

# **Making green economy happen: Integration of ecosystem services and natural capital into sectoral policies**

*Guidance for policy- and decision-makers*

*Kettunen, M., ten Brink, P., Mutafoğlu, K., Schweitzer, J.-P., Pantzar, M.,  
Claret, C. & Metzger, M. and Pavlova, D.*

## Ecosystem Science for Policy & Practice



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# Introduction

The integration of ecosystem services and natural capital into the functioning of economic sectors provides a concrete means to initiate a shift towards green economy. This process starts with the integration of ecosystem services and natural capital into the policies governing the different sectors, with a view to develop concrete transition plans for greening of the sectors.

**Green economy:** Green economy is defined as an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities<sup>1</sup>. It is seen as an alternative to that the current model of economic growth that is, based on increasing evidence, considered socially, environmentally and economically unsustainable. A green economy is low carbon, resource efficient and socially inclusive and it should maintain, enhance and - where necessary - rebuild natural capital as a critical economic asset and as a source of public benefits, especially for poor people whose livelihoods and security depend on nature. Working with and within the limits of nature is therefore at the heart of the transition to a green economy<sup>2</sup>. Nature is essential to the health and growth of economies, societies and individuals through the provision of a multitude of ecosystem services (see below). In spite of this, the values of nature to economies and society have often been overlooked and not reflected in the decisions of policy makers, businesses, communities or citizens, contributing to the loss of biodiversity and subsequent impacts on people and the economy.

**Ecosystem services, natural capital and nature-based solutions:** Ecosystem services are the direct and indirect contributions of ecosystems to human well-being<sup>3</sup>. They include nature's input to products obtained from ecosystems (food, water, timber, energy, ornamentals), beneficial ecosystem processes (water purification, pollination, pest control etc.), non-material benefits such as recreation, cultural and aesthetic values, and key basic ecological processes underpinning all ecosystem functioning. Natural capital is the economic metaphor for these benefits, one that also acknowledges that these stocks of biological resources on earth are limited<sup>4</sup>. Nature-based solutions are concrete approaches for the management of natural resources that build on the understanding of ecosystem services and natural capital, such as conservation and restoration of wetlands for water purification, conservation of ecosystems' carbon storage to mitigate climate change or adoption of management practises that encourage an increase in natural pollinators. As such nature-based solutions provide concrete means for different sectors to transition to green economy.

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<sup>1</sup> <http://web.unep.org/greeneconomy/resources/green-economy-report>

<sup>2</sup> <http://img.teebweb.org/wp-content/uploads/2013/04/Nature-Green-Economy-Full-Report.pdf>

<sup>3</sup> <http://www.teebweb.org/our-publications/teeb-study-reports/ecological-and-economic-foundations/>

<sup>4</sup> In the context of this guidance, purely abiotic natural resources fall outside the focus of the definition

**Sectoral policy integration of ecosystem services:** The integration of ecosystem service and natural capital related aspects into sectoral policies provides a key means for a transition to a greener economy. Firstly, it minimises the damage to ecosystems and their services caused by sectoral activities and maximise the positive contribution of these activities to conservation. Secondly, the integration of ecosystem services and natural capital into sectoral policies can also contribute to achieving sectoral and other wider policy objectives in a more sustainable manner, increasing policy effectiveness and create potential win-win solutions between delivering different policy objectives. For example, there are cost-effective nature-based solutions that build on the understanding of ecosystem services that can be used, for example, for the water and energy sectors. This implies using wetland restoration as a means for water purification or using the re-vegetation of river banks to restore natural shading and supply cooling water for power stations<sup>5</sup>.

Current progress with the integration of ecosystem services and natural capital in sectoral policies varies across policy areas and governance levels. However, it is generally the case that the existing policy frameworks for ecosystem services remain far from optimal<sup>6</sup>. This is particularly true when considering the integration of ecosystem services into different concrete sectoral instruments linked to planning, assessment and financing of policy implementation. Furthermore, ecosystem services are also poorly integrated into the information framework underpinning the development and implementation of sectoral policies and instruments. In particular, the majority of the existing policy instruments are still primarily focused on regulating ecosystems from the point of view of specific natural resource - in other words addressing single ecosystem services such as provisioning of agricultural commodities, fish and timber - rather than addressing the full range of services ecosystems provide. This risks leading to inappropriate trade-offs between ecosystem services - and also between ecosystem services and biodiversity conservation. For example, the use of certain pesticides and the loss of natural areas for food production can have negative effects on wild pollinators and contribute to a loss of biodiversity, pollinating services, and subsequently reduced farm output<sup>7</sup>.

Consequently, the policy sectors are commonly underperforming both as regards their long-term sustainability and their contribution to achieving the set targets for conserving biodiversity and ecosystem services.

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<sup>5</sup><http://www.teebweb.org/publication/the-economics-of-ecosystems-and-biodiversity-teeb-for-water-and-wetlands/>

<sup>6</sup> Kettunen et al. 2015; Clement et al. 2016

<sup>7</sup> E.g. Hokkanen et al. 2017 (<https://link.springer.com/article/10.1007/s11829-017-9527-3>); Bailey et al. 2014 (<http://onlinelibrary.wiley.com/doi/10.1002/ece3.924/abstract;jsessionid=83B006A5DED2C91F1B03086B61DF338F.f02t03>)

## Who and what is the guidance for?

The guidance is aimed at policy and decision-makers at different levels of governance - ranging from national to regional and local - interested at furthering the integration of biodiversity into sectoral policies while simultaneously identifying concrete opportunities for a shift towards green economy.

Integrating the ecosystem service concept into policy development and implementation across sectors needs a good evidence base (e.g. understanding of the current situation), range of tools and instruments, engagement by different stakeholders, mobilisation of resources to facilitate the uptake and a framework to monitor impacts. Furthermore, it is crucial to focus on both realising benefits to the sectors linked to the mainstreaming of ecosystem services and natural capital and reducing possible trade-offs between such benefits and other sectoral policy goals. This guidance provides a framework for systematically identifying and assessing all these important elements.

## Structure and content

The guidance consists of three steps:

**Step 1:** Assessment of the current level of policy integration across sectors. This step allows for a comprehensive understanding of the state-of-play and provides the basis for a systematic approach to the identification of key future opportunities and actions taken under Step 2 and Step 3.

**Step 2:** Identification of key policy and sectoral opportunities and needs for future integration. This step provides guidance as to how to identify and prioritise which policy sectors should be selected as the key targets for future action, based on the assessment of foreseen opportunities and needs.

**Step 3:** Planning uptake and implementation, using the green economy framework as a strategic and holistic platform. The final step gives advice as to how to use the assessment of sectoral integration of ecosystem services and natural capital as concrete means for developing 'green' transition plans for different economic sectors.

**Illustrations and examples:** Throughout the guidance a range of visualisations and illustrative examples are provided. These visualisations are aimed at to be adaptable for concrete use when applying the guidance. In addition, two examples of concrete assessment of sectoral policy integrations applying the methodology are provided.

# Step 1: Assessment of the current level of policy integration

## Assessing the current level of integration

The assessment of the current level of integration allows for a systematic approach to the identification of key opportunities and actions for ecosystem service integration to be taken under **Step 2** and **Step 3**.

Integration of ecosystem services and natural capital into policy sectors needs to take place in three different levels: conceptual (where policy documents explicitly or implicitly take ecosystem services into account), operational (where specific measures or instruments are identified and committed to addressing ecosystem services related objectives) and, finally, integration through implementation (where measures achieve integration on the ground in concrete decisions, such as creating investment) (Table 1). Integration in terms of concrete implementation builds directly on operational integration (i.e. the existence of concrete policy instruments for ecosystem services) which in turn relies on the support at the conceptual level.

