

CULTURAL AND ENVIRONMENTAL HERITAGE

Section "Further qualifications that may be attached to the application" integrated on 11/05/2019

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Starting date of the PhD Programme	01/11/2019
Duration	3 calendar years
Language of the PhD Programme	Italian and English
Mandatory stay abroad	No
Curricula	Research topics
1. Cultural and environmental heritage: memory, protection, rights	<p>1. Cultural heritage: Historic, social, economic, and cultural processes in European, Mediterranean, and Western Asian contexts; public history; conservation of ethno-cultural heritage and management of cultural resources in endangered areas.</p> <p>2. Environment, objects, and rights; diagnostic analysis of monumental and portable artefacts of historical interest; musealisation through digital and virtual modelling; promoting the appreciation and use of bio-environmental goods as common goods; legal and regulatory consequences.</p> <p>3. Environment and landscape, cities and architecture; tools for the analysis and conservation of the environment, biological and anthropological heritage, archaeology, urban settings, industrial archaeology, consolidation and restoration of historical architecture; the historical relationship between urban areas and their territories, sustainable development of tourism, fruition of historic towns.</p> <p>4. Governance and management of common goods; risk assessment and risk management, efficient use of resources, definition and quantification of ecosystemic service value, assessment of natural resource consumption and of production of solid, liquid, and gaseous waste.</p>
2. Science and Technologies for Cultural Heritage	<p>Production techniques, material characterization, state of conservation. Development of: advanced analytical protocols (spectroscopy, immune chemistry, DFT, chemometrics), micro and non-invasive diagnostic methods, intervention methods on humidity phenomena of historical buildings, interaction with pollutants, tomographic systems (digital radiography, X-Ray computer tomography, software for real-time tomography and 3D rendering. Development of innovative restoration materials and methods. Design, development, testing and performance evaluation of innovative materials (nanomaterials, polymers, biopolymers, composite materials) and methods for the consolidation, cleaning and protection of both movable and immovable cultural heritage. Survey, monitoring and representation technologies: definition of protocols and standards for the production of 3D contents aimed at monitoring cultural heritage, methods and protocols for the production of 3D models with semantic structure to be applied to cognitive systems, design of web-based application for the archiving and use of technical-scientific data related to conservation and restoration projects, production contents and design of augmented reality systems, efficient workflows, survey and monitoring multiscale integrated techniques integrated by topographic, photogrammetric, laser scanner and special positioning, UAV survey for data management, acquisition with multispectral sensors and scanners, GIS applications, 3D models (development of new procedures for the collection and optimal elaboration, ICT methodologies and techniques for the creation, analysis and representation (virtual reality and augmented/mixed reality) and multi sensorial interaction by means of digital data.</p>

PhD positions and scholarships

Position n.	Financial support	Description	Curriculum	Positions linked to research subjects
1	PhD Scholarship	Totally funded by the University of Bologna general budget	1) Cultural and environmental heritage - Memory, Protection, Rights	Bibliographical journals between the 17th and 19th centuries for the study of cultural and scientific communication
2	PhD Scholarship	Totally funded by the University of Bologna general budget	1) Cultural and environmental heritage - Memory, Protection, Rights	A multidisciplinary approach to the work of art: social context and legal cases
3	PhD	Partly financed from the central budget	1) Cultural and	Marine environmental

