



2014 Italian Presidency
of the Council
of the European Union



SAPIENZA
UNIVERSITÀ DI ROMA

DIPARTIMENTO
DI BIOLOGIA AMBIENTALE
MUSEO ORTO BOTANICO

NATURAL AND CULTURAL CAPITAL

Contributions to the Conference held at the
Botanical Garden of Rome, Italy
24 November 2014

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held at the Botanical Garden of Rome, Italy
24 November 2014



MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

Maria Carmela Giarratano

General Director, Nature Protection and Sea
Ministry of the Environment, Land and Sea Protection
Nature Protection Directorate www.minambiente.it



2014 Italian Presidency
of the Council
of the European Union



CENTRO INTERUNIVERSITARIO DI RICERCA
BIODIVERSITÀ FITOSOCIOLOGIA
ED ECOLOGIA DEL PAESAGGIO



SAPIENZA
UNIVERSITÀ DI ROMA

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www.societabotanicaitaliana.it

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Director, Sapienza Botanical Garden
Honorary President, Italian Botanical Society

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It is a pleasure to greet you and introduce the work of this conference by welcoming you to this prestigious venue, the Botanical Garden of Rome, which is not only an important site for the implementation of projects of ex-situ plant conservation and for environmental education, but, being located in the heart of Rome, it is also part of its immense cultural heritage. The natural capital is deeply influenced by the knowledge and skills developed by the human being over the centuries, and, at the same time, the cultural capital is permeated with suggestions, materials, inspirations, constraints dictated by the natural resources in each specific territory. Nature and Culture make each one of our countries of the "old" Europe unique and unparalleled. Natural and cultural capitals are crucial for the redefinition of a sustainable model of economic development of our continent, based on the extraordinary value of our natural heritage inextricably interlinked with cultural values. This conference is a real opportunity for exchanging experiences between the research and the institutional world, focusing on the interaction between natural capital and cultural capital, present and discuss best practices at various levels, promote synergies, propose initiatives, activities and projects. The "Charter of Rome on Natural and Cultural Capital" is the instrument promoted by the Italian Presidency of the EU to deliver these messages and the main topics guiding the agenda today. We are particularly honored by the audience, including leading representatives from the research institutions, Universities, the European Commission, the European Investment Bank, the European Environmental Agency, Member States, including the Director of the Ministry of the Environment of Latvia, who will hold the next Presidency of the EU Council of Ministers in the first half of 2015.

Renato Grimaldi

Director, Ministry of the Environment, Land and Sea, Italy

The European Natural Capital is intimately linked to the cultural dimension and history of the EU. Together with the intense participation in defining the Charter of Rome, the wide attendance to this Conference on "Natural and Cultural Capital: the future of Europe" testifies the great cultural and scientific interest of the subject. Several people and institutions, above all from the Directorate for Natural Capital of the European Commission, the Directorate General for the Nature and Sea Protection of the Italian Ministry of the Environment and the Italian Botanical Society research group on the MAES project, supported every step of this initiative that was held at the Botanical Garden of Rome. In recent years Italy has made a lot of progresses in the fields of knowledge, investment, sustainable management and synergic development of Natural and Cultural Capitals. Together with the Ministry for the Environment, the Sapienza Interuniversity Research Centre and the Italian Botanical Society are currently working on Habitats Directive, red list of the plants, red list of the ecosystems, check-list of the plant communities, national databank of phytosociological samples, level of the invasive character of alien species, implementation of the Italian Biodiversity Strategy, mapping ecosystems and ecoregions, MAES project, and green infrastructure programme. Moreover, the integration of nature conservation with sustainable models of economic development is the focus of the present scientific and political debate. Therefore, the scientific community has been working with the industry and small and medium-sized enterprises (Unioncamere) bringing out that there is a large share as regard green economy and services provided by natural and cultural capital. Regular meetings are needed for implementing these concepts, combining culture, nature, science, economy and policies. The next in this series of appointment will be in Latvia for the 2nd Conference on Natural and Cultural Capital.

Carlo Blasi

Honorary President, Italian Botanical Society
Director, Sapienza Botanical Garden

In opening this Conference I wish to stress the importance of the theme to my heart. I am very pleased to see that this conference attracts a lot of participants, from very different horizons, working at different scales, within Europe and I am looking forward to very stimulating discussions taking place. As Italian, I have always considered that cultural and natural landscapes are closely intertwined. This is exemplified by the Natura 2000 network of protected sites, which provides a range of services, including cultural ones, that are estimated between € 200 to 300 billion a year. Also, the EU initiative on Mapping and Assessment of Ecosystems and their Services - MAES - is a key priority for the EU and a crucial tool to assess the delivery on the EU 2020 Biodiversity Targets and in particular the 15% restoration target of degraded ecosystems, the deployment of Green Infrastructure and the No Net Loss of ecosystems and services. These tools are also powerful assets to reflect the Natural Capital more fully in all relevant policy decisions, including from other sectors and in particular those related to the territory and the economy. I am very pleased that Italy had recently joined the MAES initiative and will use this opportunity to stimulate the cooperation and positive contribution of scientists, sectors, and stakeholders, to MAES as a collective endeavour. Finally, in Europe, Man has shaped the landscape for centuries and the cultural influence is huge; it is therefore crucial to consider man and nature together and ensure that his influence remains positive and sustainable. The European Commission is therefore fully supporting the "Charter of Rome" as a vehicle to better reconnect man with nature and ensure sound green economy and jobs at all levels. This is a very important message to communicate to the new Commission and Parliament. To reach the 2050 objective of living well within the limits of our planet, there is still a long way to go and quite a few obstacles to overcome, including knowledge gaps, so we need everybody aboard!

Pia Bucella

Director, Natural Capital, DG Environment, European Commission



Eeva Furman

Director, Centre for Environmental Policy
Finnish Environment Institute (SYKE) – Finland

Know the natural capital. The more contacts with natural environments we have during the first year of life, the more diverse microbiota on human body and the better the immunological tolerance on later phases of life.

Know the operationalisation. What should be done in practice to link the Natural and the Cultural Capital, e.g. to foster a close contact with nature and thus increasing immunological tolerance? The EU OpenNESS project worked on 27 case studies to the operationalisation of natural capital and ecosystem services: from concepts to real-world applications, practices, management and policy approaches. Several methods have been and are being tested (e.g. GIS, QUICKScan, Bayesian Belief Networks, State and Transition Models, Estimap, InVest, among others) with a final output to come: an interactive platform (OPPLA) offering tools, services, advice, best practices, contacts and other assistance from experts across Europe.

Know the links. Applied knowledge on how natural processes work provides options for resilient, resource efficient, and locally adapted actions. Using, copying from, being inspired and assisted by nature in technical and social terms help linking ecosystems to solve societal problems in a sustainable way, as nature-based solutions.

Know the drivers of change. EU policies are amongst the most important drivers for ecosystem change in Europe. To understand the link better, OpenNESS works on four EU level scenarios:

- 1 Developments of already existing or currently developed policy instruments,
- 2 Emergence of new policies,
- 3 Termination of 'old' policies, and
- 4 A completely redesigned policy mix/landscape within and across particular policy fields

Participatory scenario exercise will help to reflect on different future developments of the EU regulatory frameworks: eg. How CAP would look like in various scenarios in 2030 and 2050?

Know the supply. Mapping ecosystem services in the case of Helsinki-Uusimaa Regional Plan, currently under preparation, has five themes:

- 1 Business and innovation
- 2 Logistics
- 3 Wind energy
- 4 Green infrastructure
- 5 Cultural heritage

Concerning theme 4, the objective is to identify the key areas of green infrastructure from the point of view of the potential provision of ecosystem services. To support the process, researchers carried out an analysis which is based on:

- Over 20 spatial datasets grouped thematically
- Scoring of these spatial datasets by scientific experts and local experts;
- Quantitative spatial datasets were used when available, e.g. groundwater yield, bioenergy potential

Know the demand. A web-based tool collected knowledge and made a spatial picture of those cultural ecosystem services that have a special meaning to people for recreation, education and research, aesthetics and cultural heritage, spiritual, sacred, symbolic or emblematic meanings of nature at a specific spot on the map in Uusimaa-region, Finland.

Know the values. Price is the best indicator of *market* value, but most ecosystem services *lack markets* and therefore have no price. Does this mean that they do not have a value? They raise the need for integrated valuation: monetary – social – biophysical. The question is not *value or not to value*, but the need to include the domain of money and markets in the environmental policy in a just way. One promising tool is the multicriteria analysis which is now being tested.

Know the management. A voluntary Payment for Ecosystem Services (PES) scheme on private lands to overcome resistance against centrally designed nature conservation is an example in Finland: contracted sites are ecologically valuable but low connectivity remains a problem and cost-savings are small (Southern Finland Forest Biodiversity Programme - METSO).

Know the development. Through the following EU projects:

- OpenNESS: Operationalisation of natural capital and ecosystem services 2012-2017 www.OpenNESS-project.eu
- OPERAs: Ecosystem science for policy and practice 2012-2107 www.operas-project.eu
- BESAFE: Biodiversity and ecosystem services: arguments for our future environment 2011-2015 www.besafe-project.net
- ESMERALDA: Enhancing ecosystem services mapping for policy and decision making 2014 - 2018

Know the dialogue. Tools are available to design and evaluate policy options, e.g.:

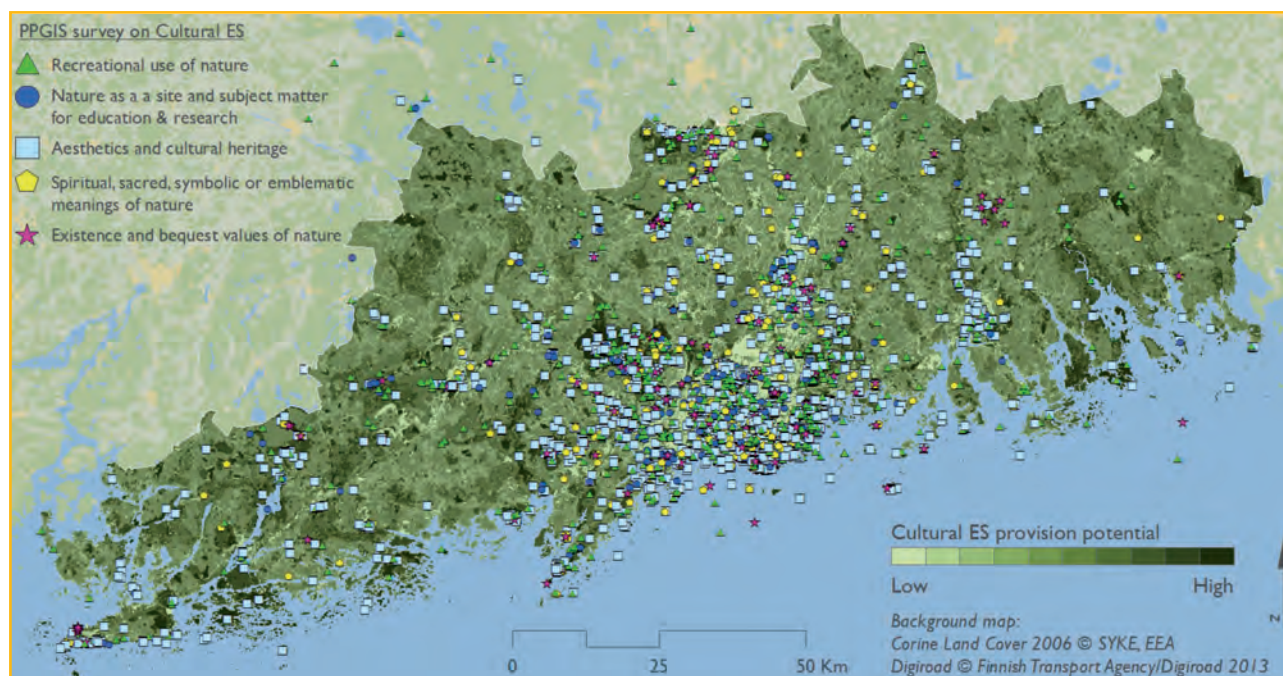
- QUICKScan is both an approach and a software tool applied in group process with policy makers and experts to develop and explore potential policy options and assess likely impacts of those options, <http://quickscan.pro/>
- ALTER-Net: Europe's Biodiversity Research Network is a consortium of 27 Partners in 16 Countries integrating research capacities across Europe, assessing changes in biodiversity, analysing the effect of those changes on ecosystem services and informing policymakers and the public at a European scale. Originally funded by the European Union's Framework VI program to stimulate a collaborative approach, ALTER-Net is now operating independently with funding from its partners, contributing to the lasting integration of Europe's research capacity on biodiversity, www.alter-net.info

Additional readings:

Borg, R., Toikka, A., Primmer, E. 2014. Social Capital and Governance: A social network analysis of forest biodiversity collaboration in Central Finland. *Forest Policy and Economics*. In press. <http://dx.doi.org/10.1016/j.forpol.2014.06.008>

Saarikoski, H., Åkerman, M., Primmer, E. 2012. The Challenge of Governance in Regional Forest Planning: An Analysis of Participatory Forest Program Processes in Finland. *Society & Natural Resources*, 25:7, 667-682. <http://dx.doi.org/10.1080/08941920.2011.630061>

Chan, K.M.A., Satterfield, T., Goldstein, J. 2012. Rethinking ecosystem services to better address and navigate cultural values. *Ecological Economics* 74, 8-18. <http://dx.doi.org/10.1016/j.ecolecon.2011.11.011>



