

Supplement: List of policy, business and societal questions

This supplement contains a list with policy (Table 1), business (Table 2) and societal (Table 3) questions. These questions were collected during different occasions as explained in the main article. The source of the questions is marked between brackets:

- 1st MAES report: questions collected during the first MAES stakeholder work in December 2012
- 13th MAES meeting: questions collected during the 13th MAES working group meeting in March 2017
- ESMEALDA: questions collected by the ESMEALDA project; a project funded under H2020 to support mapping and assessment of ecosystem services in member states of the EU
- Natural Capital Coalition: Questions collected during a review from the harmonised framework developed by the Natural capital Coalition
- Platform quality living environment: Flemish project to create a platform with maps of environmental information for citizens
- Ground Truth 2.0: EC funded project that is setting up and validating six citizen observatories in real conditions, in four European and two African demonstration cases.

The second column of each table contains comments and keywords used to derive a typology of questions.

Abbreviations used in the tables:

Q: Question

ES: Ecosystem Services

MAES: Mapping and Assessment of Ecosystems and their Services

Table 1. List with policy questions (Q stands for question)

Policy question (source of the question)	Comments for classification
How can the ecosystem service concept be made relevant and find its entry into the development of the next CAP? (13 th MAES meeting)	Q about sectoral policy (Common Agricultural Policy)
What are ecosystem services farmers could be paid for? (13 th MAES meeting)	Q about the application of payments
How can we link different result and data sets at different scales (i.e. EU, National, Local)? (13 th MAES meeting)	Q about scale (upscaling and downscaling)
Which are the priority ES that need to be mapped & assessed? (13 th MAES meeting)	Q about priority setting
How can MAES shape patterns of development through <ul style="list-style-type: none"> • Informing strategic spatial land use plans • Supporting assessments of impacts of individual developments? (13th MAES meeting) 	Q about sectoral policies (land planning and impact assessment)
Where to get an independent measurement of ES flows to validate our calculations/ models predicting ES delivery? (13 th MAES meeting)	Q about data and validation based on field observations/uncertainty
Why different methods for mapping & valuing ES will provide different results(13 th MAES meeting)	Q about the uncertainty of scientific results
How can the data & knowledge gained through MAES/ Maes-type projects be used by local planners – e.g. where to put a new housing development or road? (13 th MAES meeting)	Q about policy support (planning)
How might ecosystems & ES change under plausible future scenarios? (13 th MAES meeting)	Q about the trends of ES; scenarios and uncertainty
Farming already provides the ecosystem services that matter for our essential needs (food, energy)-why the fuss about the non-essential ones? (13 th MAES meeting)	Q about clarification (concept of multiple ecosystem services)
How mapping of degraded ecosystems could contribute for MAES process? (13 th MAES meeting)	Q about specific support for MAES (biodiversity)
How can member states contribute to development of pilot studies? Is it possible to provide technical support for them? (13 th MAES meeting)	Q about technical support
How can we better communicate the social benefits of nature based solutions into decision making? What kind of information will be recognized? (13 th MAES meeting)	Q about technical support: how to better communicate
Why should we invest in measuring carbon stocks if they do not have real-life economic value? (13 th MAES meeting)	Q about costs/resources and about the concept
How can the lack of knowledge on ESS production functions be addressed within the MAES process? (13 th MAES meeting)	Q about uncertainty which can be addressed by a tiered approach
What is needed to come to innovative integration of social and natural science to really show, assess and value the importance of a healthy natural & physical environment to human health? (13 th MAES meeting)	Q about extending the concept