	Scholarship	and co-financed by the Department of Cultural Heritage with funds from the INTERREG Italia-Croazia Prize Fish project – P.I. Dr Alessia Cariani	environmental heritage - Memory, Protection, Rights	goods: sustainable fisheries, innovation, territorial development, international cooperation
4	PhD Scholarship	Totally funded by the University of Bologna general budget	1) Cultural and environmental heritage - Memory, Protection, Rights	Not just "traditional" diplomacy: an Italian and comparative history of cultural diplomacy (1945-2019)
5	PhD Scholarship	Totally funded by the University of Bologna general budget	1) Cultural and environmental heritage - Memory, Protection, Rights	Management of productive activities and protection of environmental assets from a civil law perspective
6	PhD Scholarship	Totally funded by the University of Bologna general budget	1) Cultural and environmental heritage - Memory, Protection, Rights	Reusing forms and practices in the Late Antiquity and Middle Ages
7	PhD Scholarship	Totally funded by the University of Bologna general budget	2) Science and Technologies for Cultural Heritage	Development and testing by means of advanced analytical protocols of innovative restoration materials (nanomaterials, polymers, biopolymers, composite materials) for the consolidation, cleaning and protection of movable and immovable Cultural Heritage
8	PhD Scholarship	Totally funded by the University of Bologna general budget	2) Science and Technologies for Cultural Heritage	Advanced geomatic techniques for Cultural Heritage
9	PhD Scholarship	Partly financed from the central budget and co-financed by the Department of Cultural Heritage with funds from the ERC consolidator project no. 772544	1) Cultural and environmental heritage - Memory, Protection, Rights	Anthropology of impact investors
10	PhD Scholarship	Financed by the Department of Cultural Heritage within the framework of the ERC consolidator project n. 772544	1) Cultural and environmental heritage - Memory, Protection, Rights	Anthropology of impact investing
11	PhD Scholarship	Financed in part by the Department of Cultural Heritage with funds from European Project H2020 FlexJET, n. 792216 – P.I. Prof. Andrea Contin	1) Cultural and environmental heritage - Memory, Protection, Rights	Aviation liquid biofuels
12	PhD Scholarship	Funded by Fondazione Flaminia	1) Cultural and environmental heritage - Memory, Protection, Rights	Protection and conservation of tangible and intangible cultural assets at risk through the use of innovative technologies to monitor endangered cultural heritage
13	PhD Scholarship	funded under the three-year High Competence Plan for research, technology transfer and entrepreneurship (POR FSE funds – Resolution n. 462 of 25/03/2019). The assignment of this scholarship is subject to the declaration of residence or domicile of the scholarship holder in Emilia-Romagna.	1) Cultural and environmental heritage - Memory, Protection, Rights	Development of instruments and methods for the analysis and interpretation of environmental data sets for the characterization of areas interested by offshore activities

Positions with scholarship linked to specific topics (art. 9 of the Call for applications)

each position is reserved for one of the two Curricula of the PhD Programme and focused on the development of a specific research subject, a detailed description of which can be found at the bottom of this document.

The available positions will be awarded taking into account the research subject and curriculum for which the applicant has expressed his/her preference, as indicated in the cover page of the multi-annual research project.

Should positions linked to specific research subjects remain vacant or there should be positions linked to specific research subjects for which no candidate has expressed interest, they will be proposed to eligible applicants within the same Curriculum, who have achieved the highest score.

Admission requirements		
Please, see art. 2 of the Call for applications		
Mandatory documents to be attached to the application		
Please, see art. 3 of the Call for applications		
Further qualifications that may be attached to the application, if in possession of the applicant (only qualifications attested by documents drawn up in Italian, English, French, German and Spanish shall be considered as valid and assessed by the Admission Board)		
<ul style="list-style-type: none"> - Abstract of the second cycle master's degree thesis. Undergraduate applicants may submit the draft of the thesis approved by their supervisor (please, note that abstracts cannot exceed 5.000 characters, including spaces and formula possibly used. The above figure does not include: the title of thesis, the outline, and images such as graphs, diagrams, tables etc. - where present); - No more than 2 reference letters signed by Italian and international academics and professionals in the research field, which do not form part of the Admission Board, attesting the suitability of the applicant and his/her interest for the scientific research. <u>Please, note that the above letters cannot be uploaded by applicants. When filling the online application form on http://studenti.unibo.it, applicants will only be allowed to provide the email accounts of the requested academic/professional. The latter shall receive an email from the University of Bologna providing for the instructions for uploading. Only letters in pdf format submitted before the expiry date and time of the Call shall be accepted.</u> - Multi-annual research project, with special emphasis on the activities to be completed during the first-year course. The proposal must meet the following requirements: <ul style="list-style-type: none"> o It must indicate in the cover page the curriculum of the PhD Programme and the research subject covered by the research project proposal and for which the applicant is applying (in the absence of this information, the project proposals will be given a zero score); o It cannot exceed 20.000 characters, including spaces and formula possibly used. This figure does not include: the title of project, the outline, references and images (such as graphs, diagrams, tables etc - where present); o It must include: the state of the art; description of the project; expected results; lead-time for implementation; (proposed) criteria to be used to assess the findings obtained; references. <p>The research projects that successful applicants shall carry out during their doctoral career may possibly differ from the project proposed at the application stage. This shall be defined together with the supervisor and approved by the Academic Board.</p> - List of the publications (monographs, articles published on scientific journals, volume's chapters). - List of the abstracts and posters presented during national and international conferences, etc. - Professional Master courses completed in Italy (1st or 2nd level) relevant to the PhD Programme. - Postgraduate vocational training programmes/specialisation programmes relevant to the PhD Programme. - Thesis defended within the framework of Specialization Schools. - Teaching activity carried out at university level. - Research activity of any kind - whether basic, applied, translational, etc. - carried out in any capacity, including when covered by research grants, and as a staff member of research projects. - Vocational internships - Curricular and non-curricular training and guidance internships - Documents attesting the knowledge of foreign languages - Study periods completed by students outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes) - Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc) 		
Admission exams (art. 4 of the call for applications)		
Examination type	Schedule (please, note that applicants shall not receive any communication concerning the exams schedule)	Examination results publication (please, note that applicants shall not receive any communication concerning the publication of results)
Qualifications and research project evaluation	Non-presential.	The results of the qualifications and research project evaluation shall be available online starting from the 11/06/2019 at the page http://studenti.unibo.it (please, select: "summary of the requests in progress" - "see detail" and open the pdf file "risultati valutazione titoli e progetto")
Oral examination	Date	The results of the oral examination shall be available on the webpage http://studenti.unibo.it starting from 02/07/2019 (please, select "summary of the requests in progress" - "see detail" and open the pdf file "risultati prova orale")
	Place	