The assessment should aim take stock of the current level of integration at different relevant sectoral governance levels, starting from understanding the situation at the highest relevant level (e.g. national and/or the EU) and then moving onto regional and/or local level. The assessment should cover both the opportunities for establishing win-wins and reducing trade-off situations between achieving sectoral policy objectives and the conservation and sustainable use of nature policy.

**Conceptual integration:** Conceptual integration refers to the integration of ecosystem services and natural capital into the overall premises and objectives of different policy areas. Conceptual integration is assessed based on the key strategic policy documents setting out the scope and objectives for sectoral policies.

**Operational integration:** Operational integration refers to the uptake of ecosystem services and natural capital in practical policy implementation. Operational integration is assessed based on the availability of concrete policy tools and instruments that take up and implement the concepts.

**Implementation integration:** Implementation integration refers to the final stage of the integration process, i.e. where concrete measures achieve integration on the ground in actual policy- and

decision-making situations. In other words, implementation integration refers to the situation when a range of instruments and measures are in concrete use to protect or investment in ecosystem services, with the different instruments needed to work in unison to achieve effective implementation (see **Step 3**).

Across the above levels, four different degrees of integration can be identified: comprehensive and explicit; explicit but not comprehensive; implicit and incomprehensive; and no specific integration (see Table 1).

Table 1 Different levels of ecosystem services and natural capital integration into policy sectors

Level of integration	Conceptual integration	Operational integration	Implementation integration
<i>Comprehensive and explicit</i>	Explicit recognition of all ecosystem services, including the recognition of ecosystem services and natural capital as underpinning elements of human wellbeing	Dedicated instruments exist for addressing ecosystem services and natural capital in a comprehensive manner within a policy area.	The dedicated instruments and measures are implemented, with due procedures in place to support the implementation (e.g. funding), monitor their effectiveness (e.g. ex-post assessments) and adopt changes if needed (e.g. process for adaptive governance).
<i>Explicit but not comprehensive</i>	Some explicit integration (e.g. some specific ecosystem services), including some recognition of ecosystem services and natural capital as underpinning elements of human wellbeing.	Some instruments exist that proactively address / build on the understanding of ecosystem services and natural capital within the policy area.	The existing instruments and measures are implemented, with some procedures in place to support and/or monitor the implementation (as per above).
<i>Implicit and incomprehensive</i>	Implicit and indirect integration, generally focus on preventing negative impacts of a policy sector on ecosystem services and natural capital	No dedicated instruments exist for directly addressing ecosystem services and natural capital. Some aspects – mainly focusing on avoiding negative impacts on (some) ecosystem services - integrated into sectoral instruments.	The existing indirect instruments and measures are implemented, with procedures in place to support and/or monitor the implementation. The framework for implementation does not, however, explicitly or comprehensively cover ecosystem services or natural capital.
<i>No specific integration</i>	No recognition (direct / indirect) of ecosystem services and natural capital	No instruments exist that would in any way address ecosystem services and natural capital.	No implementation of any instruments or measures linked to



As regards the operational and implementation integration, a range of different types of policy instruments can be used to achieve the integration of ecosystem services and natural capital into sectoral policies (Table 2).

**Information instruments:** information instruments consist of indicators for assessing the implementation of sectoral policies, databases and frameworks for monitoring, mapping and accounting, and a range of science-policy assessments supporting policy development.

**Decision-support instruments:** decision-support instruments include instruments for planning and targeting, reporting, and impact and risk assessment / procedures. Planning and targeting instruments include regional management plans for implementing legislation (e.g. river basin and flood risk management plans) and programmes for targeting and implementing public funding. Furthermore, a range of restrictions affecting plans for sectoral and/or infrastructure developments are outlined in different pieces of legislation. Finally, instruments for reporting consist of different frameworks, procedures and assessments for reviewing the implementation and effectiveness of legislation (e.g. reporting for the implementation of legislation, ex-post assessments of policy instruments).

**Implementation instruments:** implementation instruments include legislative instruments, instruments for public financing, designations of protected areas, and market-based policy instruments. Legislative instruments include regulations and decisions (e.g. any dedicated standards set forward by these instruments). A range of sector-specific instruments are in place to allocate financing from public budgets towards policy implementation. In addition to public funding, an increasing number of market-based instruments such as payments for ecosystem services (PES) can be used. Finally, protected area designations form a “standardised” way for establishing a spatial framework for nature protection.

There are interdependencies between the identified instruments and instrument categories. For example, the application of decision-support instruments depends heavily on the availability of information instruments such as indicators. Similarly, regulations and directives often form the basis - or set forward the very requirements - for other instruments such as indicators, and monitoring and reporting procedures. For a successful final outcome, these interdependencies need to be understood and address - and they are explored and assessed under **Step 3** below.

**Concrete examples of assessing the current level of integration using the classifications above are provided in the last Chapter (Examples).**

Table 2 Different types of policy instruments that can be used for the integration of ecosystem services and natural capital into sectoral policies

Instrument category		Identified concrete instruments with relevance to ecosystem services and natural capital
<i>Information instruments</i>	Data, indicators, monitoring, mapping, accounting, science-policy assessments	<ul style="list-style-type: none"> <li>• Databases</li> <li>• Indicators</li> <li>• Monitoring and mapping frameworks</li> <li>• Accounting frameworks</li> <li>• Science-policy assessments and science policy interfaces supporting policy development</li> </ul>
<i>Decision-support instruments</i>	Planning and targeting, supported by indicators, monitoring and mapping	<ul style="list-style-type: none"> <li>• Regional management plans</li> <li>• Programmes for targeting and implementing funding</li> <li>• Other mechanisms supporting planning and targeting (e.g. restrictions in regulations affecting planning of infrastructure developments)</li> </ul>
	Reporting, supported by indicators, monitoring and mapping	<ul style="list-style-type: none"> <li>• Reporting and review frameworks for legislation</li> <li>• Ex-post assessments of policy instruments and related programmes (e.g. mid-term evaluations of funds)</li> </ul>
	Impact assessment procedures and risk assessment and analysis	<ul style="list-style-type: none"> <li>• Impact assessments (IA) underpinning the development of policies and legislation (e.g. <i>ex ante</i> assessments)</li> <li>• Strategic Environmental Assessment (SEA) and related guidance</li> <li>• Environmental Impact Assessment (EIA) and related guidance</li> <li>• Product life cycle assessments</li> <li>• Project selection and evaluation criteria</li> </ul>
<i>Implementation instruments</i>	Dedicated legislative acts, regulations & standards	<ul style="list-style-type: none"> <li>• National and regional legislation</li> <li>• Criteria and standards for policy sectors</li> </ul>
	Protected areas	<ul style="list-style-type: none"> <li>• National and regional protected area networks</li> </ul>
	Public investment	<ul style="list-style-type: none"> <li>• European Agricultural Fund for Rural Development (EAFRD)</li> <li>• European Maritime and Fisheries Fund (EMFF)</li> <li>• EU Structural and Cohesion Funds (ERDF, ESF, CP)</li> <li>• EU Fund for the Environment – LIFE</li> <li>• National and regional funds</li> </ul>
	Market-based instruments and certification	<ul style="list-style-type: none"> <li>• Payments for ecosystem services (PES)</li> <li>• REDD+</li> <li>• Offsetting schemes</li> <li>• Green public procurement (GPP)</li> <li>• Certification schemes</li> </ul>
	Other	<ul style="list-style-type: none"> <li>• Promoted / endorsed global, regional or nation-wide practices (e.g. soil conservation practices)</li> </ul>

## Step 2: Identification of key policy and sectoral opportunities and needs for future integration

### Identifying key policy sectors, instruments and stakeholders

**Policy areas:** All sectors of the economy benefit directly or indirectly from nature and their engagement is required for the transition to a green economy, with a view to support sustainable development. This is both in sectors' self-interest, given their reliance on inputs from nature. It also reflects their responsibilities in terms of impacts, risks and liabilities related to the natural environment.