Cultural ecosystem services: the places that have a special meaning to people



Ronan Uhel

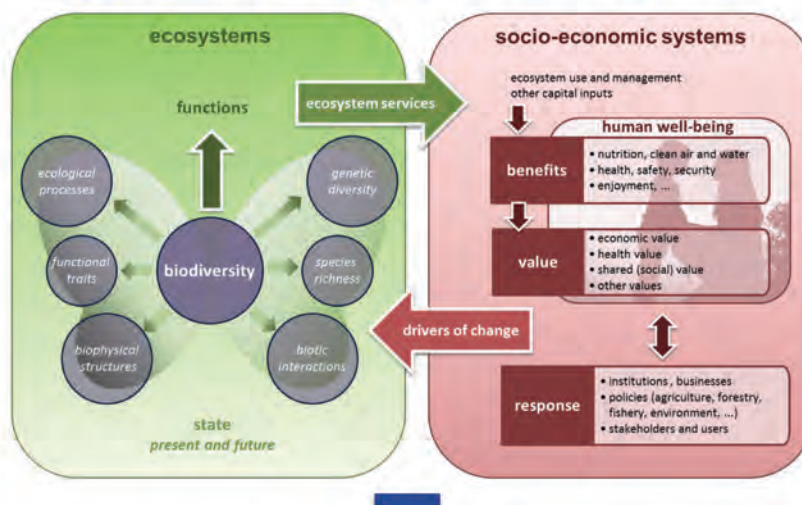
Head of Programme Natural Systems and Vulnerability
European Environmental Agency EEA

European Environment Agency: ... 33 countries and ...cultures (technical, administrative, political)

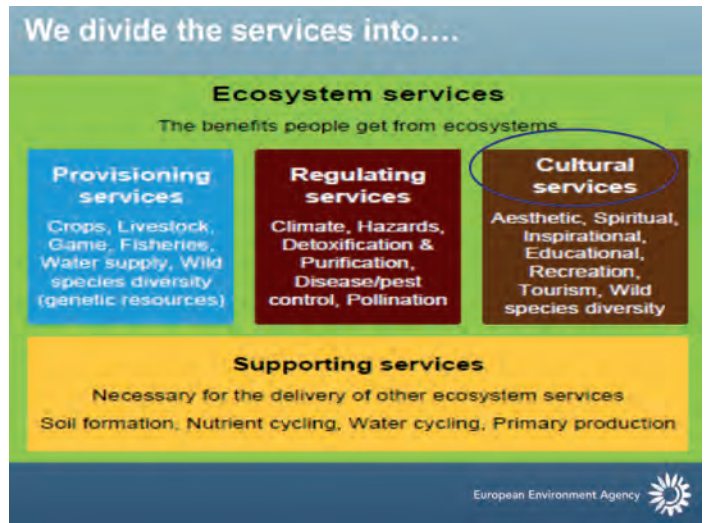
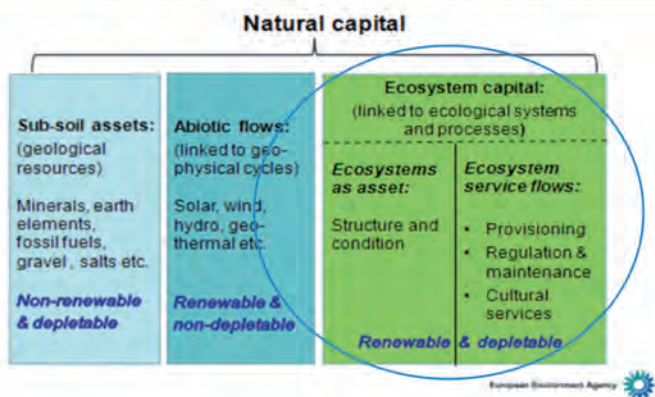
Mapping and Assessment of Ecosystems and their Services



Overall conceptual framework



Need of a common approach to framing Components of Natural Capital:



Human prosperity and well-being depend on the integrity of natural systems and it is vital to understand how our actions impact on this natural capital resource. Natural capital underpins the other capitals recognised as essential for economic and social prosperity, i.e. man-made, human, social and cultural capital.

While all types of capital are needed to support human well-being, natural capital is arguably the most important one because it supports and underpins the other forms of capital. For example, minerals, metals and energy are needed to build the components of manufactured capital.

Human and social capitals are heavily dependent on the physical health of individuals who are dependent upon ecosystem services to maintain good health. These services range from food, freshwater, timber and fibres, regulating ecosystem services, e.g. water purification, nutrient cycling, mitigation of floods, and benefits from open landscapes and urban parks that support recreation and well-being.

Information on how natural capital is being used, depleted or degraded is therefore essential to manage it sustainably. Accounting is an effective way of organising environmental (and other) information in a structured manner and is also the main tool used for reporting the wealth of nations. Hence the development of natural capital accounting is an important target in constructing the knowledge-base for better management of our natural environment.

Accounting systems are designed to bridge the gap between detailed environmental data and the information needed by the public and decision-makers to ensure long-term sustainability. They provide a structured framework for connecting economic activities to their environmental impact and for aggregating different measurements (of natural capital) across environmental issues and spatial scales.

The objective of accounting can be limited to analysing bio-physical trends in a structured manner but many accounting approaches aim to support the valuation of natural capital (in monetary or non-monetary terms), such as ecosystems accounts which provides a form of assessing the state of the environment.

The assessment of ecosystem condition provides information about its capability to continuously provide services for human well-being. This knowledge is essential to document the on-going loss and degradation of ecosystems and their services, the subsequent socio-economic impacts and the identification of pathways towards sustainable development in order to maintain the delivery of services.

As such, ecosystem assessments provide the input for decision-making by addressing and integrating basic information to sectoral policies, i.e. mainly, territorial planning, nature protection, agriculture, forestry, freshwater, marine, climate change mitigation and adaptation, and air pollution reduction.

Such an information highlights the major pressures on ecosystems and outlines the expected results. It is targeted to describe the functional relationships between ecosystem condition, the quality of its habitats, and its biodiversity.

The approach is also feasible for use in other environmental sectors, such as water, agriculture or forest management. It aims to support European policies with European-wide harmonised information, provide the baseline for assessing ecosystem services, and support the work of Member States on their national assessments.



Martijn Thijssen

Senior Advisor
ORG-ID The Netherlands

Digital Atlas of Natural Capital: basis for sustainable decisionmaking

Introduction

Over 40 years of environmental policies have realised a great deal of the policy targets. The quality of both local environment as of the larger systems (e.g. our rivers) has been restored to an often good standard. The European legislation has been of great help in achieving these results. However we are still facing some problems that cannot be solved properly by simply protecting in terms of prohibiting behaviour or taking technical measures. The decline of biodiversity and their ecosystem services is one of those problems. The cause of this decline is lying in the relative weak position that the value of these subjects have in our economy. To enhance this position it is vital to improve the transparency of these values. It is therefore that the Netherlands works enthusiastically on the implementation of MAES. When discussing the mapping of ecosystem services we realised that this should not just be done to be able to report to the Commission, but, as important, to support our own sustainable decision making.

Principles

We realised that the data should be available freely for the whole society. Therefore an efficient use of the information we were generating would best be served by making it available on the internet. Following this we concluded that we should make a Digital Atlas of Natural Capital (DANC). The DANC should provide information on the status of our natural capital, but also information on how to make better sustainable use of it. Next to this it should also be a platform for conceptual developments on this relatively new issue. To make sure we would provide the information needed and in the right terms and words a process with stakeholders was organised, including several workshops, interviews, and usability-tests. It was their needs and wishes that were leading in the development of the DANC.

The DANC

In the first version of our DANC some 300 maps of (indicators for) ecosystem services will be made available. Based on the wishes of our users we developed three main entrances towards the information. The first entrance is called 'Natural Capital'. If you follow this entrance you will enter an infographic with icons for the different ecosystem services. Clicking on these icons will bring you to specific information about the ecosystem service and – again – to the maps that are related to this ecosystem service.

The second entrance is 'applications', in fact meaning 'What's your aim? What topic are you working on that you need information for?'. If you click on this entrance you will get an

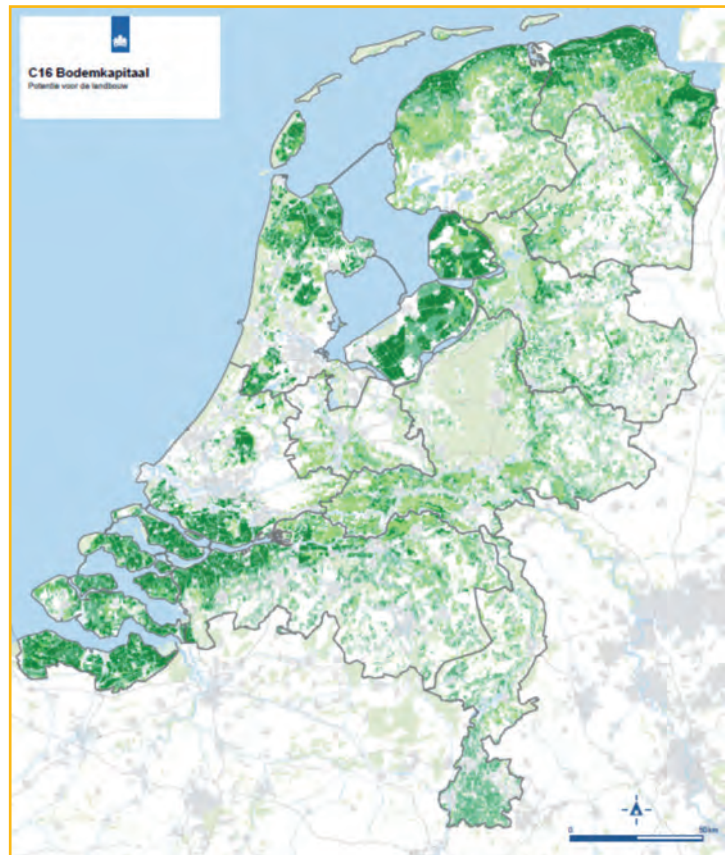


overview of subjects that relate to natural capital. Clicking on one of these subjects will show you more information on how to integrate natural capital in your decisions, and will show the maps that are relevant for your questions. The third entrance will bring you directly to the maps. This entrance is mainly for users who know very well what information they need and how to use it.

Potential usability

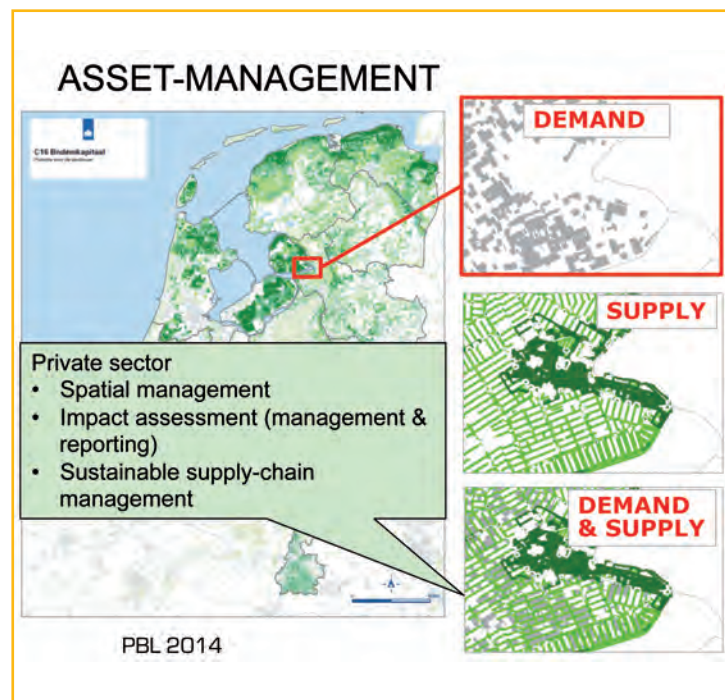
Data are only valuable if you are able to make good use of them. In the concept of natural capital there is still quite some development to be done. We would like the DANC to be the basis for better 'asset-management' of our natural capital. The Netherlands Environmental Assessment Agency (PBL) has recently done a research on the potential supply and demand of ecosystem services in The Netherlands (1). Using this information in the DANC it might be possible to analyse the potential for an ecosystem service on a certain location, and compare it to the demand for this service. Comparing the two gives you the management options. In the case of a shortage of supply one can actively work on the enhancement, or lowering the demand. And monitoring of changes in supply will give an insight whether measures on enhancing natural capital are working correctly. This will be interesting for both governmental organisations as well as for the private sector that is heavily relying on our natural capital.

(1) Natuurlijk kapitaal. Toestand, trends en perspectief (PBL, Dirx, 9.12.2014)



What do we need to fulfill our ambition?

We need further scientific valuation of methods and models. If we want to convince the 'classical' economists in taking notice of our natural capital in their decisions the knowledge should be firm and accepted. Directly related to the latter, it will help us convincing the right people if there is a community with a common language and story. We also need cooperation with the private sector and their integrated reporting systems. Private sector (at least a part of it) sees the need of sustainable production. They need the information on how to do this. Mapping may help them, if done in the right manner and with the right indicators. Finally, a shift in our common policies from strict protection towards sustainable use would be helpful. This does not mean that the ambition should be lowered. On the contrary, the results we achieved so far should be cherished and the legislation is an important driver for this. We feel however that further development can only be achieved by a focus on sustainable use. As this will incorporate the true natural values we have in our economic system.





Giulia Capotorti

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Improve the Knowledge of Natural Capital: recent advances in Italy

Basic concepts

- **Importance of the ecosystem approach.** For improving knowledge of ‘natural capital’ we need to deeply understand and recognise biodiversity from an ecosystem perspective, in terms of structure and state of biotic and physical components, functions and spatial arrangement.
- **Data availability issue.** Starting from ecosystem knowledge we can translate components into natural capital stocks, functions into ecosystem services provision and spatial arrangement into expected flows of ecosystem services. Nevertheless, in order to reach proper translations, we need to overcome constraints posed by data availability.
- **Strength of ecosystem mapping.** Ecosystem mapping allows assessment and monitoring of ecosystem extent and distribution, recognition of their territorial context and analysis of ecosystem services within suitable ecological land units. (SEEA - System of Environmental Economic Accounting, 2013; UNEP 2014, Towards a global map of natural capital: key ecosystem assets; EU Biodiversity Strategy 2020, MAES Working Group).