	Via degli Ariani 1 – Ravenna Sala Giardino pensile (3rd floor)	
Time	10 a.m.	
Applicants can ask to take the exam remotely using Skype. For further details please refer to the relevant provision laid down in art. 4 of the Call for applications.		
Evaluation criteria		
Points will be allocated to applications out of a total of 100 on the basis of the following weighting:		
1. Qualifications and research project		
<ul style="list-style-type: none"> - Minimum for admission to the oral exam: 30 points - Maximum: 50 points <p>Only qualifications relating to the last 5 calendar years prior to the calendar year of publication of the Call for applications shall be taken into consideration, with the exception of the University Degree (Diploma di laurea). Please, note that qualifications must be consistent with the PhD Programme.</p> <p>Points relating to qualifications shall be allocated on the basis of the following criteria:</p> <ul style="list-style-type: none"> - Graduation final mark. Undergraduates shall be evaluated on the basis of the Weighted Average Mark (WAM): max 15 points - Publications: max 5 points - Other relevant qualifications indicated in Curriculum Vitae: max 5 points <p>Points relating to the research project shall be allocated on the basis of the following criteria:</p> <ul style="list-style-type: none"> - Scientific value and ground-breaking nature of the proposal: max 15 points - description and structure of the proposal: max 5 points - proposal feasibility: max 5 points 		
2. Oral examination		
<ul style="list-style-type: none"> - Minimum for inclusion in the final ranking list :30 points - Maximum: 50 points <p>Oral examination includes the presentation of the research project and is intended to assess the suitability of the applicant to pursue scientific research as well as the general knowledge of issues connected to the PhD Programme. During the oral examination, knowledge of English language shall be assessed. The oral examination is carried out in Italian or in English.</p> <p>Points relating to the oral examination shall be allocated on the basis of the following criteria:</p> <ul style="list-style-type: none"> - knowledge of the English language: max 5 points - research project presentation: max 25 points - general knowledge of issues connected to the PhD Programme: max 20 points <p>Possible evaluation sub-criteria will be available on the Unibo website, selecting the relevant PhD Programme → “PhD programme information” at the bottom of the page in the section “Notices”.</p>		
Final ranking list and enrolment (arts.6 and 7 of the Call for applications)		
<p>After the publication of the results of the oral exam, the final ranking list will be available on the Unibo website, selecting the relevant PhD Programme → “PhD programme information” at the bottom of the page in the section “Notices”.</p> <p>Following the publication of the final ranking list, successful applicants must enroll on http://studenti.unibo.it by the deadline indicated on the Unibo website, selecting the relevant PhD Programme → “PhD programme information”.</p>		

Description of the research topics:

1) Bibliographical journals between the 17th and 19th centuries for the study of cultural and scientific communication (Curriculum 1)

The processes of scientific, literary and cultural communication have influenced the history and circulation of knowledge since their origin and in a decisive way. A privileged informative channel for this perspective is represented by periodical publications, emerged in the second half of the seventeenth century in France, and then spread first in Italy and then in the rest of Europe. These periodical publications have conveyed and brought together literary news, cultural debates and scientific discoveries, which have liven up the Italian and European scholarly cultural climate.

