Country Fact Sheet:
Italy (IT)

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Preface

This country fact sheet is prepared as part of task 2.1: Stakeholder identification and initial analysis of activities. The initial analysis draws upon information collected by Esmeralda project partners and previous relevant work on ecosystem mapping and assessment activities and policy and research activities in connection to that. The goal was to consider at least Draft Agenda MAES WG 2015-03-06-rev; MAES WG 06 March 2015; MESEU Final Technical report 2013-14; MESEU Inception Report 2014-15 (Final 29-01-2015); MESEU update March 2015; MESEU Synthesis Report 2012-2014 (14-01-2015); NCA Draft Reference Document for Consultation 06-01-2015 and written communication on undertaken MAES related activities by Joachim Maes (see point 5 references for tracing the source of information for this particular fact sheet). Specific for this document is the identification of obstacles and opportunities (table 1).

1. Country status of activities, prerequisites and needs

<table>
<thead>
<tr>
<th>Status of mapping ecosystem services in the country (1-3)*</th>
<th>Scale of mapping (1-3)**</th>
<th>Type of support needed (1-5)***</th>
<th>Needed support relates to (1-3)****</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In initial phase</td>
<td>1. National</td>
<td>1. Setting up a national network</td>
<td>[No Information]</td>
</tr>
</tbody>
</table>

* 1. In initial phase, much support needed, 2. On-going, still support needed, 3. Advanced, only little support needed
** 1. National, 2. Regional, 3. Local
*** 1. Setting up a national network, 2. Policy and stakeholder identification, 3. Technical mapping support (data, GIS, mapping methods), 4. Lacking personnel with appropriate expertise, 5. Other
**** WP2 stakeholder mapping/networking, WP3 ES mapping methods, WP4 ES assessment methods/tools

Prerequisites and strengths for carrying out the mapping and assessment of ecosystem services (Italy, Esmeralda project partner, 2015):

Italy explained that the MAES process in Italy is carried out by the Ministry of Environment with the scientific support of a multidisciplinary team from the Sapienza University of Rome and the Italian Botanical Society (see Annex I).

Data, concept and methodology. Italy can rely on long term data sets and maps at different scales covering: climate, physiography, geomorphology, soils, vegetation and biogeography, forests, and land cover. On an overall national analytical framework, the ecoregions of Italy have been classified in a comprehensive effort (2 Divisions, 7 provinces, 11 Sections and 33 Subsections) (see Blasi C. et al, 2014 Classification and Mapping of the Ecoregions of Italy, 2014. Plant Biosystems, Vol 148, No. 6). This classification is aimed to be used for biodiversity policies, territorial planning and management, ecological modelling, including MAES-related actions such as development of green and blue infrastructure.

Main steps of the national process are:

1) the Italian MAES Workshop, held in March 2014 at the Sapienza University of Rome. In order to establish a national MAES platform for cooperation between science and policy, the workshop brought together some twenty universities, research centers, national and European experts from JRC.
2) attending to the High-Level Conference on MAES, Brussels, 22 May 2014. Italy officially attended the Conference with a presentation of its MAES work and a declaration of support to the MAES activities in Europe during its Semester Presidency June-December 2014.
3) MAES activities. A preliminary collection of updated and detailed basic data at the national level was carried out, including ecoregions, land units, bioclimatic zones, land units, bioclimatic and biogeographic information, potential natural vegetation and CORINE land cover at the fourth level. The four steps of the MAES process have been defined: ecosystems mapping, state of ecosystems, ecosystem services assessments and integrated assessment between ecosystem condition and service provision.

Concerning problems encountered in the assessment:

During the biophysical assessment most of problems were related to the process of reclassifying natural potential vegetation CLC classes in order to identify and map the 90 Italian ecosystems. Moreover a cross-walk of the current classification with the European ones (e.g. EUNIS) will be necessary in order to ensure its consistency and robustness.

2. Policy activities

2.1. The current implementation plans and execution of the Biodiversity Strategy and in particular concerned with Target 2, Action 5

The Ministry for the Environment has provided financial support to universities and scientific societies (Italian Botanical Society and Italian Zoological Union) for the implementation of the MAES process in Italy. A preliminary collection of updated and properly detailed basic data at the national level was carried out, including ecoregions, land units, bioclimatic zones, biogeographic information, potential natural vegetation and CORINE land cover at the fourth level. Starting from these data, the Italian MAES process has been organized into the following steps:

1) Map ecosystems: Through the integration of the CORINE land cover with potential natural vegetation, bioclimatic and biogeographic information, a new Map of the Ecosystems of Italy was drawn at 1:100,000 scale, with 91 legend classes and counting 37 types of forests. Ecosystem types have been defined according to biogeographic and bioclimatic setting, geographic location and vegetation physiognomy. These types could properly been expanded or further merged according to specific classes of ecosystem services.

2) Assess the conservation status of ecosystems: the assessment is based on a multi-scale model. Selected parameters are naturalness and hemeroby, coverage and spatial configuration of the ecosystem types, while potential natural vegetation is adopted as a reference model. The model also includes the evaluation of landscape conservation status. The assessment is completed for all ecosystem at national and regional level, is ongoing at the ecoregional level.