Knowledge of Natural Capital: State of the art in Italy

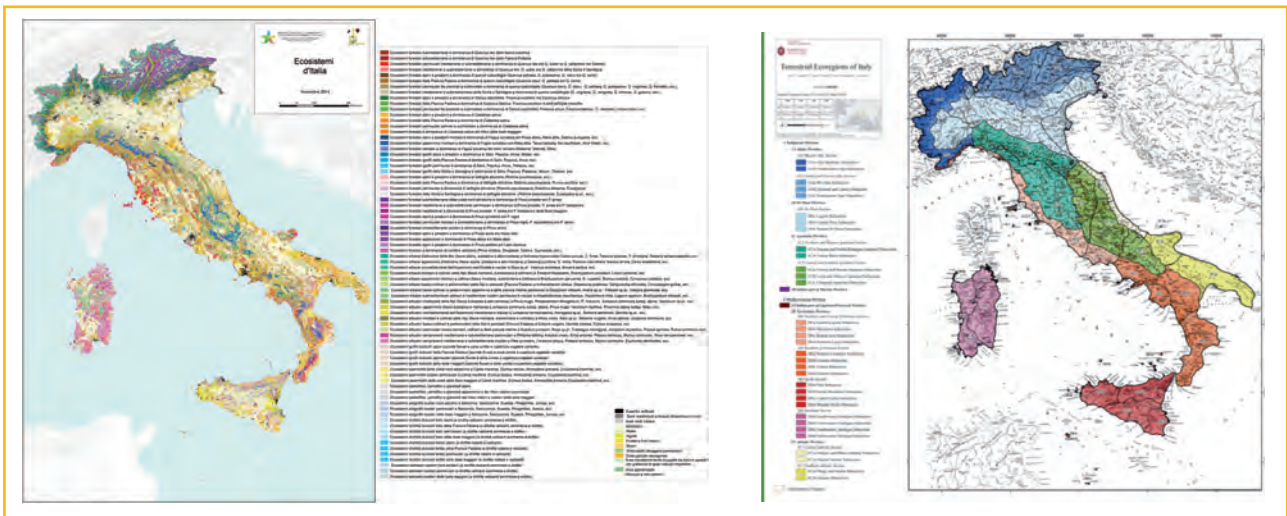
A series of national projects for improving and updating knowledge on biodiversity were carried out by the Italian Botanical Society, with the involvement of a very wide network of scientists, and supported by the Italian Ministry of the Environment. These projects relate to biotic and physical components of the national natural capital including flora, habitats, vegetation potential and vegetation communities, Important Plant Areas, old growth forests, plant invasion, bioclimate, litho-morphology and environmental land units.



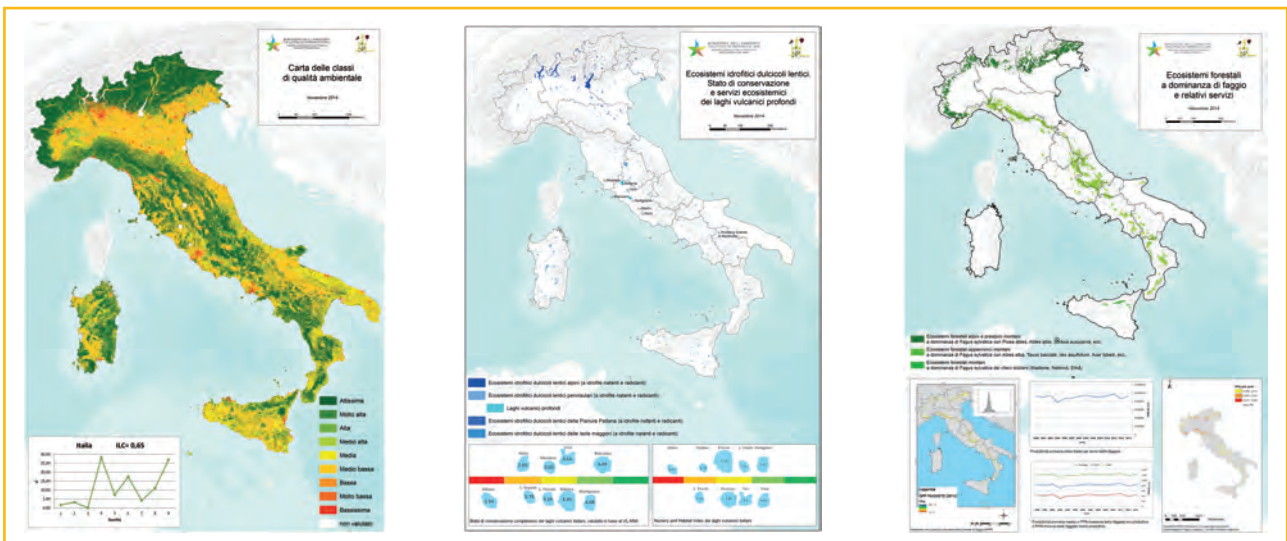
Biodiversity in Italy.
Relevant national projects
since 2005.

Mapping and Assessing Ecosystems and their Services in Italy (MAES-IT)

This background knowledge allowed to build the Ecosystem Map as well as the Ecoregion Map of Italy (ecoregions represent broad regional ecosystems) and, at present, the integration between this two maps is sustaining the assessment of ecosystem conservation status and services provision.



Ecosystem Map of Italy (*Italian MAES project*) and Terrestrial Ecoregions of Italy (*Blasi et al. 2014, Plant Biosystems 148*).



Map of the environmental quality of Italian ecosystems and two sample maps for ecosystem services provision, respectively for freshwater lentic ecosystems and beech forests (*Italian MAES project*).

Natural and cultural dimension of in depth ecosystem classification and accurate mapping

In depth ecosystem classification, accurate mapping and integration with the ecoregional features means that in Italy we can:

- dispose of detailed information on species composition and properly recognise the conservation interest of ecosystems
- accurately join field data on ecosystem functions with the assessment of service provision
- calibrate adaptation and mitigation measures to environmental changes
- and also relate definite cultural values to each ecosystem type

Future prospects

Notwithstanding the amount of acquired knowledge at the national level, increasing investment on scientific research is required:

- for capitalising and integrating available information on the natural and cultural dimension of ecosystems
- for bridging the gaps in biodiversity knowledge and reduce approximations

In other words, we need to progressively fill the white cells of our maps and databases and found critical estimations (such as environmental risk, adaptive capacity to environmental changes, agriculture sustainability, and citizen well-being) on accurate basic data.



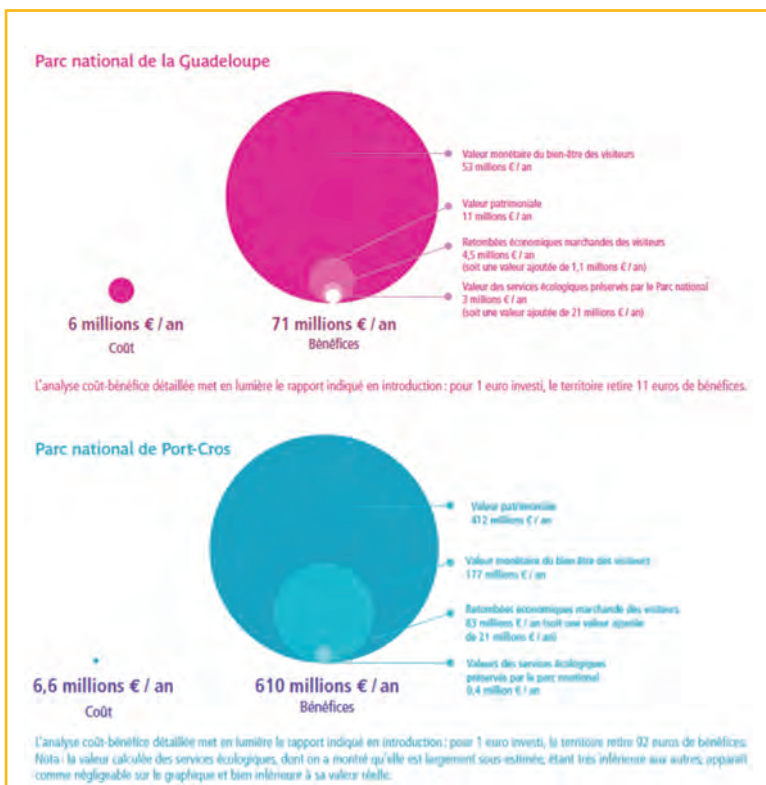
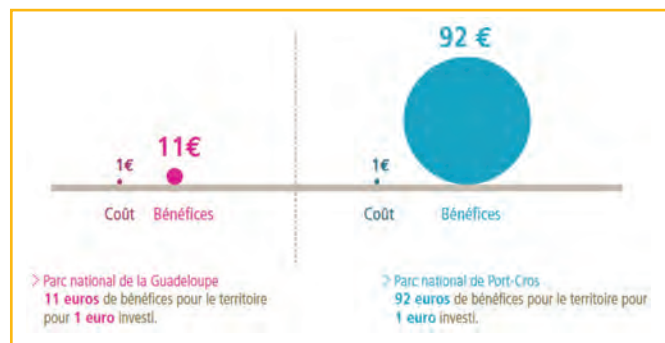
Laurent Roy

Director, Water, Marine & Biodiversity, France
Ministry of Ecology and Sustainable Development

Living well, in the ecological limits of our planet. Culture and Nature: the EU's Capital

Many thanks to the Italian presidency for this opportunity to share experience on Cultural and Natural synergies in the framework of the on-going discussion on the greening of the EU 2020 Strategy for growth and jobs. There are strong links between natural and cultural capital in the French partnership agreement, given our national priorities but also as a result of the discussions with the Commission on how to invest on policies with direct and indirect impact on jobs and territorial development. Some studies and experiences in France could feed the bibliography started by our Italian colleagues, which indeed could be a relevant reference to all of us when we need scientific evidence on socio economic impacts. This work should be carried out in an extensive way, with studies in all EU languages so as to show how dynamic and smart nature management can be. This being said, greening the EU semester and contributing to the Commission's initiative on green jobs remain a challenge.

Return on investment in protected areas and support to green jobs. The study on "National Parks, a solid value for territorial development" (1) focuses on the evaluation of costs and benefits in protected areas with high cultural value, combining ecological, heritage, intrinsic and utilitarian values, and finally, assessing the economics of ecosystem services, heritage value with local population, visitors well being and tourism income. One of the results of the study shows for the Guadeloupe National Park 11 € of return for each € invested in the territorial development. For the Port Cros National Park the return on the investment is 92 €.



Concerning the green jobs development, eco-activities are all those related to nature, biodiversity and landscape producing goods and services aimed at protecting and managing natural resources. They are among the most dynamic sector in the context of green jobs, representing 455 000 jobs, + 6.7%, from 2010 to 2011, while the national unemployment rate is growing. The conversion rate between production and created jobs is 1 to 12. Comparatively, figures are: 1 to 9 for soil and water rehabilitation, a sector for which the national investment progression is equivalent to +7.4%; 1 to 5 for used water and waste with a national investment 6 to 7 times higher.

Ecological engineering is identified as one of the 18 sectors for potential job creation. The National Plan (2) includes the:

- definition of ecological engineering jobs;
- promotion of best practices and quality standards;
- support to innovative projects and research.

The recent conclusions on the greening of the EU Semester (3) give perspectives to similar support at EU level. Consequently, it looks necessary to mobilise finances for implementing this high potential for the employment.

Protect and promote environment and heritage is the fifth priority of the French Partnership Agreement. In the EU context, the negotiation on preserving the environment and sustainable use of natural resources (Thematic Objective 6), should be proved to be an investment for sustainable growth and jobs covering a wide range of priorities: from waste, water and biodiversity to marine and urban environment, natural and cultural heritage and sustainable use of resources through innovation and green growth. The National consultation launched with over 300 public and private partners identifies three result-oriented priorities:

- Actions in favour of knowledge and good environmental status;
- Conservation and promotion measures for natural and cultural heritage and landscape;
- Promotion of sustainable, innovative and efficient use of natural resources.

In France priority levels in the operational programmes defined by the managing authorities and still under approval by the Commission, are:

- Regions as managing authorities for 2014-2020;
- Priority given to the Thematic Objective 6 which corresponds to the fifth funding priority;
- Environmental conservation and heritage: ecological continuities, cultural and natural heritage come first in territorial development.

Answers to the Commission expectations for contributing to the EU growth and job strategy are:

- Ecological transition is needed for sustainable growth and green jobs;
- Investments in cultural and natural heritage secure regional attractiveness, quality of life and tourism development.
- Evaluations of the return on investment are further required.

In conclusion, France thanks the Italian Presidency for organising this conference, which is:

- An opportunity to highlight some results in valuating natural capital linked to its cultural and socio-economic dimensions;
- A useful link with the Council conclusions on greening the EU Semester;

A step to further work, including:

- A compilation of existing studies, with the support of the EEA, providing evidence on the socio-economic impacts of natural capital, policies and return on investment, in particular of protected areas and ecological continuities;
- A further definition of green jobs and in particular links with green infrastructure;
- A support the better integration into the EU 2020 Strategy through the introduction of an EU non-binding aspirational target.

With the Charter of Rome and its background document, the Italian presidency highlights many available studies on the economic valuation of protected areas, providing evidence on the socio-economic impact of biodiversity, contributing to better integrate resource efficiency and Natural capital in the EU 2020 strategy, including through the introduction of an EU non-binding aspirational target. France welcomes the special report by the European Court of auditors N°12 "Is the ERDF effective in funding projects that directly promote biodiversity under the EU biodiversity strategy to 2020?" and support its recommendations in particular to monitor the actual implementation, identify difficulties, and facilitate the funds mobilisation.