All sectoral policy areas can therefore be relevant in terms of ecosystem services and natural capital integration and greening the existing economic sectors is as important for green economy transition as developing new green sectors. The national / regional / local context and foreseen policy developments help to determine which sectoral policy areas to focus future action on (see further guidance below).

The greening of economy requires actions on different sectoral fronts:

- ✓ Increasing the sustainability of the natural capital dependent sectors (e.g. agriculture, fisheries, forestry, tourism)
- ✓ Increasing the sustainability of the 'brown' sectors with impacts on nature and natural capital (e.g. waste, transport)
- ✓ Creating entirely new green sectors building on nature and natural capital

Recognising the multiple social and economic benefits linked to the conservation of nature and actively building on such benefits (e.g. nature-based tourism and public health care<sup>8</sup>) and investing in green innovations and sustainability within sectors (e.g. climate and biodiversity friendly technologies, nature-based solutions addressing risks and scarcities<sup>9</sup>) provide the means for action across the above areas.

**Instruments and their interplay:** Different policy instruments (Table 2) have a different role to play in sectoral integration (Figure 1). In general, information and policy- and decision support instruments form the basis for successful uptake of implementation instruments, including monitoring their effectiveness in practice. For example, different environmental impact assessment tools play an important part in integrating ecosystem service knowledge into concrete decision-making at the stage of implementation, especially if applied early enough, thoroughly enough and if the results are

<sup>8</sup> E.g. IEEP 2016 (<https://ieep.eu/publications/new-study-on-the-health-and-social-benefits-of-biodiversity-and-nature-protection>)

<sup>9</sup> E.g. IEEP 2013 ([http://ec.europa.eu/regional\\_policy/sources/docgener/studies/pdf/guide\\_multi\\_benefit\\_nature.pdf](http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/guide_multi_benefit_nature.pdf))

taken into account. Similarly, strategies and action plans can also be useful processes for coherence and good governance – e.g. the national biodiversity strategies and action plans, green economy strategies and national development plans each have the potential to support the integration of ecosystem services and nature-based solutions.

**Stakeholders and institutions:** Identification of relevant sectoral stakeholders is required to be able to map out the engagement process required to underpin integration. Key stakeholders should be identified for all different levels of integration (conceptual – operational – implementation) and instruments (information provisioning – decision-support – implementation). For example, sectoral decision-makers at national level play a key role in conceptual and operational integration whereas integration at the level of implementation is carried out by local actors and institutions. Information instruments can require inputs from a range of stakeholders, ranging from local actors (e.g. monitoring) to regional and national institutions (e.g. data collation and analysis) whereas the application of decision-support instruments (e.g. impact assessments) is often carried out by a limited number of organisations or individuals.

Finally, even while focusing on the integration of ecosystem services and natural capital within certain sectors it is important to identify any possible sectors that might be influenced by the foreseen changes, aiming to engage with and seek support from those stakeholder groups.

## Prioritisation of policy sectors based on opportunities and needs

Establishing a full picture on the interlinkages between policy sectors, related instruments, and relevant stakeholders and institutions, as per above, plays an integral role for ensuring sectoral integration, especially at the level of implementation.

The integration of ecosystem service and natural capital into sectoral policies can be driven both top-down or bottom-up, i.e. from the perspective of setting policy goals and targets or from the perspective of stakeholders' needs and opportunities on the ground (Figure 1). The identification of future opportunities or needs for integration requires looking at both of these development paths in order to recognise where changes are required and/or possible and related key institutions and stakeholders. Together with the assessment of current level of integration, this enables to determine which policy sectors hold the most opportunities or needs for integration and should be prioritised for action.

Prioritising policy action for integration of ecosystem services and natural capital in the context of different sectors builds on the following considerations:

- ✓ Identifying key **win-wins** for ecosystem services integration and delivery of sectoral objectives within sectors (e.g. improving cost-effective delivery of set water quality standards by nature-based solutions, protecting the abundance and diversity of natural pollinators for maintaining food security)
- ✓ Identifying key **win-wins** for ecosystem services integration and delivery of sectoral objectives between sectors (e.g. improving cost-effective delivery of set water quality standards by nature-based solutions, reducing costs of pollution reduction to agriculture sector and increasing attractiveness of recreation sector)
- ✓ Identifying key **trade-offs** between policy sectors required to be addressed (e.g. undermining support to nature-based solutions to address downstream water quality issues by intensified land conversion for agriculture upstream)
- ✓ Identifying key bottlenecks for development within or across policy sector (e.g. conflicting stakeholder interests or sectoral / geographical mandates, level of knowledge and available data)
- ✓ Identifying windows of opportunity (e.g. upcoming policy reforms) and linking these to possible sources to finance uptake.

Criteria for assessing the opportunities and needs in order to select key sectors for future policy action include:

- ✓ **Impact:** which win-wins (within or between policy sectors) are likely to provide the largest positive impact, both in terms of conservation and socio-economic benefits?
- ✓ **Urgency:** which trade-offs are causing or will cause the considerable impact?
- ✓ **Feasibility:** which win-wins or trade-off are likely to be feasible to address (political and stakeholder support)?
- ✓ **Opportunity:** which policy sectors have clear windows of opportunity for change?
- ✓ **Engagement:** which policy sectors include stakeholders that have good capacity to support a change?
- ✓ **Assets:** which policy sectors have the most concrete opportunities for benefiting from the existing and/or improved natural capital assets (e.g. networks of protected areas)?
- ✓ **Knowledge:** which policy sectors and/or instruments have the level of knowledge available for robust policies and instruments?