3) Assess the ecosystem services delivered by ecosystems: Biophysical assessment of selected ecosystem services for 5 pilot case studies. The 5 pilots include (ecosystem type: ecosystem service types, indicators): I) beech forests: provisioning service, above-ground woody biomass; regulating services, carbon sequestration and air pollution removal; cultural service, old-growth forests; II) urban green: regulating service, air pollution removal; III) olive groves: provisioning service, food production; regulating service, carbon sequestration; cultural service, extent of protected olive groves; IV) lakes: maintenance service, nursery and feeding habitats; regulating service, ecological state; cultural services, intensity of scientific monitoring and level of representation in protected areas; V) Posidonia beds: provisioning service, biomass; maintenance service, species distribution.

4) Set priorities for ecosystems restoration: Integration between the assessment of ecosystem conservation status and information as regards related habitats of community interest (presence, number, status and trend) (ongoing at the regional level).
5) Promote Green Infrastructure: Definition of the ecological framework for the development of green infrastructure according to the land ecological network approach (ongoing).

6) Implementation of a road-map, that will be delivered to the regions (sub-national level), for the useful utilization of the products of all MAES process (points 1-5) to obtain an efficient and targeted use of European structural and investment funds 2014-2020.

2.2. The position of (the) case study / studies in those plans

“The National Ecosystem Assessment of Italy, began in 2014, and just completed its biophysical evaluation with the production of the map of Ecosystems of Italy. The methodology used to produce the map is based on the integration of: the CORINE Land Cover 2006 – CLC; the map of natural potential vegetation, which integrates climate, geo-morphology and vegetation data; the biogeographic regions.” (MESEU, 2015)

To assess the ecosystem conservation status, a multi-scale model, previously established on the basis of land cover information, was fully updated and adapted to the currently available nationwide ecosystem map. In particular, for the conservation status assessment at the national and regional/ ecoregional level we used small and medium scale indicators based on vegetation:

- Estimation of degree of naturalness/hemeroby for each ecosystem type;
- Recognition of mature ecosystems, i.e. types that represent the mature stages of vegetation series within their respective pertinence sectors;
- Assessment of the landscape conservation status;
- Estimation of the dissimilarity between actual and potential cover of mature ecosystems;
- Assessment of spatial configuration in terms of ecosystem fragmentation, quantity and contrast of edges between different ecosystem types;
- Definition of critical thresholds for each of the aforementioned parameters and comprehensive assessment of ecosystem conservation status based on the integration between the potential extent of ecosystems, actual cover of ecosystem types, diachronic change trend of ecosystem extent, landscape conservation status, and ecosystem fragmentation.

A medium-high landscape conservation status has emerged at the national level, though the ecosystem conservation status considerably varies from bad to medium and high depending on the regional and ecoregional sectors.

2.3. List of the case studies done in the country

Assess the ecosystem services delivered by ecosystems

Biophysical assessment of selected ecosystem services for 5 pilot case studies. The 5 pilots include (ecosystem type: ecosystem service types, indicators):

- **beech forests**: provisioning service, above-ground woody biomass; regulating services, carbon sequestration and air pollution removal; cultural service, old-growth forests
- **urban green**: regulating service, air pollution removal
- **olive groves**: provisioning service, food production; regulating service, carbon sequestration; cultural service, extent of protected olive groves
- **lakes**: maintenance service, nursery and feeding habitats; regulating service, ecological state; cultural services, intensity of scientific monitoring and level of representation in protected areas
- **Posidonia beds**: provisioning service, biomass; maintenance service, species distribution.

A separate Case Study Fact Sheet is filled in for two case study: beech forests and lakes.
2.4. The possible future use of (the) case study results in Target 2 - Action 5

- Set priorities for ecosystems restoration: Integration between the assessment of ecosystem conservation status and information as regards related habitats of community interest (presence, number, status and trend) (ongoing at the regional level).
- Promote Green Infrastructure: Definition of the ecological framework for the development of green infrastructure according to the land ecological network approach (ongoing).
- Implementation of a road-map, that will be delivered to the regions (sub-national level), for the useful utilization of the products of all MAES process (points 1-5) to obtain an efficient and targeted use of European structural and investment funds 2014-2020.

