediates the questions we ask of that heritage and the environments in which we study it. • Determining how the digitisation of intangible cultural heritage affects the ongoing experience of living intangible heritage.	Interpretation. Community. Diversity.	Collaborative and transdisciplinary approach. End-user involvement. Participatory research. Evaluation tools. Interaction design.	Broader ownership of heritage. Greater understanding of cross-national perspectives.	Changing societal role of cultural heritage institutions. Generation of new values. Community development and enhancement. Greater inclusion of community and public viewpoint.		Allows for sustainable management of access to heritage resources.	**3**	**2**
Interpretation		**I.2**		A.7	Wisdom of the crowd. (User Generated Content and Annotation)	Value proposition of user generated content and annotation.	Better understanding of the knowledge of the crowd. New techniques and platforms for user interaction. Automated and non-automated decision-making process for trustworthiness of user-generated and/or annotated content. Reconsideration of authority. Reconsideration of "authorship" and "ownership".	Provenance. Dating. Authentication. Meaning. Stories. Context. Legibility	Augmented reality interfaces. Collaborative research. Industry participation. End-user participation. Data collection techniques (for example interview techniques used in oral heritage).	Added value of cultural heritage. Multiplication of viewpoints and 'interpretations' for any one given heritage resource or artefact. Increased social context for cultural heritage.	Active involvement of users with cultural heritage	More objects will be described with less effort	Neutral		
Interpretation		**I.3**			Measurement instruments	Diagnosis, dating and comparative studies	Development of new instruments, methodologies and open source databases.		Interdisciplinary approach; involvement of industry	Raising awareness; new tools for investigations and linking of cultural heritage	Innovation in this area will be useful for other fields important for society e.g. health, forensic	Increase of innovation in industry; workplace creation in service sector	Neutral		
Interpretation		**I.4**			Research infrastructure	Coherent methods and instruments	Integration of research infrastructure accessible for cultural heritage sector.		Interdisciplinary approach; politician involvement	Raising awareness; new tools for investigations of cultural heritage	Innovation in this area will be useful for other fields important for society e.g. health, forensic	Neutral	Neutral		
Interpretation		**I.5**			Language technology	Development of language technologies for the interpretation of cultural heritage.	Integration of existing techniques and development of new methodolgies for language recognition (e.g. Text mining, sentiment mining, OCR augmentation, changes in diachronic corpora, speech recognition).			Improved access to cultural heritage	Innovation in this area will be useful for other fields important for society	Increase of innovation in industry.	Neutral		

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Interpretation		**I.6**			Reference collections	Development and characterisation of reference heritage and art material libraries, systems for their cataloguing and data accessibility, including GIS	Development of databases.	Provenance	Collaborative research, knowledge transfer	Improved interpretation: dating, provenance determination, authentication	Improved understanding of heritage	Development of databases for commercial use	Neutral		
Interpretation		**I.7a**			Technical art history	Knowledge of art and heritage materials and forms	Development of databases.	Technical art history	Collaborative research, knowledge transfer	Improved interpretation: dating, provenance determination, authentication	Improved understanding of heritage	Better interpretation and resource conservation	Neutral		
Interpretation		**I.7b**				3D hyperspectral imaging (using various parts of the EM spectrum) of objects and works of art, with standardisation protocols	Development of technologies, protocols, databases.	Technical art history	Collaborative research, knowledge transfer	Improved interpretation: dating, provenance determination, authentication	Improved understanding of heritage	Better interpretation and resource conservation, content creation	Neutral		
Interpretation		**I.8**			Natural history	Development of genomic and metabolomic databases of natural history collections for better understanding of past environments, natural and social	Development of technologies, protocols, databases.	Archaeometry	Collaborative research, knowledge transfer	Improved interpretation: dating, provenance determination, authentication	Improved understanding of heritage	Better interpretation and resource conservation, content creation	Neutral		
Interpretation		**I.9**		A.4 P.3	Digital collections	Development and standardisation of concepts of authentication for digitally born materials - Comment: This is a very narrow focus, there are many issues other than *authentication* relating to digital collections that would benefit from further research.	Theoretical concepts and standards.	Authentication	Collaborative research, knowledge transfer	Improved interpretation: dating, provenance determination, authentication	Improved access to heritage	Development of new services and products; creative industries	Lower environmental impact of new products and services		
Interpretation	We believe that I.10 and I.11 should be amalgamated to form one research area.	**I.10**		I.11	• Historic integrity and modern use of art and objects. • Historic integrity and modern use of oral and intangible heritage.	• Improving our understanding of the artist's or maker's intent. • Transmission models for craft knowledge.	Improving our understanding of the artist's or maker's intent and determining the effectiveness of modern application of traditional craft skills to cultural heritage.	Craft skills; innovation;	All activities in header except SME/industry involvement. Integrated reserach in folklore, musicology and social history.	Will highlight original form and materials; enhance conservation pratctice;	Contribute to authenticity of identity; Increased ownership of past for communities.	Create new skills and insights from integrity of original expressions whether tangible. Tourism, new business.	Reduce risk of inappropriate management and conservation interventions, and reduce wasteful use of resources. Limited negative environmental impact of many traditional crafts.		