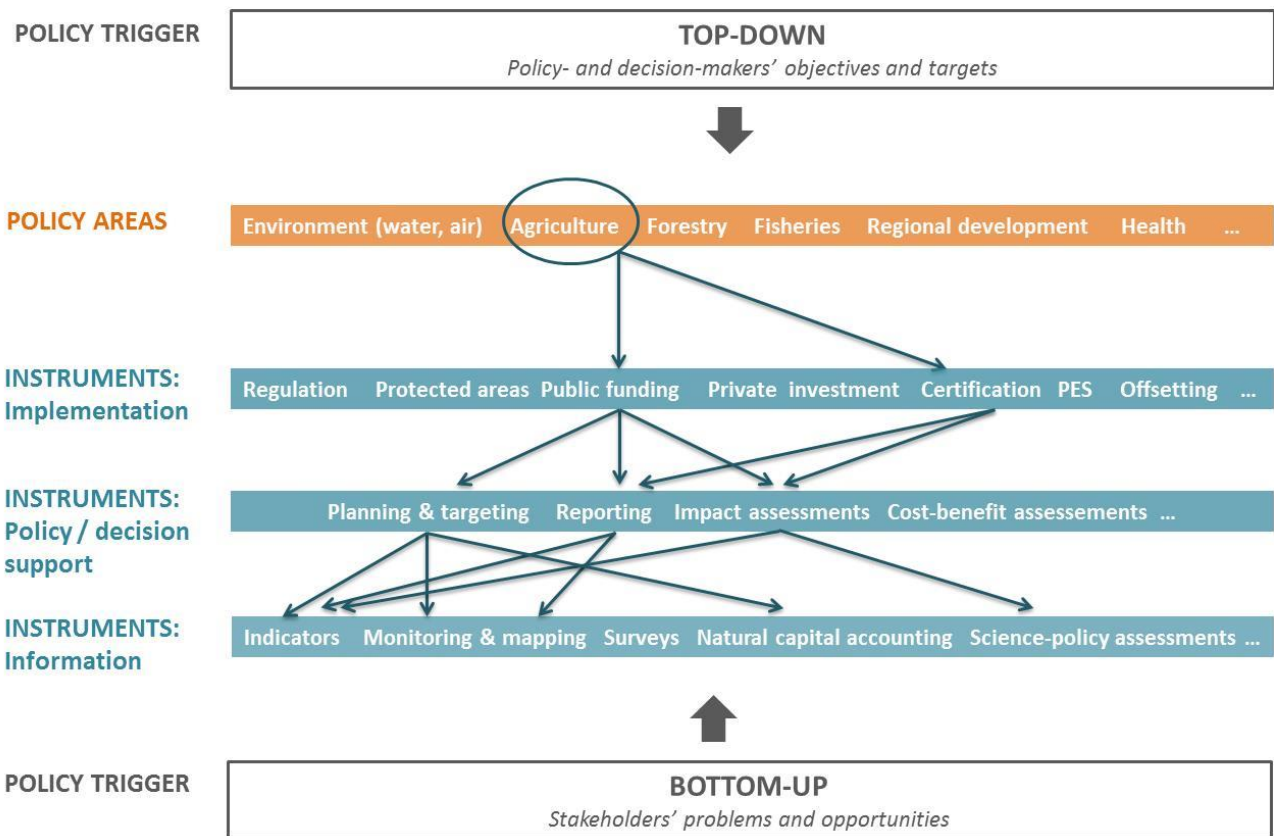


Figure 1 Illustration of the hierarchy and interplay of policy instruments supporting integration of ecosystem services and natural capital into sectoral policies.

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# Step 3: Using the green economy framework as a strategic and holistic platform for planning take up and implementation

## Mapping 'green' transition paths for key policy sectors

Following the identification of key policy sectors in the context of a future green economy a detailed sector-specific assessment can be carried out for the identified sectors. Using information from **Step 1** and **Step 2** as the starting point the assessment focuses on developing a plausible transition path for each identified sector.

The development of these pathways involves establishment of the following:

- ✓ **State-of-play:** sectors current level of sustainability (e.g. contribution to the conservation of ecosystems) and key identified assets supporting transition
- ✓ **Future goal:** objective for the greening of the sector or the new green sector
- ✓ **Future benefits:** foreseen contributions to different socio-economic priorities identified at national, regional and/or local scale (e.g. sectoral growth objectives, job creation, avoided risks and cost) and what is known about the scale of these benefits
- ✓ **Drivers for change:** which drivers can be identified that now or in the future can support a shift towards green economy within the sector?
- ✓ **Barriers to progress:** which barriers can be identified hindering the change (e.g. lack of funding, lack of capacity, social barriers / norms)
- ✓ **Indicators of change:** indicators for assessing the progress toward greening within the sector

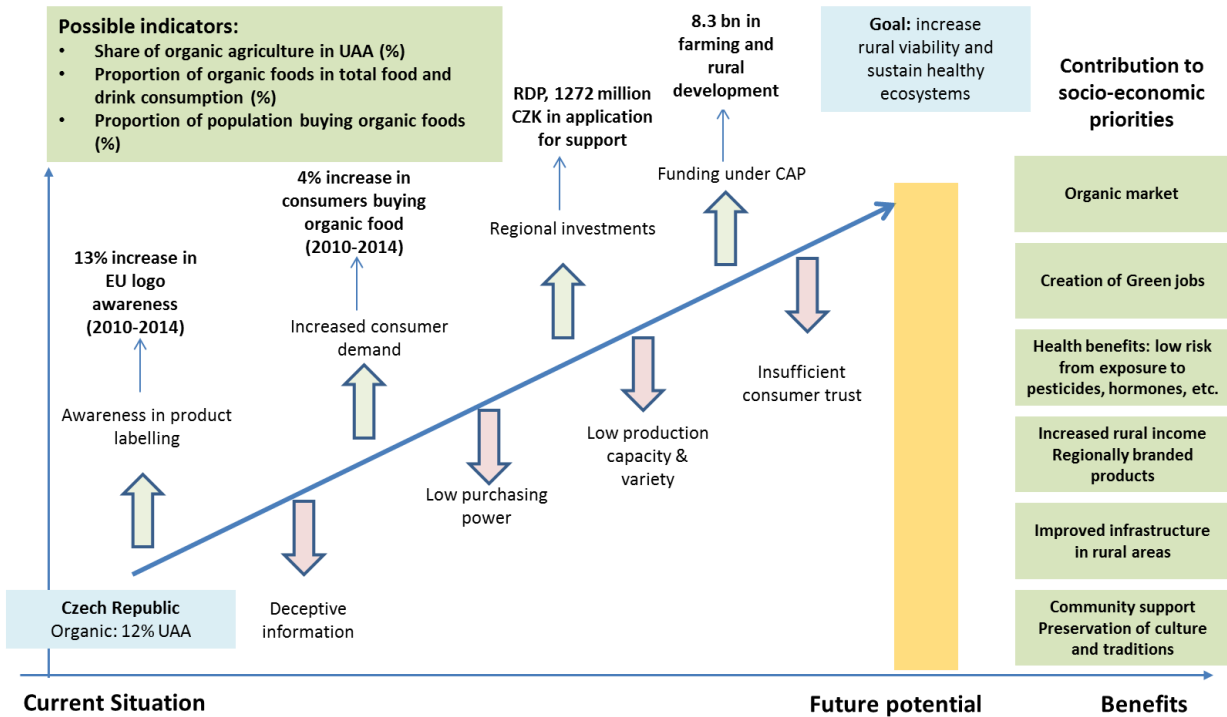
A range of illustrative pathways for different sectors across the EU countries are provided in Figure 2 and Annex 1<sup>10</sup>.

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<sup>10</sup> Adopted from ten Brink et al. (2017) Linking Biodiversity to National Economic and Social Priorities in the EU Member States, a project for the European Commission