The knowledge of periodicals and of their publishing, editorial, and classificatory-semantic structure, especially of single texts, can shed light on the modes and approached underpinning the circulation of ideas and the development of the various sectors in which the European scientific thought has been applied.

The status of art with respect to this aspect is inadequate, especially with regard to the availability of modern descriptive tools, which can make easier extracting aspects of context and contents from such bibliographic products, also taking advantage of new techniques and technologies.

2) A multidisciplinary approach to the work of art: social context and legal case (Curriculum 1)

One of the major factors allowing a proper understanding of the work of art is the study of the historical and social context in which this was created and its external events. By using a multidisciplinary methodological approach, the research project is intended to examine the themes of art history in an innovative perspective, which takes into account not only critical historical news, but also issues related to the social and legal spheres.

Problems concerning the study, the conservation and the enhancement of artistic heritage will also be investigated. Considering international events, including those occurred in recent times, it is evident that the study of masterpieces of art is intertwined with related legal events. In this respect, the research will have to investigate, through the relevant case studies, the rules provided for by the international conventions into force and the possible use of extrajudicial

procedures for the resolution of cross-border disputes arisen between States about the conservation and return of works stolen in particular situations (theft, war events, etc.).

3) Marine environmental goods: sustainable fisheries, innovation, territorial development, international cooperation (Curriculum 1)

Mediterranean fish stocks are suffering from overfishing and many stocks are at risk of decline. The EU Fisheries Policy recommends the urgent implementation of medium-term strategies and initiatives to combat resource depletion and to achieve stock sustainability, based on scientific and socio-economic analysis and innovative actions enabling fisheries operators to adopt low-impact fishing practices. Fisheries management can only achieve sustainability when all the necessary information is available for each fish stock and, among these, knowledge of the ecological structure of a species is considered essential for effective management. Today, it is crucial identifying and combining biological population units with the management units of the most important fish species exploited in the Mediterranean. This aspect must be associated with the need to develop eco-certified fishery products and to develop innovative fishery products, meeting the requirements of environmental, economic and social sustainability. The final objective will be to implement a change in practices for the exploitation of marine environmental assets, through a cross-border, territorial and socio-economic approach to the cooperative and renewable exploitation of fisheries resources that will consequently bring long-term benefits to marine ecosystems.

4) Not just "traditional" diplomacy: an Italian and comparative history of cultural diplomacy (1945-2019) (Curriculum 1)

Overall, cultural diplomacy lies at the heart of many scientific studies in both the Anglo-Saxon and transalpine contexts, but the same cannot be said about the studies on the Italian cultural diplomacy. Italy has historically made use of its numerous cultural agencies in order to promote its image in the international landscape, promoting cultural and scientific cooperation and taking advantage of its potential in the field of cultural heritage.

Within this line of research, the efforts made in the '80s by the DC and PSI to revamp the Italian institutes of culture abroad is one the areas worthy of further investigation. The aim of this research is enhancing the main Italian experiences, placing them in the complex range of foreign policy choices of our Country and emphasizing their past and future importance. From a methodological point of view, during the three-year course the research can be developed along three guidelines. First of all, the selected PhD applicant shall take stock of the existing historiography and of the research already underway in the Italian context. Secondly, some specific and innovative areas of research shall be investigated. Finally, these lines of research shall be placed in a broader European and global perspective.

5) Management of productive activities and protection of environmental assets from a civil law perspective (Curriculum 1)

Many industrial activities carried out by companies of significant size and even by SMEs require to strike a balance between the needs to pursue economic efficiency in production with the right to preserve a healthy environment. Problems however raise in conducting routine operations as well as in the management of possible emergencies caused by accidents provoking severe environmental effects. From this perspective, the analysis of the risk assessment and risk management models adopted by private companies and by public bodies reveals issues worthy of interest from a civil law perspective, such as those pertaining to contracts (articles 1321 of the Italian Civil Code et seq.) and the obligations arising from unlawful acts (articles 2043 of the Italian Civil Code et seq.).

These fundamental private law arrangements, are thus taken into consideration in a very specific context, which is characterized by the combined application of EU provisions in matter of environmental protection (Legislative Decree no. 152 of 3 April 2006).

In this context, the applicants - who has a solid command of civil law combined with a strong interdisciplinary sensitivity - will be called upon to investigate issues relating to environmental protection and especially emerging issues, including, first of all, the constant relevance of civil law rules governing contract and torts; the redefinition of the complex network of relationships between these rules and the public disciplines inspired by preventive purposes, and finally the emergence of a new balance between environmental protection and market demands, which finds an emblematic manifestation in the growing attention to corporate social responsibility.