Interpretation	We believe that I.10 and I.11 should be amalgamated to form one research area.	**I.11**		I.10	• Historic integrity and modern use of built heritage, cultural landscapes, maritime heritage and cultural spaces. • Historic integrity and modern use of oral and intangible heritage. • Public interpretations of historic integrity and their prioritisation of it in relation to other demands.	• Balance between historic integrity and modern use of buildings, cultural landscape, including tourism and lifestyles. • Public interpretations of acheiving such a balance. • The interests of education and greater community engagement. • Exploration of old and new uses of cultural spaces.	• Improving our understanding of the origin and intention of the architects/planners and determining the effectiveness of modern application of traditional uses to cultural heritage. • Increased understanding of how the public interprets planning intentions and where and how gaps in understanding develop.	Continuity; contemporary function; change; modernistation; adaptation.	Folklore research. Oral history recording (craft workers, farmers, labourers).	Greater public acceptance of planning projects and the need for a balance between integrity, preservation and access.	Improved understanding of the issues arising in relation to the incorporation of heritage sites into everyday usage.	Tourism, new business.	By encouraging re-use of historic environments, reduces landscape consumption.	**12**	**12**
Interpretation		**I.12**			Balancing intervention with aesthetics	How might we relate the unknown impact of intervention to society's need to appreciate the aesthetic?	Development of methods.		Collaborative research, knowledge transfer	Increased quality of treatments, interventions. Understanding interactions between stakeholders and cultural heritage	Understanding societal benefits	Development of new services and products	Neutral		
Interpretation		**I.13**		A.12 I.1	Interdisciplinary approaches to cultural heritage.	• Developing interdisciplinary approaches to understanding cultural heritage. • Understanding *how* individuals and groups do research.	• Development of research frameworks or methodologies that draw on a range of evidence on cultural heritage - including oral, aural, visual, digital and written.	Collaboration; Interdisciplinary research teams;	Collaborative research, knowledge transfer, perception research	Better informed research.	Research that takes into account all aspects of available research	increase of innovation; better value for money	environmental impact of research is not repeated		**11**

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Interpretation			**I.14**		Integrity of traditional forms of knowledge.	The effect of academic ideas relating to 'expertise' 'good practice' and 'regulation' on the transmission of traditional knowledge and skills, especially in the area of intangible heritage.	Historic and modern models for transmission of traditional knowledge and skills and their relative effectiveness. Primary research in collaboration with practitioners of traditional skills.	Traditional skills. Knowledge. Transmissions.	Collaborative research. Knowledge exchange. Participation of primary practitioners.	Greater understanding of how traditional skills and knowledge are transmitted. Greater understanding of how best to favour transmission of traditional knowledge and skills in a modern context.	Continuity of historic traditions and traditional knowledge communities. Contributes to sense of unique identity.	Craft industries.	Low environmental impact of traditional skills and practices.		