## Policy sector: agriculture → towards agro-ecology based agriculture

Example country: Czech Republic



## Policy sector: public health → towards nature-based solutions for health

Example country: Latvia

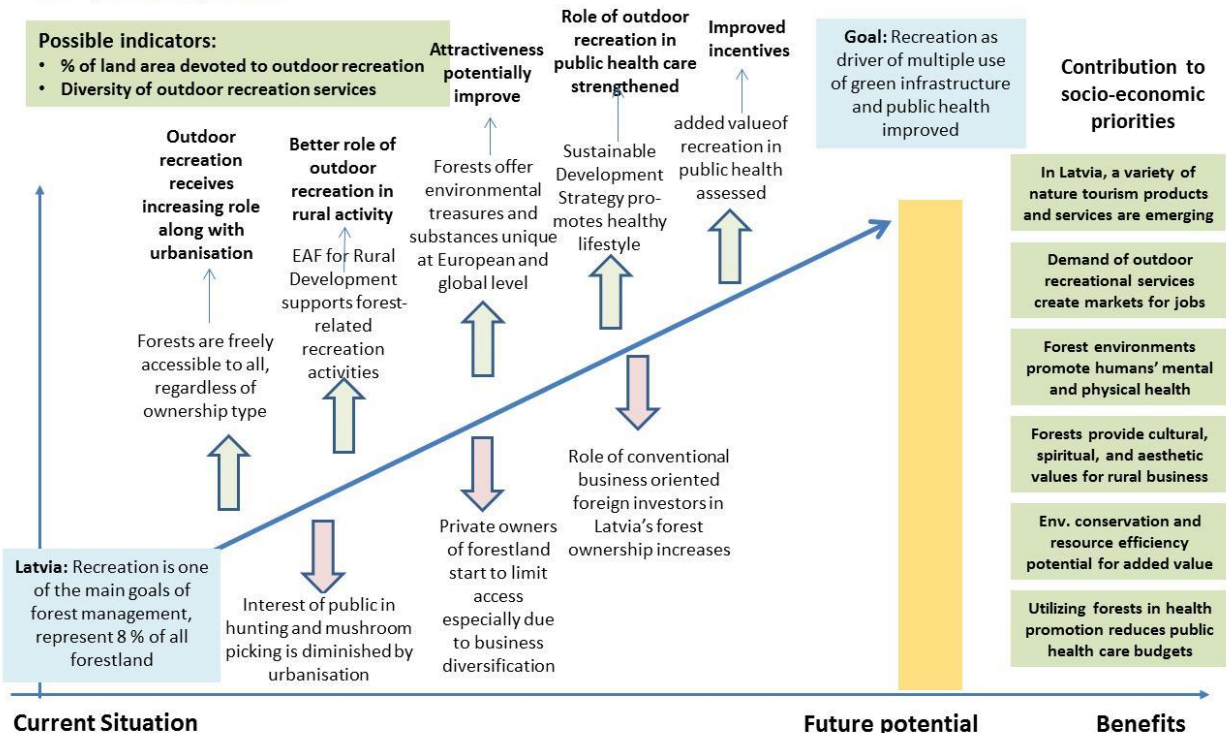


Figure 2 Illustrative transition pathways for the agriculture and public health sectors, based on assessments from different EU Member States. Adopted from ten Brink et al. (2017)



## Developing sector-specific plans for 'green' transition

Building on the identification and development of transition pathways, dedicated sector-specific transition plans can be developed. The aim of these plans is to outline the foreseen required policy actions supporting sectoral integration at different levels (conceptual, operation and implementation) and exploring the use of different possible policy instruments (information, decision-support and implementation), including developing a concrete timeline for key developments (e.g. engagement with stakeholders and institutions) (Figure 3).

The transition plan is recommended to take place in the context of sectoral policy implementation cycles (Figure 4), this way allowing for the application of different ecosystem services policy instruments (e.g. instruments knowledge and information) to be used in a systematic manner across the whole governance cycle, from policy and decision framing, to formulation, negotiation, implementation and review (Figure 4).

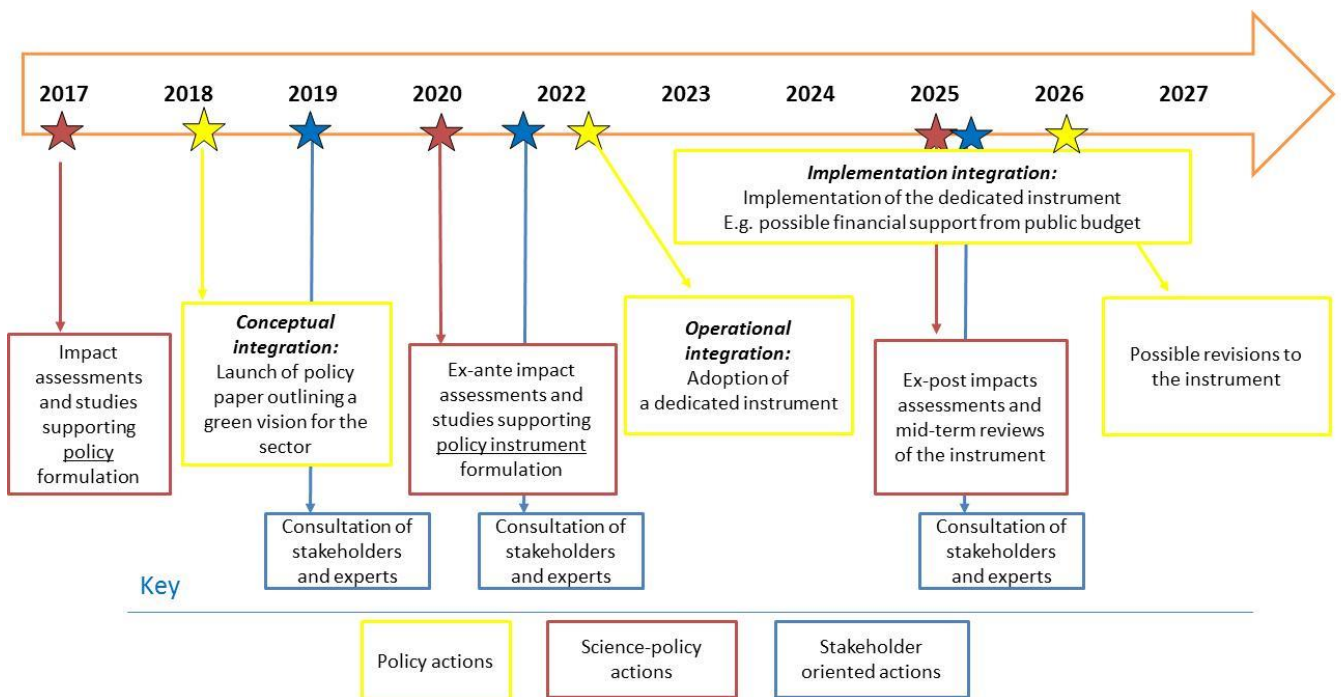


Figure 3 Mapping an illustrative timeline for the integration of ecosystem services and natural capital within a policy sector

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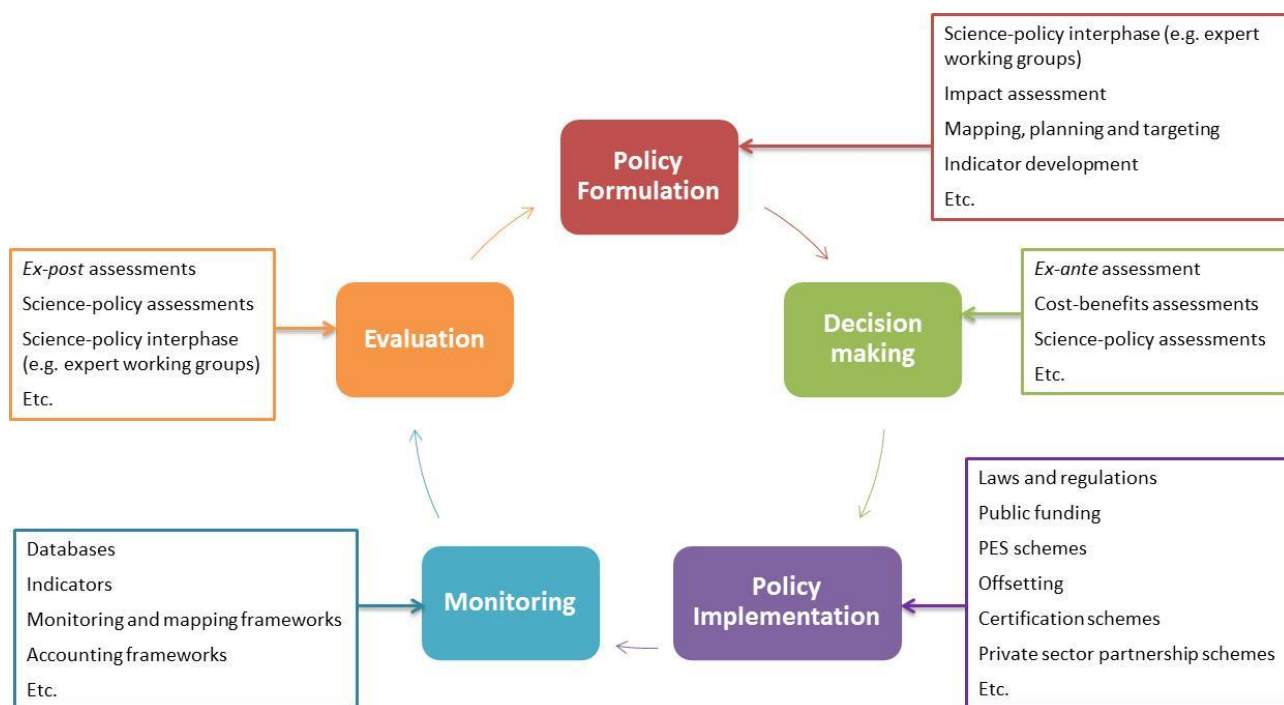