How will ministries that use or influence natural capital (transport, energy, economy) uptake MAES information/scientific information in order to improve sectorial policies? (13 th MAES meeting)	Q about policy support and sectoral uptake
What is necessary to bridge all that is known on ES in the scientific community to the policy domain? (13 th MAES meeting)	Q about science policy interface and communication
How can health benefits of ecosystem services be valued in such a way that decision making on spatial planning is influenced? (13 th MAES meeting)	Q about policy support (spatial planning)
On the long term, is there a third assessment round on ES foreseen to determine trends with higher reliability and link these to political/economic conditions and decisions? (13 th MAES meeting)	Q about uncertainty of the assessment and policy support
What is the public's current understanding of ES? (13 th MAES meeting)	Q about uncertainty of the uptake and communication
ES delivery is influenced by number of biotic and abiotic factors. What is the role of biodiversity among those factors? Would the ES Assessment really contribute to the biodiversity restoration/conservation? What would we do if we came to the conclusion that biodiversity conservation imposes (somewhere) a constraint to needed ES delivery? (13 th MAES meeting)	Q about the uncertainty of the biodiversity-ecosystem services relationship and request for more conceptual clarification
What can we take back as a mission to our MS agency and administration concerning ecosystem condition? Is there a clear target and date, some critical mass and incentive to convince the MS or region to spend efforts on it? (13 th MAES meeting)	A request for guidance on ecosystem condition
The cost-benefit analysis is an appropriate tool to handling ecosystem services and valuing such bundles. Is this work to be taken up within MAES? (13 th MAES meeting)	A request for more information about the applicability of methods
What are the main risks of trade-offs between provisioning services e.g., in the context of agriculture and the "nature relevant" services like pollination, recreation, maintaining biodiversity? (13 th MAES meeting)	Q about synergies and trade-offs
How can the national approach to ESS valuation be reconciled with the need to value cross-border ESS like migratory species support? (13 th MAES meeting)	Q about scaling and appropriate use of data
How can we use MAES/MAES-type work to determine optimisation of land use/ where restoration should occur? Some folk suggest modelling but the information required is very burdensome. - is here a suite of different questions (like a flow chart) that could be need to help policy-makers come to the right (or an) answers? (13 th MAES meeting)	A request for policy support (planning and biodiversity)
What institutional set-up is envisaged for MAES work formal reporting by MS, having in mind that monitoring needs also the allocation of resources? (13 th MAES meeting)	Q about resources/costs
How is the "intrinsic value of nature" addressed in 7th Environmental Action Plan and the Biodiversity Strategy to 2020, captured with "elsewise" utilitarian approach of ecosystem services? (13 th MAES meeting)	Q about conceptual clarification
Ecosystems that are not commercially interesting tend to be subject	Technical Q to help with priority

to more pressures by, i.e. land grab and fragmentation. Will the MAES pilots develop priority measures to address this (i.e. by prioritising their ESS?) (13 th MAES meeting)	setting
Provisioning services are best developed in terms of indicators and the easiest to communicate to policymakers and business. Are there measures planned to overcome the potential bias as ecosystem services perception is surely another business opportunity to “Harvest from nature” without sustainable management? (13 th MAES meeting)	Technical Q to help with priority setting
What can we take back as MS representatives on ES accounting? What are the envisioned useful applications on MS level? What are the envisioned application at EU level potentially impacting the MS? (13 th MAES meeting)	A request for applications and an more information on accounting
How can MAES inform the spatial targeting of expenditure to conserve and enhance ecosystems? (13 th MAES meeting)	Q about resources and costs; support to spatial planning and conservation
How, if at all, will ES approach be linked/aligned/matched with typology of Nature Based solutions that will be developed / with overarching conceptualisation of nature’s values within IPBES(13 th MAES meeting)	Q about conceptual clarification
How to harmonize across the EU the prioritization of ecosystem services which are selected by national stakeholders(13 th MAES meeting)	Technical Q about harmonization and priority setting
What are the current state and trends of the EU’s ecosystems and the services they provide to society? (1st MAES report)	Knowledge request
What are emerging trends and projected future state of the EU’s ecosystems and the services they provide to society? How is this currently affecting human well-being and what are the projected, future effects to society? (1st MAES report)	Knowledge request
What are the key drivers causing changes in the EU’s ecosystems and their services? (1st MAES report)	Knowledge request
How does the EU depend on ecosystem services that are provided outside the EU? (1st MAES report)	Knowledge request
How can we secure and improve the continued and sustainable delivery of ecosystem services? (1st MAES report)	Knowledge request
How do ecosystem services affect human well-being, who and where are the beneficiaries, and how does this affect how they are valued and managed? (1st MAES report)	Knowledge request
What is the current public understanding of ecosystem services and the benefits they provide (some key questions could usefully be included in the 2013 Eurobarometer on Biodiversity)? (1st MAES report)	Knowledge request
How should we incorporate the economic and non-economic values of ecosystem services into decision making and what are the benefits of doing so (question to be addressed 2020)? And what kind of information (e.g. what kind of values) is relevant to influence decision-making? (1st MAES report)	Technical support Q about methods