2.5. Stakeholder involvement

“The map of ecosystems of Italy was made possible thanks to the previous contribution of a large group of scientists from universities and research centres coordinated by the Italian Botanical Society and the Italian Zoological Union that provided data on the distribution of plant communities and fauna. The following steps (Assessment of the conservation status, services and economic values of target ecosystems) will be conducted by a “core group” of scientists from universities promoting the project and various governmental agencies. Results will be shared among potential stakeholders and users in order to incorporate their suggestions and needs.” (MESEU, 2015) and confirmed by (Italy, Esmeralda project partner, 2015)

2.6. Executive institutes involved by the National Government

“Italian Botanical Society”

3. Research activities

3.1. The Ecosystems covered in the country

“The ecosystems selected for the assessment are based on a national classification produced in order to better represent the specificities of the Italian territory. However a cross-walk with the European ecosystem classification (See 2nd Maes Technical Report) is reported in order to allow a consistent assessments form national to European scale.” (MESEU, 2015)

3.2. The Ecosystem Services covered in the country

“The assessment of the ecosystem services is concluded for 5 pilot types of ecosystems that are well investigated at the national level, i.e. beech forests, urban forests, olive groves, lakes and marine Posidonia beds. Assessment includes provisioning, regulating and maintenance services, such as carbon stock and sink of forests, nursery habitats and water provision of lakes, as well as cultural services provided by olive groves, old-growth forests, and lakes. Ecosystem services assessed on fauna include: number of ungulates hunted and quantity of fish caught (as for the provisioning section), wildlife damages and number of alien species (as for the regulating section), number of important bird areas and number of flag species (as for the cultural section). At the moment only the carbon sink of Italian forests was assessed using an interpolation procedure integrating CLC and National Forest Inventory data and specific algorithms for the estimation of forest biomass. But the scientific quality of the analysis has not been performed yet. No reports are currently available on these case studies” (Italy, Esmeralda project partner, 2015)
Once the ecosystems were identified and mapped, four case studies were defined classified into four typologies: forest ecosystems (temperate beech forests and urban forests), croplands (olive plantations), freshwater (lakes), marine (Posidonia oceanica prairies). The classification of services provided by these ecosystems follows CICES Common International Classification of Ecosystem Services version 4.3” (MESEU, 2015)

3.3. The indicators per ecosystem / ecosystem service (cells in the (MAES) matrix)

Table 2. Ecosystem services and indicators identified for the five case studies (MESEU, 2015, Annex 2).

<table>
<thead>
<tr>
<th>Type</th>
<th>Division</th>
<th>Group</th>
<th>Class</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forests:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Beech Forests</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Urban Forests</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Provisioning</strong></td>
<td>Materials</td>
<td>Biomass</td>
<td>Fibres &amp; other materials</td>
<td>Beech forests wooden epigeous biomass;</td>
</tr>
<tr>
<td><strong>Regulating</strong></td>
<td>Physical, chemical and</td>
<td>Atmosphere</td>
<td>Global climate</td>
<td>Carbon storage by Beech forests (NPP)</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>biological conditions</td>
<td>composition and</td>
<td>regulation through</td>
<td></td>
</tr>
<tr>
<td><strong>Regulating</strong></td>
<td>maintenance</td>
<td>climate regulation</td>
<td>reduction of GHG concentration</td>
<td></td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>Physical, chemical and</td>
<td>Atmosphere</td>
<td>Microclimate and climate at</td>
<td>Particulate pollution removed by urban and peri-urban forests</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>biological conditions</td>
<td>composition and</td>
<td>the regional level</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural</strong></td>
<td>Spiritual, symbolic and</td>
<td>Other cultural</td>
<td>Existence</td>
<td>Old-growth Beech forests</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>other interactions</td>
<td>services</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agro-ecosystems:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Olive groves</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Provisioning</strong></td>
<td>Nutrition</td>
<td>Biomass</td>
<td>Tree crops (olive groves)</td>
<td>Food productions (ha of olive groves)</td>
</tr>
<tr>
<td><strong>Regulation and</strong></td>
<td>Physical, chemical and</td>
<td>Atmosphere</td>
<td>Global climate regulation</td>
<td>Carbon storage by permanent crops (olive groves)</td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>biological conditions</td>
<td>composition and</td>
<td>through reduction of GHG</td>
<td></td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>maintenance</td>
<td>climate regulation</td>
<td>concentration</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural</strong></td>
<td>Spiritual, symbolic and</td>
<td>Other cultural</td>
<td>Existence</td>
<td>ha of olive groves within Natura 2000 Network</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>other interactions</td>
<td>services</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 3.4. Quantification methods of the indicators

“Data for the quantification of the chosen indicator will be mainly obtained from National sources such as National Forest Inventory, National statistics, Red list of species, Natura 2000 data.” (MESEU, 2015)

### 3.5. EU Directive reporting indicators & data used

“For the case studies, which were undergoing when the present report was finalized, national reports related to Habitat, WFD and Marine Strategy are planned to be used.” (MESEU, 2015, annex 2)
3.6. Scientific analysis

“At the moment only the carbon sink of Italian forests was assessed using an interpolation procedure integrating CLC and National Forest Inventory data and specific algorithms for the estimation of forest biomass. But the scientific quality of the analysis has not been performed yet” (MESEU, 2015)

3.7. Maps, reports, papers, (language)

Map(s) (of case study / studies) available (MESEU, 2015):


**Smiraglia D., Capotorti G., Guida D., Mollo B., Siervo V., Blasi C.**, 2013. Land units map of Italy. Journal of Maps 9(2), 239-244.

4. References

Ireland, Esmeralda project partner. (2015, June 8). Baseline information of ecosystem service mapping and assessment activities in Ireland. *Internal project document on Esmeralda portal*.