Figure 4 Application of different policy instruments in the context of sectoral policy cycle to support the integration of ecosystem services and natural capital

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## Developing a strategic plan for a shift towards green economy

In order to use the sectoral policy assessments to support the broader national, regional or local shift to a green economy, the outcome of the assessment need to be strategically mapped against the different possible pathways for green economy. This will form the basis for developing an approach towards green economy at national, regional or local level.

The transition to a green economy can take different development paths and happen on different scales, depending on an area's natural assets, economy and society, and priorities. Regardless of the path taken, ecosystem services and natural capital are key drivers in the transition starting with making the costs related to the loss of biodiversity and ecosystem services an integral part of the functioning of economic systems and pro-actively encouraging the uptake of opportunities provided by nature-based solutions and “green” jobs and innovations. This further provides a basis for improving the resource efficiency and long-term sustainability of different policy sectors.

In general, six possible pathways reflecting the level of ambition can be identified (Figure 2 and below). Depending on the sector specific circumstances (opportunities, needs, bottlenecks) different

pathways can be chosen for the identified key sectors, ranging from more business-as-usual approaches to pro-active uptake of nature-based solutions. The pathways are not mutually exclusive and one or more pathways can be applied within a sector, either over a period of time (e.g. starting with business-as-usual approaches and moving onto more pro-active policies) or concurrently (e.g. identifying areas for forward-looking pioneering initiatives within the broader policy regime).

**Avoiding unsustainable trade-offs:** The bottom-line for a transition to a green economy is formed by policy approaches that are aimed at minimising losses and avoiding inappropriate trade-offs between ecosystem services, both within and between sectors. This can be done through understanding the whole picture of winners and losers of a given decision (e.g. mapping the beneficiaries of ecosystem services) and the associated environmental, economic and social impacts over time and in a given location, including international impacts (e.g. associated with traded goods).

**Environmental compliance and infrastructure:** Investing in environmental infrastructure to comply with legislation and regulation can be considered to form a basis for green economy transition. These measures include, for example, water supply and waste water infrastructure to meet water quality standards, and waste infrastructure and air pollution control measures to meet emission and air quality standards. These approaches have been frequently taken both by the private and public sectors.

**Active risk management:** Proactive approaches to environmental risk management, which build on a wider appreciation and understanding of risks, form the next step in the transition. Such approaches include, for example, flood control based on risk mapping that understands the wider river basin dynamics and control of invasive alien species building on detailed taxonomy research of the species.

**Proactive investment in natural capital:** Investment in natural capital and nature-based solutions via restoration, conservation and improved management practices provides another proactive avenue for a transition to green economy. This includes, for example, the development of networks of protected areas, restoration of peatlands for carbon storage and other co-benefits, restoration of flood plains or afforestation for flood control.

**Eco-efficiency:** Measures and policies supporting eco-efficiency and wider resource efficiency across policy sectors are seen as one of the most comprehensive means to support the transition. This includes, for example, adjusting water or other resource pricing to reflect the true costs to the environment and wider environmental fiscal reform to incentivise efficient resource use via products, process and ambient standards, labelling and consumer information and positive incentives.

**Decoupling:** Finally, decoupling the economy from resource use and its negative impacts through more radical innovation and changes in demand is the ultimate step toward green economy. This

can include new clean products and processes building on biodiversity and ecosystem services such as genetic resources (e.g. pharmaceutical sector and plant based cancer treatment) and biomimicry (e.g. floor tiles and waste, architecture and natural cooling).

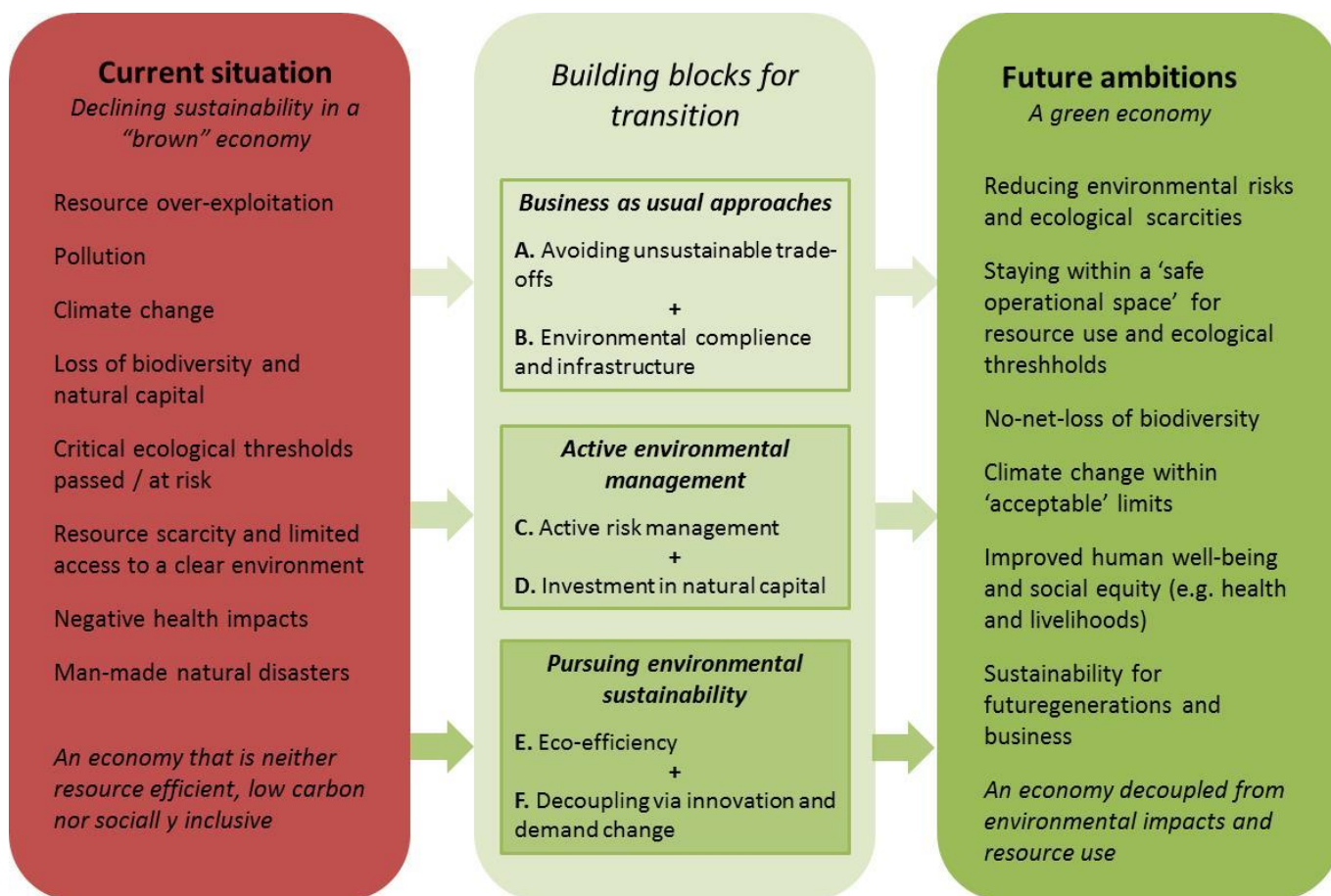


Figure 5 Strategic pathways for a transition to a green economy  
 Adopted from ten Brink et al. 2012<sup>11</sup>

<sup>11</sup> ten Brink P., Mazza L., Badura T. and Kettunen M. 2012. Nature and its Role in the Transition to a Green Economy. TEEB-UNEP, Geneva. 68 p. + Annexes.