How might ecosystems and their services change in the EU under plausible future scenarios - What would be needed in terms of review/revision of financing instruments? (1st MAES report)	Knowledge request and Q about costs and resources
What are the economic, social (e.g. employment) and environmental implications of different plausible futures? What policies are needed to achieve desirable future states? (1st MAES report) (1st MAES report)	Knowledge request and Q about conceptual clarification
How have we advanced our understanding of the links between ecosystems, ecosystem functions and ecosystem services? More broadly, what is the influence of ecosystem services on long-term human well-being and what are the knowledge constraints on more informed decision making (1st MAES report)	Knowledge request and Q about conceptual clarification
How can MAES assist MS in assessing and reviewing the priorities to be set for ecosystem restoration within a strategic framework at sub-national, national and EU level? (1st MAES report)	Q about policy support (biodiversity strategy)
How can MAES help to assess and review the design of prioritisation criteria for restoration and at which scale to get significant benefits in a cost-effective way (e.g. relevance for biodiversity; extent of degradation of ecosystems and the provision of key ecosystem services)? (1st MAES report)	Q about policy support (biodiversity strategy) and about the use of resources
How can MAES help to provide guidance and tools to support strategic deployment of green infrastructure in the EU in urban and rural areas to improve ecosystem resilience and habitat connectivity and to enhance the delivery of ecosystem services at Member State and sub-national level? (1st MAES report)	Technical support Q
How to foster synergies between existing and planned initiatives at local, regional or national levels in Member States, as well as how to promote further investments, thereby providing added value to Member States action? (1st MAES report)	Q about scale (upscaling and downscaling); Q about costs
Do the measures generate social benefits? (Esmeralda)	Application Q on how measures result in benefits
How high are costs of landscape degradation? How to protect landscape? (Esmeralda)	Q about costs and resources
What is the economic value of nature (bird watching) and what is its contribution to tourism management (Esmeralda)	Knowledge request and Q about application of methods
“What do nature and water have to do with economics?” (Esmeralda)	Knowledge request
Do people have preferences for heathland restoration or river restoration? (Esmeralda)	Q about setting priorities
Can habitats, important for providing different ecosystem services and biodiversity benefits, meet the growing needs of agricultural production or demands from society for recreation and open space amenities? (Esmeralda)	Knowledge request
How can we use ecosystem services for future vision building of a region? (Esmeralda)	Technical support Q about scenarios and uncertainty
How much to invest in forest management (Esmeralda)	Q about costs and resources based on ES

How to achieve economically viable grassland management while maintaining biodiversity? (Esmeralda)	Q about costs and resources and application (cost benefit analysis)
How can the ES approach be integrated into planning and EIA processes? (Esmeralda)	Q for policy support in the area of planning and impact assessment
how to integrate and use lessons from work on the concept and valuation of eco- system services in practical management, and how to integrate this in an overall framework of ecosystem management (Esmeralda)	Request for guidance
how to map water quality-related ESs necessary for the implementation of specific measures in different planning levels (Esmeralda)	Q for technical guidance and policy support in the area of planning
How to protect against flood risks resulting from tidal waves. (Esmeralda)	Q for technical guidance and policy support in the area of disaster risk reduction
In response to these figures, the I-O model developed below is used to answer the following question: what would be the ecological and economic impact of precautionary measures applied to fish habitats while still respecting the principles that environmental damage should be rectified at the source and that the polluter should pay? (Esmeralda)	Q about application of methods, costs and benefits and payments
Is there a positive preference for habitat restoration in coniferous forests (Esmeralda)	Q about priorities and preferences
Should the most valuable areas for ESs provision be taken into account as conservation priorities? (Esmeralda)	Q which could be addressed by assessing (social and economic) costs and benefits and biophysical trade-offs
To assess the strengths and weaknesses of an ESS approach to support decisions in integrated management; to provide a generic monetary value function to assess the public benefits of amenity (Esmeralda)	Q about uncertainty and methodological Q
What are possible impacts of planned sea uses on ecosystem service supply? (Esmeralda)	Request for policy support in the area of spatial planning
What are the most important actual and wanted ecosystem services (Esmeralda)	Q about priorities and preferences
What are trade-offs between different landscape scenarios? (Esmeralda)	Q about uncertainties (scenarios and trade-offs) which can be addressed using available methods
What environmental factors are most important for people who want to move out from the city? How to protect landscape? (Esmeralda)	Q about priority setting based on different inputs (zonal and spatial planning)
What social benefits will the plan bring about? (Esmeralda)	Q about applications of ES approach including social costs and benefits
Where further improvement in land use should be targeted to	Policy support request in the