References:

- (1) Les Parcs Nationaux : une valeur sûre pour les territoires, 2014.
www.parcsnationaux.fr/content/download/11315/102472/file/noteValeurEconomiqueBasseDef2.pdf
- (2) Les éco-activités et l'emploi environnemental en 2011 : premiers résultats, CGDD, Chiffres & Statistiques N°418, 2013.
www.developpement-durable.gouv.fr/IMG/pdf/CS418.pdf
- (3) European Union Council Conclusions on Greening the European semester and the Europe 2020 Strategy - Mid-term review, 28 October 2014 www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/envir/145488.pdf



Shirley Trundle

Nature Director, Department for Environment, Food & Rural Affairs - DEFRA, United Kingdom

UK Government perspective on natural capital

The evidence base. The UK National Ecosystem Assessment:

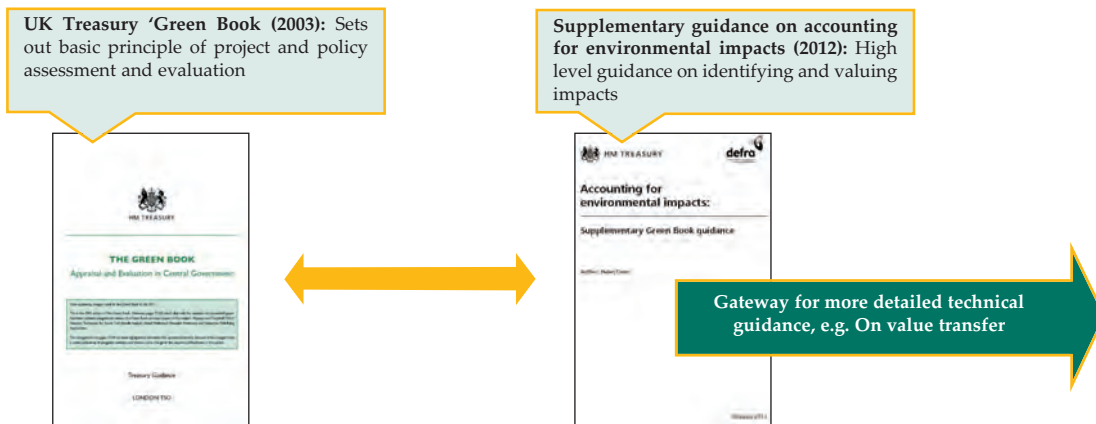
- Nature is critically important to our wellbeing and economy
- But it is consistently undervalued in decision-making
- Many of nature's services are in decline or in a degraded state



Evidence has informed policy strategies so that they set the right framework for taking ecosystems and their services into account: Natural Environment White Paper (June 2011) – key theme of natural value.

Biodiversity 2020 (July 2011) – The biodiversity strategy for England. A new approach to biodiversity conservation / focus on whole natural systems as well as individual species and sites, includes specific ecosystem approach outcome.

New guidance on taking better account of the value of nature in government policy appraisal:



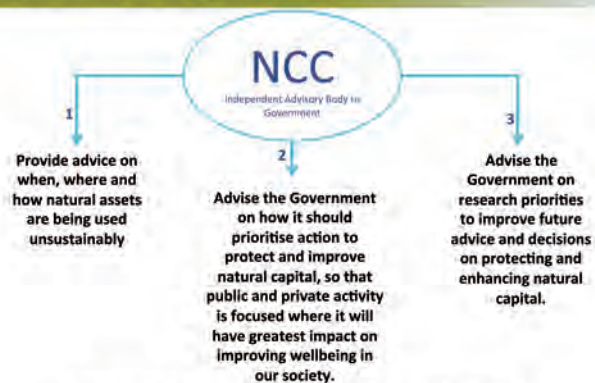
A programme of work on incorporating the value of nature in the UK's national accounts: Roadmap to Natural Capital Accounting (December 2012): Sets out programme of work to 2020

First partial estimates of the value of UK Natural Capital (May 2014)

Principles of ecosystem accounting paper (August 2014)



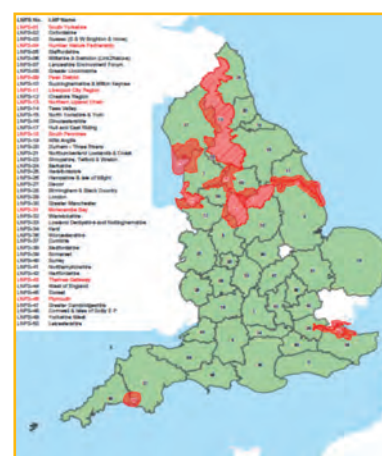
Role of Natural Capital Committee



Reports to the Economic Affairs Committee chaired by the Chancellor



Developing greener markets - opportunities for business that might be realised through an enhanced approach to the natural environment.



Establishment of 12 Nature Improvement Areas driving ecosystem restoration on a landscape scale

- NIAs: cross-sectoral partnerships (local authorities, NGOs, private land managers and local businesses)
- driving ecosystem restoration on a landscape scale
- NIAs are a flagship ecosystem approach initiative, taking the policy from headline messages into local application and delivery

Case study: North Devon (river Torridge catchment)

- 750 ha of culm grassland restored; 100 ha of wetland/woodland creation; 43 Km of hedgerow restored; advised 10% of the catchment's landowners (435 visits); volunteer biodiversity surveys; over 50 community events

High level messages: the case for investing in natural capital:

- Concept of natural capital helping to reframe debate on importance of natural environment to economy and society
- Recognising the value of natural capital to country's long-term economic growth and prosperity
- Investing in natural capital can deliver substantial economic benefits
- Compelling evidence is important!

"The natural world, its biodiversity and its ecosystems are critically important to our well-being and economic prosperity, but are consistently undervalued in conventional economic analyses and decision making" UK National Ecosystems Assessment.

Relevant links

- UK National Ecosystem Assessment: <http://uknea.unep-wcmc.org/>
- Natural Environment White Paper: <https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature>
- Natural Capital pages on the ONS website: <http://www.ons.gov.uk/ons/guide-method/user-guidance/natural-capital/index.html>
- Natural Capital Committee: <https://www.naturalcapitalcommittee.org/>
- Defra Payment for Ecosystem Services initiatives: <https://www.gov.uk/government/publications/payments-for-ecosystem-services-pes-best-practice-guide>

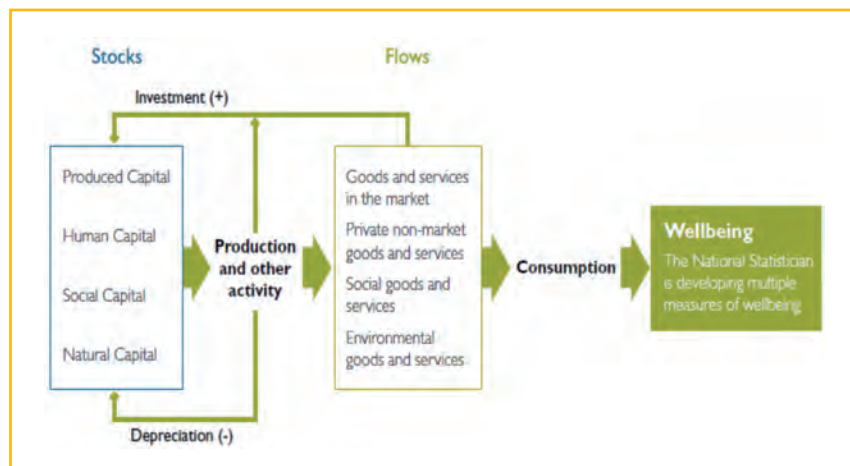


Eva Mayerhofer

European Investment Bank, Luxembourg

Financing and Investing in Natural Capital

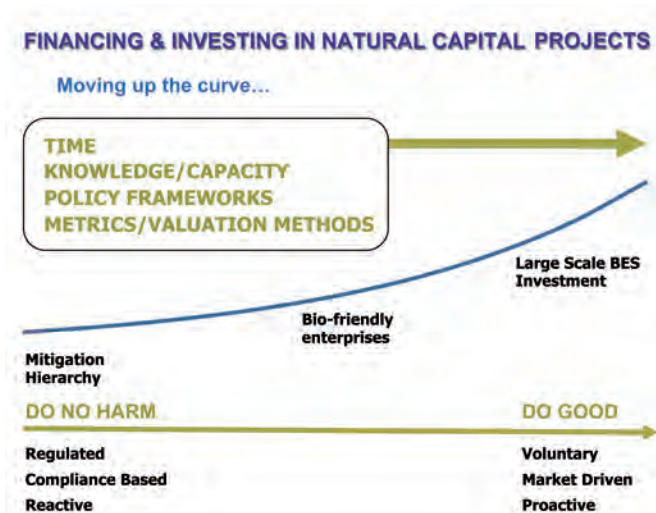
Inter-linkages between Community Capitals:



Harper and Price (2011)

Natural Capital in Finance:

- Source of Finance: national budget, private capital flows, international/EU support flows
- Scale up flows to natural capital compared to other flows: increase our slice of the pie by mainstreaming biodiversity into other sectors and into national budgets and engineering new flows
- Require necessary enabling conditions: cash, delivery mechanism, safeguards



Financing & Investing in Natural Capital Projects

Need = Asset or Commodity (Measureable, Verifiable and Tradable Value)

- metrics that are locally appropriate but standardized across markets
- an issue of scale, geography and system complexity
- an asset which can overcome risks associated with permanence in a natural system

Need = Demand (A Market)

- all projects must achieve acceptable financial and economic rates of return
- challenge of converting a 'free' asset to a cost (incentive, regulation or consumer pressure)
- challenge in identifying demand-side participants

Need = Risk Reduction (Particularly Permanence of Asset in this Case)

- ensuring the true opportunity cost is overcome
- *alignment of interests* – pure ecosystem assets vs. sustainable harvesting
- ensuring associated alternative livelihood strategies are sustainable

Need = Informed Supply-Side Project Managers

- project developers must have specialist project knowledge (common) but also financial expertise to allow them to translate their projects from grant based operations to investment opportunities....



The Natural Capital Financing Facility

- **Why?** Financing gap for biodiversity and climate adaptation; emerging market opportunities for investments in natural capital
- **Market failures:** perceived high risks, lack of track record, long pay-back periods
- **Objectives:**
 - To encourage investments in revenue-generating or cost-saving projects promoting the conservation of natural capital to meet biodiversity/adaptation objectives and support green growth;
 - To demonstrate to private investors the attractiveness of natural capital projects; build project pipeline

Project Example

- **What is the project?**
 - GI +PES - Fund green investments in business improvement districts for which local businesses would be willing to pay, because of improvements in the business environment and delivery of ecosystem services – installation of green roofs, walls, rainwater harvesting etc...
- **Who are the actors involved?**
 - Business Development Districts in large city
 - Public-private regeneration partnership comprising of local authorities city statutory bodies, local businesses and partner organisations.
- **How does it generate revenues/cost savings?**
 - The main opportunities for revenue generation lie in the financing of ambitious GI and pro-biodiversity schemes. Cost savings can also be attributed to GI installations.
- **Relevancy to the NCF**
 - While small scale GI installations are being delivered within traditional financing mechanisms, it is impossible to attract that same financing to larger scale, public realm interventions. Despite evidence of revenues and cost savings, there are also barriers to securing commercial finance due to the novel and innovative nature of the approach, and perceived risks among potential financiers. NCF investment will address these barriers and demonstrate new financial models of urban green infrastructure.
- **Benefits**
 - Potential for increasing the stock of natural assets within an intensively-used sub-region at the centre of the city. The city is rapidly growing with plants to continue this rapid growth. A strategic intervention from the NCF will support this growth to be pro-biodiversity and sustainable. Clean air, protection against surface water flooding, pollination of plants and provision of “green lungs” in the form of GI with dense urban areas – all of these are vital natural capital assets with associated positive multiplier effects on quality of life and economic productivity.



Domenico Mauriello

Unioncamere Research Department, Italy

Invest In Natural Capital. Protected Areas: a Laboratory of Green Economy and Green Jobs



Green jobs: stock, flows and value added:

- more than 3 million green jobs in the Italian economic system: 13,3% of total occupation
- 50,700 green jobs planned to be recruited by Italian enterprises in 2014 (13,2%)
- 183,300 “hybrid” professions (47,6%)
- 101 billion € of value added produced by green jobs in 2013 (10,2% of total, excluding shadow economy)

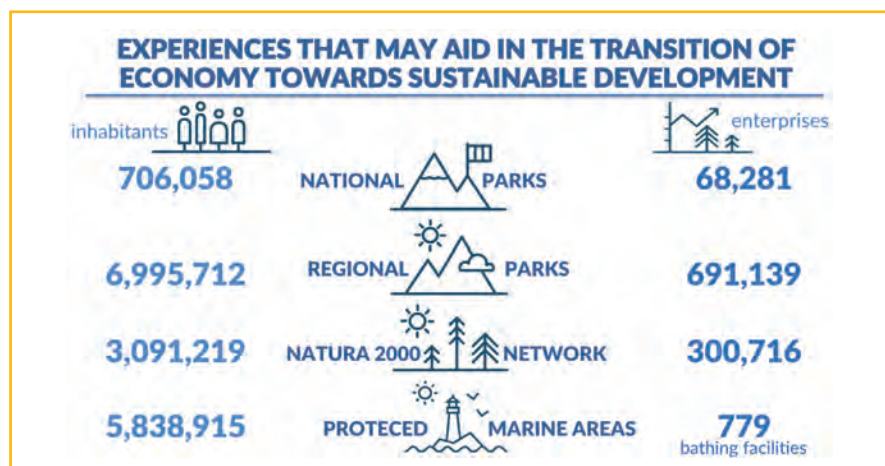
Protected areas: a great laboratory of innovative and environmentally friendly best practices, where it is possible to demonstrate the advantages of integrating nature into regional planning and into the development of local economies.

Monitoring of the real economy in protected areas.

The protagonists: **23** National parks, **152** Regional parks, **29** Marine protected areas & underwater parks, **2.299** Natura 2000 network sites involving **4,166** Italian municipalities (more than half the total): an important ‘green lung’ for municipalities with high urbanisation levels.