Protection/Safeguarding		**P.1**			Risk assessment	Lack of integrated web-based risk assessment tools	Development of web-based software.		Collaborative research; IT sector involvement	Better protection; effective management of cultural heritage	Neutral	Reduced cost due to effective resources use	Reduced CO2 emission		
Protection/Safeguarding		**P.2**			Energy efficiency of historic buildings	Strategies for improving the energy efficiency of indoor environments.	Development of economic, energy-efficient and user-friendly systems for indoor environments.	Transport, extreme events, maintenance, conservation, energy efficiency	Collaborative research, politician and end-user involvement; implementation of policy	Improved image of cultural heritage; involvement of cultural heritage field in to national plans towards EC directives; Increased sustainability of cultural heritage.	Increased comfort and life quality of society; incomes from resale of CO2 allowances; raising awareness of the standards required for cultural heritage protection.	Reduction in energy requirementscost of historic buildings and stimulation of new technologies.	Reduction of energy consumption; lower carbon footprint		
Protection/Safeguarding		**P.3**		U.1 I.6 I.9	Digital content	• Long-term curation of digitised and born-digital cultural contents. • Sustainability and interoperability for large scale digital infrastructures, digital archives and repositories.	Value assessment; risk assessment costs; format knowledge; aspects of look and feel; software (applications like games. digital installations etc.) preservation; web preservation. • Improving migration capacity of different technologies. • Development of migration paths for digital preservation. • Development of common standards.	Curation. Preservation. Digital. Sustainability. Interoperability. Infrastructures. Migration. Standards.	Collaborative research - IT/tangible heritage specialists, oral historians/folklorists etc.	Preservation of digital content	Safeguarding the cultural representations of a society; long-term easy access to the cultural heritage.	Better return on investment in the longer term; reduced recovery costs of lost digital content; development of creative industries.	Environmental impact does not need to be repeated; risk: storage and actions cost growing energy	**6**	**9**
Protection/Safeguarding		**P.4a**		P.12 P.13	Materials, technologies and procedures for recording, assessment, maintenance and conservation of all types of cultural heritage.	• Protection, exposition, conservation and restoration of cultural heritage, taking into account the criteria of durability, minimal intervention, reversibility, compatibility and retreatability • Procedures for selection of cultural heritage that can and cannot be preserved.	• Development of material and techniques. • Development of procedures and standards for 'new fields' such as born digital heritage. • Consider instances in which it is legitimate to 'let go' of the heritage item or resource.		Collaborative research; industry involvement; knowledge exchange	Preservation of authentic substance and value of cultural heritage	Raising awareness of the standards required for cultural heritage protection.	Increased competitiveness of European industry	Reduction of CO2 emission due to protection of original materials		
Protection/Safeguarding		**P.4b**				• Long-term effects of conservation treatments, carried out at present and in the past, on historic materials, objects and sites, including modelling and simulation of these effects, in order to improve the materials and procedures of the conservation practice. • Access to records of prior interventions.	• Development of evaluation methodologies. • Access to records of prior interventions.		Knowledge exchange, interdisciplinary research; industry involvement; participation of end-users	Preservation of authentic substance and value of cultural heritage	Raising awareness of the standards required for cultural heritage protection.	Decreased cost of misguided conservation treatments due to increase time span between conservation treatments	Neutral		
Protection/Safeguarding		**P.5**			Protection and conservation of modern materials used in contemporary art and architecture	Identification, conservation and protection of contemporary materials such as plastics, ceramics, information carriers, concrete and other composite objects and constructions, electronics, new alloys, glasses, dyes, mortars and other, as well as of objects made of them	Development of models, theoretical concepts, novel tools, methods and materials for conservation of contemporary arts.	Conservation	Knowledge exchange, interdisciplinary research; industry involvement; participation of end-users	Preservation of authentic substance and value of cultural heritage; optimisation of the use of resources, development of standards	Raising awareness of value of contemporary art; preservation of contemporary heritage	Reduced financial losses caused by degradation of contemporary art; better use of resources	Neutral		