strengthen the supply of analysed ES? (Esmeralda)	area of spatial planning
Where are optional areas for specific land use that have not been realized so far? (Esmeralda)	Policy support Q about spatial planning which can be addressed using specific methods
Whether or not aquatic vegetation removal in the study area gives full cost recovery? (Esmeralda)	Q about cost and benefits
What are emphasised as particular priorities in current development policy and/or seen as major areas of opportunity for future economic growth? (Esmeralda)	Policy support request in the areas of planning and economy
Which measures protect against flooding having the highest BC-ratio?	Specific Q about costs and benefits

Table 2. List of business questions

Business question (source of the question)	Comments for classification
What is the economic value of nature (bird watching) and what is its contribution to tourism management? (Esmeralda)	Q about cost and benefits
How to combine land use models with economic evaluation of ES can be useful in development plans for settlement expansions (Esmeralda)	Policy support request in the area of spatial planning
What are potential areas providing algae resources for commercial use? (Esmeralda)	Specific Q about costs and benefits Q about priorities
How to develop an accounting framework to see the impact on ES for several management options in our quarries (Esmeralda)	Specific application
How to use Invest for projects related to forest management and in proceedings relating to land use changes (Esmeralda)	Q about particular tools
How to do conflict identification, integrated framework to assess water provisioning services addressing the ecosystem-water-food-energy-nexus?	Policy support request in areas of planning and economy
What coastal areas are of high tourism and leisure development potential? (Esmeralda)	Q about priorities
How to identify possibilities for and conflicts between white-water rafting , fish habitat and hydropower in an Alpine river (Esmeralda)	Specific application
How to pay for (water related) ES to maintain water resources (Esmeralda)	Policy support request in areas of planning and economy
Which activities, when, and where in the watershed yield the greatest returns, under different investment scenarios? (Esmeralda)	Specific Q about costs and benefits
Why does nature matters for my business? (Natural Capital Coalition)	Knowledge request
Need for indicators, data and classification systems that can facilitate mainstreaming business use as well as simplifying terminology (Natural Capital Coalition)	Request for guidance
Which methods are out there to map impacts, dependencies, value (Natural Capital coalition)	Request for guidance
Which best practices for using nature valuation in business decision making exist? ((Natural Capital Coalition)	Knowledge request
What are my organization's dependencies on natural capital? (Natural Capital Coalition)	Policy support request in areas of planning and economy
Are their business opportunities linked to ecosystem services (new costumers, new products, new investors...)?	?
What, why and how natural capital measurement and management can add value in decision making (Natural Capital Coalition)	Policy support request in areas of planning and economy
How can I measure the impact of my business on natural capital (Natural Capital Coalition)	Request for guidance
How nature valuation can be practically used in business applications e.g., strategic planning, management at site and supply chain levels,	Request for guidance

financial accounts, corporate reporting and disclosure? (Natural Capital Coalition)	
Which incentives can be developed to drive business engagement? (Natural Capital Coalition)	application

Table 3. List of societal questions.

Example of Societal question (source of the question)	Comments for classification
How to facilitate education for citizens so more people are convinced of the importance of green for society.(Ground Truth 2.0)	Application
How to show the possible impact of green measures in order to make a selection of measures our neighbourhood could take to improve the quality of our neighbourhood (Ground Truth 2.0)	Policy support in spatial planning
How can I measure the impact of a policy or project on my environment? (Ground Truth 2.0)	Specific Q on costs and benefits
Where are the best places to realise cycling and walking trails in the city? (Ground Truth 2.0)	Policy support spatial planning
I want to be able to signal environmental issues to policy makers (Ground Truth 2.0)	Information
How to create public support for green measures (Ground Truth 2.0)	Awareness raising
How to find information about the benefits of green (Ground Truth 2.0)	Information
How to validate data with observations (Ground Truth 2.0)	Citizens science
How to learn and understand some key words (Ground Truth 2.0)	Information
How can I advocate the importance of a particular green space for the community? (Platform quality living environment)	Specific Q on benefits
What is the quality of air, water, access to green... in my present/future living environment? (Platform quality living environment)	Specific Q on quality
Where is the best place to live? (Platform quality living environment)	Specific Q on quality