The methodology: municipalities with at least 45% (National Parks) or 50% (Natura 2000 network) of land surface within the protected area (with adjustments for those municipalities not exceeding this threshold). 3,765 Municipalities covered by Natura 2000 sites; 822 Municipalities with at least 50% of their surface; 19.1% of the total Italian surface covered by Natura 2000 sites.

Experiences that may aid in the transition of economy towards sustainable development:



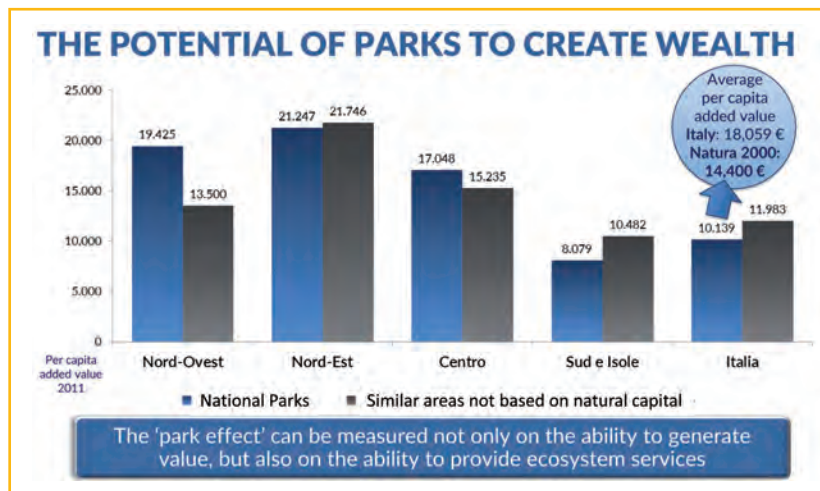
- 1 Many sites of protected areas have experienced difficulties often related to their cultural marginalisation and to a lack of acknowledgement of their identity. 0.9% variation of population 1991-2012; -5.6% in National Parks but +5.1% in Italy. But things are changing and we are witnessing 'reversal' phenomena: between the beginning of 2012 and the beginning of 2013, population decline in Natura 2000 sites ends: +0.02%
- 2 Young people and women rediscover protected areas. And they create business: 30.5% resident population under 30 of age, 31,2% in National Parks, 29,4 in Italy. 35,514 young people-owned enterprises (12% of the total), 13,1% in National Parks, 11% in Italy. 75,630 women-owned businesses (1/4), 26,8% in National Parks, 23,6% in Italy. The highest percentages in trade, commerce and agriculture.
- 3 Protected areas represent a 'living system'. Even from the economic standpoint. 9,7 is the number of businesses per 100 inhabitants in national parks and in Natura2000 sites. The national average is 10.2. 3 is the average number of employees in businesses. The figure in the national parks is 2,3. The national average is 3.7. Protected areas are the lifeblood of their inhabitants, as they protect the enormous wealth of biodiversity of these areas, making it a source of occupation and welfare.

There is a 'park effect'. In the future, it will be even more evident.

The real economy of national parks is a model for contrasting the crisis. The cumulative % variation in added value 2011-2013 (in current terms): Italy - 1.8%, national parks - 0.6%.

Which actions support the development of protected areas?

- Adopting a permanent monitoring system of the economy of the protected areas that can evaluate, monitor and assess operational projects for economic enhancement and support of action plans;
- Giving due importance to the natural capital of protected areas in the assessment of national wealth, by integrating economic data with environmental data, thereby acknowledging its value in public policy;
- Supporting the central role of protected areas in cohesion policies as a catalyst for local development, leading them to contaminate the "outside areas" with their sustainable management model and to develop projects that go beyond local boundaries;
- Encouraging the creation of «networks» involving protected areas with different characteristics, policy makers, public entities, civil society, environmental groups, production chains, the research community and economic representatives;
- Strengthening the identity of protected areas not only among inhabitants and tourists, but also among businesses, by raising awareness of the competitive value of natural capital, starting from the data and the experiences of the real economy.



www.unioncamere.gov.it www.starnet.unioncamere.it





Miguel Aymerich Huyghues-Despointes

Vice-Director of the Environment, Ministry of Agriculture, Food and Environment, Spain

Spanish Ecosystem Assessment: Ecosystems and Biodiversity for human wellbeing

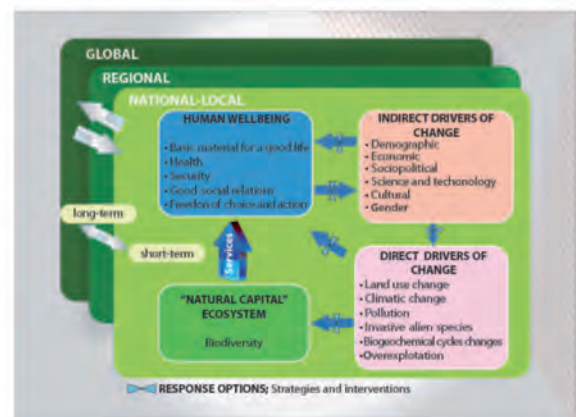
Framework

Spanish National Ecosystem Assessment: focuses on the relationships between ecosystems, biodiversity and human wellbeing.

- Maps and assesses ecosystem services
- Makes information available on natural capital
- Promotes scientific knowledge

to understand the complex interactions between nature and society.

Second phase is being undertaken for accounting ecosystem services.



Overview

| | |
|--|--|
| <p>WHAT</p> <p>SNEA is the first analysis done on the state and trends of biodiversity and ecosystems of Spain and its contribution to our human wellbeing.</p> | <p>WHO</p> <p>More than 60 researchers from 20 institutions, Ministries and Regional Governments, International advisory board, Stakeholders involved: NGOs, enterprises, general population.</p> |
| <p>HOW</p> <p>Data bases, Cartographic Information, Literature review, Expert panels, Focus groups, Workshops, Interviews, Questionnaires</p> | <p>WHEN</p> <p>Launched in 2009 in Spain by Spanish Ministry of Agriculture, Food and Environment and Biodiversity Foundation in collaboration with Autonomous University of Madrid</p> |

SNEA

What we have done

14 types of ecosystems assessed by different teams of experts

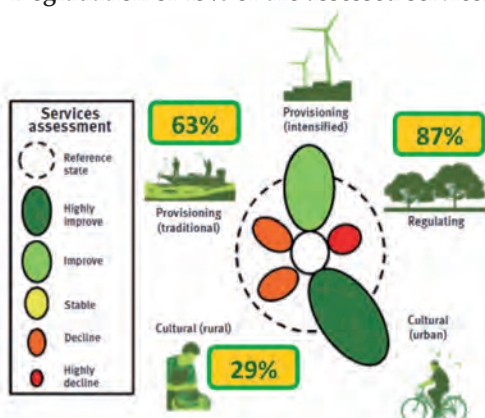
22 ecosystem services from:

- Provisioning (N=8)
- Regulation (N=7)
- Cultural (N=7)

6 direct and 6 indirect drivers of change:

Key findings

Degradation of 45% of the assessed services



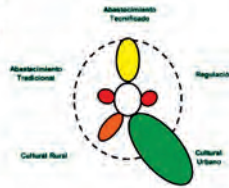
At the national level (integrating all 14 ecosystem types): 45% of the ecosystem services assessed show a declining trend. The most affected are the regulating services (87%) and the provisioning services (63%), while cultural services are the least affected (29%).

There is a clear trade-off of services depending on their demand: those that are associated with an urban lifestyle (i.e., production of biotic materials, recreation or environmental education) are increasing, while those that have traditionally been associated with rural population have shown a reduced flow.

Freshwater and marine ecosystems are under the most critical pressure



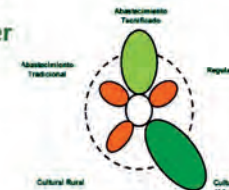
Rivers and riverbanks



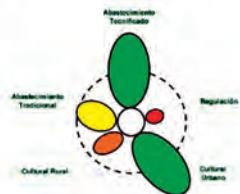
Wetlands and lakes



Acuíferos and groundwater



Marine



Available information (www.ecomilenio.es)

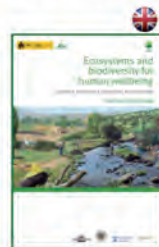
Final Report
+2000 Pgs.
33 Chapters



Synthesis Report
303 Pgs.
11 Chapters



Synthesis of key findings
90 Pgs.
9 Chapters



Educational materials

34 Pgs.
1 slide presentation



Cartographic information

86 Maps



Natura 2000 network: our natural capital

Spain: Natura 2000 Network: 27% of the Spanish Terrestrial surface (148.000 km²)
Sites of Community Importance (SCI): 1.448
Special Protection Areas (SPA): 598

Main challenge: Ensuring the implementation of the EU nature legislation, in particular in relation to ensuring an adequate management of the Natura 2000 Network.

Natura 2000 Network is the essential cornerstone for protecting and securing our natural capital.





Birgit de Boissezon

Head of Unit, Sustainable Management of Natural Resources
DG Research and Innovation, European Commission

Towards a new policy agenda for EU Research and Innovation: Linking Natural and Cultural Capital

Commission Priorities

- A New Boost for Jobs, Growth and Investment
- A Connected Digital Single Market
- A Resilient Energy Union with a Forward-Looking Climate Change Policy
- A Deeper and Fairer Internal Market with a Strengthened Industrial Base
- A Deeper and Fairer Economic and Monetary Union
- A Reasonable and Balanced Free Trade Agreement with the U.S.
- An Area of Justice and Fundamental Rights Based on Mutual Trust
- Towards a New Policy on migration
- A Stronger Global Actor
- A Union of Democratic Change

EU R&I policy and the Charter of Rome

EU objectives

- Define and implement EU R&I objectives and priorities for promoting nature-based solutions which increase economic, social and environmental resilience and improve risk management.
- Demonstrate that innovating with nature provides sustainable and cost-effective solutions, notably for re-naturing and greening cities, climate change adaptation, biodiversity and ecosystem restoration, cultural heritage and human health and well-being.
- Promote and structure environmental research at EU and international levels to increase its impact.

Linking to the Charter of Rome ...

'Know the Natural Capital'

'Natural Capital': Natural assets that provide humans with a flow of ecosystem services, non-renewable resource stocks (e.g. fossil fuels, minerals) and renewable natural resource flows (e.g. solar and wind energy).

EU FP RESEARCH ON BIODIVERSITY AND ECOSYSTEMS and R&I POLICY ON OPEN ACCESS

Example: Pollinators (STEP www.step-project.net): *Food security - >50% crops depend or benefit from insect pollination; - Pollination service worth ~22 B € / year in Europe (crops only) with major contribution from wild pollinators; - Pollinate and ensure survival of emblematic species of natural landscape*

'Invest in Natural Capital'

R&I Policy on Nature-Based Solutions and Renaturing Cities

- To promote positive, innovative responses to societal challenges, that are inspired and supported by nature, maintain or enhance natural capital and simultaneously meet environmental, social, and economic objectives.
- To position Europe as a world leader both in R&I on nature-based solutions and in the global market for nature-based solutions by adopting a systemic approach to applying nature-based solutions to societal challenges, transforming challenges into innovation opportunities.
- H2020 Expert Group priorities: - *Sustainable Urbanisation* ; - *Improved Risk Management and Resilience* ; - *Restoration of Degraded Ecosystems* ; - *Climate Change Adaptation and Mitigation*.

'Secure the functionality of ecosystems'

FP Research

- **Operationalization of Natural Capital and Ecosystem Services (OPERAs & OpenNESS)**

Cultural Landscapes of Montado (Portugal)

Using the ecosystem services and natural capital concepts to combine practice, productive, ecological and cultural aspects of socio-ecological systems to promote improved management of cork trees. Key issues are the effects of climate change, land management and pollution in pushing Montado landscapes toward economic and ecological tipping points.

Wild food as cultural ecosystem service. Wild plants and animals consumed as food provide an important ecosystem service that

need more policy attention due to the significance of wild food to European traditions, cultural identity and recreation.

- SC5-7-2015: More Effective Ecosystem Restoration in the EU
- Nature-Based Solutions and Renaturing Cities

'Link Natural and Cultural Capital'

'Cultural Capital'

Intangible (people, beliefs, music, cultural ecosystems and cultural diversity etc.) or tangible (historic buildings, artefacts etc.) assets.

EU FP RESEARCH ON CULTURAL HERITAGE (Examples)

- cultural capital per se: MEMORI www.memori-project.eu
- Dosimeter to indoor climate and light, oxidizing acidic air pollutants
- Prototype of a portable reader for in-situ measurements and analysis
- Cultural landscapes

HERCULES (www.hercules-landscapes.eu)

- Community-based hub for good Landscape Stewardship, roadbook for management of heritage values, typology and map/crowd sourcing

MEMOLA (www.memolaproject.eu)

- Contextual strategies of preservation, diffusion and valorisation of cultural heritage and the environment, new participatory methods

Developing a dynamic EU R&I agenda on Cultural Heritage

- To move from a more conservation based agenda to a dynamic policy for cultural heritage with focus on development opportunities co-designed by all stakeholders, giving value to our Cultural Heritage, attract investment, new economic activities and enterprises - Horizon 2020 Expert Group;
- To promote innovative use of cultural heritage for economic growth and jobs, social cohesion and environmental sustainability, through;
- innovative finance, investment, governance and business models to enable cultural heritage to be a successful production factor;
- innovative use of cultural heritage to encourage integration, inclusiveness, cohesion and participation;
- innovative combined (re)use of cultural and natural heritage.

'Link Natural and Cultural Capital'

'Synergies between Natural and Cultural Capital'

Goal: to generate economic assets, employment opportunities, support to key sectors (e.g. tourism) and contribute to the well-being of society and citizens.