6) Reusing forms and practices in the Late Antiquity and Middle Ages (Curriculum 1)

The idea of reusing objects, materials, architectural elements or buildings to maintain their function over time or transform them to obtain new items, is an extremely felt need in contemporary societies with a higher rate of economic development. At the heart of this attitude is the concern for an intelligent use of resources, which combines the possibility of satisfying mass needs with the promotion of the introduction into the production cycle of items that can be processed again.

However, reuse is not a trait of the contemporary world, since it was widely employed both in ancient times - especially starting from the third century A.D. - and in the Middle Ages. Pre-modern societies seem to have conceived its functionality from at least two fundamental perspectives. On the one hand, there was an ideological appropriation of the past realized through a conscious reenactment of its architectural vestiges, buildings, written materials, political terminologies, social concepts, literary styles. This has been a popular trend among the members of the establishment as a way to legitimize power through the cultural heritage of the past. Along with this, a more pragmatic perspective lies in the attempt to recover what is still instrumental in social organization from residential buildings, public monuments and material goods.

This line of research shall cover all the project proposals aimed at studying the architectural, economic and cultural reuse in the late antique and medieval world. All proposals containing elements of hybridization of knowledge through the use of investigation techniques or research models from fields other than the one of candidate are encouraged.

7) Development and testing by means of advanced analytical protocols of innovative restoration materials (nanomaterials, polymers, biopolymers, composite materials) for the consolidation, cleaning and protection of movable and immovable Cultural Heritage (Curriculum 2)

The aim of the research is to develop and test new materials for restoration based on non-toxic products and deriving from renewable sources to ensure safety for the operator and the environment. Different formulations will be developed according to the type of heritage substrate to be treated (i.e.: canvas/panel and wall paintings, metal/alloys and stone objects, etc.). The performance evaluation and safety of the formulations will be carried out by setting up advanced analytical protocols. In particular, both mock ups and real heritage substrates will be used to evaluate the formulations in terms of consolidation, cleaning and protection performances, release of residues, short and long-term interactions with the materials constituting the substrates.

8) Advanced geomatic techniques for Cultural Heritage (Curriculum 2)

The research line is devoted to surveying, monitoring and representation methods and technologies for Cultural Heritage (CH). Geomatics is the scientific framework to develop and setup new approaches and workflows dealing with the different aspects of CH, from the analysis at territorial level to the scale of the single objects.

Multi-scale integrated techniques can include acquisition technologies ranging from topographic instrumentation, digital photogrammetry, laser scanning and other 3D high-resolution scanners, UAV, remote sensing by optical multispectral and radar satellite imagery.

Data processing and management can be in particular oriented to advanced 3D modeling and GIS-BIM applications, and can take also in consideration the issues related to different aspects of risk management for Cultural Heritage.

The PhD candidate will concentrate the research on the characterization of the quality of the achieved data and on the possibility to use them for multi-scale, multi-resolution and multi-temporal analyses, working on selected case studies.

9) Anthropology of impact investors (Curriculum 1)

The candidate's research will contribute to the project 'The Hau of Finance: Impact Investing and the Globalization of Social and Environmental Sustainability' (IMPACT HAU), funded by ERC consolidator grant 772544 (<https://cordis.europa.eu/project/rcn/218697/factsheet/en>).

Investors and entrepreneurs increasingly collaborate with civil society actors to do the work of sustainable development using private capital. IMPACT HAU will assess whether, and where, this tendency may represent a cultural shift, what it entails, and how far-reaching and heterogeneous it is. Through exchange theory we frame the study of impact investing beyond capitalism, treating impact bonds as ethnographic objects. We will use fine-grained ethnographic research to assess whether impact investing is merely opening new frontiers for financialization and deepening the political crisis of the developed world, or whether indeed it is helping to bring about the radical transitions that can lead to greater sustainability.

The candidate will undertake a PhD in anthropology to study 'sustainable and responsible investing', with a focus on bond issuers and investors. Possible field sites include 'green' stock exchanges, centres of Islamic finance, institutional investors, auditors or development banks. The successful candidate will have qualifications to masters level, including a good degree in anthropology. (S)he will be able to demonstrate knowledge of and, preferably, relevant experience in finance or related areas such as business, philanthropy or international development. (S)he will have excellent written and spoken English, and knowledge of another language relevant to the PhD proposal if applicable. (S)he must be prepared to conduct research as part of a team, residing in Ravenna or Bologna, and must either have knowledge of or commit to learn Italian.