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Protection/Safeguarding		**P.6**		A.8a R.6a	Industrial heritage & Maritime heritage - tangible and intangible.	• Protection of industrial and maritime heritage and the safeguarding of their associated intangible expressions (crafts/trades, oral histories, song, etc.)	• Development of strategies towards protection of industrial heritage & Maritime heritage (both tangible and intangible). • Exploration of the links between community memory and physical preservation of industrial and maritime heritage.		Collaborative research; involvement of politicians; user involvement. Memory collection projects to conscientise public at local level. Community involvement.	Raising awareness of value of this heritage	Raising awareness of the undervalued heritage; enhancement of local identity	Revitalized degraded city areas; job creation in degraded areas	Reduced CO2 emission due to increased lifetime of buildings and structures	**7**	
Protection/Safeguarding		**P.7**			Built heritage - including vernacular built heritage and associated crafts and skills.	Stabilisation of historic structures endangered by adverse changes in hydrogeological conditions in the ground.	Development of technologies for stabilising.		Collaborative research, user involvement	Preparedness to impact of global climate change	Safety of buildings and structures ensured	Improvement of industry competitiveness; revitalized degraded areas	Reduced CO2 emission due to increased lifetime of buildings and structures		
Protection/Safeguarding		**P.8**			Landscape heritage	Protection of cultural landscapes, seascapes and heritage and the safeguarding of their associated intangible expressions (crafts/trades, oral histories, song, etc.)	Development of strategies towards conservation of cultural heritage; new forms of governance.		Collaborative research; policy support research; transdisciplinarity	Protecting landscape heritage; rising awareness of heritage value	Raising awareness of the heritage; enhancement of local identity	Revitalized degraded areas; job creation	Preserve physical condition of landscapes	**8**	**10**
Protection/Safeguarding		**P.9a**			Understanding and modelling of decay	Development of models for reliable prediction of the behaviour of materials, objects and assemblies under various combinations of stressors (chemical, physical, biological)	Development of models and theoretical concepts.	Conservation, climate	Collaborative research	Optimisation of the use of resources, development of standards	Sustainable use of heritage	Optimisation of the use of resources	Better use of energy		
Protection/Safeguarding		**P.9b**				Understanding and modelling future risks of biological decay due to spread of species (mould, insects, rodents etc) with climate change	Development of models.		Collaborative research, knowledge transfer. Monitor/assess document preservation record of local and institutional authorities.	Optimisation of the use of resources, development of new products	Improved access to heritage	Development of new services and products	Neutral		
Protection/Safeguarding		**P.10**			Defining and understanding damage	Developing and defining the concept of useful lifetime for various forms of heritage	Development of models and theoretical concepts.	Conservation	Collaborative research, participatory research, end-user involvement	Optimisation of the use of resources, development of standards	Sustainable use of heritage	Optimisation of the use of resources	Better use of energy		
Protection/Safeguarding		**P.11a**			Investigation of damage mechanisms	Multidisciplinary approach on the interactions between environment and materials	Understanding of interactions between environment and materials/objects/collections; development of new tools.		Collaborative research;	rising awareness of potential threads	reduced risk of potential losses; knowledge transfer between sectors as health, security, safety etc.	Understanding of damage mechanism of materials can be used by other sectors of industry experiencing problems with product durability. In consequence competitiveness of European industry will increase. Reduced cost of potential losses	Neutral		
Protection/Safeguarding		**P.11b**				Interactions between specific environmental factors (temperature, moisture, ...) and complex artefacts made of different materials	Understanding of interactions between environment and materials/objects/collections; development of new tools.		Collaborative research;	rising awareness of potential threads	reduced risk of potential losses; knowledge transfer between sectors as health, security, safety etc.	Understanding of damage mechanism of materials can be used by other sectors of industry experiencing problems with product durability. In consequence competitiveness of European industry will increase. Reduced cost of potential losses	Neutral		