# Examples of application

## Assessment of current level of integration in Scotland

Scotland is an environmentally diverse country that faces many of the challenges encountered across Europe within one relatively small country. The analysis aimed to explore how explicit and comprehensive the Scottish policy framework was in taking into account, sustaining and improving the benefits that humans derive from ecosystems. It also compared the level of national integration (and political ambition) to the level of integration at the EU level, reflecting the role of the EU as a driver behind sectoral integration.

The analysis encompassed eight policy sectors identified to be particularly relevant for Scotland: the environment, split up between its air, soil and water components, a broad category including agriculture, rural development and land use, forestry, fisheries and coastal matters, climate change, and finally bioenergy.

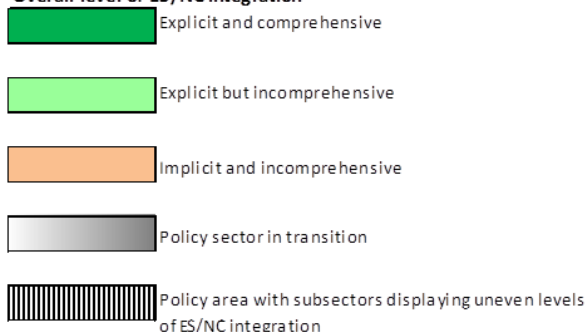
Figure 6 below illustrates the overall, summarised performance of Scotland across these eight policy areas.

In most of the eight sectors assessed, Scotland does as well as the EU if not better. Most of the time because Scottish policymakers have committed to provisions presented as optional in European action plans. However, a number of them are in a transitional state, as strategic policies are still in the process of being translated into concrete norms, projects and practices depending on policy cycles and agendas in each area. The pace at which water environment policy integrates ecosystem services and natural capital depends on how the River Basin Management Plans review and implementation processes are timed. In the case of soil policy, significant changes are ongoing due to the relatively recent rise of soil ecological quality as a public issue. Such examples call for continued monitoring of these policy sectors. Discrepancies between the various aspects of climate and land use policy also illustrate the limits of considering such broad policy areas as relevant units for analysis.

The operational integration of ecosystem services and natural capital is often significantly more limited than conceptual uptake despite the voluntarism of Scottish authorities. Gaps in available and accessible data and more generally in the evidence base for the design of appropriate instrument is a recurring theme in policy.

	Environment: Air	Environment: Soil	Environment: Water	Agriculture & Rural Dvpt	Forest	Marine/coastal environment, fisheries	Climate	Bioenergy
Conceptual integration	+	=	-	=	=	=	=	-
Operational integration	+	+	=	+	+	+	+	+

**Overall level of ES/NC integration**



**Comparison with EU policy**

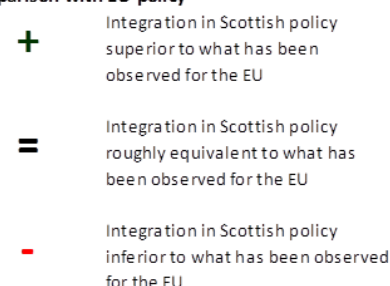


Figure 6 Current level of the integration of ecosystem services and natural capital into sectoral policies in Scotland

## Assessment of the current level of integration in the Lower Danube Basin

The Lower Danube is one of the last free flowing stretches of the river in Europe. Its ecosystems provide multiple benefits. The range of all these benefits is not yet fully evaluated and recognised, giving prevail of economic factors in decision-making at the expense of ecosystem and social ones. The local level questionnaire was carried out at local level in Pleven town, distributed at a stakeholder meeting and filled in by 18 respondents.

The objective of the sectoral integration assessment was assess the level of integration, relevance and effectiveness of existing policy framework and instruments on the enhancement of freshwater ecosystem services and natural capital focusing on the freshwater ecosystem in the Lower Danube Basin.

As a part of the assessment, a dedicated stakeholder mapping and questionnaire was undertaken, focusing on the Bulgarian national stakeholders, to identify drivers and barriers in ES conceptual adoption. Stakeholder questionnaires were conducted at two levels – national and local – to assess the level of understanding of ecosystem services and natural capital, use of concepts and major gaps and solutions for better integration and application of ecosystem services. 12 responses were

received by national stakeholders – from the environmental sector, the Ministry of Environment and Water, the Ministry of Justice, the Forestry University, NGOs, independent experts dealing with ecosystem services.

Based on the analysis and the stakeholders input the following conclusions and recommendations can be drawn:

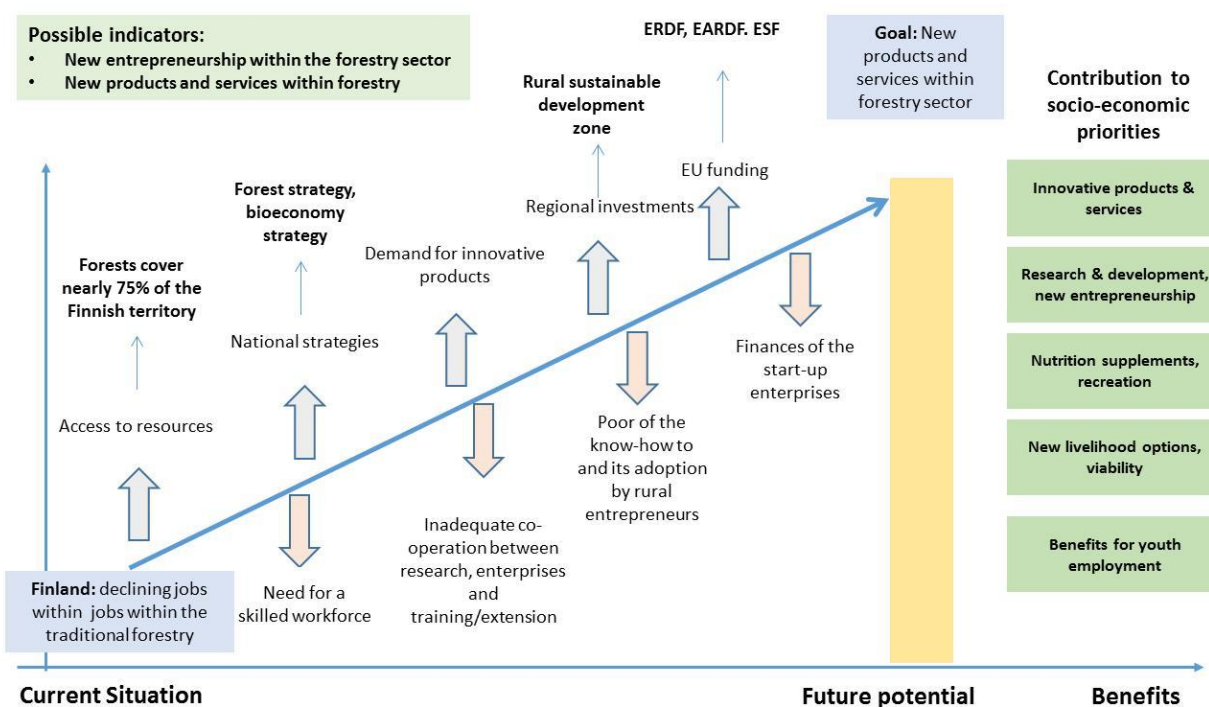
- ✓ The ecosystem service framework is being incrementally implemented and supported by financing instruments by the 2014-2020 Bulgarian programs (notably the rural development), with explicit intent, but without comprehensive, impact-based interventions;
- ✓ Institutional stakeholders, esp. in central and park authorities have to develop capacity and execute specific functions related to ecosystem services assessment and management, but face significant challenges in interpreting and delegating responsibilities related to these functions;
- ✓ All stakeholders state desire for improved information and awareness about the different ecosystem services approaches, programmatic objectives and management regimes;
- ✓ There is insufficient knowledge and awareness about some types of ES instruments – particularly ecosystem services mapping and economic instruments, beyond basic currently applied ones;
- ✓ National science and academic stakeholders have insufficient impact on the process of conceptualizing and developing ecosystem services approaches and instruments, and need to be informed and engaged in this scoping process to a greater degree.