- Innovative combined (re)use of cultural and natural heritage
- Cultural heritage in European landscapes and environments
- More effective way of integrating the management of natural and cultural heritage
- New methods of planning and designs to help integrate ecological and cultural-historical strategies

'Create synergies among green infrastructure, urban and rural areas'

Nature-Based Solutions and Renaturing Cities

- Renaturing Cities: Addressing Environmental Challenges and the Effects of the Economic Crisis through Nature-based Solutions (Brussels, 13-14.5.2014);
- European Conference on Renaturing Cities: Systemic Urban Governance for Social Cohesion (Milan, 1-2.12.2014);
- Nature-Based Solutions to Environmental, Health and Societal Challenges – (Brussels, 18-20.5.2015) co-organised ALTER-NET/EC;
- Green Infrastructure and Urban Biodiversity for Sustainable Urban Development and the Green Economy (FP7 GREENSURGE - <http://greensurge.eu/>) Biocultural diversity and governance in urban contexts.

For more information

- on HORIZON 2020: <http://ec.europa.eu/programmes/horizon2020/>
- on the European Research Area http://ec.europa.eu/research/eral/index_en.htm
- on EU research on biodiversity and ecosystems and on cultural heritage: http://ec.europa.eu/research/environment/index_en.cfm?pg=cultural



Constantinos Cartalis

University of Athens
Scientific Advisor Piraeus Bank Group - Cultural Foundation, Greece

Cultural landscapes in Natura 2000 sites: towards an integrated management of cultural and natural heritage.

Recommendations of the International Meeting of Athens/Stymfalia, 10-11 October 2014.

The International Meeting took place in Athens and Stymfalia in Corinthia, Peloponnese, Greece, with participants from the European Commission, the European Environment Agency, the Council of Europe, UNEP, UNESCO, ICOMOS, ICOM, IFLA, ICCROM, ERBD, WWF, International Centre for Mediterranean Cultural Landscapes, European Council of Spatial Planners, etc.

Landscapes can be seen as the outcome of the interplay between socio-economic and biophysical forces. In recent years there is increasing recognition, both internationally and nationally, of the need to manage landscapes as composites of both natural and cultural heritage. Cultural landscapes have come to be recognized as the interface between nature and culture, tangible and intangible heritage, biological and cultural diversity. For example, the management of a natural environment may be difficult unless a clear understanding is reached in terms of the human culture that shaped it. At the same time, understanding the natural environment is critical to comprehend how it reshapes this culture through feedback processes. Natura 2000 is the centrepiece of the policy of the European Union (EU) for nature and biodiversity. Presently, the Natura 2000 network accounts for over 26,400 sites with a total surface area of about 986 000 km², comprising nearly 768,000 km² of land, and approximately to 218,000 km² of sea. The terrestrial component of the Natura 2000 network represents 17.9 % of the EU-27 land. Cultural landscapes in Natura 2000 sites (in resemblance to the bio-cultural landscapes of the UNESCO CBD Programme; see Florence Declaration on the links between biological and cultural diversity, 2014), reflect the dynamic interplay between cultural and natural heritage at the landscape level.

How can the dynamic interplay between cultural and natural heritage be described? Which modifications are needed in existing EU policies and funding mechanisms so as to support the joint management of natural and cultural heritage in cultural landscapes in Natura 2000 sites? Is there a need for separate management plans for the cultural landscape and for the natural and semi-natural habitats and landscapes of a Natura 2000 site? or should we consider the cultural landscape as a critical and indispensable element of the Natura 2000 site, and thus orient our efforts to a common, integrated, management plan, with potential differentiations per zone?

Declaration of Stymfalia

Recommendations – 1

- Knowledge: Sufficient and reliable site information is needed on the state of landscapes, their cultural and natural values, the transformation processes, the driving forces, the risks and pressures, the feedback processes, as well as the links between cultural and natural heritage.
- Education: Existing educational programmes (such as Erasmus+ and others) can support tailor made projects regarding the integrated management of cultural and natural heritage in order to address skills gaps through transnational and trans-disciplinary partnerships.
- A reorientation of University curricula to link natural sciences with culture is required in order to build capacity that will underpin the integrated management of cultural and natural heritage.

Recommendations – 2

Management: Management plans of landscapes with important cultural and natural heritage, especially those located within Natura 2000 sites, need to be supported by an integrated set of (natural and cultural) heritage criteria rather than separate ones.

Recommendations – 3

International and EU (environmental, cultural, economic, regional development, agricultural, maritime and research) policies need to be reconsidered so as to prioritize the integration of cultural and natural heritage into local, regional and

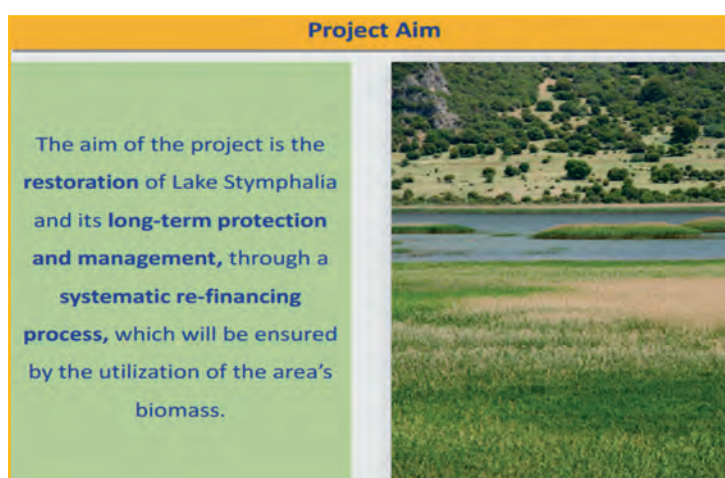
sectoral policies. (recent communication COM (2014) 477 on the integrated approach to cultural heritage in Europe, a solid step).

Recommendations – 4

- Development, at a pilot basis, of a network of cultural landscapes in Natura 2000 sites throughout Europe.
- Development of sustainable and high quality tourism should also include products linked to cultural and natural heritage. To this end “Cultural landscapes in Natura 2000 sites” may be considered as a potential culture route crossing several countries and connecting them in a common, cultural and environmental, narrative.

Recommendations – 5

Development of a budget line linking existing EU funding programmes* in the fields of environment, culture, education, research and regional development, will facilitate synergies and allow for the best possible exploitation of funds for projects aiming at the integrated management of cultural and natural heritage at the landscape level: (e.g. Horizon 2020, LIFE, Structural and Investment Funds - ESIF, European Regional Development Fund, European Agricultural Fund for Rural Development, European Maritime and Fisheries Fund, etc.).



The LIFE Stymfalia Project



All material (programme + profile of participants, presentations, executive summary, working paper, declaration) of the International Meeting may be found at www.piop.gr

Next steps:

- Support to the Ministry of Culture and the Ministry of Environment for the preparation of the bid file for the 1st UNESCO cultural landscape in Greece.
- Participation in ICOM’s Conference on “Museums and Cultural Landscapes”.
- Inventory of Cultural Landscapes in Natura 2000 sites in Greece.
- Cultural Landscapes Tourism initiative.
- Manual on the joint management of cultural and natural heritage



Giovanna Del Gobbo

University of Florence, Transdisciplinary
Chair on Human Development and
Culture of Peace, Italy



Fabio Attorre

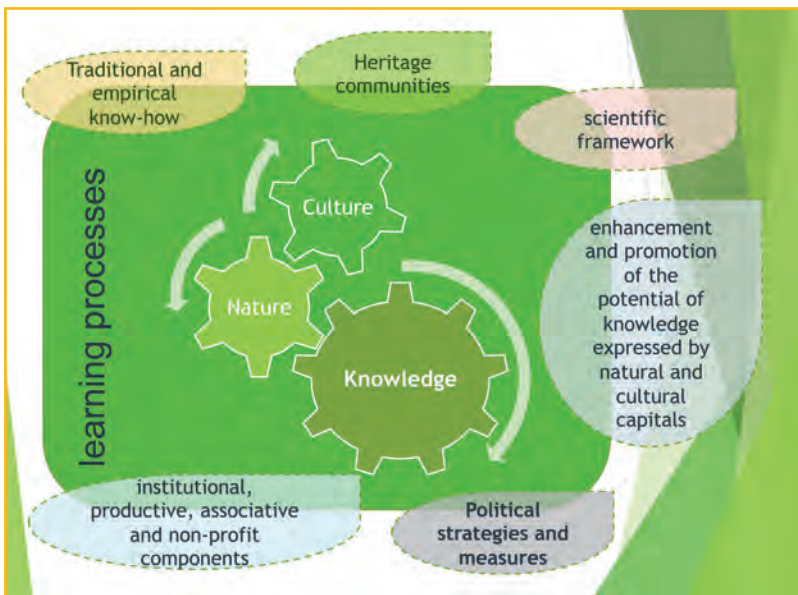
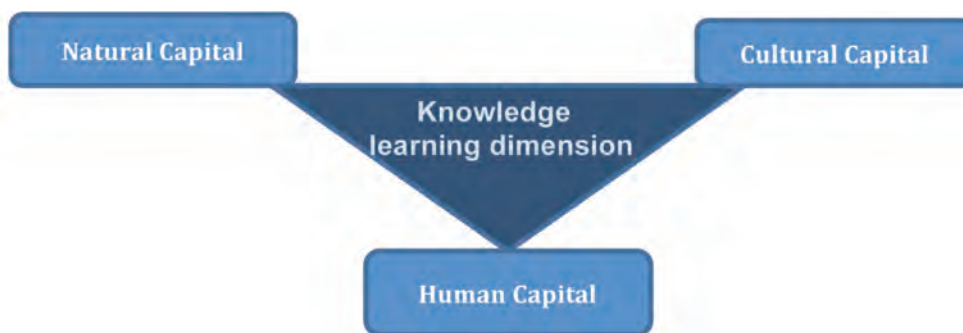
University of Rome
La Sapienza, Italy

Natural and Cultural Capital

Transdisciplinary strategies for *community-based processes* towards sustainable and inclusive development

Problem: combining social inclusion, human development and environmental sustainability.

Potential: natural sciences and human sciences together in a transdisciplinary perspective analyse problems and find solution to enhance the value of natural and cultural capital.



Traditional and empirical know-how. A way ... citizen science

Citizen science is defined as organised research where the balance between scientific, educational, societal and policy goals varies across projects. It is a growing worldwide phenomenon recently invigorated by evolving new technologies that connect people easily and effectively with the scientific community. New technology provides a valuable tool for citizens to play a more active role in sustainable development. Through collaboration with scientists in research projects citizens can contribute valuable information that can be used to develop and deliver policies, improve understanding and respond to many of the challenges facing society today.

Key points for research projects:

- Mapping, researching and documenting - participative methodologies - local cultural and natural heritage;
- Participatory governance for the heritage;
- Policies for new forms of dynamic safeguard, working to build new “ecosystems of digital cultural and natural assets”;
- Technological models for the recognition of citizens as resources for the definition and management of new services (from models of value chain to new models of *prosumer*), engaging and proactively involving European citizens in such activities and services.

Key points for researching:

- experimental model of research/monitoring/learning, for the management of natural and cultural capital in a lifelong learning perspective;
- test of appropriate regulatory instruments to drive the changes and adjustments required by international conventions;
- new professional profiles and competencies for production of environmental goods and services in a sustainable and inclusive economy (tourism, culture and environment; assessment, monitoring and training; ...) including well-being and social prosperity;
- “collaborative construction space” in which to provide and share cognitive tools developed within the human sciences and the natural sciences.

New technologies:

- Linking Natural and Cultural capital;
- Making the best use of traditional and scientific knowledge;
- Increasing the capacity of using the acquired knowledge to promote sustainable development and deal with environmental issues;
- Engaging and proactively involving European citizens in such activities.

From Experiences to Best Practices:

SmartEcoPhone project, between research and enterprise. Enhancing the natural and cultural capital of Rome. Aims: an application in English and Italian for smart phones and tablets (both iOS and Android systems) dedicated to the historical parks and gardens of Rome, which has been developed through a joint venture between public institutions and private enterprises within the framework of an EU-funded project.

- Spreading the knowledge of the Parks among citizens and tourists by interactively exploring the cultural and natural heritage;
- Building the cultural identity;
- Monitoring and reporting to the responsible institution.

Cocullo 2013 as innovative space of safeguard. Cucullo is a good example of action research: a “community of practice” and knowledge, between nature and culture, is active in a joint work with anthropologists (a plan to protect the rite) and herpetologists (a plan to protect the species) with the support of local policy makers, protected areas, mountain communities, inspired by the international conventions (Convention for the Safeguarding of ICH, the Convention on Cultural Diversity, Convention on Biological Diversity).

Study Circles – cross border laboratory Italy-Slovenia, development of human resources and cooperation networks promoting natural and cultural capitals. Study Circles in Italy-Slovenia is a cross border laboratory for the development of human resources and cooperation networks promoting local resources (European territorial cooperation Programme Italy Slovenia 2007-2013, Axis 2 - Increase competitiveness and development of a knowledge-based society). The project is a lifelong learning project aimed to support the endogenous natural and cultural potential: it does not propose “pre-packaged” activities but rather stimulates the involvement of local actors to invest in their own territory. Adapting population coping strategies toward social change can be fostered through an enlarged educational supply and demand the same time. Nesting of initiatives based on self-organisation and closer to local culture in the frame of adult education is therefore expected.

Study Circles and local knowledge. Study Circles have been facilitated on several subject: to mention a few, a study circle on the production of fruit-vegetable gardens (<http://www.study-circles.eu/it/frutta-dal-giardino-dellimperatore-rifioritura-della-frutticoltura/158>), on the protection of biodiversity and landscape (<http://www.study-circles.eu/it/circolo-di-studio-biovagando-tra-saperi-e-sapori/256>) as well on local agricultural products.



Maria Betti

Director, Joint Research Centre, Institute for Environment and Sustainability, Ispra, Italy

Urban and rural areas as reservoirs of Natural and Cultural Capital

The current economic crisis in many countries calls for a rethinking of economic policies and for the promotion of measures that support long-term and sustainable growth and jobs. These issues are central to a number of European Commission initiatives to re-launch growth and jobs in the EU, such as the 2020 climate and energy package, and the “Green Employment Initiative - Tapping into the job creation potential of the green economy”. History shows that such a strong focus on economic policies to promote growth and jobs has not always gone hand in hand with the principle of sustainability, and specifically the consideration of our environment and the services it provides.