Protection/Safeguarding		**P.11c**				Degradation of chemically unstable materials	Understanding of material transformation.		Interdisciplinary approach; involvement of industry	rising awareness of potential threads	reduced risk of potential losses; knowledge transfer between sectors as health, security, safety etc.	Understanding of damage mechanism of materials can be used by other sectors of industry experiencing problems with product durability. In consequence competitiveness of European industry will increase. Reduced cost of potential losses	Neutral		

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Protection/Safeguarding		**P.12a**			Non-invasive testing	Development of non-invasive and non-destructive testing methods for immoveable and moveable cultural heritage	Development of models and technologies.	Conservation	Collaborative research, knowledge transfer	Optimisation of the use of resources, development of standards	Improved access to heritage	Development of new services and products	Lower environmental impact of new products and services		
Protection/Safeguarding		**P.12b**				Development of non-invasive real-time condition monitoring technologies and software support systems for immoveable and moveable cultural heritage, including new photonic sensors integrating colour and 3D vision	Development of models and technologies.	Conservation	Collaborative research, knowledge transfer	Optimisation of the use of resources, development of standards	Improved access to heritage	Development of new services and products	Lower environmental impact of new products and services		
Protection/Safeguarding		**P.13**			Intervention	Development of new environmentally-friendly materials and processes for conservation (consolidation, cleaning, restoration …) based on new technologies, e.g. nanotechnology, photonic technologies, rapid prototyping	Development of new services and products.	Conservation	Collaborative research, knowledge transfer	Optimisation of the use of resources, development of new products	Improved access to heritage	Development of new services and products	Lower environmental impact of new products and services		
Protection/Safeguarding		**P.14**			Environmental sensing and dosimetry	Development of sensing systems to detect and control active biodeterioration	Development of new services and products.	Maintenance	Collaborative research, knowledge transfer	Optimisation of the use of resources, development of new products	Improved access to heritage	Development of new services and products	Neutral		
Protection/Safeguarding	Change	**P.15a**		P.9b U.2	Climate change mitigation and adaptation.	• Development of decision-making tools to improve the resilience of heritage assests to climate change, including extremely-long-term monitoring solutions. • Development of criteria for recognition of what can not be saved.	• Development of models and concepts. • Exploration of traditional knowledge systems previously in place (traditional environmental knowledge).	Climate; Innovation, Traditional Knowledge Systems. Traditional Environmental Knowledge (TEK)	Collaborative research, knowledge transfer, participatory research	Optimisation of the use of resources, development of new products. Reinterpretation and re-use of existing approaches to climate change.	Improved access to heritage; Community engagement with culture and climate adaptation ideas and traditions.	Development of new services and products	Neutral		
Protection/Safeguarding		**P.15b**				Understanding of rebound effects ('unintended consequences') of climate change mitigation and adaptation strategies		Climate							
Protection/Safeguarding			**P.16**		Protection and safeguarding of intangible heritage - including traditional crafts, music, literature, memory etc.	• Assessment of existing EU body of knowledge - collaborative and comparative. • Development of systems and procedures for long term protection and safeguarding.	• Understanding of how traditional craft knowledge is transmitted. • Understanding of how music, literature, oral history memory are transmitted.	Traditional skills. Knowledge. Transmissions.	Collaborative research. Comparative case studies. Cross national research infrastructures. Community engagement.	Improved systems and procedures. Improved understanding of existing body of knowledge. Community involvement.	Community involvement. Safeguarding of unique living traditions. Identity and cohesion.	Potential tourism benefit from safeguarding of unique intangible heritage.	Traditional knowledge systems include many low-environmental-impact skills and traditions.		