# Annex I: EXAMPLE - Sector transition pathways in different EU Member States

Illustrative transition pathways for different sectors based on assessments from different EU Member States. Adopted from ten Brink et al. 2017<sup>12</sup>

## Policy sector: forestry → towards sustainable forestry

Example country: Finland

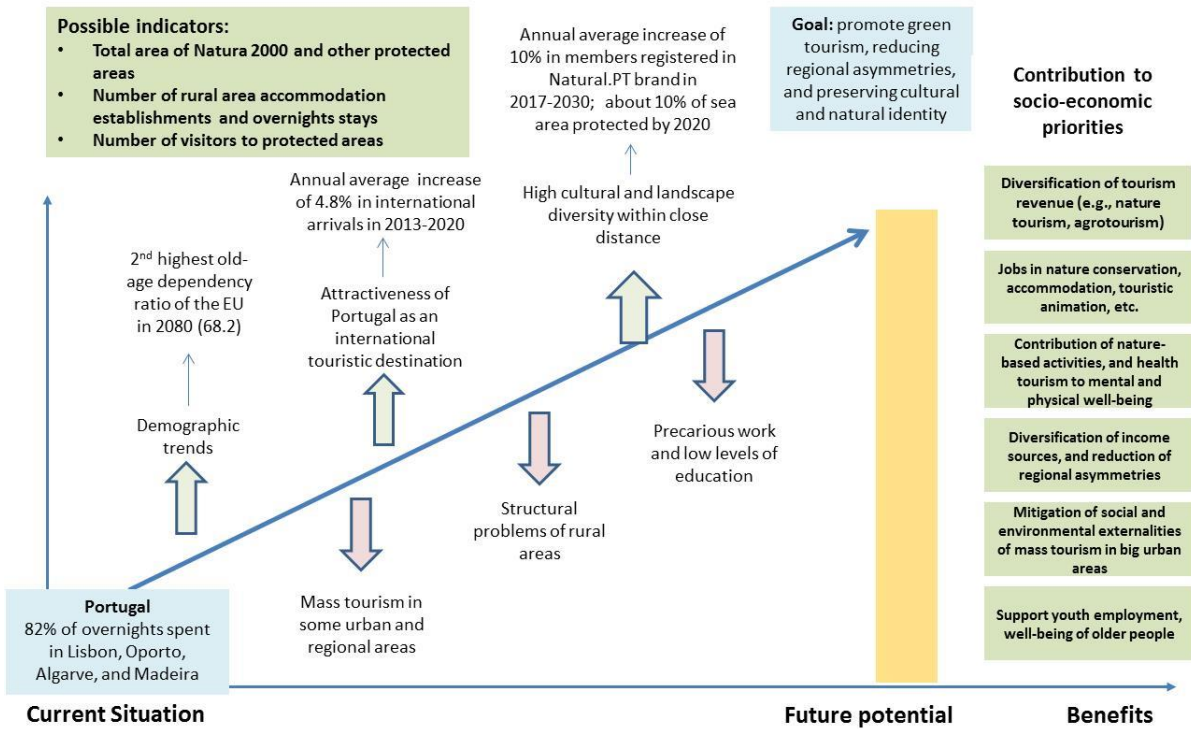


<sup>12</sup> Adopted from ten Brink et al. (2017) Linking Biodiversity to National Economic and Social Priorities in the EU Member States, a project for the European Commission



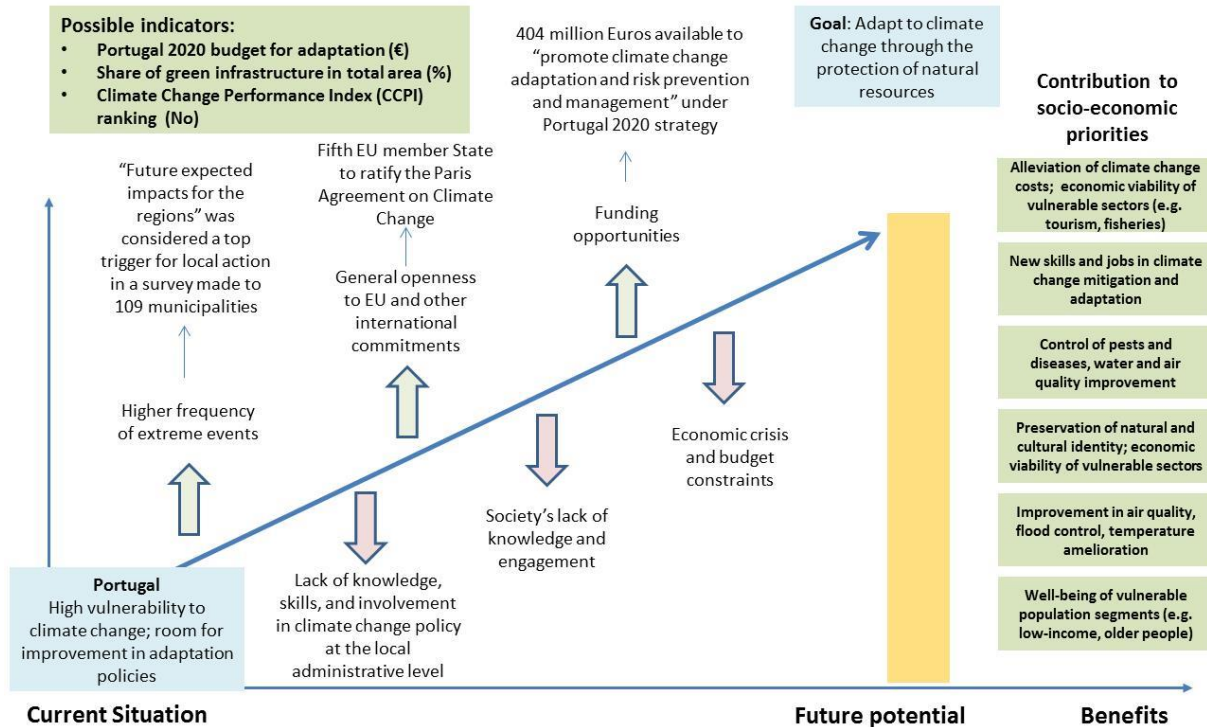
## Policy sector: tourism → towards ecotourisms

Example country: Portugal



## Policy sector: climate → towards nature-based climate adaptation

Example country: Portugal



# Policy sector: fisheries → towards sustainable fisheries

Example country: Spain