2010 was the International Year of Biodiversity. However, pressures such as land use change and pollution are still on the rise. In the past, biodiversity-related policies have not had significant impacts, mainly because of a lack of integration of these policies within economic sectors, low levels of public interest, and limited funding for conservation. The EU Biodiversity Strategy sets biodiversity targets to be achieved by 2020. These include the further conservation and restoration of ecosystems, which is essential if we are to preserve and enhance the services they provide.



The Joint Research Centre (JRC) is the European Commission's in-house science service. Part of the JRC's scientific support to environment-related policies aims to help fulfil the long-term vision of the EU's 7th Environmental Action Programme, namely "Living well within the limits of our planet". It is within this context that I would like to describe some of the activities carried out by the JRC. A Working Group on Mapping and Assessment of Ecosystems and their Services, or MAES, was set up under the Common Implementation Framework of the EU Biodiversity Strategy to 2020, the JRC has an active role here.

In a recently published report that describes forest landscape patterns and forest fragmentation in Europe, the JRC estimates that 70% of the European territory has poorly connected woodlands. The study also shows that around 15% of woodland in Europe is strongly fragmented by human activities, such as roads, agriculture and expanding settlements. The JRC has also assessed the relationship between Green Infrastructure and the delivery of ecosystem services at the regional scale in Europe. A novelty of our approach is the dynamic coupling of ecosystem service indicators with a fine spatial and temporal resolution land-use model. This allows us to explore in detail the spatial aspects of future ecosystem services in Europe, taking into account the land-use impacts of ongoing demographic, economic and agricultural developments. The approach is particularly relevant in the current policy context, as it allows for the evaluation of regional and infrastructural investments options.

Europe could become a world leader in innovation by developing nature-based solutions, i.e. solutions that are inspired, used, or are supported by ecosystem services to improve economic, social and environmental resilience. There is particular scope and urgency for developing nature-based solutions for urban areas, and for building resilience to climate change, natural hazards and environmental degradation in rural and natural areas. Horizon 2020, the EU's research and innovation framework programme, may provide further opportunities in this area.

The future will show how the valuation of ecosystem services can support sustainable economic policies that promote growth and jobs, and that also help protect and enhance our environment. European landscapes reflect not only the continent's diverse climate and geology, but also centuries of interactions between man and nature. The cultural landscapes of Europe are among the main contributors to Europe's biodiversity. The Charter of Rome bridges the interrelations and interactions between Natural and Cultural Capital. It aims to strengthen nature and biodiversity policy, and to mainstream it into other policies related to the territory and the economy. This is why the Charter of Rome on Natural and Cultural Capital merits all our support.





Carlo Blasi

University of Rome La Sapienza, Italy

Green infrastructure in agricultural systems and metropolitan areas

International policy framework

Several policies and strategies at the global and continental level embody the framework of European Green Infrastructure Strategy (COM 2013/249):

- Convention on Biological Diversity (CBD, 1992) and its ecosystem approach;
- CBD Strategic Plan for Biodiversity 2011–2020 and 11th Aichi Biodiversity Target;
- Global Strategy for Plant Conservation 2011–2020, target 13;
- European Biodiversity Strategy to 2020 and 7th Environment Action Programme (EAP);
- Habitats Directive and Natura 2000 network;
- Greening measures and agri-environment payments of the new Common Agricultural Policy 2014-2020.

Italian policy framework

Since 2010 Italy has made available a National Biodiversity Strategy which mainly focuses on Biodiversity and Ecosystem services, Biodiversity and Climate Change, Biodiversity and Economic Policies. A body of National Conferences, closely related to this Strategy, has been organised in 2013 on “The Nature of Italy. Biodiversity and Protected areas: the green economy for the revival of the country” (www.minambiente.it/pagina/la-natura-delitalia). Key themes that have been debated at the conferences, i.e. Green Jobs, Protected Areas and Natura2000, Green Infrastructure and Ecosystem Services, Scientific Research and Natural Capital, represent the seeds of the idea of a Charter of Rome on natural and cultural capital involving all the EU Member States.

Traditional Agricultural Landscapes

Traditional Agricultural Landscapes represent outstanding models for investigating relationship between natural and cultural capital. They result from the long lasting interaction between humans and their environment and are usually associated with the use of low-impact agricultural practices, significant habitat diversity, and presence of semi-natural vegetation. By nursing cultural values joined to traditional modes of production, they also exercise a positive influence on preservation of soil resources and autochthonous species, species richness and abundance, and occurrence of species and habitats of particular conservation interest.

Agriculture and metropolitan areas

Agriculture still determines the landscape character even for the majority of Italian metropolitan areas. Agriculture, which frequently boasts traditional features, has a close relationship with natural capital elements across the whole country. An emblematic trait is that landscapes with natural matrix cover 40% of the national land and host 10% of agricultural patches as well as landscapes with agricultural matrix cover 55% and host 16% of natural patches (*Barbati et al. 2004, ASITA*).

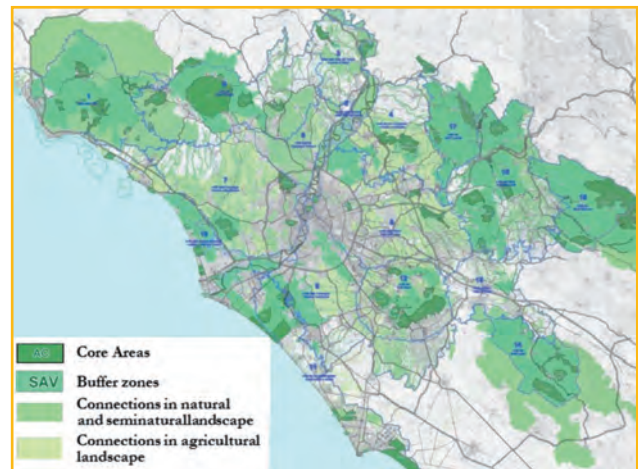
Relationship between distribution area of vegetation types and certified typical agricultural products are exemplified in the “Nature-Agri-Cultural” map of Rome Metropolitan Area.

| | Artificial areas | Agricultural areas | Forest and semi-natural areas |
|---------------------------|------------------|--------------------|-------------------------------|
| Bari | 5,5 | 88,3 | 6,1 |
| Bologna | 5,9 | 68,1 | 25,4 |
| Firenze | 5,7 | 43,6 | 50,3 |
| Genova | 6,2 | 11,3 | 82,4 |
| Milano | 34,5 | 61,3 | 3,7 |
| Napoli | 31,8 | 50,9 | 16,9 |
| Reggio di Calabria | 3,2 | 49,6 | 47,2 |
| Roma | 12,8 | 58,5 | 27,2 |
| Torino | 6,9 | 35,0 | 57,5 |
| Venezia | 10,0 | 67,5 | 0,8 |

Percentage of main classes of 1th Corine Land Cover level for each Italian metropolitan area.

Landscape Ecological Network

The Landscape Ecological Network represents the main Green Infrastructure in metropolitan areas, within which agricultural land plays a major role.



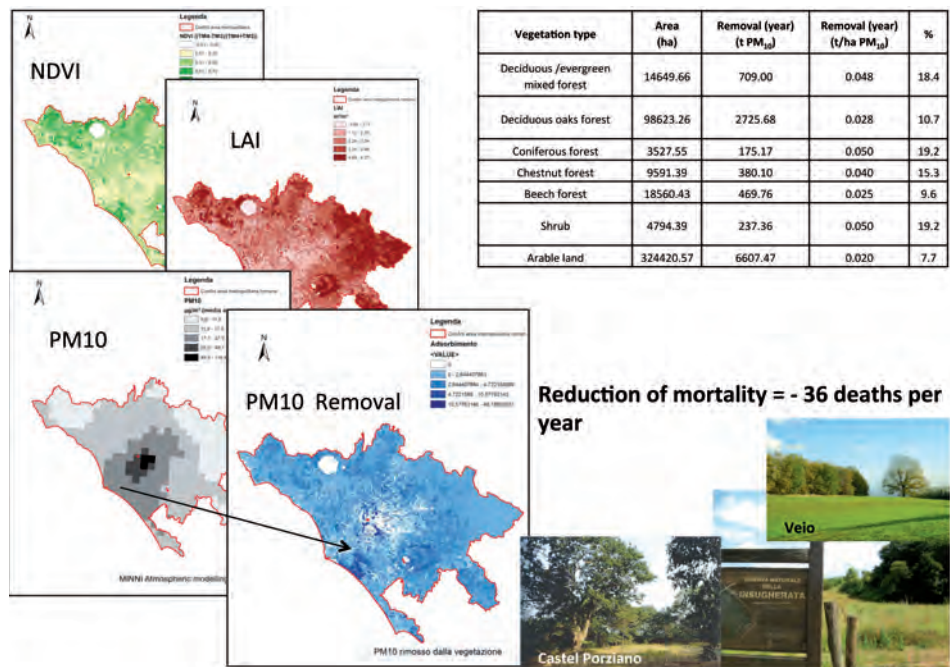
| Land cover % | Node | | Landscape connections | |
|-------------------------------|------------|--------------|---------------------------------------|----------------------------|
| | Core Areas | Buffer zones | in natural and seminatural landscapes | in agricultural landscapes |
| Artificial surfaces | 3,8 | 4 | 13,4 | 12,1 |
| Agricultural areas | 13,7 | 31,9 | 51,6 | 84,9 |
| Forest and semi-natural areas | 64,5 | 63,9 | 34,5 | 3,0 |
| Wetlands | 0,5 | 0,1 | 0,2 | 0 |
| Water bodies | 17,5 | 0,1 | 0,5 | 0 |
| Area (in ha) | 44,6 | 147,0 | 145,7 | 68,9 |
| % LEN | 11 | 36 | 36 | 17 |

"Nature-Agri-Cultural" map of Rome Metropolitan Area.

Land Ecological Network (LEN) of Rome Metropolitan Area: land cover composition (percentage), overall area (hectares) and percentage relative to the total LEN of core areas, buffer zones and landscape connections. (source: Blasi et al. 2008, *Plant Biosystems* 142)

Green Infrastructure and Ecosystem Services

The Italian MAES process is providing interesting methodological insights for the development of Green Infrastructure. Actually, a robust model for mapping and assessing ecosystems and their services and setting priorities for their maintenance and restoration was developed for application at multiple scales, from national to local. Within this framework Green Infrastructure and ecosystem services are being investigated for the Italian metropolitan areas, starting from Rome.



Air pollution removal in Rome Metropolitan Area (source: Fausto Manes, Italian MAES project).

Concluding remarks

- Integration between cultural and natural capital is evident in Italy especially when considering traditional agricultural landscapes;
- Thanks to the mapping of ecosystems and their services, the MAES project provides very effective tools for quantifying such integration;
- For all this reason it is essential to plan an upcoming workshop on scientific methodology and to go on the debate on the main topics of the Charter of Rome.



Daiga Vilkašte

Director, Department of Nature Protection
Ministry of Environmental Protection and Regional Development, Latvia

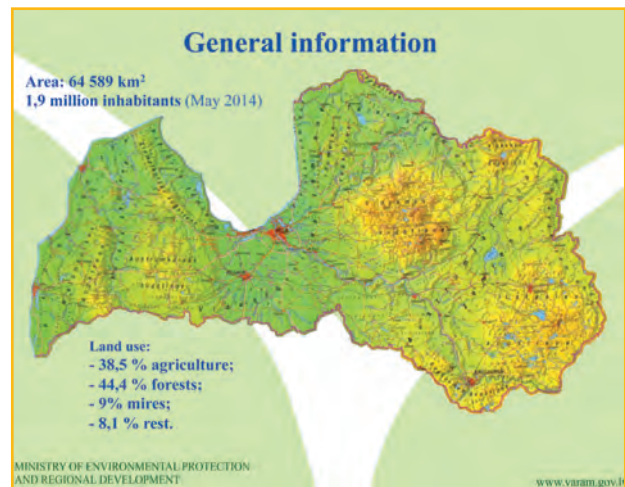
Next steps, way forward

Latvia: General information

Sustainable Development Strategy of Latvia until 2030

Capital Approach. The concept of capital is used in the strategy in wide meaning and includes elements, which are difficult to express directly in monetary terms. Our main capital is people – their skills, knowledge and talents. **Our** capital is nature, environment and space of Latvia. Also cultural heritage and creativity, the ability to co-operate and to do something jointly, which would be impossible to do individually, is our capital and the source of growth.

Objective. The value of natural resources of Latvia and the availability of natural environment gives a unique opportunity to develop – green economy and sustainable consumption, to create and preserve the image of Latvia as - green country - an important part of international identification of the state.



Sustainable Management of Natural Values and Services

Objective: to become the EU leader in the preservation, increase and sustainable use of natural capital.