10) Anthropology of impact investing (Curriculum 1)

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The candidate will undertake a PhD in anthropology to study impact investing, through the ethnographic study of a project funded by green bond, a sustainability bond or a development impact bond, examining symmetrically bond issuance and use of proceeds. Examples of possible field studies include: the use of green bonds to finance infrastructure in China; development impact bonds for refugee integration in the Middle East; or a sustainability bond to support female entrepreneurs in South East Asia. The successful candidate will be educated to masters level, including a good degree in anthropology. (S)he will be able to demonstrate knowledge of and, preferably, relevant experience in finance or related areas such as business, philanthropy or international development. (S)he will have excellent written and spoken English, and knowledge of a language relevant to the proposed field study (e.g. Arabic, Chinese, Khmer, Vietnamese). (S)he must be prepared to conduct research as part of a team, residing in Ravenna or Bologna, and must either have knowledge of or commit to learn Italian.

11) Aviation liquid biofuels (Curriculum 1)

The use of electric batteries will reduce the dependence of land transport on liquid fuels in the future; however, the same is unlikely to be true for the aviation sector, which will continue to rely on liquid fuels at least in the near future.

The need for more renewable fuels for aviation is widely recognised: in particular, lignocellulosic biofuels (not in competition with food crops) or biofuels from organic waste.

The objective of the FlexJET H2020 project (Grant 792216) is to demonstrate and validate the technical and economic feasibility of integrating the thermo-catalytic reforming (TCR) process (pyrolysis followed by product reforming) treating organic waste and the SABR process treating used vegetable oils, to produce a biofuel using green hydrogen and TCR oil. The project involves top industry leaders and will build the first demonstrator capable of treating up to 3480 tonnes per year of dried food waste and 1360 tonnes per year of waste vegetable oil to produce 1200 tonnes per year of liquid biofuels for aviation.

The candidate will support an international team, in demonstrating and validating the technical and economic feasibility of this approach, together with its environmental and social sustainability as well as its cost competitiveness on a commercial scale.

Research activities will include: testing on different waste streams using a small TCR prototype to be installed in the new "Fraunhofer Project Center at University of Bologna" to be inaugurated in 2019 in Marina di Ravenna; modelling of processes using specially developed software tools; evaluation of the environmental and social sustainability of the demonstrator.

The candidate will spend up to one year conducting research at the Partners premises, in Germany (BIGA Energie, Engstingen and Fraunhofer UMSICHT, Sulzbach-Rosenberg) and in England (University of Birmingham).

12) Protection and conservation of tangible and intangible cultural assets at risk through the use of innovative technologies to monitor endangered cultural heritage

This line of research intends to apply to sample cases and thus validate an innovative methodology designed to develop plans for risk mitigation and the and subsequent redevelopment of cultural heritage exposed to risk. Two types of possible - often interrelated - events shall be considered: 1) natural disasters such as earthquakes, floods, tsunamis, fires, landslides, avalanches, landscape and soil degradation; 2) human activity such as war, terrorism, acts of vandalism, pollution, uncontrolled urban development. An analysis of vulnerability of the cultural site shall make it possible to highlight and estimate quantitatively the factors that determine the possible risks to which it may be subjected and, consequently, to propose a plan that provides guidelines and suggestions for preventive actions aimed at mitigating the operations to be carried out in times of crisis and those relating to the management of the post-emergency situation. The aim of this research is to refine and validate the methodology by means of summary sheets and tables of degradation and risk assessments, taking into account all possible variables and making the method universally applicable, also thanks to the innovative technologies available today.

13) Development of instruments and methods for the analysis and interpretation of environmental data sets for the characterization of areas interested by offshore activities

The aim of the research is the exploitation of the large amount of environmental data collected by the offshore industry during monitoring studies in the Adriatic Sea to identify the emerging criticalities in the area, to evaluate sustainable solutions for the upgrading of the infrastructures and to define scenarios for the sustainable use of resources. The evaluation of the magnitude of the impacts requires a reference baseline that could be identified in the data relating to the ante operam studies. The analysis of the data related to the extraction phase of the gas fields can provide indications on the possible alterations induced by the offshore activities. The analysis of these data will also provide useful information to assess the resistance and resilience of ecological systems to multiple sources of human disturbance.