Recognition		**R.1a**			Cultural heritage ethics and identity	Is there an ethical or cultural boundary to what you can do with cultural heritage? - This needs re-wording to be in any way clear!	Raising awareness of/proficiency in digital possibilities (ranging from understanding processes to actual coding).	Tourism, Exploitation function, energy efficiency	Sharing expertise and best practice in Centres of Competence	How does the use of cultural heritage contribute to identity	Increased knowledge of the role of cultural heritage in society; increased wellbeing	New opportunities for the use of cultural heritage in commercial settings (e.g. creative industries)	Neutral		
Recognition		**R.1b**		R.2b R.3		• How does the use of cultural heritage contribute to identity at a personal, national, European, and/or global level? • Consider also the manipulation of cultural heritage in the service of cultural identity (eg. Kosovo/Balkans wars where destruction of cultural heritage was used as a weapon to control and destroy cultural identity). • To understand the perceptions and aspiration of people for cultural value. • Changing values/meanings of physical and intangible heritage in a digital world.	• Determining how cultural identity can contribute to the wellbeing of a community, including recovery from conflict (and vice versa). • Determining how cultural identity can contribute to the the resolution of issues arising from the experience of immigration into a community.	Living heritage. Social cohesion. Cultural diversity. Values. Representation. Identity (sense of place). Perception. Meaning. Significance.	Joint oral history recording (local and immigrant communities, academic and community participants).	How does the use of cultural heritage contribute to identity	Increased knowledge of the role of cultural heritage in society; increased wellbeing; Promotion and understanding of cultural diversity.	New opportunities for the use of cultural heritage in commercial settings (e.g. creative industries)	Neutral	**11**	**5**

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Recognition		**R.2a**			Value of Cultural Heritage	Cultural value of treatments, interventions	Development of an approach/methodology/new theoretical concepts.	Values, representation, identity (sense of place), perception, meaning, significance	Collaborative research; knowledge exchange; participatory research; end user involvement	Increased quality of treatments, interventions	Better understanding by the public of cultural heritage and quality of life	Increase/decrease in visitors	Neutral - no negative environmental impacts		
Recognition		**R.2b**				To understand the perceptions and aspiration of people for cultural value	Application of existing knowledge and approaches to this area.		Collaborative research; knowledge exchange; participatory research; end user involvement	Understanding interactions between stakeholders and cultural heritage	Better understanding by the public of cultural heritage and quality of life	Increase/decrease in visitors	Neutral - no negative environmental impacts		
Recognition		**R.3**			Value of Cultural Heritage	Changing values/meanings of physical heritage in a digital world	Development of an approach/methodology/new theoretical concepts.		Interdisciplinary research, evaluation tools, theoretical prepositions	Renewing value of physical heritage	Better understanding of the role of cultural heritage		Neutral		
Recognition		**R.4**			Cognitive-perceptual theory	Lack of knowledge in how we perceive aspects of cultural heritage	Application of existing and development of new knowledge and approaches to this area, perception research.		Collaborative research; knowledge exchange; participatory and transdisciplinary research; end user involvement	understanding interactions between stakeholders and cultural heritage; understanding of decision making process of professionals managing cultural heritage field	Improvement of life quality due to understanding of esthetical needs of society	An important increase of competitiveness of industry due to better design based on improved theory	Neutral		
Recognition	Use	**R.5**			Rights and responsibilities around cultural heritage: tangible, intangible and digital.	• Individual rights, collective responsibilities and the balances between public and private domain. • Heritage as a human right. • Impact of 'right' to universal access on the heritage itself and associated values.	• Insights into perceptions of and attitudes to cultural heritage by different stakeholders.		Collaborative research; participatory and transdisciplinary research; perception research; Involvement of local communities.	Raising awareness of the value of cultural heritage and the responsibilities of individuals and society	Enlarge the public support and consciousness for cultural heritage	Increasing employment and visitors	Neutral		
Recognition		**R.6a**		P.6	Understanding values	Systematic research into value systems, including economic values, social values, 'world view' and increased quality of life.	• Development of models, new theoretical concepts and understanding of of non-financial benefits of cultural heritage. • Building on environmental, social and cultural pillars of sustainability. • Development of metrics for assessment of value and significance.	Values	Collaborative research; knowledge exchange; participatory and transdisciplinary research; end user involvement	Increased recognition of heritage	Understanding societal benefits	Increase/decrease in visitors; better understanding of and hence investment in cultural heritage.	Neutral		
Recognition		**R.6b**				Policy research into the added value of heritage science .	Development of models.	Values	Knowledge exchange; participatory research	Increased recognition of heritage science	Understanding societal benefits	Increase/decrease in visitors	Neutral		