- Priority Long-term Action Directions
- Management of Natural Capital
- Creation of Market Instruments
- Capitalisation of Natural Assets
- Promotion of Sustainable Lifestyle

Sustainable Management of Natural Values and Services

Possible Solutions:

- Management of Natural Capital
- Creation of Market Instruments
- Capitalisation of Natural Assets
- Promotion of Sustainable Lifestyle

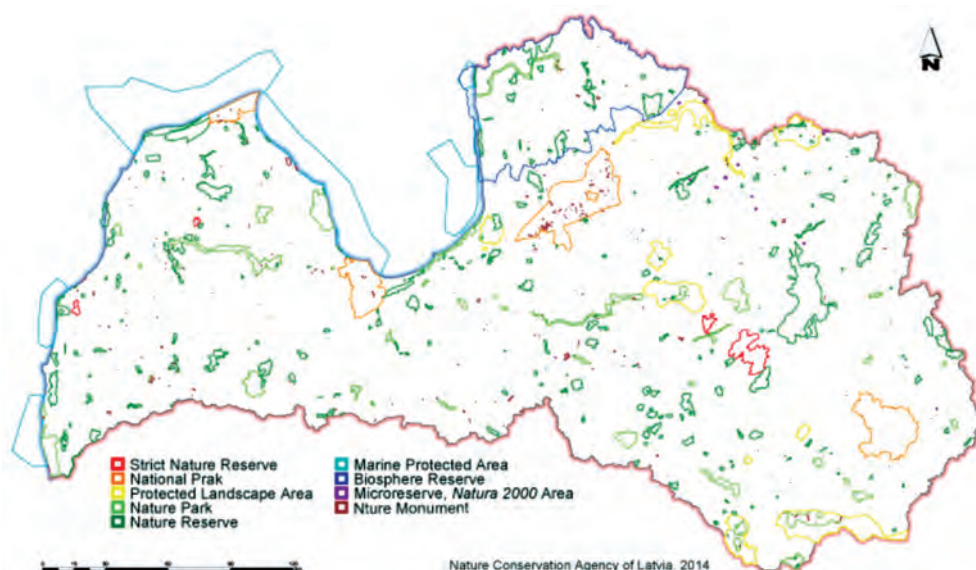
Legislation - Natural and Cultural Capital synergies

- The first protected territory - Moricsala strict nature reserve (1912)
- Law on Specially Protected Nature Areas
- National parks are vast areas with outstanding nature formations of national importance, landscapes and cultural heritage landscapes untouched by human activities or nearly natural, a diversity of biotopes, abundance of cultural and historical monuments. Along with nature protection, scientific research, education and organization of leisure have an important role.



- The main goals of national parks shall be nature protection, preservation of cultural and historical heritage, scientific research, organization of education and recreation, which are restricted by the goals of the protection of nature and cultural environment.
- Biosphere Reserve - Biosphere reserve is a broad territory in which landscapes and ecosystems of international significance are located. The goal of establishing biosphere reserves is to ensure the preservation of natural diversity and to promote sustainable social and economic development of the territory.
- 42 Nature Parks - Nature parks are territories that represent the natural, cultural and historical values of a particular area, and that are suitable for recreation, education and the instruction of society.
- Organization of recreation and economic activities in nature parks shall be carried out by ensuring the preservation of the natural, cultural and historical values located in such parks.
- 9 Protected Landscape Areas: Protected landscape areas are territories remarkable for original and diverse landscapes and special beauty. The goals of such territories are to protect and preserve the cultural environment and landscapes characteristic of Latvia in all their diversity, as well as to ensure an appropriate preservation of environments for recreation of society and for tourism, and to use environmentally friendly management methods.

Protected Nature Areas of Latvia



The project “Parks & Benefits” (ended 24.1.2012)

- The project strengthened sustainable nature tourism approaches in the Baltic Sea Region (six countries: Germany, Denmark, Norway, Estonia, Latvia, Lithuania) and communicates the mutual benefits to protected areas and to their surrounding regions for regional development and sustained natural development.

LIFE projects

Nature Conservation Agency: “LIFE Ecosystem Services - Assessment of ecosystems and their services for nature biodiversity conservation and management”

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4913&docType=pdf

Baltic Environmental Forum: “LIFE Grass service - Alternative use of biomass for maintenance of grassland biodiversity and ecosystem services”

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4576&docType=pdf

Baltic Environmental Forum: “Innovative approaches for marine biodiversity monitoring and assessment of conservation status of nature values in the Baltic Sea”, the MARMONI project <http://marmoni.balticseaportal.net/>

Future, next steps, cooperation

- MARMONI project’s final conference from 27 to 28 January 2015 in Jurmala, Latvia
- Conference “EU Biodiversity Strategy to 2020 - implementation” from 26 to 27 May 2015 in Riga, Latvia
- Mapping of specially protected species/biotops according “Environmental Policy Strategy 2014 - 2020”.



CHARTER OF ROME ON NATURAL AND CULTURAL CAPITAL *

Foreword

The Charter of Rome is a bridging initiative on the interrelations and interactions between Natural and Cultural Capital. It aims at strengthening nature and biodiversity policy, mainstreaming it into other policies related to the territory and the economy.

The current economic crisis in many Countries calls for rethinking economic policies and the promotion of measures aiming at supporting long-term and sustainable growth and jobs to be implemented at all governance levels, from EU to national and regional.

The EU Strategy 2020 on smart, sustainable and inclusive growth is a key step towards the establishment of a renewed European governance, centred on the needs of society and of the whole planet, as well as to the close links between economic, social and environmental policies, including jobs.

The European Commission put all of these issues at the centre of a number of initiatives to relaunch growth and jobs in the EU, such as the “Green Employment Initiative: Tapping into the job creation potential of the green economy”.

Among the potential instruments and initiatives to be implemented on the promotion of green jobs, some key strategic ones are those supporting investments on the restoration and conservation of Natural Capital and on the development of synergies between Natural and Cultural Capital, such as the Green Infrastructure Strategy 3. The overall goal is to tap into both of these Capitals to generate economic benefits, employment opportunities, and support key sectors such as tourism.

The EU Biodiversity Strategy to 2020 4 aims at protection of biodiversity for its intrinsic value and refers to the maintenance and enhancement of ecosystems and their services and contributes, among other, to the EU’s sustainable growth objectives and to the mitigation and adaptation to climate change, while promoting economic, territorial and social cohesion and safeguarding the EU’s cultural heritage. The Strategy also emphasizes that the full implementation of EU nature legislation is key to conserving and restoring biodiversity, and hence Natural and Cultural Capital.

The EU Birds and Habitat Directives (2009/147/EC; 92/43/EEC) aim to meet “ecological, scientific and cultural requirements, while taking account of economic and recreational ones” and “to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, ... making a contribution to the general objective of sustainable development; whereas the maintenance of such biodiversity may in certain cases require the maintenance, or indeed the encouragement, of human activities”.

The European Natural Capital is intimately linked to the cultural dimension and history of the EU. Taking into account Natural and Cultural Capital assets together in decision making is essential in the EU given the human influence on ecosystems. We all want to ensure that this influence remains positive and sustainable.

The Charter of Rome on Natural and Cultural Capital seeks to achieve the long-term vision of the EU 7th Environmental Action Plan: in 2050, we live well, within the planet’s ecological limits. The Charter of Rome aims at providing support for strengthening implementation of Birds and Habitat Directives and for the protection, conservation and enhancement of Natural Capital and to further develop synergies with Cultural Capital in the European Union and in its Member States.

NATURAL CAPITAL

1. Improve the knowledge of Natural Capital

Our natural environment is important because it provides people with goods and services that are vital for wellbeing and prosperity. Natural Capital is the stocks of natural assets that provide these benefits. Good knowledge of the biodiversity and ecosystems that make up these stocks is essential.

This knowledge base should be made more accessible to citizens and decision makers to ensure that policy continues to build on a sound understanding of the state and dynamics of the environment.

To address this challenge we need to:

- Promote and Support scientific knowledge on Natural Capital at the international, national, and local levels including research on the societal benefits;
- Make information and quality data sets and systems available to research and decision making, either in public and private sectors;
- Map, assess, monitor, evaluate, plan and manage ecosystems and their services.

2. Invest in Natural Capital

Investment in Natural Capital supports smart, sustainable and inclusive growth in Europe. To address this challenge we need to:

- Reduce environmentally harmful subsidies and provide economic and financial incentives to support Natural Capital investments (cost/effectiveness) in the public and private sector;
- Implement methodologies for accounting for Natural Capital stocks and flows, including economic flows aimed at the enhancement of Natural Capital;
- Increase knowledge, communication and information to all on the overall benefits of ecosystems;
- Include Natural Capital and ecosystem approaches into all territorial decisions, spatial planning and management.

3. Secure the functionality of natural and healthy ecosystems

Healthy and resilient ecosystems can provide society with a full range of economically valuable goods and services.

To address this challenge we need to:

- Strengthening implementation of the EU nature legislation by appropriate conservation and management of habitats and species and the contribution of Natura 2000 network in protecting Natural and Cultural Capitals;
- Make use of good knowledge and data on biodiversity, ecosystems, their structures and functions, and on links with ecosystem services and associated benefits;
- Maintain, restore and enhance ecosystem capacities to provide a range of goods and services and associated benefits;
- Explore Natural Capital as a solution to major challenges such as those related to urban areas, climate change and adaptation, agriculture and soil, forestry, hydrogeological risks, tourism and recreation.

CULTURAL CAPITAL

4. Link Natural and Cultural Capitals

Human influence on European ecosystems has been constant and widespread throughout History. The Cultural Capital includes the capacity of human populations to deal with the Natural Capital.

The Cultural Capital is related to three main features of individual people and groups in each given and specific geographical and socio-economic context: - knowledge, including the traditional and scientific dimensions; - capacities as the way knowledge is retained, increased, elaborated and developed; - practices corresponding to all activities producing tangible and intangible flows of goods and services.

Natural and Cultural Capitals are dynamics and synergies should be strengthened providing goods and services with different degrees of contribution from each capital, e.g. forest wild fruits vs. arable irrigated crops.

To maintain a positive link between Cultural and Natural Capitals we need to:

- Take into account social and cultural dimension of ecosystem management;
- Promote locally-adapted knowledge, capacities and activities with positive impacts on Natural Capital;
- Link benefits, goods and services from ecosystems (supply) with the patterns of culture, society and economy (demand).

5. Create synergies among green infrastructure, urban and rural areas

Species, habitats, ecosystems, land units and infrastructures are part of a multifunctional and interconnected spatial structure of natural and semi-natural areas.

Green infrastructure connects natural and semi-natural areas with urban and rural areas. They are drivers for transition to a green economy and have many natural, cultural, social and economic connections.

To address this challenge we need to:

- Identify the inter-connections and multi-functionality of natural and semi-natural areas.
- Improve the synergies between natural and semi-natural areas (including protected areas), green infrastructure, urban and rural areas;
- Map, assess, monitor, evaluate, plan and manage the territorial links between natural and semi-natural areas, green infrastructure, urban and rural areas;
- Consider green infrastructure as a cost-effective alternative or complementary measure to 'grey infrastructure' in support of both nature and people.

* Council of the European Union 17017/14, 17.12.2014:

www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/envir/146374.pdf

Official text of the Charter of Rome: <http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2016540%202014%20INIT>

CONCLUSIONS

Dear Colleagues,

First of all, I would like to extend my warmest thanks for your contributions and a special thank to Latvia for the constructive introduction. Let me bring to you greetings from the Undersecretary of State of the Ministry of Environment, Barbara Degani. She apologises for not being able to be here today due to unexpected work commitment.

Now, I wish to summarize the main points of our profitable work today, thanks to the afternoon contributions of our highly qualified colleagues. The time spent today has been an important opportunity to analyse in depth the scientific aspects that promote the Charter of Rome, as well as the exchange of good practices. The key points emerged today are: improving knowledge of our Natural Capital, mapping with scientific methods the natural capital, but also promotion of human and economic investments on nature resources; the overcoming of the traditional vision related to urban and rural habitats represents a new general framework encouraging green infrastructures as a link among different territorial vocations. There are strong synergies between biodiversity and cultural diversity, and actions that favoured the development of a green economy through the involvement of private sector, banks, and entrepreneurs in order to better promote the interlinkage between natural and cultural capital. Finally, I would like to underline, once again, that the initiative of the Charter of Rome aims to increase awareness of the important synergies between Natural and Cultural Capitals in Europe, as well as at enhancing the integration of biodiversity concerns into sectoral policies, also in order to develop a greener economy. Thank you for your attention and we are confident that the Latvian Presidency will continue this important and constructive work in favour of the Charter of Rome. Thank you.

Maria Carmela Giarratano

Ministry of the Environment, Land and Sea, Italy

In line with the EU nature and biodiversity strategies, relevant environmental directives and overall policies, a strong interconnection between Natural and Cultural Capital assets, and between these assets and activities with a territorial dimension are fundamental for biodiversity conservation and sustainable management of ecosystems in Europe, in particular in the context of the current financial and economic crisis.

Further investigation on the linkage between Natural and Cultural Capital needs to be put in place, with special reference on those knowledge, capacities and activities that contribute to sustainable management of biodiversity.

Mainstreaming ecosystems and their services into strategies, planning, management and practices of public and private actors is an important way, to achieve key targets and for the development of a sound green economy, that need to be implemented at EU, national and regional level, starting from the opportunity provided within the financial framework 2014-2020.

In order to achieve these objectives the EU and its Member States will need to: - improve the knowledge of biodiversity and Natural Capital and data availability; - pursue the full implementation of the EU nature legislation, enhance the contribution of Natura 2000 to the conservation and restoration of Natural and Cultural Capitals; - promote efficient green investments from the public and private sectors; - maintain and restore healthy and productive ecosystems; - identify and account for stocks of ecosystems and flows of ecosystem goods and services, as well as - integrate Natural and Cultural Capital values in sectoral policies.

Consequently, in the coming years, the scientific community should assist policies in moving from words to deeds. In this perspective it is essential to go forward from the overall regional and national syntheses to the concrete territories particularly in metropolitan areas and in all those lands where cumulative human pressures make conservation a real challenge both for biodiversity and for landscapes where nature, history and social and economic development of local populations are combined. For this reason, and as it is coherently established by the EU MAES programme, it will be necessary to assess the conservation state of each ecosystem in order to plan the rehabilitation measures, structural and spatial, that will bring significant improvements on the scale of the related environmental services. The analysis of the spatial configuration linked to the landscape ecology and the assessment of the ecological connectivity (ecological territorial network) will provide key knowledge elements particularly useful to progress from the evaluation phase to the implementation of green infrastructure defining a new land management planning. The aim is to implement actions with a systemic complexity able to provide and promote, at the same time, ecosystem and cultural services that are clearly connected with agricultural activities and sustainable tourism.

Carlo Blasi

Honorary President, Italian Botanical Society
Director, Sapienza Botanical Garden

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