Recognition	**Change**	**R.7**		P.3	Sustainability (including all 4 'pillars of sustainability: environmental, economic, social, and cultural).	Understanding embodied energy in heritage materials, structures and assemblies	• Development of models, theoretical concepts. • Development of metrics for assessment. • Risk identification/Documentation of loss.	Values	Collaborative research; knowledge exchange; Involvement of traditional craftspersons as well as academics/technicians.	Increased recognition of heritage science, policy development	Understanding societal benefits	Understanding economic benefits	Lower pressure on the environment through more sustainable use of heritage		

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Change	Protection	**C.1**			Environmental assessment and monitoring (pollution, climate change, seismic risk)	Development of integrated resource and environmental management/monitoring systems based on optimally balanced environmental costs and conservation benefits.	Understanding of synergic interaction and influence of the pollutants with materials and environments.	Global and climate change	Collaborative research, knowledge transfer	Optimisation of the use of resources, development of new products; raising awareness of potential threads	Improved access to heritage; Reduced risk of potential losses; improved safety at work	Development of new services and products; understanding of environmental interaction with materials can be used by other sectors of industry experiencing problems with product durability. In consequence competitiveness of European industry will increase. Reduced cost of potential losses	Lower environmental impact of new products and services; raising awareness of impact of environment, encompassing global climate change, on cultural heritage constituting large part of our living and working space will in long term cause pressure on environment and human health		
Change		**C.2**		C.4	Mitigation and adaptation for climate change.	• Mitigation of the negative effects of climate change on materials and structures. • Develop new standards for conservation norms(eg. RH etc.) in new climatory regimes. • Explore potential positive impacts of climate change. • Explore ways in which heritage resources can be potentially be used to mitigate against climate change. • Explore loss of sites due to climate change.	• Development and implementation of adequate technologies. • Development of new standards. • Raw data on effects and impacts of climate change.	climate change	Collaborative research, involvement of end user and politicians; policy implemented	Raising awareness of potential threats.	Reduced risk of potential losses; improved safety at work	Understanding of environmental interaction with materials can be used by other sectors of industry experiencing problems with product durability. In consequence competitiveness of European industry will increase. Reduced cost of potential losses	Raising awareness of impact of environment, encompassing global climate change, on cultural heritage constituting large part of our living and working space will in long term cause pressure on environment and human health		
Change		**C.3**			Measurement instruments	Non-invasive instruments and methodologies for diagnosis and monitoring	Development of new instruments.		Interdisciplinary approach; involvement of industry	Raising awareness; new tools for investigations of cultural heritage	Innovation in this area will be useful for other fields important for society ex. health, forensic	Increase of innovation of industry; workplace creation in service sector	Neutral		
Change		**C.4**		C.2	Climate change	• Understanding of the effects of climate change on built, archaeological, coastal, submerged heritage and intangible cultural expressions (due to forced migration, etc). • Understanding the effects of climate change on heritage in the vicinity of rivers and lakes (inland waterbodies). • Understanding the effects of climate change on different materials in cultural collections.	• Development of models and concepts. • Monitoring cases over extended time frames.	Climate; Traditional Knowledge Systems (TKS); Traditional Environmental Knowledge (TEK)	Collaborative research, case studies.	Optimisation of future management in a changed climate. Understanding the adaptive capacity of intangible expressions.	Improved access to heritage. Mechanisms to encourage safeguarding for ICH	Better use of resources	Neutral		

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Change		**C.5**			Global change adaptation	• Opportunities for heritage sites, environments and resources (tangible, intangible and digital) in reducing the effects of climate change. • Social impacts of climate change and its implications for tangible and intangible heritage (eg. movement of people). • Cultural heritage in the contex of social and societal change (social globalisation, public memory, increased migration). • Cultural Heritage in the context of economic and political change (globalisation, European economic policy, changing political regimes, economic crises). • Cultural Heritage in the context of Technological change (new technologies, new interventions, new media).	• Knowledge of all agents driving global change and their effects on local scale. • Investigate traditional knowedge systems for local solutions to the effects of global change. • Explore whether there is a conflict at European policy level between economic growth/economic cohesion and cultural heritage preservation. • Explore sustainable models for change.	Climate. Traditional Knowledge Systems (TKS). Traditional Environmental Knowledge (TEK). Global Change. Economic. Political. Social. Societal. Technological. Globalisation.	Interdisciplinary approach; scenario building; Local community engagement; Local SME engagement	See global change as an chance for adaptive management of sites/landscapes	Communities re-engaging with cultural memory to find and adapt local and traditional solutions. Improved understaning of and planning for change.	Benefits in efficient managment of change and of resources.	Reduction of negative effects of global change. Indigenous solutions to local issues.		**7**